

NRL 324-m³ Chamber Pressurization Experiment: Pressurant Concentration Histories With and Without Obstacles to Flow

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NRL 324-m³ CHAMBER PRESSURIZATION EXPERIMENT: PRESSURANT CONCENTRATION HISTORIES WITH AND WITHOUT OBSTACLES TO FLOW

INTRODUCTION

Gas-mixing and scale-modeling studies continue in the new 324-m³ fire-test facility at the Naval Research Laboratory (NRL). These studies extend previous studies conducted in the NRL 5-m³ chamber and in its one-sixth-scale model at the University of Washington (UW). We explore further the concept of suppressing unwanted fires in pressurizable spaces by injection of nitrogen gas as proposed by Carhart and Fielding [1]. The chamber of this new facility is of sufficient size to allow realistic full-scale tests. Objectives of these tests were to place the new facility in operation, to infer pressurant gas-concentration histories from temperature (thermocouple) measurements during chamber pressurization from 1 to 2 atmospheres (101.3 to 202.6 kPa), and to present results in a convenient form consistent with the Corlett et al. scale-modeling hypothesis [2].

In this report, we describe the 324-m³ chamber, its nitrogen pressure system, and experiments both with and without obstacles to flow, and we then present the reduced data.

DESCRIPTION OF EQUIPMENT

Figure 1 shows a view of the 324-m³ facility as one looks to the southwest. The steel pressure vessel lies horizontally on two concrete piers; design pressure is 5 atmospheres (507 kPa) according to the ASME Unfired Pressure Vessel Code. The chamber was tested hydrostatically at 7.65 atmospheres (775 kPa); 324.2 m³ of water filled the vessel. Its inside diameter is 5.85 m and its length is 14.82 m. The cylindrical section is 8.35 m long. Installed in the center of the north hemispherical end is a 457-mm-diameter pressure-relief device. The disk design rupture pressure is 5 atmospheres for temperatures to 260°C. A catwalk attaches around the vessel on all sides but the north, providing convenient access to the seven viewports, three on the east and four on the west. Above these viewports, four nitrogen pressure cylinders are mounted symmetrically. Each cylinder is 8.534 m long and each has a 0.610-m diameter. Each has a volume of 2.088 m³ and a design pressure of 122 atmospheres (12.36 MPa). A nitrogen tube trailer shown in the right foreground of Fig. 1 supplies nitrogen gas, beginning at 233 atmospheres (23.61 MPa), to the four pressure cylinders, which normally are charged to 100 atmospheres (10.13 MPa). Just west of the chamber, and behind the tube trailer, the instrument trailer appears. It houses all instruments, data collection devices, and control devices. Facing the instrument trailer, but not visible in Fig. 1, is a walk-in hatch, centered in the west side of the chamber, which provides chamber access.

Nitrogen Pressurization System

Figure 2 is a schematic of the high-pressure piping system typical of each nitrogen pressure cylinder. For convenience, only one pressure cylinder and the north manifold are shown. Both cylinders on the west side connect to the north manifold, while the two cylinders on the east side connect to the south manifold. Flow is controlled from either or both ends of a cylinder to its manifold by a manual valve and an actuated 2-in. (5-cm) valve in series. Four pipes from each manifold extend into the chamber, so that a nozzle exit is located 1.170 m from the top inside surface of the chamber

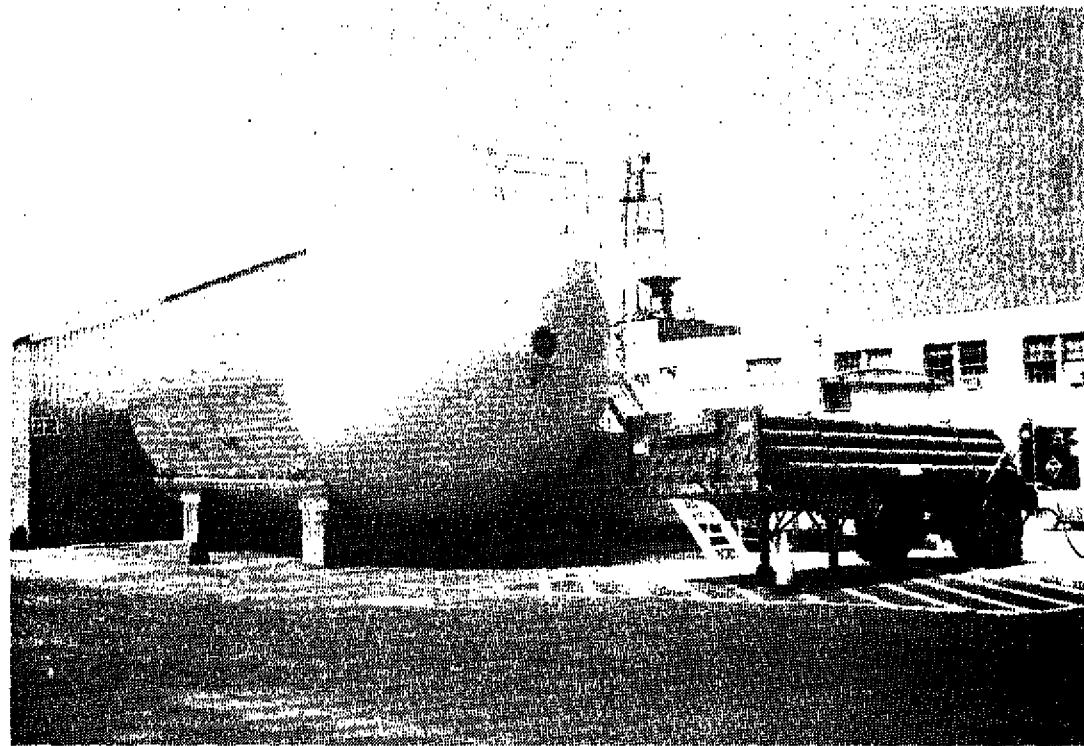


Fig. 1 — The NRL 324-m³ fire chamber facility

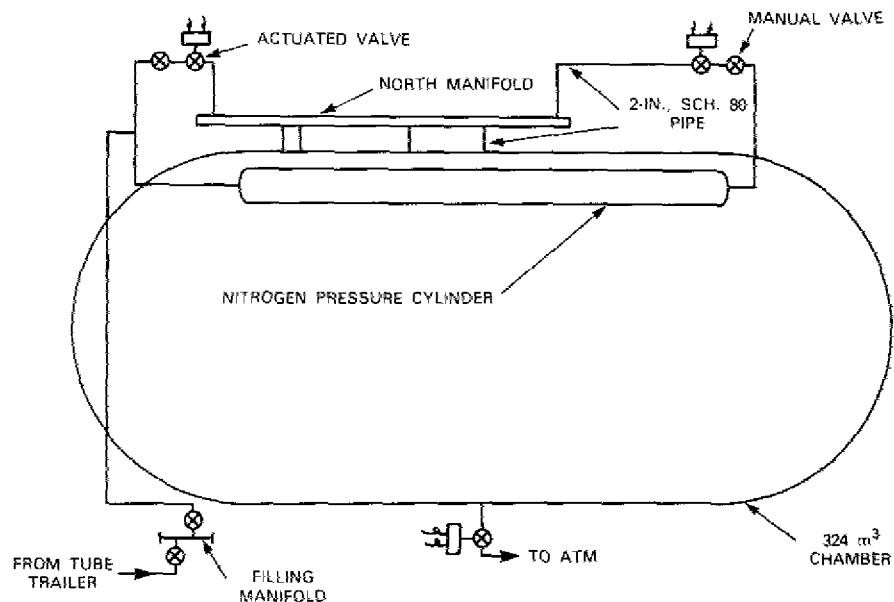


Fig. 2 — Typical high-pressure piping for each of the four nitrogen pressure cylinders

and is directed vertically downward on a line normal to the chamber axis. The four pipes from each manifold are located along the chamber length so that either a three-nozzle or a four-nozzle array (equally spaced) can be selected. Pipe extensions without nozzles are capped. The high-pressure steel pipe is 2-in. (5-cm), schedule 80. Nozzle flow calibration is possible since an ASTM, thin-plate, square-edged orifice [3] connects between the north and south manifold.

Nozzles

Figure 3 shows a nozzle assembly view. Nozzles connect to the 2-in. pipe extensions. The high-density polyethylene liner minimizes heat flow to the nitrogen gas stream and thus maximizes the temperature difference between the injected pressurant gas and the chamber resident gas. In this system flow in each nozzle throat remains critical [4] during chamber pressurization.

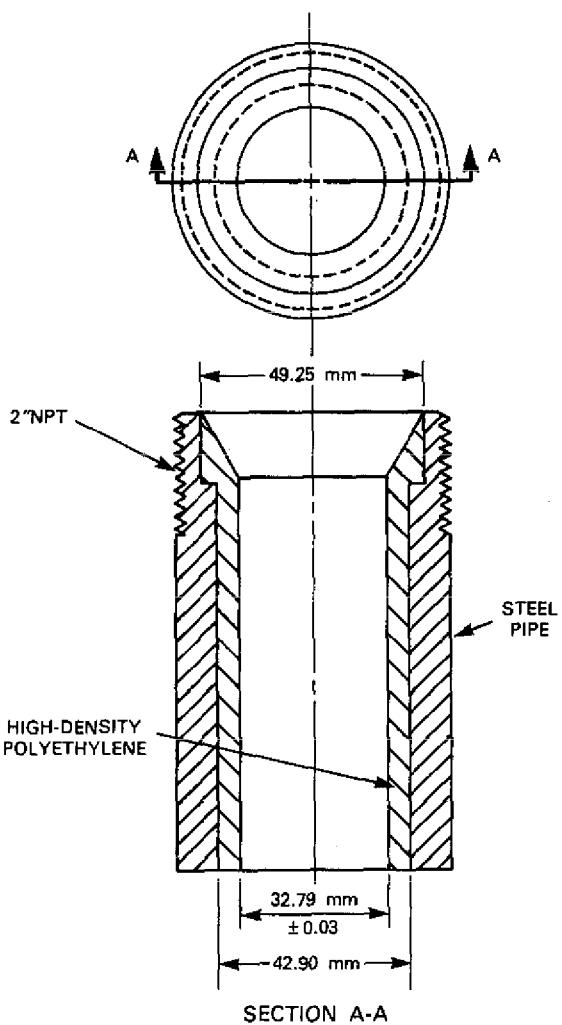


Fig. 3 — Sectional view of nozzle assembly

Thermocouple and Nozzle Locations

In Fig. 4, we show the two positions of the 13-thermocouple array. Position 2 is along the chamber centerline, while position 1 is displaced laterally 0.6 of the distance to the chamber wall and is in the upper northwest quadrant of the chamber. If the $z = 0$ plane bisects the chamber normal to its axis and positive z -values are to the north and negative ones to the south, then the cylindrical r - and θ -coordinates for position 2 are 0.000 m and 0° , respectively; for position 1 they are 2.017 m and 45° , respectively. The z -coordinates for each of the 13 thermocouples remain the same for both positions, i.e., $z = z_I$, where $I = 1, \dots, 13$, and the 13 z -coordinates are, respectively, -0.586, -0.293, 0.000, 0.293, 0.586, 0.878, 2.049, 2.342, 2.635, 2.928, 3.220, 3.513, and 3.806 m. The thermocouples are bare-wire chromel-alumel, 0.10 mm in diameter, with time constants of less than 0.2 s.

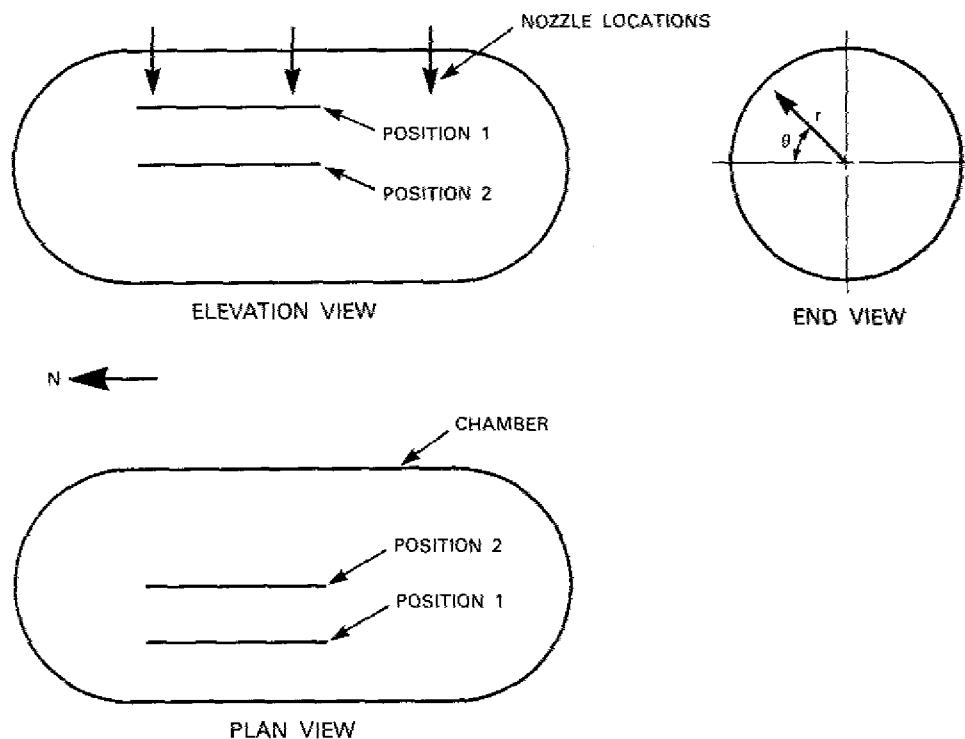
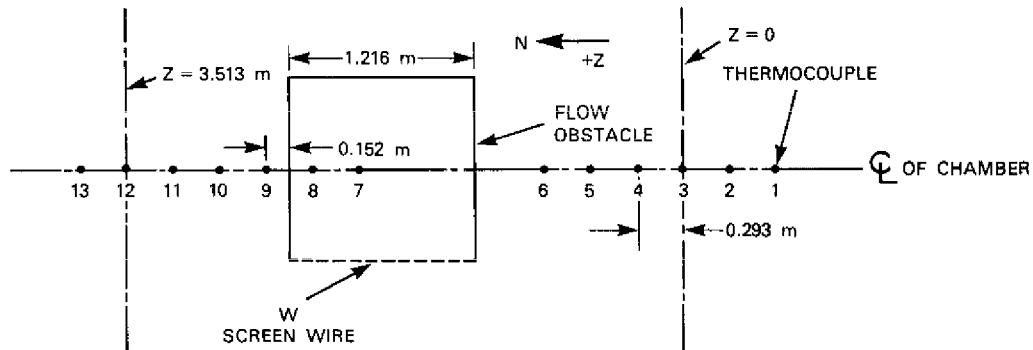


Fig. 4 — Schematic showing the two positions inside the chamber of the 13-thermocouple array: position 1 is off center; position 2 is along the chamber centerline. Three nozzle locations are also shown.

When three nozzles are used, they are located in the three vertical planes $z = +1.216$, 0.0, and -1.216 m, with nozzle exits directed downward normal to the chamber axis and positioned 1.170 m below the top of the chamber wall. The south nozzle is in the plane $z = -1.216$ m.

Flow Obstacle

Figure 5 is a plan-view sketch that shows the location of the flow obstacle in the chamber. The obstacle is a metal cabinet, 1.216 m wide by 1.216 m deep by 2.667 m high, with the top, bottom, and three sides closed. The fourth side is covered with a screen wire that has 15 openings per 25.4 mm with 0.25 mm wire diameter; the screen side is shown in Fig. 5 facing to the west. In the experiments, it also faced to the north. The top of the cabinet extends 0.686 m above the chamber centerline, along which the 13 thermocouples are positioned.



PLAN VIEW

Fig. 5 — Plan-view schematic of chamber interior giving obstacle location and thermocouple / locations for position 2 relative to the vertical plane $z = 0$

EXPERIMENTAL PROCEDURE

The procedure used for experiments without the flow obstacle (uncluttered) and the procedure used with the flow obstacle (cluttered) are described as follows.

Without Flow Obstacle (Uncluttered)

The same procedure was repeated in each of two sets of runs with no flow obstacle. There were seven replicate runs in set 1 and four in set 2 (see Table 1). For set 1, the thermocouple array was in position 1; for set 2, it was in position 2. Three pressure cylinders charged to about 100 atmospheres were used in each set. The two west cylinders fed nitrogen gas to the north manifold, and one east cylinder fed the south manifold. Flow was from both ends of each cylinder. The north manifold fed two nozzles (north and center) while the south fed the third (south). The z -coordinates for the north, center, and south nozzles were 3.513, 0.000, and -3.413 m, respectively.

Table 1 — Description of Experiments

Experimental Set Number	Scaling Run Numbers	Number of Runs	Thermocouple Position Number	Nozzles Used	Clutter Condition	Obstacle Screen Position	Numbers of A- and B-Tables
1	230-236	7	1	3	Unclut.	—	2-8
2	237-240	4	2	3	Unclut.	—	9-12
3	241-244	4	2	1 (South)	Cluttered	West	13-16
4	245-248	4	2	1 (South)	Cluttered	North	17-20

Data collection was started 30 s prior to the start of a run. A run was started by the simultaneous opening of the appropriate six activated valves. Nitrogen gas flowed into the chamber until its pressure increased from 1 to 2 atmospheres, requiring about 12 s. The valves were then closed. Data collection continued for a total of 300 s. Seventeen channels of data were recorded by two data loggers (Doric-Digitrend 200) as follows:

- 13 channels for the thermocouple array,
- 2 channels for pressurant gas supply temperatures,

1 channel for chamber pressure, and
1 channel for nitrogen cylinder pressures.

Data loggers scanned each channel twice per second. Loggers were controlled in parallel so that each agreed in time.

With Flow Obstacle (Cluttered)

Two sets (3 and 4), of four replicate runs each, were made with an obstacle (see Table 1). The same procedure was used as described above, with the following exceptions. The thermocouple array was used only in position 1 and only the south nozzle was used. The south manifold was fed nitrogen by three pressure cylinders, the two east cylinders and one west cylinder. The chamber was pressurized to 2 atmospheres in about 30 s. For set 3, the screened side of the obstacle faced west; for set 4, it faced north.

EXPERIMENTAL RESULTS

Detailed data for the four sets of experiments listed in Table 1 are presented in a comprehensive series of five tables, A, B, C, D, and E. The information found in each comprehensive table is described below prior to discussion of the data.

A-Tables

Tables 2A to 20A, called A-tables, present temperature histories at 1-s intervals, as determined by the 13-thermocouple array at each *I*-Location, 1 through 13. Interior chamber coordinates of each *I*-location are given by the subtable located in the upper right-hand corner of the A-tables. In addition, the first four columns in the A-tables, respectively, give:

- (1) Time in seconds with $t = 0$ corresponding to the time the activated-valve switch is thrown to open.
- (2) Nitrogen pressure cylinder pressures in atmospheres.
- (3) Pressurant gas supply temperature at nozzle exit in K.
- (4) Chamber pressure in atmospheres.

Each A-table is programmatically produced (see Appendix A) from the two magnetic data tapes obtained during the experimental run. Accordingly, A-tables are produced for all the runs in each set.

Table 2A — Scaling Run 230: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time <i>t</i> (s)	Press Cyl	<i>T_s</i> (K)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations <i>I</i>													COORDINATES		
				1	2	3	4	5	6	7	8	9	10	11	12	13	I (M)	R (DEG)	Z (M)
-5	***	***	1.002	285.2	284.0	283.9	285.0	285.0	285.1	283.2	283.2	284.2	284.2	284.2	284.2	283.2	1	1.756	45 -0.586
-4	***	***	1.002	285.2	284.0	283.9	285.0	285.0	285.2	283.2	283.2	284.2	284.2	284.2	284.2	283.2	2	1.756	45 -0.293
-3	***	***	1.002	285.2	284.0	283.9	285.0	285.0	285.1	283.2	283.2	284.2	284.2	284.2	284.2	283.2	3	1.756	45 0.000
-2	***	***	1.002	285.2	284.0	283.9	285.0	285.0	285.1	283.2	283.2	284.2	284.2	284.2	284.2	283.2	4	1.756	45 0.293
-1	***	***	1.002	285.9	284.3	283.9	285.3	285.3	286.4	283.2	283.2	284.2	284.2	284.2	284.2	283.2	5	1.756	45 0.586
0	3.64	262.0	1.055	292.9	290.6	289.2	291.2	292.4	293.6	285.7	287.2	288.2	287.2	288.7	287.2	286.7	6	1.756	45 0.878
177	0.75	257.6	1.185	298.4	296.3	295.7	297.5	298.5	298.6	291.2	292.2	294.2	293.2	294.2	293.2	293.2	7	1.756	45 2.049
270	4.42	234.3	1.304	301.5	299.3	299.4	300.8	301.5	301.9	296.2	296.2	297.2	297.7	297.7	297.2	297.2	8	1.756	45 2.342
364	4.15	252.2	1.413	303.5	301.3	301.6	302.6	303.1	302.7	299.2	300.2	300.2	300.2	299.2	299.2	299.2	9	1.756	45 2.635
459	1.87	250.4	1.509	303.9	302.8	302.4	303.7	304.0	304.1	300.2	300.7	301.7	301.7	302.2	301.2	301.2	10	1.756	45 2.928
554	4.35	247.9	1.597	303.1	303.5	303.6	304.3	304.5	304.7	303.2	302.2	303.2	303.2	304.2	303.2	302.2	11	1.756	45 3.220
650	2.14	244.3	1.678	305.5	305.0	304.8	305.5	305.4	305.4	303.2	302.2	303.7	303.7	303.7	303.7	303.7	12	1.756	45 3.513
746	4.90	241.6	1.753	305.8	304.5	304.7	305.3	305.2	305.4	303.2	303.2	304.2	303.2	303.2	303.2	303.2	13	1.756	45 3.806
844	0.95	239.2	1.798	306.2	304.7	304.5	305.3	305.3	305.5	303.2	302.2	304.2	304.2	304.2	304.2	303.2			
940	8.64	236.7	1.863	306.2	304.7	304.3	305.7	305.6	305.5	303.7	302.7	304.2	304.2	303.7	303.2	303.2			
1037	9.86	232.6	1.922	305.5	304.5	304.5	305.4	304.9	304.9	303.2	302.2	303.2	304.2	304.2	304.2	304.2			
1136	9.39	196.3	1.966	304.8	303.4	303.7	304.5	304.2	304.4	301.7	301.7	302.7	302.7	303.7	302.7	302.7			
1237	5.24	164.7	1.976	303.5	301.9	302.1	303.0	302.8	302.8	301.2	301.2	302.2	302.2	302.2	302.2	302.2			
13	***	***	1.975	302.5	300.9	300.9	302.1	302.0	302.0	300.7	300.2	302.2	302.2	302.2	302.2	302.2			
14	***	***	1.973	302.4	301.0	301.0	302.2	301.7	302.0	300.2	300.2	301.2	302.2	302.2	302.2	302.2			
15	***	***	1.971	302.3	300.9	300.8	301.8	301.4	301.6	300.2	300.2	301.2	301.2	302.2	302.2	302.2			
16	***	***	1.970	301.7	300.2	300.4	301.4	301.2	301.0	300.2	300.2	301.2	301.2	302.2	302.2	301.2			
17	***	***	1.969	301.0	300.0	300.0	301.0	300.8	300.9	300.2	300.2	301.2	301.2	301.2	301.2	301.2			
18	***	***	1.967	300.9	299.7	299.9	301.0	300.6	300.6	299.2	299.2	300.2	300.2	301.2	300.7	300.2			
19	***	***	1.966	300.2	299.3	299.2	300.2	300.2	299.8	298.2	299.2	299.2	300.2	300.2	301.2	300.2			
20	***	***	1.965	299.8	298.8	298.4	299.3	299.6	299.8	299.2	299.2	300.2	300.2	300.2	300.2	299.2			
25	***	***	1.960	299.2	298.0	298.2	299.5	300.1	300.0	298.2	297.2	299.2	299.2	300.2	299.2	298.2			
30	***	***	1.956	299.1	298.0	298.0	299.0	298.8	299.0	297.2	297.2	298.2	298.2	299.2	299.2	298.2			
35	***	***	1.953	298.7	297.7	297.5	298.5	298.5	298.7	297.2	297.2	299.2	299.2	299.2	299.2	298.2			
40	***	***	1.950	298.2	297.1	297.2	298.2	298.3	298.5	297.2	297.2	298.2	298.2	299.2	299.2	298.2			
45	***	***	1.948	298.1	296.9	297.3	298.2	298.2	298.4	297.2	297.2	298.7	299.2	299.2	298.2	298.2			
50	***	***	1.945	297.7	296.9	297.0	298.0	298.1	298.1	297.2	297.2	298.2	298.2	299.2	297.2	297.2			
55	***	***	1.943	297.7	296.8	296.5	297.7	297.8	297.9	296.2	296.2	297.2	297.2	298.2	298.2	297.2			
60	***	***	1.942	297.8	296.7	296.0	297.3	297.4	297.5	296.2	296.2	297.2	297.2	298.2	296.2	297.2			
65	***	***	1.940	297.7	296.4	296.1	296.7	297.2	296.9	296.2	296.2	297.2	297.2	297.2	294.2	297.2			
70	***	***	1.938	297.4	296.1	295.4	295.8	296.9	296.9	296.2	296.2	297.2	297.2	296.2	294.2	296.2			
80	***	***	1.936	297.3	295.5	295.9	296.0	296.8	296.8	295.2	295.2	296.2	296.2	296.2	294.2	296.2			
90	***	***	1.933	296.7	295.2	295.1	296.2	296.2	296.4	295.2	295.2	296.2	296.2	296.2	294.2	295.2			
100	***	***	1.931	295.7	294.6	294.5	296.0	296.2	296.3	294.2	294.2	296.2	296.2	295.2	294.2	295.2			
110	***	***	1.929	296.0	294.7	294.6	294.0	295.7	296.0	294.2	294.2	295.2	295.2	294.2	295.2	295.2			
120	***	***	1.927	295.9	294.6	294.6	295.5	295.5	295.6	294.2	294.2	295.2	295.2	295.2	293.2	294.2			
130	***	***	1.925	295.7	294.4	294.5	295.5	295.6	295.5	294.2	294.2	295.2	295.2	294.2	293.2	294.2			
140	***	***	1.923	295.4	294.2	294.3	295.2	295.1	295.2	294.2	293.2	294.2	294.7	294.2	293.2	294.2			
150	***	***	1.921	295.1	293.9	294.0	295.2	295.0	294.9	294.2	293.2	294.2	294.2	294.2	292.2	294.2			
160	***	***	1.920	295.0	293.8	293.9	294.8	294.8	294.8	293.2	293.2	294.2	294.2	294.2	293.2	293.2			
170	***	***	1.918	294.8	293.5	293.4	294.2	294.5	294.1	293.2	293.2	294.2	294.2	294.2	293.2	293.2			
180	***	***	1.917	294.2	293.1	293.2	294.2	294.2	294.2	293.2	293.2	294.2	294.2	294.2	293.2	293.2			
190	***	***	1.915	294.3	292.9	293.2	294.1	294.1	294.1	292.2	292.2	293.2	294.2	293.2	292.2	292.2			
200	***	***	1.914	294.1	292.8	292.9	293.9	293.8	293.9	292.2	292.2	293.2	293.2	292.2	292.2	292.2			
210	***	***	1.913	293.8	292.8	292.8	293.7	293.8	293.7	292.2	292.2	293.2	293.2	292.2	292.2	292.2			

Table 3A — Scaling Run 231: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time (s)	Press Cyl (atm)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES				
			1	2	3	4	5	6	7	8	9	10	11	12	13	I (m)	R (m)	THETA (DEG)	Z (m)	
-5	***	***	1.003	286.3	285.6	285.6	286.3	286.4	286.5	286.2	286.2	287.2	287.2	287.2	286.2	286.2	1.756	45	-0.286	
-4	***	***	1.003	286.6	285.6	285.6	286.5	286.5	286.2	286.2	287.2	287.2	287.2	287.2	286.2	286.2	1.756	45	-0.293	
-3	***	***	1.003	286.5	285.6	285.6	286.5	286.5	286.5	286.2	286.2	287.2	287.2	287.2	286.2	286.2	1.756	45	0.000	
-2	***	***	1.003	286.3	285.6	285.6	286.5	286.5	286.3	286.2	286.2	287.2	287.2	287.2	286.2	286.2	1.756	45	0.293	
-1	***	***	1.003	286.5	285.6	285.6	286.5	286.5	286.2	286.2	287.2	287.2	287.2	287.2	286.2	286.2	1.756	45	0.586	
0	483	307.1	1.003	287.3	285.9	285.6	286.7	286.9	287.9	286.2	286.2	287.2	287.2	287.2	286.7	286.2	1.756	45	0.878	
1	503	261.2	1.065	294.8	292.4	290.7	292.7	293.5	294.4	289.2	290.2	291.2	290.2	291.2	289.2	289.2	1.756	45	2.049	
2	497	257.1	1.195	299.5	298.1	297.8	298.8	299.0	298.4	293.7	295.2	296.2	294.7	295.7	294.7	295.2	1.756	45	2.342	
3	490	254.2	1.313	302.9	301.5	301.4	302.0	302.5	302.4	298.2	300.2	299.2	300.2	300.2	300.2	300.2	1.756	45	2.635	
4	490	251.8	1.418	304.5	303.6	303.2	303.8	304.3	304.8	301.2	301.2	301.7	302.2	302.7	301.7	301.7	1.756	45	2.928	
5	483	250.1	1.513	305.9	304.5	303.9	305.2	305.4	305.1	307.2	304.2	304.2	303.2	303.2	303.2	304.2	1.756	45	3.220	
6	483	247.4	1.600	306.8	304.7	304.7	305.2	305.4	305.5	304.2	304.2	305.2	305.2	305.7	304.7	305.2	1.756	45	3.513	
7	483	244.5	1.681	306.7	304.9	305.1	305.9	305.8	305.3	304.2	304.2	305.2	305.2	305.2	305.2	305.2	1.756	45	3.806	
8	480	240.5	1.754	306.3	304.9	305.6	306.4	306.6	305.3	305.2	305.2	306.2	305.7	305.7	305.2	305.7	1.756	45		
9	476	238.3	1.822	306.1	305.2	304.9	305.9	305.8	305.5	306.2	304.2	305.2	305.2	305.2	305.2	306.2	1.756	45		
10	476	235.9	1.884	305.7	304.7	304.7	305.7	306.0	306.2	305.2	304.7	305.2	305.2	304.7	305.2	305.2	1.756	45		
11	429	229.1	1.941	305.9	304.6	304.8	305.1	304.7	304.5	305.2	304.2	305.2	305.2	306.2	304.2	304.2	1.756	45		
12	429	180.2	1.976	303.8	303.5	303.8	304.6	304.6	304.4	304.2	303.7	304.7	304.7	304.7	304.2	304.2	1.756	45		
13	429	163.0	1.982	303.5	302.5	302.5	303.7	303.3	303.3	303.2	303.2	304.2	305.2	305.2	304.2	304.2	1.756	45		
14	***	***	1.980	303.8	301.8	302.1	303.5	302.9	302.9	303.2	303.2	304.2	304.2	304.2	303.7	303.7	1.756	45		
15	***	***	1.978	303.2	301.4	301.8	302.8	302.1	301.9	302.2	302.2	304.2	304.2	304.2	304.2	303.2	1.756	45		
16	***	***	1.977	303.9	301.6	301.6	302.4	302.3	301.7	301.7	302.2	303.2	304.2	304.2	303.7	303.2	1.756	45		
17	***	***	1.975	302.9	301.7	301.8	302.4	302.4	302.1	302.2	302.2	303.2	304.2	304.2	303.2	302.2	1.756	45		
18	***	***	1.974	302.2	301.3	301.5	302.6	302.2	302.0	302.1	302.2	302.2	303.2	303.2	303.2	302.2	1.756	45		
19	***	***	1.973	301.9	301.0	301.5	302.4	302.1	302.1	301.2	301.2	302.2	302.2	302.7	303.2	301.7	301.2	1.756	45	
20	***	***	1.971	301.3	300.6	301.2	302.0	301.9	302.1	301.2	301.2	302.2	302.2	302.2	302.2	301.2	1.756	45		
21	***	***	1.970	301.2	300.2	300.6	301.5	301.4	301.7	301.2	301.2	302.2	302.2	302.2	302.2	301.7	1.756	45		
26	***	***	1.966	300.8	299.5	299.3	300.1	300.1	299.9	300.2	300.2	300.2	301.2	300.2	300.2	300.2	1.756	45		
31	***	***	1.962	299.9	298.9	299.2	300.0	299.9	300.0	300.2	300.2	301.2	301.2	301.2	301.2	301.2	1.756	45		
36	***	***	1.959	299.9	298.8	298.8	299.7	299.5	299.5	300.2	300.2	301.2	301.2	301.2	300.2	300.2	1.756	45		
41	***	***	1.956	299.7	298.8	298.9	299.6	299.5	299.5	299.2	299.2	300.2	300.2	300.2	299.2	299.2	1.756	45		
46	***	***	1.954	299.4	298.4	298.5	299.2	299.5	299.5	298.2	298.2	299.2	299.2	299.2	299.2	299.2	1.756	45		
51	***	***	1.952	299.3	298.4	298.5	299.1	299.0	299.1	298.2	298.2	299.2	299.2	299.2	299.2	299.2	1.756	45		
56	***	***	1.950	299.1	298.3	298.6	298.6	298.6	298.9	298.2	299.2	299.2	299.2	299.2	299.2	298.2	1.756	45		
61	***	***	1.948	298.7	297.7	297.7	298.9	298.8	299.0	298.2	298.2	299.2	299.2	299.2	299.2	298.2	1.756	45		
66	***	***	1.946	298.6	297.4	297.7	298.3	298.6	298.7	298.2	298.2	299.2	299.2	299.2	298.2	298.2	1.756	45		
71	***	***	1.945	298.4	297.4	297.5	298.3	298.4	298.3	298.2	297.2	298.2	298.2	297.7	297.2	298.2	1.756	45		
81	***	***	1.942	298.1	297.3	297.3	298.1	298.1	298.3	297.2	296.7	298.2	298.2	297.2	297.2	298.2	1.756	45		
91	***	***	1.940	298.0	296.9	297.1	298.0	297.4	297.4	297.2	296.2	297.2	297.2	297.2	297.2	297.7	1.756	45		
101	***	***	1.938	297.4	296.5	296.6	297.4	297.1	297.1	297.2	296.2	297.2	297.2	297.2	296.2	297.2	1.756	45		
111	***	***	1.936	296.9	296.2	296.4	297.2	297.2	297.2	297.2	296.2	297.2	297.2	297.2	296.2	297.2	1.756	45		
121	***	***	1.934	297.1	295.3	295.8	297.0	297.0	297.1	296.2	296.2	297.2	297.2	297.2	296.2	296.2	1.756	45		
131	***	***	1.932	296.9	295.7	295.5	296.7	296.7	296.9	296.2	296.2	297.2	297.2	297.2	295.2	296.2	1.756	45		
141	***	***	1.930	296.6	295.5	295.5	296.4	296.0	296.4	296.2	296.2	296.2	297.2	296.2	295.2	296.2	1.756	45		
151	***	***	1.929	296.4	295.2	295.4	296.2	295.9	295.9	296.2	296.2	296.2	297.2	296.2	294.2	296.2	1.756	45		
161	***	***	1.927	295.9	295.0	295.2	296.0	296.0	296.1	296.2	296.2	296.2	296.2	296.2	294.2	295.2	1.756	45		
171	***	***	1.926	296.0	294.6	294.8	296.0	295.9	295.8	296.2	295.2	296.2	296.2	296.2	294.2	295.2	1.756	45		
181	***	***	1.924	295.9	294.5	294.5	295.9	295.8	295.9	295.2	295.2	295.2	295.2	295.2	295.2	295.2	1.756	45		
191	***	***	1.923	295.7	294.5	294.5	295.2	295.1	295.7	295.2	295.2	295.2	295.2	295.2	294.2	295.2	1.756	45		
201	***	***	1.922	295.4	294.3	294.3	295.1	295.0	295.2	295.2	295.2	295.2	295.2	295.2	294.2	294.2	1.756	45		

Table 4A — Scaling Run 232: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time (s)	Cyl <i>P</i> (atm)	Chamber <i>T₁</i> (K)	<i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES		
				1	2	3	4	5	6	7	8	9	10	11	12	13	I (M)	R (M)	Theta (deg)
-5 ***	***	1.005	281.6	280.7	280.6	281.6	281.4	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2	1	1.756	45	-0.586
-4 ***	***	1.005	281.6	280.7	280.6	281.6	281.5	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2	2	1.756	45	-0.293
-3 ***	***	1.005	281.6	280.7	280.7	281.6	281.4	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2	3	1.756	45	0.000
-2 ***	***	1.005	281.5	280.7	280.7	281.6	281.4	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2	4	1.756	45	0.293
-1 ***	***	1.005	281.5	280.7	280.6	281.6	281.4	281.5	281.2	281.2	282.2	282.2	282.2	282.2	281.2	5	1.756	45	0.586
0.97 0.61	279.6	1.006	282.7	281.4	280.9	282.1	282.4	283.3	281.2	281.2	282.2	282.2	282.2	282.2	281.2	6	1.756	45	0.878
1.03 0.95	236.9	1.096	289.9	287.6	285.6	287.5	289.4	290.1	283.2	286.2	287.7	286.7	287.2	285.7	285.7	7	1.756	45	2.049
2.76 3.65	232.1	1.227	295.3	293.6	292.5	294.0	294.9	294.9	291.2	292.2	291.2	292.2	292.2	292.2	292.2	8	1.756	45	2.342
3.71 4.52	248.4	1.307	298.4	297.3	296.7	297.1	297.9	297.7	294.2	295.2	296.2	294.2	295.2	294.2	294.2	9	1.756	45	2.635
4.65 5.32	246.2	1.415	299.8	298.5	298.0	298.9	299.3	299.2	295.7	296.2	297.2	296.2	297.2	296.7	296.7	10	1.756	45	2.920
5.60 6.47	244.0	1.516	300.7	299.4	299.8	300.4	300.6	300.9	298.2	298.2	299.2	298.2	299.2	298.2	298.2	11	1.756	45	3.220
6.55 7.55	241.3	1.604	300.9	300.1	300.0	300.8	300.8	301.0	299.7	298.7	299.7	299.7	299.7	299.7	299.7	12	1.756	45	3.513
7.51 8.42	239.3	1.687	300.8	300.0	300.2	301.1	301.3	301.2	300.2	300.2	301.2	300.2	300.2	300.2	300.2	13	1.756	45	3.806
8.47 9.62	236.7	1.762	301.4	300.0	300.6	301.3	301.7	300.9	300.2	299.7	299.7	299.7	299.7	299.2	299.2	2	1.756	45	4.098
9.44 1.77	234.2	1.831	301.8	300.7	300.7	301.7	301.9	301.7	301.2	300.2	301.2	300.2	300.2	300.2	300.2	3	1.756	45	4.392
10.40 1.73	231.3	1.894	301.3	300.4	301.1	302.0	301.6	300.2	299.7	298.7	300.7	300.7	300.7	300.7	300.7	4	1.756	45	4.685
11.38 1.77	219.3	1.952	301.1	300.0	300.6	300.6	300.3	300.3	299.2	298.2	299.2	299.2	299.2	299.2	299.2	5	1.756	45	5.078
12.39 1.265	172.3	1.974	299.9	299.5	300.0	300.3	299.9	299.9	299.2	298.2	298.2	299.2	299.2	299.2	299.2	6	1.756	45	5.371
13.39 1.806	169.8	1.979	299.4	298.0	298.6	298.9	298.7	298.7	298.2	298.2	299.2	299.2	299.2	299.2	299.2	7	1.756	45	5.664
14 ***	***	1.978	298.6	297.4	297.5	298.0	297.6	298.0	298.2	297.2	298.2	299.2	299.2	299.2	299.2	8	1.756	45	5.957
15 ***	***	1.976	298.0	296.8	296.7	297.9	297.5	297.8	297.7	297.7	298.2	297.2	297.7	298.2	297.7	9	1.756	45	6.250
16 ***	***	1.975	297.6	296.9	296.7	297.6	297.1	297.0	297.2	297.2	298.2	297.2	297.2	297.2	297.2	10	1.756	45	6.543
17 ***	***	1.973	296.7	295.7	296.3	296.8	296.4	296.9	297.2	297.2	298.2	298.2	298.2	298.2	298.2	11	1.756	45	6.836
18 ***	***	1.972	296.9	295.5	295.3	296.8	296.7	296.8	297.2	297.2	298.2	298.2	297.2	297.2	296.2	12	1.756	45	7.129
19 ***	***	1.970	297.2	295.6	295.7	296.8	296.6	296.7	296.7	296.7	297.7	297.2	298.2	297.2	297.2	13	1.756	45	7.422
20 ***	***	1.969	297.2	296.0	295.8	296.8	296.6	296.5	296.5	296.2	297.2	297.2	297.2	297.2	297.2	14	1.756	45	7.715
21 ***	***	1.968	296.5	295.5	295.7	296.4	295.9	295.9	295.2	295.2	296.2	297.2	297.2	297.2	297.2	15	1.756	45	8.008
26 ***	***	1.963	296.4	295.4	295.5	296.0	295.5	295.8	295.7	295.7	296.7	296.7	297.2	297.2	296.2	16	1.756	45	8.291
31 ***	***	1.959	295.7	295.0	294.5	295.2	295.1	295.1	295.2	295.2	296.2	296.2	296.2	296.2	296.2	17	1.756	45	8.584
36 ***	***	1.956	295.2	294.3	294.0	295.0	295.0	295.2	295.2	295.2	296.2	296.2	295.2	295.2	295.2	18	1.756	45	8.877
41 ***	***	1.954	295.3	294.0	293.8	294.2	294.0	294.1	294.2	294.2	295.2	295.2	295.2	295.2	295.2	19	1.756	45	9.170
46 ***	***	1.951	294.2	293.2	293.1	293.8	293.7	293.6	294.2	294.2	295.2	295.2	295.2	294.2	294.2	20	1.756	45	9.463
51 ***	***	1.949	293.8	292.9	293.8	293.7	293.8	293.2	293.2	294.2	294.2	294.2	294.2	293.2	293.2	21	1.756	45	9.756
56 ***	***	1.946	293.6	292.4	292.8	293.7	293.5	293.2	293.2	294.2	294.2	294.2	294.2	293.2	293.2	22	1.756	45	10.049
61 ***	***	1.944	293.5	292.4	292.6	293.4	293.2	293.2	293.2	294.2	294.2	294.2	294.2	293.2	293.2	23	1.756	45	10.342
66 ***	***	1.942	293.2	292.3	292.4	293.2	293.3	293.3	292.2	293.2	294.2	294.2	294.2	293.2	293.2	24	1.756	45	10.635
71 ***	***	1.941	293.2	292.0	292.7	292.9	293.0	292.2	292.2	294.2	294.2	294.2	294.2	292.2	292.2	25	1.756	45	10.928
81 ***	***	1.938	293.0	291.8	290.9	292.7	292.8	292.6	292.2	292.2	293.2	292.2	293.2	292.2	292.2	26	1.756	45	11.221
91 ***	***	1.935	292.6	291.3	291.0	292.2	292.2	292.5	292.2	292.2	292.2	292.2	292.2	292.2	292.2	27	1.756	45	11.514
101 ***	***	1.932	292.4	291.2	291.3	292.0	291.8	291.8	291.2	292.2	292.2	292.2	292.2	291.2	291.2	28	1.756	45	11.807
111 ***	***	1.930	291.7	290.8	290.8	291.5	291.5	291.5	291.2	291.2	292.2	292.2	292.2	291.2	291.2	29	1.756	45	12.099
121 ***	***	1.927	291.7	290.8	290.7	291.6	291.5	291.6	291.2	291.2	292.2	292.2	292.2	291.2	291.2	30	1.756	45	12.392
131 ***	***	1.925	291.5	290.4	290.4	291.3	291.2	291.3	291.2	291.2	292.2	292.2	292.2	291.2	290.2	31	1.756	45	12.685
141 ***	***	1.923	290.9	289.9	289.7	291.0	291.0	291.0	290.2	290.2	291.2	291.2	291.2	289.2	290.2	32	1.756	45	12.978
151 ***	***	1.921	290.5	289.5	289.6	290.5	290.5	290.3	290.2	290.2	291.2	291.2	291.2	290.2	290.2	33	1.756	45	13.271
161 ***	***	1.920	290.4	289.5	289.6	290.5	290.3	290.2	290.2	290.2	290.2	291.2	291.2	290.2	290.2	34	1.756	45	13.564
171 ***	***	1.918	290.0	289.1	289.2	289.6	289.1	289.1	289.2	289.2	290.2	290.2	290.2	289.2	289.2	35	1.756	45	13.857
181 ***	***	1.917	289.9	289.1	289.2	289.9	289.8	289.9	289.2	289.2	290.2	290.2	290.2	289.2	289.2	36	1.756	45	14.150
191 ***	***	1.915	289.7	288.8	288.9	289.6	289.7	289.2	289.1	289.2	290.2	290.2	290.2	289.2	289.2	37	1.756	45	14.443
201 ***	***	1.914	289.5	288.6	288.5	289.2	288.9	289.1	289.2	289.2	290.2	290.2	290.2	289.2	289.2	38	1.756	45	14.736

Table 5A — Scaling Run 233: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time / (s)	Press Cyl <i>P</i> (atm)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations <i>i</i>													COORDINATES				
			1	2	3	4	5	6	7	8	9	10	11	12	13	1	R (m)	THETA (deg)	Z (m)	
-5	***	1.008	285.6	284.9	284.5	283.5	283.4	283.4	283.2	283.2	286.2	286.2	286.2	285.2	285.2	1	1.756	45	-0.586	
-4	***	1.008	285.6	284.9	284.4	283.5	283.4	283.4	283.2	283.2	286.2	286.2	286.2	285.2	285.2	2	1.756	45	-0.293	
-3	***	1.008	285.6	284.9	284.4	283.5	283.4	283.4	283.2	283.2	286.2	286.2	286.2	285.2	285.2	3	1.756	45	0.000	
-2	***	1.008	285.6	284.9	284.5	283.5	283.4	283.5	283.2	283.2	286.2	286.2	286.2	285.2	285.2	4	1.756	45	0.293	
-1	***	1.008	285.6	284.9	284.5	283.5	283.4	283.4	283.2	283.2	286.2	286.2	286.2	285.2	285.2	5	1.756	45	0.586	
0	1.483	305.1	1.008	286.7	284.9	284.5	283.9	286.4	287.9	285.2	283.2	286.2	286.2	286.2	285.2	285.2	6	1.756	45	0.878
1	1.497	262.4	1.008	292.6	290.0	287.9	289.6	291.2	292.4	287.2	288.2	290.2	289.2	289.2	288.2	288.2	7	1.756	45	2.049
2	1.497	256.5	1.195	298.0	296.6	294.9	296.1	296.9	296.9	292.7	294.2	295.2	294.2	295.7	294.2	294.2	8	1.756	45	2.342
3	1.490	254.1	1.312	301.2	299.6	299.7	300.7	299.5	299.9	296.2	297.2	298.2	297.2	298.2	297.2	297.2	9	1.756	45	2.635
4	1.486	250.8	1.416	303.1	301.3	301.2	302.4	303.0	303.0	299.7	299.7	301.2	300.7	300.7	299.7	299.7	10	1.756	45	2.928
5	1.483	247.7	1.511	304.5	303.0	302.3	303.8	303.9	304.1	302.2	302.2	302.2	302.2	301.2	302.2	302.2	11	1.756	45	3.220
6	1.483	244.7	1.597	304.5	303.3	303.5	304.2	304.5	304.8	303.7	303.2	304.2	303.7	304.2	303.2	303.2	12	1.756	45	3.513
7	1.476	243.3	1.676	305.4	303.8	303.8	304.2	304.6	305.3	304.2	304.2	305.2	304.2	304.2	302.2	303.2	13	1.756	45	3.606
8	1.476	240.7	1.748	305.2	303.9	303.8	304.9	305.0	305.6	304.2	304.2	305.2	304.2	304.7	304.2	304.2	14	1.756	45	3.847
9	1.476	237.9	1.815	305.5	303.6	304.6	304.6	304.7	305.2	304.2	303.2	304.2	304.2	304.2	304.2	304.2	15	1.756	45	4.042
10	1.476	235.4	1.877	305.5	303.7	303.9	304.6	304.5	305.2	303.7	303.2	304.2	304.2	304.2	303.7	304.2	16	1.429	231.7	1.934
11	1.429	231.7	1.934	304.3	302.7	303.4	304.2	304.7	304.6	303.2	303.2	304.2	304.2	304.2	304.2	304.2	17	1.429	186.5	1.972
12	1.429	186.5	1.972	302.7	301.7	302.1	303.3	303.5	303.5	302.7	302.2	303.2	303.2	303.7	302.7	303.7	18	1.429	169.7	1.979
13	1.429	169.7	1.979	302.8	301.5	301.9	302.8	302.5	302.5	302.2	302.2	303.2	303.2	303.2	303.2	303.2	19	1.429	169.7	1.978
14	***	***	1.978	302.8	301.6	301.8	302.4	302.0	302.0	302.2	302.2	303.2	302.7	303.2	302.2	302.2	20	***	***	1.969
15	***	***	1.976	302.3	301.2	301.2	302.2	301.9	301.8	302.2	301.2	302.2	302.2	302.2	302.2	302.2	21	***	***	1.968
16	***	***	1.974	301.7	300.4	300.5	301.4	300.8	300.7	300.7	300.7	302.2	302.2	302.2	302.2	301.7	22	***	***	1.973
17	***	***	1.973	301.0	299.6	299.5	300.8	300.4	300.6	300.2	300.2	302.2	302.2	302.2	302.2	302.2	23	***	***	1.971
18	***	***	1.971	300.5	299.3	299.2	300.0	299.5	300.0	300.0	300.2	302.2	302.2	302.2	302.2	301.2	19	***	***	1.970
19	***	***	1.970	300.1	298.7	299.0	300.2	300.2	300.3	300.2	300.2	302.2	301.2	302.2	302.2	301.2	20	***	***	1.969
20	***	***	1.969	300.0	299.3	299.3	300.3	300.2	299.6	300.2	300.2	300.2	301.2	301.2	301.2	300.7	21	***	***	1.968
21	***	***	1.968	300.6	299.5	299.5	300.3	299.9	299.8	300.2	300.2	301.2	301.2	301.2	301.2	300.2	22	***	***	1.963
22	***	***	1.963	299.7	298.6	298.7	300.0	300.0	299.6	300.2	301.2	301.2	301.2	301.2	300.2	23	***	***	1.960	
23	***	***	1.960	299.9	298.1	298.3	299.5	299.3	299.3	298.2	299.2	300.2	300.2	299.7	299.2	299.2	24	***	***	1.956
24	***	***	1.956	298.5	297.8	297.9	298.9	299.0	299.1	298.2	298.2	299.2	300.2	300.2	299.2	299.2	25	***	***	1.954
25	***	***	1.954	298.3	297.2	297.5	298.5	298.5	298.6	298.2	298.2	299.2	299.2	299.2	299.2	299.7	26	***	***	1.954
26	***	***	1.954	298.3	297.4	297.5	298.5	298.4	298.3	297.2	297.2	298.2	298.2	298.2	298.2	298.2	27	***	***	1.949
27	***	***	1.949	298.2	297.2	297.3	298.1	298.0	297.7	297.2	297.2	298.7	298.7	298.2	298.2	298.2	28	***	***	1.947
28	***	***	1.947	297.9	296.7	296.6	297.7	297.8	298.0	297.2	297.2	298.2	298.2	298.2	298.2	298.2	29	***	***	1.945
29	***	***	1.945	297.8	296.5	296.7	297.3	297.8	297.8	297.2	297.2	298.2	298.2	298.2	298.2	298.2	30	***	***	1.944
30	***	***	1.944	298.0	296.4	296.4	297.3	297.3	297.5	297.2	297.2	298.2	298.2	298.2	298.2	298.2	31	***	***	1.942
31	***	***	1.942	297.8	296.6	296.7	297.0	297.0	297.4	297.2	297.2	298.2	298.2	298.2	298.2	298.2	32	***	***	1.940
32	***	***	1.940	297.4	296.2	296.2	297.4	297.2	297.2	297.2	297.2	298.2	297.2	297.2	297.2	296.2	33	***	***	1.937
33	***	***	1.937	296.8	295.9	296.0	297.1	297.1	296.9	296.2	296.2	297.2	297.2	296.2	296.2	296.2	34	***	***	1.935
34	***	***	1.935	296.3	295.2	295.6	296.7	296.7	296.5	296.2	295.2	297.2	296.2	296.2	294.2	296.2	35	***	***	1.933
35	***	***	1.933	296.4	294.9	294.5	295.6	295.8	295.9	296.2	295.2	297.2	296.2	296.2	295.2	295.2	36	***	***	1.931
36	***	***	1.931	296.1	294.9	294.8	295.8	296.6	295.8	295.2	295.2	296.2	296.2	295.2	295.2	295.2	37	***	***	1.929
37	***	***	1.929	296.3	295.0	295.0	295.7	295.6	295.7	295.2	295.2	296.2	296.2	295.2	295.2	295.2	38	***	***	1.927
38	***	***	1.927	295.9	294.7	294.6	295.3	295.3	295.5	295.2	295.2	296.2	296.2	295.2	295.2	295.2	39	***	***	1.926
39	***	***	1.926	295.8	294.9	294.5	294.8	295.2	295.2	295.2	295.2	296.2	296.2	296.2	295.2	295.2	40	***	***	1.924
40	***	***	1.924	295.4	294.3	294.3	295.1	295.4	294.8	295.2	295.2	296.2	296.2	296.2	295.2	295.2	41	***	***	1.923
41	***	***	1.923	295.1	293.3	294.2	295.0	294.7	294.7	295.2	294.2	295.2	295.2	295.2	294.2	294.2	42	***	***	1.921
42	***	***	1.921	294.7	293.6	293.8	293.9	293.6	294.6	294.2	294.2	294.2	295.2	295.2	294.2	294.2	43	***	***	1.920
43	***	***	1.920	294.6	293.4	293.0	294.5	294.7	294.3	294.2	294.2	295.2	295.2	295.2	294.2	294.2	44	***	***	1.919

Table 6A -- Scaling Run 234: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time (s)	Press Cyl <i>t</i> (atm)	Chamber <i>T_a</i> (K)	<i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES			
				1	2	3	4	5	6	7	8	9	10	11	12	13	I (m)	R (m)	Theta (deg)	Z (m)
-5	***	1.001	281.9	280.9	280.9	281.9	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2	1	1.756	45	-0.586	
-4	***	1.001	281.9	280.9	280.9	281.9	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2	2	1.756	45	-0.293	
-3	***	1.061	281.9	280.9	280.9	281.8	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2	3	1.756	45	0.000	
-2	***	1.001	281.9	280.9	280.9	281.9	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2	4	1.756	45	0.293	
-1	***	1.001	282.0	280.9	280.9	281.9	281.8	281.8	281.2	281.2	282.2	282.2	282.2	282.2	281.2	5	1.756	45	0.586	
0.94	456	277.9	1.001	283.4	281.9	281.2	282.7	293.3	293.6	281.2	281.2	282.2	282.2	282.2	282.2	281.2	6	1.756	45	0.878
1.62	014	256.8	1.089	289.5	288.1	286.8	288.1	289.3	290.7	285.2	286.7	287.2	286.2	287.2	286.2	285.7	7	1.756	45	2.049
2.74	735	252.8	1.219	295.5	293.6	292.7	294.2	295.0	295.2	290.2	290.2	292.2	291.2	292.2	292.2	292.2	8	1.756	45	2.342
3.70	367	249.7	1.299	298.6	297.1	296.6	297.3	297.3	298.0	293.2	293.2	294.2	294.2	295.2	295.2	295.2	9	1.756	45	2.635
4.64	400	247.2	1.405	300.1	298.7	298.5	299.5	299.8	299.6	296.7	296.2	296.7	296.7	297.2	296.7	296.2	10	1.756	45	2.928
5.59	143	244.1	1.503	300.8	299.7	299.7	300.6	300.8	300.6	298.2	297.2	299.2	299.2	298.2	298.2	298.2	11	1.756	45	3.220
6.54	400	242.1	1.593	301.7	300.3	300.2	301.5	301.6	301.7	299.2	298.2	300.2	299.7	300.2	299.2	299.2	12	1.756	45	3.513
7.50	293	239.4	1.673	302.2	300.5	301.0	302.0	302.0	301.5	300.2	300.2	300.2	300.2	301.2	301.2	300.2	13	1.756	45	3.806
8.46	612	236.2	1.747	301.3	300.0	300.9	301.3	301.4	301.7	300.2	300.2	301.2	301.2	301.2	301.2	302.2				
9.43	238	234.1	1.817	301.7	300.1	300.3	301.3	301.7	301.8	301.2	301.2	302.2	302.2	302.2	302.2	302.2				
10.40	201	232.4	1.879	301.0	299.8	300.2	301.4	302.0	301.6	300.7	300.2	301.2	301.2	301.2	301.2	301.7				
11.37	673	219.6	1.937	301.2	299.8	299.9	301.0	300.9	300.7	300.2	300.2	301.2	301.2	301.2	301.2	301.2				
12.38	476	171.2	1.966	300.3	299.5	299.5	300.4	300.2	300.0	300.2	300.2	301.2	301.2	301.2	301.2	301.2				
13.38	537	163.7	1.974	299.3	298.7	299.0	299.5	299.0	298.8	299.7	299.2	300.2	300.2	300.2	299.7	299.7				
14	***	1.974	298.5	297.7	297.8	298.5	298.6	298.9	299.2	299.2	300.2	299.2	300.2	299.2	299.2	299.2				
15	***	1.972	298.1	296.9	296.7	296.8	297.5	298.7	298.2	298.7	299.7	299.7	299.7	299.7	299.2	299.2				
16	***	1.971	297.8	296.9	296.5	297.6	297.7	298.0	297.2	298.2	298.2	298.2	298.2	298.2	298.2	298.2				
17	***	1.969	297.0	296.1	296.2	296.6	297.3	297.8	297.2	297.2	297.2	298.2	298.2	298.2	298.2	297.2				
18	***	1.968	296.7	295.3	295.7	296.5	296.5	297.2	297.2	297.2	297.2	298.2	298.2	298.2	298.2	298.2				
19	***	1.966	296.9	295.8	295.3	296.2	296.3	296.8	297.7	297.2	298.2	298.2	298.2	298.2	297.7	297.2				
20	***	1.965	297.3	296.2	295.5	296.7	296.7	296.8	297.2	297.2	297.2	297.2	297.2	297.2	297.2	296.2				
21	***	1.965	297.0	296.0	296.6	296.3	296.6	296.6	297.2	296.2	297.2	297.2	297.2	297.2	296.2	296.2				
26	***	1.960	293.7	293.1	295.3	296.3	296.7	296.7	296.2	296.2	297.2	297.2	297.2	297.2	296.2	296.2				
31	***	1.956	295.9	295.0	295.0	296.2	296.2	296.4	296.2	296.2	297.2	297.2	297.2	297.2	296.2	295.7				
36	***	1.953	295.9	294.6	295.1	296.0	295.7	295.9	295.2	295.2	296.2	296.2	296.2	296.2	295.2	295.2				
41	***	1.951	295.6	294.0	294.1	295.2	295.2	295.9	295.2	295.2	296.2	296.2	296.2	296.2	295.2	294.2				
46	***	1.949	295.0	294.5	294.7	295.2	295.0	295.2	295.2	295.2	296.2	296.2	296.2	296.2	295.2	294.2				
51	***	1.947	295.0	294.1	294.2	294.7	294.5	294.9	295.2	295.2	295.7	296.2	296.2	296.2	295.2	294.2				
56	***	1.945	294.6	293.3	293.5	294.3	294.3	294.7	295.2	295.2	295.2	295.2	295.2	295.2	295.2	294.2				
61	***	1.943	294.4	293.1	292.7	293.3	293.4	294.3	294.2	294.2	294.2	295.2	295.2	295.2	294.2	294.2				
66	***	1.941	294.2	292.6	292.2	293.1	293.2	293.8	294.2	293.2	294.2	294.2	294.2	294.2	293.2	294.2				
71	***	1.940	294.1	291.9	291.7	292.6	292.6	293.8	293.2	293.2	294.2	294.2	294.2	294.2	293.2	293.2				
81	***	1.937	293.5	291.7	291.7	292.7	292.9	293.1	293.2	292.2	293.2	293.2	293.2	293.7	292.2	293.2				
91	***	1.935	293.1	291.7	291.9	292.4	292.7	292.9	292.2	292.2	293.2	293.2	293.2	293.2	291.2	292.2				
101	***	1.932	293.0	291.8	291.8	292.7	292.7	292.8	292.2	292.2	293.2	293.2	293.2	293.2	292.2	292.2				
111	***	1.930	292.8	291.9	292.6	292.8	292.9	292.9	292.9	292.2	292.2	293.2	293.2	293.2	292.2	291.2	292.2			
121	***	1.928	292.6	291.6	291.7	292.6	292.7	292.7	292.1	291.2	292.2	292.2	292.2	292.2	291.2	292.2				
131	***	1.926	292.4	291.3	291.2	292.2	292.2	292.4	292.2	291.2	292.2	292.2	292.2	292.2	291.2	291.2				
141	***	1.925	292.3	291.1	290.9	291.3	291.6	291.9	291.2	291.2	292.2	292.2	292.2	291.2	289.2	291.2				
151	***	1.923	292.1	291.0	291.0	291.6	291.6	291.7	291.2	291.2	292.2	292.2	292.2	291.2	289.2	291.2				
161	***	1.921	291.9	290.9	290.9	291.6	291.7	291.6	291.2	290.2	290.2	292.2	292.2	291.2	290.2	291.2				
171	***	1.920	291.5	290.4	290.5	291.0	291.2	291.4	290.7	290.2	291.2	291.2	291.2	291.2	290.2	290.2				
181	***	1.918	291.3	290.1	289.9	290.7	290.9	291.0	290.2	290.2	291.2	291.2	291.2	291.2	290.2	290.2				
191	***	1.917	290.8	289.7	289.6	290.4	290.8	290.2	290.2	291.2	291.2	291.2	291.2	289.2	290.2	290.2				
201	***	1.916	290.7	289.4	289.4	290.3	290.1	290.2	290.2	291.2	291.2	291.2	291.2	289.2	290.2	290.2				

Table 7A — Scaling Run 235: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time <i>t</i> (s)	Press <i>P</i> (atm)	Cyl <i>T₁</i> (K)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations <i>I</i>													COORDINATES		
				1	2	3	4	5	6	7	8	9	10	11	12	13	<i>R</i> (m)	Theta (deg)	<i>Z</i> (m)
-5 ***	***	1.001	283.9 283.0 282.9 283.8 283.8 283.9 283.9 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 1.756 45 -0.386																
-4 ***	***	1.001	283.9 283.0 282.9 283.8 283.8 283.9 283.9 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 1.756 45 -0.293																
-3 ***	***	1.001	283.9 283.0 282.9 283.8 283.8 283.9 283.9 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 1.756 45 -0.000																
-2 ***	***	1.001	283.9 283.0 282.9 283.8 283.8 283.9 283.9 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 1.756 45 0.293																
-1 ***	***	1.001	283.9 283.0 282.9 283.8 283.8 283.9 283.9 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 1.756 45 0.386																
0.94 653	300.8	1.001	284.5 283.3 282.9 283.8 283.8 283.9 283.9 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 283.2 1.756 45 0.678																
183.367	261.2	1.072	291.8 289.5 288.0 289.7 290.7 291.8 290.2 290.2 290.2 290.2 290.2 290.2 290.2 290.2 290.2 290.2 290.2 1.756 45 2.049																
276.313	256.3	1.202	297.1 295.6 295.2 296.1 296.9 297.1 293.2 292.2 293.2 293.2 293.2 293.2 293.2 293.2 293.2 293.2 293.2 1.756 45 2.342																
369.867	254.9	1.318	300.2 299.2 298.0 299.4 299.8 299.4 295.2 295.7 296.2 296.2 297.2 296.7 295.7 295.7 295.7 295.7 295.7 1.756 45 2.635																
463.959	253.8	1.424	302.2 300.8 300.6 301.6 302.1 301.8 297.2 298.2 299.2 298.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 1.756 45 2.920																
558.772	248.5	1.519	303.1 301.9 301.8 302.5 302.8 303.0 300.7 301.2 302.2 301.7 301.7 300.7 300.7 300.7 300.7 300.7 300.7 1.756 45 3.220																
654.661	245.7	1.606	304.0 303.1 301.9 302.6 302.7 302.4 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 1.756 45 3.513																
751.306	243.1	1.639	303.4 302.4 302.4 303.1 303.3 303.3 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 1.756 45 3.806																
847.486	240.2	1.733	304.5 302.7 302.9 303.8 303.7 303.5 302.2 301.7 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 1.756 45 4.096																
943.980	237.1	1.802	304.0 302.7 302.6 303.8 303.6 303.8 303.8 301.2 301.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 1.756 45 4.386																
1040.893	235.2	1.865	304.4 303.1 302.7 303.8 303.9 303.3 303.3 301.7 301.7 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 1.756 45 4.678																
1138.020	231.5	1.923	303.4 302.2 303.1 303.6 303.3 303.3 302.7 303.2 301.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 302.2 1.756 45 5.066																
1237.160	182.8	1.964	302.5 301.3 301.7 302.2 302.0 301.9 300.7 300.7 300.7 301.7 301.7 301.7 300.7 300.7 300.7 300.7 300.7 1.756 45 5.356																
1337.680	164.5	1.974	301.9 300.2 300.9 301.9 301.6 300.7 300.2 300.2 300.2 301.2 301.2 301.2 301.2 301.2 301.2 301.2 300.2 1.756 45 5.646																
14 ***	***	1.973	301.4 300.1 300.3 301.2 301.0 300.9 300.9 300.2 300.2 300.2 301.2 301.2 301.2 301.2 301.2 301.2 300.2 1.756 45 5.936																
15 ***	***	1.971	301.2 300.0 299.0 300.4 299.9 300.9 300.2 300.2 300.2 300.2 300.2 300.2 300.2 300.2 300.2 300.2 300.2 1.756 45 6.226																
16 ***	***	1.970	299.7 298.9 298.6 299.5 299.0 299.3 299.3 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 1.756 45 6.516																
17 ***	***	1.968	299.0 297.7 297.7 298.6 298.7 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 1.756 45 6.806																
18 ***	***	1.967	298.7 297.8 297.7 299.1 299.1 299.1 299.5 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 1.756 45 7.096																
19 ***	***	1.966	298.6 297.6 298.0 299.1 299.1 299.5 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 1.756 45 7.386																
20 ***	***	1.964	298.6 297.5 297.7 299.0 299.9 299.5 299.5 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 1.756 45 7.676																
21 ***	***	1.963	298.2 297.4 298.1 299.1 299.4 299.3 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 299.2 1.756 45 8.066																
22 ***	***	1.959	299.0 297.9 297.9 298.4 298.5 298.5 298.5 298.2 297.2 298.2 298.2 298.2 298.2 298.2 298.2 298.2 298.2 1.756 45 8.356																
31 ***	***	1.955	298.5 297.3 296.8 297.4 297.0 297.1 297.2 297.2 297.2 297.2 297.2 297.2 297.2 297.2 297.2 297.2 297.2 1.756 45 8.646																
36 ***	***	1.952	298.0 296.8 296.2 296.9 296.8 296.8 296.8 296.8 296.8 296.8 296.8 296.8 296.8 296.8 296.8 296.8 296.8 1.756 45 8.936																
41 ***	***	1.949	297.0 296.0 295.9 296.8 296.7 296.7 297.1 296.2 297.2 297.2 297.2 297.2 297.2 297.2 297.2 297.2 297.2 1.756 45 9.226																
46 ***	***	1.947	296.8 295.9 296.0 296.7 296.7 296.7 296.7 296.7 296.7 296.7 296.7 296.7 296.7 296.7 296.7 296.7 296.7 1.756 45 9.516																
51 ***	***	1.945	296.8 295.8 295.9 296.6 296.5 296.5 296.5 296.7 296.2 296.2 296.2 296.2 296.2 296.2 296.2 296.2 296.2 1.756 45 9.806																
56 ***	***	1.943	296.3 295.5 295.5 296.5 296.5 296.4 295.7 295.2 295.2 295.2 295.2 295.2 295.2 295.2 295.2 295.2 295.2 1.756 45 10.096																
61 ***	***	1.941	296.3 295.2 295.2 296.2 296.2 296.2 295.7 295.2 295.2 295.2 295.2 295.2 295.2 295.2 295.2 295.2 295.2 1.756 45 10.386																
66 ***	***	1.940	296.5 295.2 295.2 296.0 295.8 295.8 295.7 295.2 295.2 295.2 295.2 295.2 295.2 295.2 295.2 295.2 295.2 1.756 45 10.676																
71 ***	***	1.938	296.0 295.2 295.2 295.8 295.8 295.8 295.0 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 1.756 45 11.066																
81 ***	***	1.936	295.7 294.8 293.7 294.5 294.5 294.5 294.8 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 1.756 45 11.356																
91 ***	***	1.933	295.2 293.8 293.4 294.5 293.5 294.0 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 1.756 45 11.646																
141 ***	***	1.931	294.9 293.6 293.5 294.2 294.3 294.5 294.5 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 1.756 45 11.936																
151 ***	***	1.929	294.8 293.6 293.7 294.0 294.4 294.8 294.8 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 1.756 45 12.226																
121 ***	***	1.927	294.6 293.7 293.5 293.9 293.8 294.1 294.1 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 1.756 45 12.516																
131 ***	***	1.925	294.5 293.3 293.2 293.5 293.5 294.1 294.1 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 1.756 45 12.806																
141 ***	***	1.924	293.8 293.2 293.3 294.1 294.1 294.1 293.9 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 1.756 45 13.096																
151 ***	***	1.922	293.8 292.9 293.2 294.0 293.9 293.9 293.9 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 294.2 1.756 45 13.386																
161 ***	***	1.921	293.6 292.6 292.6 293.1 293.7 293.8 293.8 293.2 293.2 293.2 293.2 293.2 293.2 293.2 293.2 293.2 293.2 1.756 45 13.676																
171 ***	***	1.919	293.4 292.2 291.9 293.1 293.1 293.3 293.3 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 1.756 45 13.966																
181 ***	***	1.918	293.2 292.4 292.4 293.2 293.2 293.2 293.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 1.756 45 14.256																
191 ***	***	1.917	293.1 291.7 291.7 292.9 292.8 292.6 292.6 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 1.756 45 14.546																
201 ***	***	1.915	292.9 291.4 291.7 292.6 292.4 292.4 292.4 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 292.2 1.756 45 14.836																

Table 8A — Scaling Run 236: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time (s)	Press <i>P</i> (atm)	Cyl <i>T_c</i> (K)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES		
				1	2	3	4	5	6	7	8	9	10	11	12	13	X (m)	R (m)	Theta (deg)
-5 ***	.999	.999	290.1	288.8	288.8	289.8	289.8	289.8	289.8	289.2	288.7	290.2	290.2	289.2	289.2	289.2	1 1.756	45	-0.596
-4 ***	.999	.999	290.1	288.8	288.8	289.8	289.8	289.9	289.2	289.2	289.2	290.2	290.2	289.2	289.2	289.2	2 1.756	45	-0.293
-3 ***	.999	.999	290.0	288.9	288.8	289.8	289.8	289.9	289.2	289.2	288.2	290.2	290.2	289.2	289.2	289.2	3 1.756	45	0.000
-2 ***	.999	.999	290.0	288.9	288.8	289.8	289.8	289.9	289.2	289.2	289.2	290.2	290.2	289.2	289.2	289.2	4 1.756	45	0.293
-1 ***	.999	.999	290.1	288.9	288.8	289.8	289.8	289.9	289.2	289.2	289.2	290.2	290.2	289.2	289.2	289.2	5 1.756	45	0.586
053.816	286.3	.999	292.8	291.2	290.0	291.7	292.2	293.0	289.2	289.2	290.2	290.2	290.2	289.2	289.2	289.2	6 1.756	45	0.678
177.442	266.8	1.086	300.4	298.2	296.2	298.2	299.5	300.3	293.2	294.2	294.7	294.2	295.2	293.7	293.7	293.7	7 1.756	45	2.049
272.673	265.1	1.219	303.9	302.4	301.3	302.6	302.7	302.9	299.2	299.2	301.2	301.2	300.2	299.2	299.2	299.2	8 1.756	45	2.342
366.622	261.7	1.334	307.2	305.2	305.1	305.8	306.3	306.6	302.2	301.7	303.7	303.7	304.7	303.7	303.7	303.7	9 1.756	45	2.635
461.279	259.8	1.441	309.7	307.6	307.9	308.7	308.5	308.4	306.2	306.2	307.2	306.2	307.2	306.2	306.2	306.2	10 1.756	45	2.928
558.027	257.2	1.506	310.3	308.9	308.9	309.7	309.6	309.5	308.2	306.2	308.2	308.2	308.2	308.2	308.2	308.2	11 1.756	45	3.220
653.524	253.2	1.594	311.3	309.6	308.8	310.0	310.1	310.0	307.2	307.7	308.2	308.7	308.7	308.7	308.2	308.2	12 1.756	45	3.513
749.317	249.5	1.675	311.3	309.8	309.8	310.5	310.0	310.5	308.2	308.2	310.2	310.2	310.2	309.2	309.2	309.2	13 1.756	45	3.806
845.905	247.1	1.749	310.2	310.0	310.1	311.1	311.3	311.0	309.2	308.2	308.7	308.7	308.7	308.7	308.2	309.2			
942.592	244.4	1.818	311.0	309.5	309.6	310.4	310.3	309.4	309.2	308.2	310.2	309.2	309.2	309.2	309.2	309.2			
1039.646	241.7	1.881	310.5	309.3	309.9	310.8	310.0	310.2	308.7	308.7	309.7	310.2	310.2	309.7	309.7	309.7			
1137.857	236.8	1.937	309.8	308.9	309.2	309.8	309.8	310.2	308.2	308.2	309.2	309.2	309.2	308.2	309.2	309.2			
1238.388	176.7	1.964	309.0	307.9	308.0	308.7	308.7	308.3	302.2	307.2	308.2	308.2	308.2	308.2	308.2	308.2			
1338.514	165.8	1.969	307.6	306.9	307.3	308.1	308.0	308.0	306.7	307.2	307.7	307.2	307.7	306.7	307.2	307.2			
14 ***	***	1.968	306.3	305.5	306.5	307.5	306.9	306.8	306.2	306.2	307.2	307.2	307.2	306.2	307.2	307.2			
15 ***	***	1.966	305.9	304.7	305.9	307.1	306.7	306.4	306.2	306.2	307.2	307.2	307.2	306.2	306.2	306.2			
16 ***	***	1.964	306.1	305.0	305.0	306.7	306.6	306.4	306.4	305.2	305.2	307.2	307.2	306.2	306.2	306.2			
17 ***	***	1.963	306.1	304.8	305.3	306.0	305.6	305.8	305.5	305.2	306.7	306.2	307.2	306.2	306.2	306.2			
18 ***	***	1.961	305.9	304.4	304.6	305.5	305.3	305.6	305.3	305.2	306.2	306.2	306.2	306.2	306.2	306.2			
19 ***	***	1.960	305.5	304.0	304.1	305.2	305.0	305.2	305.2	305.2	305.2	306.2	306.2	306.2	305.7	305.7			
20 ***	***	1.958	305.0	303.8	304.0	305.0	304.9	305.2	305.2	304.2	304.2	305.2	305.2	305.2	305.2	305.2			
21 ***	***	1.957	305.0	303.8	303.4	304.5	304.7	304.5	304.2	304.2	306.2	306.2	306.2	305.2	305.2	305.2			
26 ***	***	1.952	305.0	304.0	303.7	304.6	304.5	304.2	303.2	303.2	304.2	305.2	305.2	304.2	303.7	304.2			
31 ***	***	1.949	304.5	303.4	303.0	303.8	303.8	303.7	303.2	304.2	305.2	305.2	305.2	304.2	304.2	304.2			
36 ***	***	1.946	304.2	303.1	303.1	303.8	303.8	304.0	303.2	303.2	304.7	304.2	304.2	303.2	304.2	304.2			
41 ***	***	1.943	303.9	302.6	302.6	303.5	303.5	303.9	303.2	303.2	304.2	304.2	304.2	303.2	303.2	303.2			
46 ***	***	1.941	303.5	302.4	302.4	303.1	303.1	303.2	302.2	302.2	303.2	303.2	303.2	303.2	303.2	303.2			
51 ***	***	1.939	302.6	301.8	301.8	302.7	302.7	302.9	302.2	302.2	303.2	303.2	303.2	303.2	302.2	302.2			
56 ***	***	1.936	302.6	301.5	301.6	302.5	302.4	302.7	302.2	301.2	303.2	303.2	303.2	303.2	302.2	302.2			
61 ***	***	1.935	302.6	301.2	301.0	301.5	302.4	302.9	301.2	301.2	303.2	303.2	303.2	303.2	302.2	302.2			
66 ***	***	1.933	302.4	300.9	300.2	300.5	302.2	302.2	301.2	301.2	302.2	302.2	302.2	302.2	301.2	301.2			
71 ***	***	1.932	302.4	301.1	300.8	301.6	302.2	302.3	301.2	301.2	302.2	302.2	302.2	301.2	301.2	301.2			
81 ***	***	1.929	302.2	301.2	301.0	302.1	302.1	302.2	301.2	301.2	302.2	302.2	301.2	299.7	301.2				
91 ***	***	1.926	302.3	300.8	300.7	301.4	301.6	301.8	301.2	300.2	301.2	302.2	301.2	300.2	300.2	300.2			
101 ***	***	1.924	301.7	300.4	300.3	301.3	301.5	301.6	300.2	299.7	301.2	301.2	301.2	299.2	300.2				
111 ***	***	1.922	301.2	299.5	300.1	301.2	301.2	301.0	300.2	299.2	300.2	300.2	301.2	300.2	299.2	300.2			
121 ***	***	1.920	300.9	299.0	300.0	300.9	301.0	301.1	300.2	300.2	300.2	300.2	300.2	300.2	299.2	300.2			
131 ***	***	1.919	300.5	299.1	299.8	300.8	300.9	300.9	300.2	300.2	300.2	300.2	300.2	300.2	299.2	300.2			
141 ***	***	1.917	300.5	299.1	299.1	300.2	300.5	300.9	300.2	299.2	300.2	300.2	300.2	299.2	299.2	299.2			
151 ***	***	1.915	300.4	299.0	299.9	300.9	300.3	300.6	299.2	299.2	300.2	300.2	300.2	299.2	299.2	299.2			
161 ***	***	1.913	300.2	298.9	299.0	299.9	299.8	299.8	299.2	299.2	300.2	300.2	300.2	299.2	299.2	299.2			
171 ***	***	1.912	300.1	298.8	298.8	299.7	299.6	299.7	299.2	299.2	300.2	300.2	300.2	299.2	299.2	299.2			
181 ***	***	1.910	299.9	298.7	298.6	299.5	299.6	299.5	299.2	299.2	300.2	300.2	300.2	299.2	299.2	299.2			
191 ***	***	1.909	299.7	298.5	298.2	299.4	299.5	299.5	299.2	299.2	299.2	299.2	299.2	298.2	298.2	298.2			
201 ***	***	1.908	299.5	298.1	298.0	299.1	298.7	299.1	298.2	298.2	299.2	299.2	299.2	298.2	298.2	298.2			

Table 9A — Scaling Run 237: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time <i>t</i> (s)	Press <i>P</i> (atm)	Cyl <i>T_s</i> (K)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES				
				1	2	3	4	5	6	7	8	9	10	11	12	13	1	R (m)	Theta (deg)	Z (m)	
-5	***	***	.979	281.8	280.0	280.9	281.9	281.9	281.6	281.2	281.2	282.2	282.2	282.2	282.2	281.2	1	0.000	0.0	-0.586	
-4	***	***	.979	281.9	280.0	280.9	281.9	281.7	281.7	281.3	281.2	282.2	282.2	282.2	282.2	281.2	2	0.000	0.0	-0.293	
-3	***	***	.979	281.8	280.0	280.9	281.9	281.8	281.7	281.2	281.2	282.2	282.2	282.2	282.2	281.2	3	0.000	0.0	0.600	
-2	***	***	.979	281.8	280.0	280.9	281.9	281.8	281.6	281.2	281.2	282.2	282.2	282.2	282.2	281.2	4	0.000	0.0	0.293	
-1	***	***	.979	281.3	280.9	282.4	281.7	283.1	283.7	281.2	281.2	282.2	282.2	282.2	282.2	281.2	5	0.000	0.0	0.586	
0	.503	253.6	1.025	289.4	283.4	277.2	284.7	288.6	289.4	283.2	285.7	285.7	284.7	283.7	284.2	282.2	6	0.000	0.0	0.878	
1	.503	249.9	1.147	294.4	288.0	277.9	290.3	292.9	293.2	289.2	291.2	291.2	290.2	290.2	279.2	286.2	7	0.000	0.0	2.049	
2	.497	247.3	1.260	298.6	291.7	279.1	292.2	295.5	295.6	292.2	294.2	294.7	293.7	293.7	286.7	286.7	8	0.000	0.0	2.342	
3	.497	244.7	1.363	299.7	292.4	279.5	295.3	297.5	296.5	295.2	296.2	298.2	297.2	294.2	280.2	293.2	9	0.000	0.0	2.635	
4	.490	242.4	1.456	301.3	294.5	279.4	296.4	299.6	299.5	297.7	298.2	293.2	299.7	297.2	280.7	295.7	10	0.000	0.0	2.520	
5	.490	240.7	1.541	301.8	296.7	279.6	298.1	299.8	299.5	298.2	299.2	300.2	300.2	298.2	281.2	296.2	11	0.000	0.0	3.220	
6	.486	238.5	1.618	302.2	296.8	280.6	299.2	300.0	300.7	297.7	299.2	300.7	300.7	300.7	298.7	281.7	295.2	12	0.000	0.0	3.513
7	.483	236.0	1.690	302.3	297.6	280.9	299.1	301.1	300.4	298.2	298.2	300.2	300.2	299.2	298.2	295.2	13	0.000	0.0	3.806	
8	.483	232.5	1.756	302.3	296.8	280.3	299.3	299.7	299.4	298.7	299.2	300.7	300.7	298.2	281.2	290.7					
9	.476	230.1	1.818	301.8	297.7	280.3	299.9	299.5	298.4	295.2	299.2	301.2	300.2	298.2	282.2	298.2					
10	.456	228.4	1.874	301.4	297.6	279.7	298.8	299.5	299.5	296.0	298.7	300.2	300.2	297.2	281.2	290.2					
11	.435	200.1	1.923	300.8	297.4	281.4	299.0	299.9	299.8	298.2	298.2	299.2	299.2	297.2	280.2	297.2					
12	.435	161.4	1.937	299.9	298.2	290.4	295.7	299.1	299.0	297.7	298.7	300.2	300.2	297.2	286.2	297.2					
13	.435	165.1	1.938	298.5	297.6	295.2	297.8	298.3	298.3	298.2	298.2	300.2	300.2	298.2	292.2	298.2					
14	***	***	1.937	298.0	296.5	295.1	296.9	297.2	297.3	297.7	298.2	299.2	299.2	299.2	298.7	295.2	298.2				
15	***	***	1.935	297.9	296.5	295.5	297.2	297.1	296.8	297.2	298.2	299.2	299.2	299.2	297.2	298.2					
16	***	***	1.934	297.6	296.4	295.9	297.4	297.2	297.1	297.2	297.7	298.7	298.7	298.2	298.2	298.2					
17	***	***	1.933	297.4	296.4	296.0	297.3	297.1	297.0	296.2	297.2	298.2	298.2	298.2	296.2	298.2					
18	***	***	1.931	297.3	296.1	295.9	297.3	297.1	296.8	297.2	297.2	298.2	298.2	298.2	298.2	297.2					
19	***	***	1.930	297.1	295.8	295.6	296.9	296.6	296.5	297.2	297.2	298.2	298.2	298.2	297.2	297.2					
20	***	***	1.929	296.8	295.5	295.2	296.6	296.4	296.3	296.7	296.7	297.7	297.7	298.2	296.2	297.2					
21	***	***	1.928	296.7	295.5	295.2	296.4	296.1	296.5	296.2	297.2	297.2	298.2	298.2	296.2	297.2					
26	***	***	1.924	296.0	295.0	294.8	296.0	295.7	295.6	295.2	295.7	297.2	297.2	297.2	297.2	296.2	295.7				
31	***	***	1.921	295.2	294.4	294.5	295.6	295.5	295.4	295.2	295.2	297.2	297.2	297.2	297.2	296.2	296.2				
36	***	***	1.918	295.0	293.9	294.2	294.8	294.8	294.7	295.2	295.2	296.2	296.2	297.2	292.2	296.2					
41	***	***	1.916	294.7	293.9	293.5	294.8	294.9	294.7	295.2	295.2	295.2	295.2	295.2	291.2	295.2					
46	***	***	1.914	294.5	293.5	293.0	294.6	294.2	294.6	294.6	295.2	294.2	295.2	295.2	290.2	295.2					
51	***	***	1.912	294.5	293.3	292.2	293.1	293.4	293.5	294.2	293.2	293.2	294.2	294.2	289.2	294.2					
56	***	***	1.910	294.0	292.8	292.4	292.9	293.0	292.5	292.7	292.2	293.2	293.2	294.2	290.2	294.2					
61	***	***	1.908	293.8	292.6	281.7	292.4	292.5	292.0	292.2	291.2	294.2	294.2	294.2	290.2	294.2					
66	***	***	1.906	293.6	292.4	290.3	292.5	292.4	291.9	292.2	291.2	293.2	293.2	293.2	289.2	292.2					
71	***	***	1.905	293.0	291.5	290.6	292.4	292.4	292.0	292.2	291.2	293.2	293.2	293.2	289.2	292.2					
81	***	***	1.902	292.2	291.1	291.3	292.3	292.2	292.4	292.2	292.2	293.2	293.2	293.2	291.2	292.2					
91	***	***	1.900	292.4	291.4	291.6	292.5	292.6	292.6	292.2	292.2	293.2	293.2	293.2	291.2	292.2					
101	***	***	1.897	291.9	291.0	290.8	292.0	292.2	292.4	292.2	292.2	292.2	293.2	292.2	290.2	292.2					
111	***	***	1.895	291.7	290.6	290.4	291.4	291.4	291.1	291.2	291.2	292.2	292.2	292.2	291.2	291.2					
121	***	***	1.893	291.5	290.5	290.3	291.1	291.1	290.9	291.2	291.2	292.2	292.2	292.2	290.2	291.2					
131	***	***	1.891	291.0	289.9	289.9	291.0	290.9	290.6	290.2	290.2	292.2	291.2	291.2	289.2	291.2					
141	***	***	1.890	290.8	289.6	289.6	290.7	290.6	290.6	290.2	290.2	291.2	291.2	291.2	289.2	291.2					
151	***	***	1.888	290.5	289.5	289.3	290.2	290.3	290.4	290.2	290.2	291.2	291.2	291.2	289.2	290.2					
161	***	***	1.886	290.1	289.1	288.9	289.7	289.8	289.7	290.2	290.2	291.2	291.2	291.2	289.2	290.2					
171	***	***	1.885	289.7	288.8	288.6	289.6	289.5	289.6	289.2	289.2	291.2	291.2	290.2	289.2	290.2					
181	***	***	1.883	289.5	288.8	288.3	289.5	289.2	289.4	289.2	289.2	290.2	290.2	290.2	288.2	289.2					
191	***	***	1.882	289.3	288.3	287.7	289.0	288.9	288.9	288.2	288.2	290.2	290.2	290.2	288.2	289.2					
201	***	***	1.880	289.2	288.2	287.9	288.9	288.6	288.6	288.7	289.2	289.2	289.2	289.2	289.2	289.2					

Table 10A — Scaling Run 238: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time (s)	Press Cyl <i>P</i> (atm)	Chamber <i>T_t</i> (K)	<i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations 1													COORDINATES				
				1	2	3	4	5	6	7	8	9	10	11	12	13	1	R (M)	Theta (deg)	Z (M)	
-5	***	***	.985	280.1	279.1	279.1	280.0	280.0	280.0	280.2	280.2	280.2	280.2	280.2	280.2	279.2	1	0.000	00	-0.586	
-4	***	***	.985	280.2	279.1	279.1	280.0	280.0	280.0	280.2	279.2	280.2	280.2	280.2	280.2	279.2	2	0.000	00	-0.293	
-3	***	***	.985	280.1	279.1	279.1	280.0	280.0	280.0	280.2	279.7	280.7	280.2	280.2	280.2	279.2	3	0.000	00	0.000	
-2	***	***	.985	280.1	279.2	279.1	280.0	280.0	280.0	280.2	280.2	280.2	280.2	280.2	280.2	279.2	4	0.000	00	0.293	
-1	***	***	.985	280.1	279.1	279.1	280.0	280.0	280.0	279.9	280.2	279.2	280.7	280.2	280.2	279.2	5	0.000	00	0.586	
0.91	7.96	277.0	.986	281.8	279.4	281.3	280.2	281.4	281.9	280.2	280.2	280.2	281.2	280.2	280.2	280.2	6	0.000	00	0.878	
176	0.61	257.9	1.052	289.1	284.2	275.5	283.5	287.5	288.1	283.7	285.2	286.2	285.2	284.2	280.2	281.2	7	0.000	00	2.049	
272	1.122	255.0	1.178	294.7	289.5	277.7	289.6	292.5	292.3	289.2	290.2	291.2	290.2	279.2	286.2	8	0.000	00	2.342		
366	3.344	252.7	1.291	297.5	291.1	279.7	293.2	295.5	296.2	293.2	293.7	294.2	293.7	291.2	280.7	290.2	9	0.000	00	2.635	
461	0.041	249.8	1.395	299.3	292.8	280.4	295.9	297.5	297.0	296.2	296.2	297.2	297.2	296.2	281.2	293.2	10	0.000	00	2.928	
556	3.344	245.5	1.488	301.4	295.5	280.6	296.5	297.7	297.4	297.7	297.7	299.2	298.7	297.2	281.2	294.7	11	0.000	00	3.220	
652	0.034	243.1	1.574	301.5	296.0	280.5	298.5	299.3	298.5	298.2	298.2	300.2	300.2	297.2	282.2	294.2	12	0.000	00	3.513	
748	1.119	239.3	1.651	301.4	296.9	279.6	298.2	300.2	300.5	298.2	299.2	300.2	300.2	297.2	281.2	293.7	13	0.000	00	3.806	
844	6.94	237.5	1.722	301.7	296.2	280.9	298.4	300.1	298.6	298.2	300.2	301.2	301.2	298.2	281.2	296.2					
942	3.85	234.7	1.766	301.9	296.7	279.4	298.2	299.4	298.5	300.2	298.2	301.2	300.2	297.2	280.2	296.2					
1039	5.92	232.6	1.828	301.2	295.1	279.3	298.4	298.8	298.1	298.2	298.2	299.7	299.7	297.7	280.2	296.7					
1136	8.71	228.7	1.885	300.0	296.2	279.9	298.6	298.9	297.9	297.2	298.2	300.2	299.2	295.2	281.2	298.2					
1237	4.22	180.3	1.929	299.5	292.2	280.0	297.7	297.7	298.1	297.2	297.7	299.7	299.7	297.7	296.2	295.2					
1337	0.027	159.2	1.941	297.8	293.0	290.8	298.3	298.4	298.2	296.2	297.2	298.2	298.2	298.2	296.2	286.2	289.2				
14	***	***	1.941	297.4	295.2	294.9	297.8	297.7	297.2	297.2	297.7	297.7	298.2	298.2	297.2	292.2	294.2				
15	***	***	1.939	296.8	295.5	295.2	297.3	296.9	296.4	297.2	297.2	298.2	298.2	298.2	296.2	296.2					
16	***	***	1.938	296.4	295.0	295.0	296.5	296.5	296.0	297.2	297.2	297.2	298.2	298.2	298.2	296.7	296.7				
17	***	***	1.936	296.4	295.1	295.1	296.2	295.7	295.6	297.2	297.2	298.2	298.2	298.2	298.2	296.2	296.2				
18	***	***	1.935	296.0	295.2	295.2	296.2	295.3	295.8	297.2	296.2	298.2	298.2	298.2	296.2	296.2					
19	***	***	1.934	295.5	294.6	294.8	295.9	295.7	295.6	296.2	296.2	297.2	297.2	297.2	296.2	296.7					
20	***	***	1.933	294.9	294.4	294.8	295.6	295.4	295.5	296.2	296.2	297.2	297.2	297.2	296.2	296.2					
21	***	***	1.932	295.1	294.3	294.9	295.7	295.6	295.5	296.2	296.2	297.2	297.2	297.2	294.7	296.2					
26	***	***	1.927	294.8	293.8	293.9	294.6	294.8	294.8	293.2	295.2	295.2	295.2	296.2	296.2	294.2	295.2				
31	***	***	1.924	294.5	293.3	293.1	293.7	293.8	294.3	293.2	295.2	295.2	295.2	295.2	294.2	295.2					
36	***	***	1.920	293.9	293.0	293.1	293.8	294.1	294.1	294.2	294.7	295.2	295.2	295.2	294.2	294.2					
41	***	***	1.918	293.5	292.3	291.5	293.5	294.2	294.0	294.2	294.2	294.2	295.2	295.2	294.2	291.7	294.2				
46	***	***	1.916	293.1	292.2	292.0	293.1	293.5	293.5	294.2	294.2	294.2	294.2	294.2	294.2	291.2	293.2				
51	***	***	1.914	292.4	291.3	291.7	292.6	293.2	293.1	293.2	294.2	294.7	294.2	294.2	294.2	290.2	293.2				
56	***	***	1.912	291.9	290.9	290.4	291.2	292.8	292.9	293.2	293.2	294.2	293.2	293.2	293.2	289.2	293.2				
61	***	***	1.910	292.4	290.9	290.6	291.1	291.9	291.9	293.2	292.2	293.7	293.2	293.2	293.2	288.2	292.2				
66	***	***	1.909	292.3	291.5	291.3	291.9	291.9	292.9	292.2	292.2	292.2	292.2	292.2	292.2	289.2	291.2				
71	***	***	1.907	292.0	291.0	291.0	291.7	291.8	292.1	291.7	291.2	292.2	291.2	291.7	290.2	291.2					
81	***	***	1.905	292.0	290.8	290.7	291.7	291.5	291.5	291.2	291.2	292.2	292.2	292.2	292.2	290.7	291.2				
91	***	***	1.902	291.4	290.4	290.2	291.3	291.3	291.4	291.2	291.2	291.7	292.2	292.2	292.2	291.2	291.2				
101	***	***	1.900	291.1	290.0	289.9	290.9	291.0	291.1	291.2	291.2	291.2	292.2	292.2	292.2	289.2	291.2				
111	***	***	1.898	290.9	290.1	290.1	291.0	291.0	291.0	290.7	291.2	291.2	292.2	292.2	292.2	290.2	290.2				
121	***	***	1.896	290.7	289.9	289.8	290.9	290.9	290.7	290.2	290.2	291.2	291.2	291.2	291.2	289.2	290.2				
131	***	***	1.894	290.6	289.5	289.5	290.5	290.5	290.6	290.2	290.2	291.2	290.2	290.2	290.2	289.2	290.2				
141	***	***	1.893	290.4	289.3	289.5	290.4	290.1	290.2	290.2	289.2	290.2	290.2	290.2	289.2	289.2					
151	***	***	1.891	290.1	289.0	289.0	289.7	289.7	289.6	290.2	289.2	290.2	290.2	290.2	289.2	289.2					
161	***	***	1.890	289.6	288.8	288.8	289.6	289.5	289.5	289.2	289.2	290.2	290.2	290.2	289.2	289.2					
171	***	***	1.888	289.4	288.4	288.3	289.3	289.3	289.3	289.2	289.2	289.2	289.2	289.2	289.2	289.2					
181	***	***	1.887	289.3	288.3	288.4	289.3	289.3	289.0	289.2	288.2	289.2	289.2	289.2	288.2	288.2					
191	***	***	1.885	289.1	288.1	288.1	289.0	288.6	288.8	288.2	288.2	289.2	289.2	289.2	288.2	288.2					
201	***	***	1.884	288.8	288.1	287.9	288.8	288.6	288.6	288.2	288.2	289.2	289.2	289.2	288.2	288.2					

Table 11A — Scaling Run 239: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time (s)	Press Cyl <i>P</i> (atm)	Chamber <i>P</i> (atm)		Chamber Absolute Temperatures (K) at Locations /													COORDINATES			
																	R (m)	Theta (deg)	Z (m)	
				1	2	3	4	5	6	7	8	9	10	11	12	13				
-5	***	***	.996	274.2	273.2	273.2	274.3	274.2	274.1	274.2	274.2	275.2	275.2	275.2	274.2	273.2	1	0.000	00 -0.586	
-4	***	***	.996	274.2	273.2	273.2	274.3	274.2	274.2	274.2	274.2	275.2	275.2	275.2	274.2	273.2	2	0.000	00 -0.293	
-3	***	***	.996	274.2	273.3	273.2	274.3	274.2	274.2	274.2	274.2	275.2	275.2	275.2	274.2	273.2	3	0.000	00 0.000	
-2	***	***	.996	274.2	273.2	273.2	274.3	274.2	274.1	274.2	274.2	275.2	275.2	275.2	274.2	273.2	4	0.000	00 0.293	
-1	***	***	.996	274.2	273.2	273.2	274.3	274.2	274.2	274.2	274.2	275.2	275.2	275.2	274.2	273.2	5	0.000	00 0.586	
0.87	0.653	265.6	.996	276.5	273.9	271.4	274.7	276.4	277.3	274.2	274.7	275.2	275.2	275.2	280.7	273.7	6	0.000	00 0.870	
1.78	0.810	248.4	1.057	283.8	278.1	267.2	278.7	281.5	282.1	277.2	279.2	279.2	278.2	279.2	271.2	275.2	7	0.000	00 2.049	
2.72	1.446	247.6	1.182	288.5	282.9	271.3	283.4	286.3	286.9	282.2	284.2	284.7	284.2	283.2	272.7	279.7	8	0.000	00 2.342	
3.66	1.163	246.7	1.297	291.8	287.2	273.3	285.2	288.6	288.1	286.2	287.2	288.2	287.2	286.2	273.2	283.2	9	0.000	00 2.635	
4.60	0.929	244.2	1.399	293.1	285.8	273.9	287.5	290.2	289.9	289.2	289.7	290.7	290.2	289.7	273.7	286.2	10	0.000	00 2.928	
5.56	0.775	238.3	1.492	293.8	287.5	272.8	288.9	290.9	290.7	290.2	290.2	292.2	292.2	291.2	273.2	289.2	11	0.000	00 3.220	
6.51	0.635	235.2	1.577	294.6	289.2	272.6	290.7	291.8	291.5	291.2	291.7	293.2	292.2	291.2	274.2	287.7	12	0.000	00 3.513	
7.47	0.539	232.3	1.654	294.9	290.5	272.9	291.0	293.3	293.5	290.2	290.2	292.2	293.2	293.2	289.2	274.2	269.2	13	0.000	00 3.806
8.44	0.537	229.1	1.726	294.8	290.4	272.3	292.7	293.5	291.6	291.2	292.2	293.2	293.2	293.7	291.7	273.2	289.2			
9.41	0.574	226.4	1.792	294.2	290.3	272.1	291.3	292.4	292.0	291.2	292.2	293.2	293.2	293.2	292.2	274.2	292.2			
10.39	0.593	223.8	1.834	294.4	290.4	272.2	291.3	293.2	293.1	291.2	292.2	293.2	293.2	291.2	273.2	291.2				
11.36	0.762	223.0	1.891	294.5	290.5	272.5	291.5	291.8	291.5	292.2	292.2	293.2	293.2	291.2	273.2	290.2				
12.35	0.667	219.9	1.938	292.8	287.4	272.8	291.2	291.3	290.4	292.2	292.2	293.2	293.2	291.2	273.2	290.2				
13.35	0.576	159.5	1.947	289.8	286.5	280.8	290.4	290.5	290.6	291.2	290.7	291.7	291.7	290.2	279.2	285.7				
14.36	0.116	164.1	1.947	290.4	288.2	285.8	290.2	290.1	289.9	290.2	290.2	291.2	291.2	290.2	286.2	288.2				
15	***	***	1.946	269.8	288.5	287.3	289.9	289.6	289.7	289.2	289.2	290.2	290.2	290.7	286.7	289.2				
16	***	***	1.944	289.5	288.2	287.4	289.8	289.8	289.7	290.2	289.2	290.2	290.2	290.2	287.2	289.2				
17	***	***	1.943	289.4	288.1	287.6	289.6	289.5	289.5	290.2	289.2	290.2	290.2	290.2	291.2	273.2				
18	***	***	1.941	288.8	287.7	287.7	289.4	289.3	289.3	289.2	289.2	290.2	290.2	290.2	290.2	287.2				
19	***	***	1.940	288.2	287.0	287.2	288.5	288.4	288.5	289.2	289.2	290.2	290.2	290.2	287.2	290.2				
20	***	***	1.939	288.4	286.8	287.0	288.5	288.2	288.1	289.2	289.2	290.2	290.7	291.2	286.2	290.2				
21	***	***	1.938	288.3	287.4	287.2	288.3	288.0	288.0	289.2	289.2	290.2	290.2	290.2	288.2	290.2				
22	***	***	1.932	288.8	287.3	287.5	288.6	288.4	288.4	288.7	288.7	289.7	289.7	289.7	289.2	289.2				
27	***	***	1.933	288.1	286.9	287.1	288.1	288.6	288.6	288.2	288.2	289.2	289.2	289.2	288.2	288.2				
32	***	***	1.930	287.5	286.3	285.9	287.5	287.3	287.9	288.2	287.2	287.2	289.2	289.2	288.2	288.2				
27	***	***	1.927	287.3	286.9	285.4	286.5	286.4	286.4	285.4	285.4	287.2	287.2	288.2	289.7	289.2	287.2	287.7		
42	***	***	1.924	286.4	285.0	285.3	286.8	286.4	286.6	287.2	287.2	288.2	288.2	288.2	287.2	287.2				
47	***	***	1.922	286.7	285.5	285.7	286.7	286.6	286.5	286.5	287.2	287.2	288.2	288.2	286.2	287.2				
52	***	***	1.920	286.5	285.3	285.9	286.3	286.2	286.2	286.2	286.2	287.2	287.2	287.2	286.2	287.2				
57	***	***	1.919	286.2	285.1	285.0	285.9	285.9	285.5	285.7	285.2	285.2	286.2	287.2	287.2	284.7	286.2			
62	***	***	1.917	286.2	284.9	284.7	285.8	285.5	285.4	285.7	285.2	286.2	286.2	286.2	286.2	285.2	286.2			
67	***	***	1.915	285.9	284.8	284.7	285.6	285.6	285.5	285.2	284.2	284.2	285.2	285.2	285.2	286.2	285.2			
72	***	***	1.914	285.5	284.5	285.8	285.8	285.4	285.2	285.2	285.2	286.2	286.2	285.2	286.2	284.2				
82	***	***	1.911	284.8	283.6	283.5	284.5	284.7	285.0	284.2	284.2	285.2	285.2	285.2	285.2	284.2	284.2			
92	***	***	1.909	284.8	283.8	283.8	284.8	284.7	284.6	284.6	284.2	284.2	285.2	285.2	285.2	284.2	284.2			
102	***	***	1.907	284.0	283.7	283.8	284.8	284.7	284.7	284.2	284.2	285.2	285.2	285.2	284.2	284.2				
112	***	***	1.905	284.5	283.5	283.5	284.4	284.2	284.4	284.2	284.2	284.7	285.2	285.2	283.2	284.2				
122	***	***	1.903	283.8	282.6	282.5	283.7	283.6	283.8	284.2	283.2	284.2	284.2	284.2	284.2	283.2	284.2			
132	***	***	1.901	283.8	282.7	282.5	283.5	283.4	283.5	283.2	283.2	284.2	284.2	284.2	284.2	283.2	283.2			
142	***	***	1.900	283.7	282.8	282.7	283.8	283.4	283.7	283.2	283.2	284.2	284.2	284.2	284.2	282.2	283.2			
152	***	***	1.898	283.6	282.7	282.3	283.4	283.4	283.3	283.2	283.2	284.2	284.2	283.2	284.2	282.2	283.2			
162	***	***	1.897	283.1	281.9	282.2	283.2	283.0	282.8	282.2	282.2	283.7	283.2	283.2	282.2	282.2	282.2			
172	***	***	1.895	282.9	281.8	281.8	282.8	282.7	282.7	282.2	282.2	283.2	283.2	283.2	281.2	282.2				
182	***	***	1.894	282.8	281.8	281.7	282.7	282.5	282.4	282.2	282.2	283.2	283.2	283.2	281.2	282.2				
192	***	***	1.893	282.9	281.9	281.9	282.8	282.7	282.3	282.2	282.2	283.2	283.2	283.2	281.2	282.2				

Table 12A — Scaling Run 240: Uncluttered 324-m³ Chamber, Three 3.279-cm Nozzles

Time <i>t</i> (s)	Press Cyl <i>P</i> (atm)	Chamber <i>T_s</i> (K)	<i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES		
				1	2	3	4	5	6	7	8	9	10	11	12	13	I (M)	R (deg)	Z (M)
-5 ***	***	.993	275.3	274.3	274.2	275.2	275.3	274.3	274.2	275.2	275.2	275.2	275.2	275.2	274.2	1	0.000	00 -0.586	
-4 ***	***	.993	275.3	274.2	274.2	275.3	275.2	275.3	274.2	274.2	275.2	275.2	275.2	275.2	274.2	2	0.000	00 -0.293	
-3 ***	***	.993	275.3	274.3	274.2	275.3	275.2	275.3	274.2	274.2	275.2	275.2	275.2	275.2	274.2	3	0.000	00 0.000	
-2 ***	***	.993	275.3	274.3	274.2	275.3	275.2	275.3	274.2	274.2	275.2	275.2	275.2	275.2	274.2	4	0.000	00 0.293	
-1 ***	***	.993	275.3	274.3	274.2	275.3	275.2	275.3	274.2	274.2	275.2	275.2	275.2	275.2	274.2	5	0.000	00 0.586	
0.94 687	274.2	.993	275.7	274.7	275.7	275.5	275.5	276.0	274.2	274.7	275.7	275.7	275.7	281.7	274.2	6	0.000	00 0.878	
178.986	254.8	1.045	262.9	270.3	270.2	278.4	281.7	282.4	277.2	279.2	280.2	279.2	278.2	273.2	275.2	7	0.000	00 2.049	
275.235	250.3	1.170	288.3	284.7	271.2	283.3	288.1	288.8	283.2	284.2	285.2	284.2	284.2	273.2	277.2	8	0.000	00 2.342	
369.347	249.9	1.285	292.4	287.3	274.3	287.0	290.3	289.8	287.2	287.2	289.2	289.2	288.2	273.2	281.2	9	0.000	00 2.635	
463.939	246.9	1.387	294.2	287.3	274.7	289.9	292.2	292.0	289.2	289.7	291.2	290.7	288.7	274.2	283.7	10	0.000	00 2.928	
559.061	241.9	1.479	295.3	290.3	275.0	291.5	293.1	293.1	291.2	291.2	293.2	292.2	290.2	276.2	285.2	11	0.000	00 3.220	
654.796	238.6	1.564	295.9	294.6	274.8	291.6	293.8	293.8	291.7	292.2	293.2	293.2	291.7	275.2	284.7	12	0.000	00 3.513	
750.735	235.2	1.641	295.7	290.2	274.3	292.9	294.0	293.2	291.2	293.2	294.2	293.2	291.2	274.2	289.2	13	0.000	00 3.806	
847.248	233.1	1.713	295.9	289.9	274.1	292.9	294.1	294.2	292.2	292.7	294.2	294.2	291.2	273.2	290.2				
944.116	230.8	1.778	296.0	289.3	274.0	293.8	294.5	293.1	292.2	292.2	293.2	293.2	291.2	274.2	290.2				
1042.048	228.9	1.819	296.3	291.9	274.7	293.4	294.2	293.8	292.2	292.2	293.2	293.2	292.2	274.2	292.2				
1139.320	226.5	1.875	295.2	291.5	273.9	293.2	293.6	294.4	292.2	292.2	294.2	294.2	291.2	275.2	289.7				
1239.054	199.9	1.927	294.7	290.6	274.5	293.9	294.3	293.4	291.2	292.2	293.2	293.2	291.2	274.2	287.2				
1338.616	160.5	1.950	293.7	290.6	279.9	293.3	293.3	293.5	292.2	291.7	292.7	292.7	291.2	281.2	288.2				
1438.864	164.6	1.952	293.1	291.0	288.6	293.1	292.4	291.7	290.2	290.2	292.2	291.2	291.2	288.2	289.2				
15 ***	***	1.931	292.2	290.8	289.6	292.4	291.7	291.6	290.7	290.2	291.2	291.2	291.2	289.2	289.7				
16 ***	***	1.949	291.7	290.4	289.6	291.7	291.3	291.3	290.2	290.2	291.2	291.2	292.2	289.2	290.2				
17 ***	***	1.947	291.5	290.0	289.3	291.3	290.9	290.9	290.2	290.2	291.2	291.2	291.2	289.7	290.2				
18 ***	***	1.946	291.2	289.7	289.5	290.7	290.7	290.8	290.2	290.2	291.2	291.2	291.2	289.2	290.2				
19 ***	***	1.945	291.0	289.5	289.4	290.4	290.0	290.6	290.2	290.2	291.2	291.2	291.2	288.2	290.2				
20 ***	***	1.944	290.7	289.4	289.4	290.0	289.9	290.5	290.2	290.2	291.2	291.2	291.2	289.2	290.2				
21 ***	***	1.943	290.5	289.2	289.3	290.0	289.9	290.2	289.2	289.2	291.2	291.2	291.2	289.2	290.2				
22 ***	***	1.942	290.2	289.0	288.9	289.5	289.6	289.7	289.2	289.2	290.2	290.2	291.2	289.2	290.2				
27 ***	***	1.938	288.8	287.7	287.8	289.3	288.8	288.9	289.2	289.2	290.2	290.2	290.2	289.2	289.2				
32 ***	***	1.934	288.8	288.1	288.1	288.8	289.1	289.0	289.2	289.2	290.2	290.2	290.2	288.2	288.2				
37 ***	***	1.931	288.4	287.3	287.4	288.7	288.6	288.9	288.2	288.2	289.2	289.2	289.2	286.7	288.2				
42 ***	***	1.929	288.3	286.3	287.2	288.1	288.3	288.5	288.2	288.2	289.2	289.2	289.2	287.7	288.2				
47 ***	***	1.927	286.9	285.7	285.5	286.8	286.9	287.0	287.2	287.2	288.2	288.2	289.2	287.2	287.2				
52 ***	***	1.925	287.3	286.2	285.1	286.4	287.0	286.8	287.2	287.2	288.2	288.2	288.2	286.2	287.2				
57 ***	***	1.923	287.7	285.8	284.9	286.6	287.0	286.3	286.2	286.2	287.2	287.2	287.2	284.7	286.7				
62 ***	***	1.921	287.2	284.7	285.0	285.9	285.8	285.5	287.2	287.2	287.2	287.7	287.7	287.2	283.2	286.2			
67 ***	***	1.920	286.5	284.7	284.6	285.9	285.8	286.0	286.2	286.2	286.2	286.2	286.2	283.2	285.2				
72 ***	***	1.918	286.4	285.1	285.0	286.1	286.3	286.2	285.2	285.2	286.2	286.2	286.2	284.2	285.2				
82 ***	***	1.916	286.5	285.5	285.4	286.3	286.3	286.5	285.2	285.2	286.2	286.2	286.2	285.2	285.2				
92 ***	***	1.913	286.5	285.5	285.4	286.4	286.2	285.9	285.2	285.2	286.2	286.2	286.2	285.2	285.2				
102 ***	***	1.911	286.1	284.9	284.8	285.9	286.0	286.0	285.2	285.2	286.2	286.2	286.2	285.2	285.2				
112 ***	***	1.909	285.9	284.8	284.8	285.9	285.8	285.8	284.2	284.2	285.2	285.2	286.2	284.2	285.2				
122 ***	***	1.907	285.3	284.3	284.3	285.4	285.3	285.2	285.2	284.2	285.2	285.2	285.2	284.2	284.2				
132 ***	***	1.906	285.2	284.1	284.2	285.3	285.4	285.2	284.2	284.2	285.2	285.2	285.2	284.2	284.2				
142 ***	***	1.904	284.9	283.9	283.9	285.0	284.5	284.8	284.2	284.2	285.2	285.2	284.2	283.2	284.2				
152 ***	***	1.902	284.8	283.8	283.7	284.7	284.5	284.5	284.2	284.2	284.2	284.2	284.2	283.2	283.2				
162 ***	***	1.901	284.5	283.5	283.5	284.3	284.4	283.2	283.2	284.2	284.2	284.2	284.2	282.7	283.2				
172 ***	***	1.899	284.2	283.1	283.0	284.3	284.2	284.2	283.2	283.2	284.2	284.2	284.2	284.2	282.2	283.2			
182 ***	***	1.898	284.0	283.0	282.9	284.0	283.9	283.7	283.2	283.2	284.2	284.2	284.2	282.2	283.2				
192 ***	***	1.897	283.7	282.7	282.7	283.8	283.8	283.8	283.2	283.2	284.2	284.2	284.2	283.2	282.2				

Table 13A -- Scaling Run 241: Cluttered 324-m³ Chamber, South 3.279-cm Nozzle

Time (s)	Press Cyl <i>t</i> (atm)	Chamber <i>T_s</i> (K)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES					
				1	2	3	4	5	6	7	8	9	10	11	12	13	I (m)	R (m)	Theta (deg)	Z (m)		
-5	***	***	1.009	289.6	289.1	289.0	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2	0.000	0.00	-0.586			
-4	***	***	1.009	289.6	289.2	289.0	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2	0.000	0.00	-0.293			
-3	***	***	1.009	289.6	289.1	289.0	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2	0.000	0.00	0.000			
-2	***	***	1.009	289.6	289.1	289.0	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2	0.000	0.00	0.293			
-1	***	***	1.009	289.6	289.1	289.0	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2	0.000	0.00	0.586			
0	269.269	290.6	1.010	289.7	289.2	289.1	289.6	289.6	289.5	290.2	290.2	290.2	290.2	290.2	290.2	290.2	0.000	0.00	0.678			
185.490	301.8	1.036	293.6	292.4	291.0	292.1	292.5	293.0	290.2	291.2	291.2	291.2	291.2	290.2	290.2	290.2	0.000	0.00	2.049			
282.405	275.6	1.051	297.8	296.9	296.5	296.9	297.5	298.1	293.2	293.2	294.7	294.2	294.7	293.2	293.2	293.2	0.000	0.00	2.342			
379.408	268.4	1.143	300.5	299.7	299.4	299.9	300.4	300.5	295.2	296.2	298.2	297.2	297.2	296.2	296.2	296.2	0.000	0.00	2.635			
476.265	266.3	1.192	302.6	301.8	301.7	302.3	302.4	302.6	299.2	298.7	299.7	299.7	300.2	298.7	299.2	299.2	0.000	0.00	2.928			
572.701	262.6	1.237	302.6	302.5	303.1	303.8	303.4	303.5	302.2	302.2	301.2	302.2	302.2	301.2	302.2	302.2	0.000	0.00	3.220			
668.303	263.0	1.281	303.6	303.7	304.2	304.6	305.4	305.7	303.7	304.2	303.7	304.7	305.7	303.7	304.2	304.2	0.000	0.00	3.513			
763.347	262.2	1.323	304.9	305.0	304.9	305.9	306.1	305.9	305.2	306.2	306.2	306.2	306.2	305.2	305.2	305.2	0.000	0.00	3.606			
864.382	261.2	1.363	305.8	305.2	304.5	306.4	306.1	306.1	307.2	308.7	307.7	307.7	307.7	306.7	306.2	306.2	0.000	0.00	3.862			
970.122	260.4	1.402	307.4	306.7	307.0	307.3	307.3	307.4	309.2	308.2	308.2	308.2	308.2	307.2	306.2	306.2	0.000	0.00	4.147			
1068.714	258.9	1.427	306.9	306.3	307.5	307.0	306.6	306.6	310.2	309.2	308.2	308.2	308.2	307.2	307.2	307.2	0.000	0.00	4.427			
1166.724	258.9	1.463	307.3	307.3	307.3	308.1	307.9	307.8	310.7	310.2	308.7	308.7	308.2	307.2	307.2	307.2	0.000	0.00	4.724			
1264.694	257.7	1.498	308.7	308.3	308.9	309.1	308.6	308.2	311.2	311.2	309.2	309.2	309.2	307.2	307.2	307.2	0.000	0.00	5.000			
1362.806	256.7	1.531	307.0	307.0	307.8	307.5	306.3	306.6	312.2	311.2	309.2	309.2	309.2	308.2	308.2	307.7	0.000	0.00	5.287			
1460.932	256.9	1.563	307.9	306.8	306.1	307.4	307.8	307.9	311.2	312.2	309.2	310.2	310.2	309.2	309.2	309.2	0.000	0.00	5.559			
1559.099	255.7	1.595	306.6	307.9	308.6	308.8	309.7	310.4	311.7	310.2	310.7	311.7	310.7	310.7	310.7	310.7	0.000	0.00	5.834			
1657.408	253.6	1.625	307.3	306.8	306.8	308.1	309.4	310.3	312.2	312.2	311.2	311.2	312.2	312.2	310.2	310.2	310.2	0.000	0.00	6.125		
1755.779	254.1	1.655	308.7	308.3	308.3	309.0	309.2	309.3	313.2	312.7	311.2	310.2	311.2	309.7	308.7	308.7	0.000	0.00	6.425			
1854.184	252.3	1.684	308.1	307.9	308.9	308.8	308.8	308.7	309.0	314.2	313.2	311.2	312.2	311.2	308.2	308.2	308.2	0.000	0.00	6.702		
1953.177	252.0	1.702	307.5	307.3	306.6	307.3	307.0	307.0	308.4	314.2	312.2	310.2	311.2	311.2	309.2	308.2	308.2	0.000	0.00	7.000		
2051.650	251.5	1.729	307.0	307.0	306.9	307.5	307.8	307.1	314.2	313.7	311.2	312.2	312.2	310.2	309.7	309.7	309.7	0.000	0.00	7.299		
2150.218	251.9	1.756	307.6	306.6	306.6	306.6	306.8	308.3	314.2	312.2	312.2	312.2	311.2	309.2	309.2	309.2	0.000	0.00	7.556			
2248.765	250.5	1.781	307.8	307.3	306.7	306.6	307.0	307.0	313.2	312.2	310.2	310.2	310.2	308.2	308.2	309.2	0.000	0.00	8.000			
2347.279	249.8	1.806	308.5	307.9	307.5	308.4	308.6	308.6	309.1	314.2	311.2	310.2	311.2	311.2	309.2	309.2	309.2	0.000	0.00	8.347		
2445.871	249.1	1.830	308.4	308.0	308.0	309.1	308.8	309.3	314.2	312.7	310.2	309.7	309.2	308.7	308.7	308.7	0.000	0.00	8.681			
2544.469	248.1	1.854	309.9	309.4	308.8	310.2	310.0	310.0	314.2	313.2	309.2	309.2	308.2	307.2	307.2	307.2	0.000	0.00	9.000			
2643.729	247.8	1.869	309.0	308.4	308.4	308.9	308.9	307.9	314.2	313.2	310.2	309.2	309.2	307.2	307.2	307.2	0.000	0.00	9.229			
2742.304	246.9	1.892	308.0	307.0	306.9	307.6	307.2	307.1	314.2	312.7	309.2	309.2	309.2	307.2	307.2	307.2	0.000	0.00	9.492			
2841.265	246.0	1.913	307.2	306.6	306.3	307.0	306.8	306.6	312.2	312.2	309.2	309.2	309.2	308.2	308.2	307.2	0.000	0.00	9.741			
2940.027	244.9	1.934	305.8	306.4	305.3	307.1	306.7	307.0	312.2	312.2	308.7	308.7	309.2	308.7	308.7	308.7	0.000	0.00	10.000			
3039.002	239.5	1.954	305.2	305.1	305.7	305.9	305.4	304.8	311.2	311.2	310.2	310.2	310.2	310.2	310.2	310.2	0.000	0.00	10.259			
3139.003	227.5	1.967	304.9	304.9	305.3	306.0	305.3	305.5	311.2	311.2	309.7	309.2	309.2	307.7	307.7	307.7	0.000	0.00	10.517			
32	***	***	1.974	304.9	304.2	303.8	305.4	305.9	306.7	310.2	310.2	308.2	308.2	307.2	307.2	307.2	0.000	0.00	10.774			
33	***	***	1.977	304.8	304.3	304.6	305.9	306.1	306.4	310.2	310.2	308.2	308.2	307.2	307.2	306.2	0.000	0.00	11.031			
34	***	***	1.978	304.2	303.5	304.0	305.0	305.6	306.0	310.2	309.2	307.7	307.2	307.2	306.2	306.2	306.2	0.000	0.00	11.289		
35	***	***	1.980	303.6	303.5	303.5	305.2	305.2	304.9	309.2	309.2	307.2	307.2	306.2	305.2	305.2	305.2	0.000	0.00	11.548		
36	***	***	1.981	303.8	303.5	303.9	304.7	304.6	304.5	305.2	305.2	306.7	306.7	306.2	306.2	304.2	304.2	305.2	0.000	0.00	11.807	
37	***	***	1.981	303.8	303.3	303.9	304.5	304.8	304.9	308.2	308.2	306.2	306.2	306.2	305.2	305.2	305.2	0.000	0.00	12.066		
38	***	***	1.980	304.1	303.6	303.8	304.3	304.4	304.2	308.2	307.2	305.2	305.2	306.2	306.7	305.2	305.2	305.2	0.000	0.00	12.324	
39	***	***	1.980	304.0	303.4	302.8	303.3	303.4	303.4	308.2	306.2	305.2	305.2	306.2	305.2	304.2	304.2	304.2	0.000	0.00	12.583	
44	***	***	1.976	302.7	302.2	301.8	302.4	302.6	302.0	306.2	306.2	305.2	304.2	304.2	304.2	304.2	303.2	303.2	304.2	0.000	0.00	12.842
49	***	***	1.974	301.6	301.5	301.5	302.7	302.2	301.8	304.2	304.2	303.2	303.2	303.2	303.2	304.2	304.2	304.2	0.000	0.00	13.101	
54	***	***	1.971	301.5	301.4	301.5	302.4	302.7	301.8	303.2	303.2	303.2	303.2	303.2	303.2	303.2	303.2	303.2	0.000	0.00	13.359	
59	***	***	1.970	301.0	300.8	300.6	301.8	302.1	302.0	303.2	303.2	301.2	303.2	303.2	303.2	301.2	303.2	303.2	0.000	0.00	13.618	
64	***</td																					

Table 14A — Scaling Run 242: Cluttered 324-m³ Chamber, South 3.279-cm Nozzle

Time <i>t</i> (s)	Press Cyl <i>P</i> (atm)	Chamber <i>T_l</i> (K)	<i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations <i>l</i>													COORDINATES		
				1	2	3	4	5	6	7	8	9	10	11	12	13	I (m)	R (deg)	Z (m)
-5 ***	***	1.006	292.4	291.8	291.8	292.4	292.3	292.3	292.2	292.2	293.2	293.2	293.2	293.2	293.2	292.2	1 0.000	00 -0.586	
-4 ***	***	1.006	292.4	291.8	291.7	292.4	292.3	292.3	292.2	292.2	293.2	293.2	293.2	293.2	293.2	292.2	2 0.000	00 -0.293	
-3 ***	***	1.006	292.4	291.8	291.8	292.4	292.3	292.3	292.2	292.2	293.2	293.2	293.2	293.2	293.2	292.2	3 0.000	00 0.000	
-2 ***	***	1.006	292.4	291.8	291.8	292.4	292.2	292.3	292.2	292.2	293.2	293.2	293.2	293.2	293.2	292.2	4 0.000	00 0.293	
-1 ***	***	1.006	292.4	291.8	291.8	292.4	292.3	292.3	292.2	292.2	293.2	293.2	293.2	293.2	293.2	292.2	5 0.000	00 0.586	
0.85	925	330.8	1.008	293.2	292.4	292.1	292.8	292.9	293.2	292.7	292.7	293.2	293.2	293.2	293.2	292.7	6 0.000	00 0.878	
105.442	287.1	1.047	298.2	296.9	294.6	295.7	297.1	298.6	294.2	294.2	294.2	294.2	295.2	294.2	294.2	294.2	7 0.000	00 2.049	
282.793	277.9	1.101	301.4	300.6	300.3	300.9	301.4	301.8	296.7	297.2	298.2	297.2	298.2	297.2	297.2	297.2	8 0.000	00 2.342	
300.306	271.6	1.152	304.5	303.5	303.1	303.8	304.1	304.4	299.2	300.2	301.2	306.2	301.2	306.2	300.2	300.2	9 0.000	00 2.635	
477.905	267.3	1.199	305.9	304.9	304.7	305.4	305.5	306.4	301.2	302.7	304.2	303.7	303.7	301.7	302.7	301.7	10 0.000	00 2.928	
575.476	267.5	1.245	307.4	307.0	306.8	307.2	307.9	305.2	305.2	305.2	305.2	304.2	305.2	304.2	305.2	306.2	11 0.000	00 3.220	
673.830	266.0	1.274	308.1	307.8	307.0	307.9	308.1	309.2	307.2	307.2	307.2	307.2	305.2	305.2	306.2	306.2	12 0.000	00 3.513	
771.442	265.9	1.315	308.4	307.7	308.0	308.0	308.3	309.2	309.2	309.7	308.7	309.7	308.2	308.2	308.2	308.2	13 0.000	00 3.806	
869.143	265.3	1.355	308.8	308.9	308.6	310.0	310.6	311.3	310.2	310.2	310.2	311.2	309.2	310.2	310.2	310.2			
967.000	263.4	1.393	310.2	310.2	310.7	311.9	311.6	310.7	311.2	311.2	310.2	310.7	310.7	309.2	310.2	310.2			
1064.871	262.6	1.430	311.1	310.5	310.0	310.9	310.5	311.1	311.2	311.2	311.2	311.2	311.2	309.2	310.2	310.2			
1162.861	261.7	1.466	311.8	310.8	310.9	311.3	311.3	311.7	313.2	311.7	311.2	312.2	312.2	310.2	311.2	311.2			
1260.864	261.2	1.500	311.2	310.8	310.6	310.4	310.2	310.8	315.2	312.2	312.2	312.2	312.2	313.2	310.2	311.2			
1358.932	260.5	1.533	311.0	310.4	309.9	311.1	311.2	311.4	315.2	314.2	312.7	313.2	313.2	311.2	312.2	312.2			
1437.156	259.5	1.564	311.7	310.4	310.9	310.9	310.9	313.0	316.2	315.2	313.2	313.2	313.2	311.2	312.2	312.2			
1556.034	259.1	1.585	311.9	310.8	311.1	311.6	311.5	310.9	315.2	314.2	313.2	313.2	313.2	311.2	312.2	312.2			
1654.228	258.5	1.615	312.4	311.8	311.9	312.2	312.3	312.4	315.2	314.7	312.7	312.2	312.7	310.2	312.2	312.2			
1752.578	257.1	1.644	312.3	311.9	311.9	312.6	312.5	311.9	315.2	314.2	313.2	313.2	313.2	311.2	313.2	313.2			
1851.031	256.8	1.673	312.9	312.3	311.8	312.8	312.8	312.3	312.7	315.2	314.2	313.2	313.2	311.2	313.2	313.2			
1949.558	256.0	1.701	312.4	312.1	312.3	312.3	312.0	312.2	315.2	315.2	313.2	313.2	313.2	312.2	313.2	313.2			
2048.051	255.5	1.727	311.9	311.6	311.2	311.3	311.0	311.3	315.7	315.2	313.2	312.7	314.2	312.2	312.2	312.2			
2146.585	254.5	1.753	311.1	310.6	310.9	310.9	310.5	310.4	316.2	315.2	313.2	313.2	313.2	312.2	313.2	313.2			
2245.578	254.4	1.769	310.4	310.2	310.8	311.6	312.2	313.2	315.2	315.2	314.2	313.2	313.2	312.2	313.2	313.2			
2344.088	253.6	1.794	309.8	309.9	310.4	311.9	313.1	313.8	313.2	314.2	312.7	312.2	313.2	311.2	313.2	313.2			
2442.388	253.0	1.818	310.3	311.0	310.9	312.2	312.4	312.8	315.2	314.2	312.2	312.2	312.2	309.2	311.2	311.2			
2540.296	252.5	1.841	312.0	311.7	311.6	312.3	312.4	312.7	315.7	313.7	312.7	313.2	312.7	310.2	311.7	311.7			
2636.898	251.8	1.864	311.7	311.3	311.5	311.7	312.6	313.1	316.2	315.2	312.2	313.2	313.2	309.2	310.2	310.2			
2741.324	250.7	1.886	312.7	312.6	312.7	312.6	312.6	312.5	316.2	315.7	311.7	312.7	313.2	309.7	310.7	310.7			
2840.358	250.4	1.907	310.9	311.2	311.5	311.1	310.6	310.4	316.2	316.2	316.2	312.2	312.2	313.2	310.2	310.2			
2939.823	249.6	1.921	309.8	309.3	309.1	309.8	309.6	309.8	315.2	316.2	312.2	312.2	312.2	309.2	310.2	310.2			
3038.942	242.9	1.940	309.6	309.4	309.8	309.9	309.9	310.1	315.2	315.7	312.2	312.2	312.2	310.2	310.7	310.7			
3138.925	230.0	1.954	309.3	308.7	308.8	309.8	310.0	310.0	315.2	314.2	311.2	311.2	311.2	310.2	311.2	311.2			
32 ***	***	1.961	309.3	309.5	310.2	310.4	309.8	309.4	313.7	314.2	310.7	311.2	311.2	309.7	311.2	311.2			
33 ***	***	1.965	308.3	309.0	309.8	310.1	309.7	309.9	314.2	313.2	310.2	311.2	311.2	310.2	311.2	311.2			
34 ***	***	1.967	308.1	308.1	308.9	309.7	309.5	309.1	314.2	313.2	310.2	311.2	311.7	309.2	310.7	310.7			
35 ***	***	1.968	308.3	307.9	308.1	308.9	308.5	308.4	313.2	313.2	309.2	310.2	311.2	309.2	310.2	310.2			
36 ***	***	1.968	308.1	307.6	307.6	308.1	308.1	308.4	313.2	313.2	303.2	303.2	310.2	308.2	309.2	309.2			
37 ***	***	1.968	308.0	307.5	307.4	308.1	308.1	308.2	312.2	311.7	309.2	309.2	309.2	306.7	308.2	308.2			
38 ***	***	1.968	308.0	307.5	307.5	308.1	307.8	308.0	312.2	311.2	308.2	309.2	309.2	307.2	307.2	307.2			
39 ***	***	1.967	308.2	307.5	306.9	307.7	307.3	307.1	310.7	310.7	308.2	308.2	309.2	306.7	307.7	307.7			
44 ***	***	1.964	306.6	306.1	305.9	305.9	305.7	305.8	309.2	309.2	307.2	306.7	306.7	305.2	306.2	306.2			
49 ***	***	1.961	305.2	305.0	304.8	305.0	304.5	304.4	306.2	306.2	307.2	307.2	307.2	304.2	305.2	305.2			
54 ***	***	1.959	305.1	304.3	303.2	303.2	303.3	303.9	306.2	306.2	307.2	307.2	306.2	304.2	304.2	304.2			
59 ***	***	1.957	303.9	303.5	303.5	303.6	303.8	303.9	305.2	305.2	306.2	306.2	306.2	304.2	305.2	305.2			
64 ***	***	1.955	303.3	303.0	303.1	303.7	303.7	303.6	305.2	304.2	306.2	305.2	305.2	304.2	305.2	305.2			
69 ***	***	1.954	303.5	302.9	302.7	303.3	303.2	303.5	305.2	305.2	305.2	305.2	305.2	304.2	305.2	305.2			
74 ***	***	1.952	303.1	302.8	302.7	303.2	303.4	303.5	305.2	304.2	304.2	304.2	304.2	305.2	304.2	304.2			
79 ***	***	1.951	303.5	303.0	303.0	303.1	303.1	303.5	304.2	304.2	305.2	304.2	304.2	302.2	304.2	304.2			
84 ***	***	1.950	303.8	302.7	302.7	302.5	303.1	303.3	304.2	304.2	305.2	304.2	304.2	302.2	304.2	304.2			
85 ***	***	1.949	303.5	302.7	302.5	302.7	302.9	303.0	303.2	303.2	304.2	304.2	304.2	302.2	304.2	304.2			

Table 15A — Scaling Run 243: Cluttered 324-m³ Chamber, South 3.279-cm Nozzle

Time (s)	Press Cyl <i>P</i> (atm)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES			
			1	2	3	4	5	6	7	8	9	10	11	12	13	I (m)	R (m)	Theta (deg)	Z (m)
			(K)																
-5 ***	***	1.000	289.0	288.4	288.5	289.1	288.9	289.0	290.2	290.2	291.2	291.2	291.2	291.2	290.2	1 0.000	0.000	-0.396	
-4 ***	***	1.000	289.0	288.5	288.5	289.0	288.9	289.0	290.2	290.2	291.2	291.2	291.2	291.2	290.2	2 0.000	0.000	-0.293	
-3 ***	***	1.000	289.0	288.5	288.5	289.0	288.9	288.9	290.2	290.2	291.2	291.2	291.2	291.2	290.2	3 0.000	0.000	0.000	
-2 ***	***	1.000	289.0	288.5	288.5	289.1	288.9	288.9	290.2	290.2	291.2	291.2	291.2	291.2	290.2	4 0.000	0.000	0.293	
-1 ***	***	1.000	289.0	288.5	288.5	289.1	288.9	288.9	290.2	290.2	291.2	291.2	291.2	291.2	290.2	5 0.000	0.000	0.596	
059.020	289.2	1.000	289.1	288.5	288.6	289.0	288.9	289.1	290.2	290.2	291.2	291.2	291.2	291.2	290.2	6 0.000	0.000	0.078	
191.272	298.9	1.028	293.0	291.7	290.5	291.7	292.4	293.3	291.2	291.2	291.2	292.2	292.2	291.2	291.2	7 0.000	0.000	2.049	
288.255	275.7	1.082	297.2	296.4	296.3	296.7	297.3	297.4	294.2	294.2	294.7	294.7	295.7	294.2	294.7	8 0.000	0.000	2.342	
385.667	266.6	1.134	300.1	299.2	298.9	299.7	300.3	300.7	297.2	298.2	298.2	299.2	297.2	297.2	298.2	9 0.000	0.000	2.635	
483.207	262.6	1.182	302.4	301.0	301.6	302.0	302.2	302.2	298.7	299.7	300.2	301.2	301.2	299.7	300.2	10 0.000	0.000	2.928	
580.796	261.4	1.228	303.3	302.5	301.7	302.7	303.2	303.9	302.2	302.2	303.2	302.2	303.2	302.2	302.2	11 0.000	0.000	3.220	
678.354	260.8	1.271	304.5	304.0	303.9	304.5	305.0	305.4	303.2	304.7	304.2	304.7	305.2	302.7	303.7	12 0.000	0.000	3.513	
776.020	259.2	1.313	306.6	305.5	305.8	305.8	305.9	306.8	306.2	306.2	306.4	306.2	307.2	303.2	305.2	13 0.000	0.000	3.806	
873.687	239.4	1.353	305.3	303.5	306.2	306.3	306.1	306.2	307.7	306.7	307.7	307.7	308.2	305.7	306.7				
971.503	259.2	1.391	306.5	305.9	305.7	306.3	306.0	307.1	308.2	307.2	309.2	309.2	309.2	307.2	308.2				
1070.102	257.6	1.416	306.0	305.2	305.0	305.9	305.8	306.5	309.2	309.2	309.2	310.2	310.2	308.2	308.2				
1167.929	257.1	1.452	307.1	306.1	305.7	306.3	307.0	307.4	309.7	310.2	310.7	310.7	310.7	310.7	309.2				
1265.939	256.5	1.487	308.7	308.3	308.0	308.6	308.6	309.1	311.2	310.2	311.2	311.2	311.2	308.2	309.2				
1363.890	255.9	1.521	308.8	307.5	307.7	308.1	307.4	306.9	311.7	309.7	310.2	310.2	310.7	308.7	309.2				
1462.136	254.2	1.553	308.1	307.5	307.6	307.4	307.1	308.0	312.2	311.2	311.2	310.2	311.2	310.2	309.2				
1560.391	253.0	1.584	307.6	307.0	306.2	308.9	308.6	308.5	312.7	311.7	311.2	310.2	310.2	310.2	308.2				
1658.667	253.5	1.614	306.3	307.9	308.1	310.2	309.7	310.2	314.2	313.2	311.2	310.2	310.2	311.2	309.2				
1757.585	252.4	1.634	306.9	307.1	307.8	309.2	309.2	309.3	314.2	313.2	310.2	310.2	310.2	309.2	309.2				
1855.966	251.0	1.662	307.3	306.4	307.2	310.0	308.3	309.3	314.2	312.7	310.2	310.2	310.2	307.7	308.7				
1954.422	250.5	1.690	307.9	307.3	307.4	308.6	307.6	307.0	313.2	313.2	310.2	310.2	310.2	308.2	309.2				
2052.549	249.9	1.717	308.6	307.2	307.4	307.8	306.6	307.0	314.2	312.2	310.2	310.2	312.2	307.2	308.7				
2151.558	248.9	1.743	308.3	307.3	306.8	308.0	308.2	308.3	314.2	312.2	310.2	310.2	310.2	308.2	309.2				
2250.211	249.9	1.769	308.9	308.5	308.8	308.9	308.7	308.8	315.2	312.7	311.2	310.7	310.7	309.2	309.7				
2348.905	248.1	1.794	307.5	306.9	308.3	308.2	308.0	307.9	315.2	312.2	311.2	311.2	310.2	309.2	309.2				
2448.082	247.6	1.810	306.3	306.6	307.1	308.2	308.2	308.0	314.2	313.2	310.2	310.2	310.2	308.2	309.2				
2546.833	246.7	1.833	306.0	305.9	307.1	308.6	308.3	308.3	311.7	312.7	310.2	310.2	310.2	308.7	308.7				
2645.646	246.6	1.856	306.4	306.4	307.1	308.2	308.5	308.8	313.2	312.2	310.2	310.2	310.2	308.2	308.2				
2744.524	245.5	1.879	307.1	307.2	308.1	308.0	308.0	308.5	312.7	313.2	309.7	310.2	309.7	308.7	308.2				
2843.433	244.9	1.901	307.3	306.8	306.6	307.5	306.6	307.1	313.2	314.2	309.2	310.2	310.2	306.2	308.2				
2942.405	242.5	1.922	307.2	306.9	307.4	307.7	307.6	308.2	312.2	312.7	309.7	310.2	310.2	306.7	307.7				
3041.303	239.5	1.939	305.7	304.4	305.9	306.4	306.3	307.0	313.2	313.2	309.2	310.2	310.2	308.2	309.2				
3142.040	221.3	1.946	305.8	305.5	305.5	306.5	306.2	306.5	313.2	314.2	309.2	310.2	310.2	309.2	308.2				
32 ***	***	1.952	305.8	305.5	305.2	305.9	305.7	305.7	312.7	312.7	308.7	308.7	307.7	308.2					
33 ***	***	1.955	305.8	305.3	305.3	305.8	305.5	305.3	312.2	311.2	308.2	308.2	308.2	308.2					
34 ***	***	1.957	305.2	304.6	304.8	305.4	305.1	305.2	311.2	310.2	307.7	308.2	308.2	306.2	308.2				
35 ***	***	1.957	304.7	304.4	304.5	305.2	304.9	305.1	311.2	310.2	307.2	308.2	308.2	305.2	307.2				
36 ***	***	1.957	304.8	304.4	304.5	305.0	304.7	304.9	310.2	310.2	306.7	307.2	307.2	304.7	305.7				
37 ***	***	1.957	304.7	304.0	304.4	304.6	304.6	304.6	310.2	310.2	306.2	306.2	306.2	305.2	305.2				
38 ***	***	1.956	304.9	304.0	304.1	304.5	304.4	304.5	309.5	310.2	306.2	306.2	306.2	305.2	305.7				
39 ***	***	1.956	304.7	303.9	304.9	304.5	304.3	304.3	309.2	310.2	306.2	306.2	306.2	304.2	305.2				
40 ***	***	1.952	302.9	302.7	302.1	303.6	303.4	303.4	308.2	308.2	309.2	309.2	305.2	304.2	305.2				
41 ***	***	1.950	302.7	301.8	302.6	302.6	302.9	302.8	306.2	306.2	305.2	305.2	303.2	304.2					
54 ***	***	1.948	301.7	301.2	301.0	301.2	302.0	301.9	305.2	305.2	303.2	303.2	303.2	303.2	303.2				
55 ***	***	1.946	300.9	300.2	300.6	300.9	301.0	301.7	304.2	303.2	303.2	302.2	302.2	301.2	302.2				
64 ***	***	1.944	300.2	299.0	300.0	300.2	300.0	299.8	303.2	303.2	303.2	302.7	302.2	301.2	302.2				
69 ***	***	1.942	300.4	299.5	299.5	300.2	300.4	299.9	303.2	303.2	303.2	302.2	302.2	301.2	302.2				
74 ***	***	1.941	301.0	300.3	300.4	300.4	300.3	300.4	302.2	302.2	303.2	303.2	302.2	301.2	302.2				
79 ***	***	1.940	300.2	299.9	299.1	300.3	300.4	300.6	302.2	302.2	302.2	302.2	302.2	304.2	302.2				
84 ***	***	1.938	300.3	299.5	299.2	300.9	300.6	301.2	301.2	301.2	302.2	301.2	301.2	301.2	301.2				
89 ***	***	1.937	299.6	298.6	298.0	299.7	299.7	299.9	301.2	301.2	301.2	302.2	302.2	301.2	301.2				

Table 16A — Scaling Run 244: Cluttered 324-m³ Chamber, South 3.279-cm Nozzle

Time <i>t</i> (s)	Press Cyl <i>P</i> (atm)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations <i>i</i>													COORDINATES		
			1	2	3	4	5	6	7	8	9	10	11	12	13	I (M)	R (DEG)	Z (M)
-5 ***	***	.993	290.4	290.1	290.2	290.5	290.3	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2	1 0.000	00 -0.586	
-4 ***	***	.993	290.4	290.1	290.2	290.5	290.4	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2	2 0.000	00 -0.293	
-3 ***	***	.993	290.4	290.1	290.1	290.5	290.3	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2	3 0.000	00 0.000	
-2 ***	***	.993	290.4	290.1	290.2	290.5	290.3	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2	4 0.000	00 0.293	
-1 ***	***	.993	290.4	290.1	290.2	290.4	290.4	290.4	291.2	291.2	291.2	291.2	291.2	291.2	291.2	5 0.000	00 0.586	
0.97 224	291.0	.994	290.6	290.1	290.1	290.5	290.4	290.5	291.2	291.2	291.2	291.2	291.2	291.2	291.2	6 0.000	00 0.078	
190.918	344.6	1.023	294.4	293.3	292.1	293.0	293.7	294.2	292.2	292.2	292.2	292.2	292.2	292.2	292.2	7 0.000	00 2.049	
287.986	277.7	1.077	298.7	298.1	297.8	298.0	298.6	299.2	295.2	295.2	295.2	295.2	295.2	295.2	295.2	8 0.000	00 2.342	
385.537	269.6	1.129	301.4	300.9	300.9	301.2	301.7	302.0	298.2	298.2	299.2	298.2	297.2	298.2	299.2	9 0.000	00 2.635	
483.068	266.1	1.177	303.9	303.3	302.7	303.1	303.5	303.8	300.2	299.7	301.2	300.7	301.7	300.2	301.2	10 0.000	00 2.928	
580.687	266.1	1.222	304.8	304.5	304.1	304.7	304.8	305.2	303.2	302.2	303.2	303.2	304.2	302.2	303.2	11 0.000	00 3.220	
678.279	263.0	1.265	305.3	305.4	305.4	305.6	306.0	306.0	305.7	303.7	305.2	305.2	305.2	304.2	304.2	12 0.000	00 3.513	
775.925	262.5	1.307	307.7	307.2	306.8	307.3	307.1	308.1	307.2	306.2	307.2	307.2	305.2	305.2	305.2	13 0.000	00 3.806	
873.670	261.5	1.347	308.5	308.0	308.0	308.1	307.8	308.5	309.2	308.7	308.7	308.7	308.7	307.7	307.7			
971.442	261.0	1.385	308.4	307.7	308.0	308.5	308.5	309.3	311.2	309.2	310.2	309.2	309.2	307.2	308.2			
1070.075	260.5	1.409	309.4	308.7	308.8	309.5	310.0	309.7	311.2	309.2	310.2	310.2	310.2	307.2	308.2			
1167.963	259.2	1.445	308.8	309.0	309.3	309.3	308.8	307.5	312.7	311.2	310.2	310.2	310.2	310.2	308.7	308.7	308.7	
1265.939	258.5	1.480	309.5	309.2	308.8	309.4	309.3	308.5	313.2	312.2	311.2	311.2	312.2	310.2	310.2			
1364.037	257.8	1.513	309.7	310.4	310.3	310.4	310.2	309.4	313.7	311.2	311.7	311.2	311.2	309.7	310.2			
1462.211	257.6	1.545	310.6	310.5	310.5	310.6	310.4	310.2	310.6	313.2	311.2	312.2	312.2	311.2	311.2			
1560.391	256.0	1.576	309.9	309.4	310.0	310.6	310.4	310.8	314.2	313.2	311.7	312.2	311.2	309.7	310.2			
1658.707	256.5	1.606	310.4	309.5	309.5	310.0	309.4	309.3	314.2	313.2	311.2	311.2	311.2	309.2	310.2			
1757.071	254.9	1.634	309.4	309.0	309.0	309.5	308.8	308.6	314.7	314.2	312.2	311.7	311.7	310.2	310.7			
1855.831	254.2	1.663	309.3	309.1	309.0	309.3	309.7	311.0	316.2	314.2	312.2	312.2	310.2	311.2				
1954.469	253.0	1.681	308.7	308.8	309.7	310.0	310.6	311.2	316.2	315.2	312.2	313.2	312.2	310.2	310.2			
2053.010	252.6	1.708	310.1	309.8	309.1	310.2	311.1	311.7	316.2	313.2	312.2	312.2	311.7	309.2	310.2			
2151.633	251.4	1.734	310.4	309.5	310.2	310.2	310.0	310.2	315.2	313.2	312.2	311.2	311.2	309.2	309.2			
2250.276	251.4	1.760	310.7	310.2	310.2	310.2	309.7	310.8	315.2	313.2	312.2	311.7	309.2	310.2				
2348.959	251.3	1.784	311.0	310.4	310.5	310.5	310.2	310.4	310.7	316.2	313.2	312.2	312.2	310.2	310.2			
2447.697	250.5	1.808	311.6	310.9	310.6	310.4	311.0	311.7	316.2	313.2	312.7	310.7	311.2	311.2				
2546.503	249.7	1.831	312.2	312.3	311.6	312.0	312.2	312.0	316.2	313.2	311.2	312.2	310.2	311.2				
2645.728	248.7	1.847	310.8	310.3	310.5	310.3	309.8	308.3	315.2	314.2	312.2	312.2	313.2	311.2	311.2			
2744.602	248.2	1.869	309.6	309.0	309.0	309.4	308.5	307.9	314.7	313.2	312.2	312.2	311.7	312.2				
2843.483	247.6	1.890	308.7	308.5	308.1	308.5	308.8	307.6	313.2	312.2	311.2	311.2	311.2	311.2				
2942.405	247.3	1.911	308.9	308.5	307.5	307.8	307.4	308.0	313.2	312.7	311.2	312.2	311.2	311.2				
3041.429	244.5	1.931	309.1	308.7	308.0	308.0	308.5	308.9	313.2	312.2	311.2	312.2	311.2	311.2				
3141.279	233.1	1.942	309.2	308.8	309.1	308.9	308.7	309.0	313.2	312.2	310.2	311.2	312.2	311.2				
3241.289	222.2	1.952	309.3	309.4	308.6	308.9	308.8	308.7	313.2	311.2	310.2	310.7	311.2	310.7				
33 ***	***	1.958	309.5	309.3	309.3	309.2	308.8	308.7	313.2	310.2	310.2	310.2	309.2	310.2				
34 ***	***	1.960	308.4	308.2	308.5	308.9	308.5	308.1	312.2	310.2	310.2	310.2	309.2	309.7				
35 ***	***	1.961	306.6	307.5	308.1	308.2	307.8	307.5	312.2	310.2	309.2	309.2	309.2	308.2				
36 ***	***	1.962	306.4	307.3	307.7	308.0	307.5	307.4	311.2	309.7	308.2	308.2	308.7	307.2	308.2			
37 ***	***	1.962	306.6	306.6	307.0	307.6	307.1	307.0	311.2	310.2	308.2	308.2	309.2	307.2	308.2			
38 ***	***	1.962	305.7	306.4	307.3	307.5	306.8	307.0	310.2	309.2	307.7	308.2	306.2	307.7				
39 ***	***	1.961	306.0	306.2	306.3	306.7	306.6	306.5	310.2	309.2	307.2	308.2	306.2	307.2				
40 ***	***	1.960	306.1	306.0	306.1	306.4	306.2	306.1	310.2	309.2	307.2	307.2	306.2	307.2				
45 ***	***	1.957	305.7	305.3	304.9	305.0	304.9	304.2	308.2	307.7	306.2	306.2	306.2	305.2	306.2			
50 ***	***	1.954	303.0	302.6	302.6	302.7	303.2	303.3	307.2	306.2	304.2	305.2	305.2	303.7	305.2			
55 ***	***	1.952	302.4	301.9	301.9	302.0	302.3	302.4	306.2	305.7	304.2	304.2	304.7	304.2	303.2	304.7		
60 ***	***	1.950	302.0	301.4	301.5	301.6	302.1	301.8	305.2	305.2	304.2	304.2	304.2	303.2	301.2	303.2		
65 ***	***	1.949	302.4	301.9	302.2	302.0	302.0	301.8	304.2	304.2	304.2	304.2	303.2	302.2	301.2	302.2		
70 ***	***	1.947	302.3	302.0	302.1	302.1	302.2	302.2	303.2	303.2	303.2	303.2	303.2	302.2	301.2	302.2		
75 ***	***	1.946	302.3	301.5	302.0	302.0	302.0	302.0	303.2	303.2	303.2	303.2	303.2	302.2	301.2	302.2		
80 ***	***	1.944	302.3	301.7	301.6	301.5	301.8	301.8	303.2	302.7	303.2	303.2	303.2	301.2	302.7			
85 ***	***	1.943	302.3	301.5	301.5	301.5	301.8	301.5	303.2	302.2	303.2	303.2	303.2	302.2	303.2			

Table 17A — Scaling Run 245: Cluttered 324-m³ Chamber, South 3.279-cm Nozzle

Time t (s)	Press P (atm)	Cyl T _c (K)	Chamber P (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES		
				1	2	3	4	5	6	7	8	9	10	11	12	13	R (M)	THETA (DEG)	Z (M)
-5 ***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	300.2	299.2	1	0.000	00 -0.586	
-4 ***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	300.2	299.2	2	0.000	00 -0.293	
-3 ***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	300.2	299.2	3	0.000	00 0.000	
-2 ***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	300.2	299.2	4	0.000	00 0.293	
-1 ***	1.006	298.6	298.1	298.1	298.6	298.5	298.4	300.2	299.2	300.2	300.2	300.2	300.2	300.2	299.2	5	0.000	00 0.586	
0.963.378	337.2	1.006	298.8	298.2	298.1	298.6	298.6	298.7	300.2	299.2	300.2	300.2	300.2	300.2	299.2	6	0.000	00 0.878	
189.605	297.5	1.037	303.0	302.7	301.5	302.4	303.1	303.8	300.2	300.2	301.2	301.2	301.2	300.2	300.2	7	0.000	00 2.049	
286.714	285.6	1.093	308.2	307.3	307.2	308.0	308.5	308.4	303.2	302.7	304.7	304.7	303.7	303.2	306.2	8	0.000	00 2.342	
384.136	280.7	1.146	310.0	310.0	309.4	309.6	310.2	310.2	306.2	306.2	308.2	308.2	308.2	307.2	306.2	9	0.000	00 2.635	
481.660	276.3	1.195	312.4	312.0	311.5	311.8	312.2	312.9	308.7	308.7	311.2	311.2	309.7	308.7	308.7	10	0.000	00 2.928	
579.582	275.0	1.233	314.5	313.1	314.3	313.8	313.8	313.5	311.0	310.5	313.2	313.5	313.2	311.0	310.5	11	0.000	00 3.220	
676.650	273.2	1.286	315.6	315.0	314.4	314.7	315.2	315.2	314.2	312.7	315.7	315.7	312.7	312.7	312.7	12	0.000	00 3.513	
774.150	272.3	1.329	316.5	315.9	316.2	316.3	316.7	316.8	315.2	314.2	317.2	317.2	315.2	314.2	316.2	13	0.000	00 3.806	
872.503	270.6	1.356	316.5	316.1	316.7	316.5	315.9	315.6	316.2	315.2	317.2	318.2	318.2	316.2	316.2				
970.136	270.2	1.356	316.2	316.0	316.6	316.9	316.9	316.8	317.7	316.7	318.7	318.2	318.2	317.2	316.7				
1067.789	269.7	1.434	317.0	316.5	316.9	317.0	316.9	316.9	321.2	318.2	319.2	318.2	316.2	316.2					
1165.497	269.2	1.471	318.5	317.7	317.3	317.8	318.1	317.8	323.2	319.2	320.7	320.7	316.7	316.7					
1263.136	266.8	1.506	318.7	318.1	318.0	317.9	318.2	318.5	323.2	319.2	321.2	321.2	319.2	319.2					
1360.663	266.9	1.540	318.7	318.2	318.7	319.3	319.2	319.2	325.2	321.2	322.7	322.2	321.7	319.2	318.2				
1458.265	266.2	1.573	319.4	319.0	319.3	319.6	319.1	318.0	324.2	321.2	322.2	322.2	321.2	318.2	318.2				
1556.782	265.3	1.594	319.0	317.8	318.9	319.2	318.7	318.4	325.2	321.2	322.2	322.2	319.2	319.2					
1653.755	264.2	1.635	316.8	317.3	318.1	318.6	319.5	319.5	323.2	322.2	322.2	322.2	320.2	319.2					
1752.347	263.9	1.655	317.4	317.0	318.0	319.2	319.3	320.3	324.2	323.2	322.2	323.2	323.2	320.2	320.2				
1849.854	262.5	1.665	318.3	318.1	318.5	319.3	320.0	319.7	326.7	324.2	321.2	322.7	323.7	321.2	319.2				
1947.327	261.7	1.713	319.8	319.4	319.7	319.4	319.9	319.6	327.2	324.2	322.2	323.2	324.2	322.2	321.2				
2043.881	261.7	1.741	319.0	319.9	319.3	319.2	318.1	317.1	327.2	325.7	324.2	323.2	322.2	320.2					
2132.517	260.6	1.767	318.3	317.9	317.9	318.0	317.8	317.8	327.2	327.2	326.2	325.2	323.2	321.2					
2241.000	259.8	1.784	318.1	317.7	317.3	317.8	317.6	317.3	326.2	327.2	325.2	324.2	322.2	321.2					
2338.969	259.9	1.810	317.3	317.3	318.5	318.2	317.8	317.8	326.7	327.2	324.2	324.2	322.7	321.2					
2435.844	258.8	1.834	317.8	318.1	317.9	318.6	318.6	319.0	327.2	326.2	324.2	324.2	323.2	321.2					
2531.388	257.6	1.858	318.2	318.0	318.5	318.8	317.5	317.3	326.2	325.2	324.2	324.2	321.7	319.7					
2630.116	257.2	1.881	318.0	317.8	317.9	318.4	318.0	319.0	326.2	324.2	324.2	323.2	324.2	322.2	320.2				
2726.942	256.4	1.903	317.6	318.6	318.7	319.4	319.8	320.9	323.7	324.2	324.7	323.2	322.2	320.7	320.7				
2831.449	255.3	1.924	315.6	315.6	316.6	317.4	319.0	318.8	324.2	324.2	325.2	323.2	322.2	319.2					
2933.585	247.8	1.938	316.0	316.3	317.3	317.8	317.3	317.4	323.2	325.2	325.2	324.2	322.2	318.2					
3032.861	234.1	1.953	316.4	316.2	316.0	318.0	317.8	317.7	323.7	323.7	323.2	322.7	320.7	318.2					
31 ***	1.962	315.3	315.4	316.0	316.9	316.5	316.9	325.2	323.2	323.2	320.2	320.2	319.2	317.2					
32 ***	1.966	315.4	314.9	315.1	316.3	316.5	315.9	322.7	321.2	319.7	319.7	319.2	317.2	318.2					
33 ***	1.968	315.3	314.6	314.7	315.6	315.4	315.3	321.2	320.2	319.2	319.2	318.2	317.2	317.2					
34 ***	1.969	315.1	314.7	314.5	315.3	315.1	315.2	319.7	319.7	318.7	318.2	318.7	317.2	317.2					
35 ***	1.969	314.7	314.3	314.4	314.9	314.7	314.6	320.2	319.2	318.2	319.2	319.2	317.2	316.2					
36 ***	1.969	314.3	313.8	314.3	314.6	314.4	314.5	319.2	318.2	318.2	318.2	318.2	316.7	315.7					
37 ***	1.969	314.4	313.0	313.5	314.5	314.4	314.3	319.2	318.2	318.2	318.2	318.2	316.2	316.2					
38 ***	1.968	314.3	313.8	313.1	314.1	314.0	313.4	319.2	318.2	318.2	318.2	318.2	316.2	316.2					
39 ***	1.964	312.3	311.7	311.8	312.4	312.3	312.2	327.2	316.2	316.2	316.2	316.2	316.2	313.7	314.7				
40 ***	1.961	312.0	310.9	311.1	311.1	311.3	310.8	316.2	313.7	316.2	315.5	314.7	311.5	312.0					
53 ***	1.959	311.6	310.7	310.1	310.0	316.2	310.0	315.2	313.2	313.2	314.2	314.2	312.2	311.2					
58 ***	1.956	310.7	310.3	310.2	309.8	311.0	310.4	314.2	312.2	313.2	313.2	313.2	312.2	311.2					
63 ***	1.955	310.5	309.6	309.9	309.8	310.1	310.0	313.2	312.2	312.2	313.2	313.2	312.2	312.2					
68 ***	1.953	310.0	309.6	309.9	310.0	310.2	309.6	312.2	311.2	313.2	313.2	313.2	312.2	312.2					
73 ***	1.951	310.2	309.5	309.5	309.7	309.8	309.5	312.2	311.2	313.2	313.2	312.2	312.2	312.2					
78 ***	1.950	310.2	309.6	309.5	309.7	309.8	309.6	312.2	311.2	312.2	312.2	312.2	312.2	310.2					
83 ***	1.949	310.2	309.7	309.7	309.8	309.9	309.6	312.2	311.2	312.2	312.2	312.2	312.2	310.2					
88 ***	1.947	310.5	310.0	310.0	310.2	310.0	309.9	312.2	310.2	311.2	312.2	311.2	312.2	310.2					
93 ***	1.945	310.6	309.8	309.6	309.4	310.2	310.1	311.2	310.2	311.2	312.2	312.2	311.2	310.2					

Table 18A — Scaling Run 246: Cluttered 324-m³ Chamber, South 3.279-cm Nozzle

Time <i>t</i> (s)	Press <i>P</i> (atm)	Chamber <i>T₁</i> (K)	<i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations <i>I</i>													COORDINATES		
				1	2	3	4	5	6	7	8	9	10	11	12	13	<i>I</i> (m)	<i>R</i> (deg)	<i>Z</i> (m)
-5 ***	***	1.005	289.0	288.6	288.5	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2	1	0.000	00 -0.586	
-4 ***	***	1.005	289.0	288.6	288.5	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2	2	0.000	00 -0.293	
-3 ***	***	1.005	289.0	288.6	288.6	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2	3	0.000	00 0.000	
-2 ***	***	1.005	289.0	288.6	288.6	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2	4	0.000	00 0.293	
-1 ***	***	1.005	289.0	288.6	288.6	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2	5	0.000	00 0.586	
0.92 412	290.4	1.005	289.1	288.6	288.5	288.9	288.9	288.8	290.2	289.2	290.2	290.2	290.2	290.2	289.2	6	0.000	00 0.878	
1.05 361	299.6	1.031	292.9	291.6	290.5	291.3	291.7	292.1	290.2	290.2	291.2	291.2	291.2	290.2	290.2	7	0.000	00 2.049	
2.03 119	275.0	1.065	297.1	295.9	294.7	295.6	296.3	296.7	293.2	292.7	294.7	294.2	294.7	293.7	293.2	8	0.000	00 2.342	
3.80 884	268.4	1.136	299.8	298.7	298.5	299.2	300.0	299.9	296.2	296.2	298.2	298.2	298.2	297.2	296.2	9	0.000	00 2.635	
4.78 604	264.9	1.183	302.2	301.2	301.1	301.5	301.7	301.5	299.7	297.7	300.2	300.7	301.2	299.2	298.2	10	0.000	00 2.928	
5.76 537	262.9	1.228	303.1	302.4	302.1	302.4	303.0	303.5	301.2	300.2	302.2	303.2	303.2	301.2	300.2	11	0.000	06 3.220	
6.74 330	263.1	1.270	304.9	304.0	304.0	304.2	304.2	304.7	303.7	302.2	304.7	304.7	302.2	302.2	302.2	12	0.000	00 3.513	
7.72 156	261.1	1.312	305.1	304.4	304.8	305.3	305.7	305.4	305.2	304.2	306.2	306.2	307.2	304.2	303.2	13	0.000	00 3.806	
8.70 054	261.7	1.351	305.1	304.5	304.6	305.2	305.7	305.3	306.2	305.7	307.7	307.7	307.2	305.2	304.7				
9.67 959	259.8	1.389	305.4	305.4	305.2	306.1	306.4	306.4	308.2	307.2	308.2	308.2	308.2	305.2	305.2				
10.65 918	258.5	1.425	305.2	305.3	305.7	307.1	307.1	307.5	310.7	308.2	309.2	309.2	309.2	306.2	306.2				
11.64 048	258.2	1.460	306.8	306.3	306.8	307.6	307.8	308.4	311.2	310.2	309.2	309.2	309.2	307.2	307.2				
12.62 748	257.7	1.482	307.9	307.0	306.7	307.7	308.5	309.4	313.2	313.2	310.2	310.2	310.2	308.2	308.2				
13.60 946	256.7	1.515	309.4	308.7	308.5	308.9	309.5	310.0	313.2	312.7	310.7	310.2	310.2	306.7	308.7				
14.59 177	255.6	1.547	308.7	307.7	307.8	308.7	308.7	308.9	315.2	313.2	311.2	311.2	311.2	310.2	309.2				
15.57 531	255.1	1.578	308.5	307.6	307.1	308.0	307.9	307.6	314.7	314.2	311.7	311.2	311.2	309.7	309.2				
16.55 918	254.3	1.608	307.7	306.7	307.1	307.6	307.0	306.8	314.2	313.2	311.2	311.2	311.2	309.2	309.2				
17.54 388	254.0	1.636	307.4	307.0	306.8	307.9	307.3	306.8	314.7	313.2	311.2	310.7	310.2	308.7	308.2				
18.52 891	253.4	1.664	307.8	307.2	306.8	307.8	308.1	308.0	314.2	312.2	311.2	311.2	310.2	309.2	309.2				
19.51 939	252.6	1.682	308.0	307.8	308.1	308.2	308.5	308.0	313.2	312.2	311.2	311.2	311.2	309.2	308.2				
20.50 531	251.5	1.709	309.3	308.3	308.6	308.6	308.9	309.1	309.2	314.2	312.2	312.2	312.2	310.2	309.7	309.2			
21.49 218	250.4	1.735	308.4	308.8	309.2	308.8	309.3	309.1	315.2	313.2	312.2	312.2	312.2	311.2	310.2	309.2			
22.47 952	250.4	1.760	307.9	308.7	309.5	309.5	309.1	307.4	315.7	312.2	312.2	311.7	311.2	309.7	309.2				
23.46 721	249.3	1.784	307.3	306.8	307.2	307.4	307.0	306.9	315.2	315.2	312.2	312.2	310.2	309.2	310.2				
24.45 551	248.3	1.807	306.6	306.4	306.4	307.1	306.8	306.6	316.7	314.2	312.2	312.2	310.7	309.2	310.2				
25.44 374	247.9	1.830	307.0	306.8	307.3	307.7	307.8	307.5	318.2	315.2	312.2	311.2	310.2	309.2	309.2				
26.43 646	247.5	1.845	306.5	305.9	306.1	306.3	306.7	308.1	318.2	314.2	311.2	310.2	310.2	308.2	308.2				
27.42 575	246.9	1.868	307.9	307.0	306.8	307.1	307.1	306.6	317.7	314.2	311.7	311.7	311.7	308.2	308.7				
28.41 537	246.4	1.889	308.5	307.7	307.7	307.5	307.9	308.0	317.2	314.2	311.2	311.2	312.2	310.2	309.2				
29.40 541	245.1	1.910	305.5	305.7	306.6	307.5	307.1	305.3	315.7	312.7	312.5	311.7	311.7	310.2	308.7				
30.39 558	244.0	1.930	306.4	306.0	306.1	306.8	306.8	306.6	315.2	313.2	311.2	311.2	312.2	310.2	308.2				
31.39 119	234.6	1.947	305.5	305.2	306.2	306.5	306.7	305.4	315.2	312.7	311.7	311.2	311.2	310.2	308.7				
32.39 061	223.2	1.957	304.5	304.9	305.1	305.7	305.6	305.5	315.2	311.2	310.2	310.2	311.2	310.2	308.2				
33 ***	***	1.961	304.9	304.5	304.9	305.5	306.1	305.7	313.2	310.2	309.2	309.2	310.2	309.2	308.2				
34 ***	***	1.964	304.5	304.0	304.3	304.8	304.8	304.9	313.2	310.7	309.7	309.2	309.2	307.7	307.7				
35 ***	***	1.966	303.8	303.6	304.0	304.7	304.6	305.2	312.2	310.2	309.2	308.2	308.2	307.2	307.2				
36 ***	***	1.967	303.9	303.4	303.6	304.2	304.1	304.9	311.2	310.2	308.2	308.2	308.2	307.2	306.2				
37 ***	***	1.967	303.5	303.1	303.1	303.7	303.9	303.9	311.2	309.2	308.2	307.2	307.2	305.2	305.2				
38 ***	***	1.967	303.8	303.1	303.0	303.3	303.2	303.3	309.7	309.2	307.2	307.2	306.7	304.7	304.7				
39 ***	***	1.966	303.8	303.1	302.9	303.0	303.1	303.1	309.2	309.2	307.2	306.2	306.2	303.2	304.2				
40 ***	***	1.966	303.7	303.1	303.5	303.4	303.6	303.9	308.7	308.2	306.2	306.2	305.7	303.2	304.2				
45 ***	***	1.963	302.3	302.2	301.8	303.0	303.1	302.7	306.2	305.7	304.2	305.2	304.2	302.2	303.2				
50 ***	***	1.960	300.4	300.0	300.1	300.3	300.9	300.4	304.2	304.2	304.2	305.2	303.7	301.2	302.2				
55 ***	***	1.958	300.2	299.4	299.4	299.5	300.2	300.2	304.2	304.2	303.2	303.2	303.2	301.2	302.2				
60 ***	***	1.956	300.4	299.9	299.8	300.0	299.9	299.7	304.2	303.2	303.2	303.2	303.2	302.2	301.2	302.2			
65 ***	***	1.954	300.9	300.4	300.3	300.4	300.2	299.9	303.2	302.2	303.2	303.2	303.2	302.2	299.2	301.2			
70 ***	***	1.953	300.6	300.6	300.2	300.7	300.4	300.3	302.2	301.7	303.2	302.2	301.7	299.2	301.2				
75 ***	***	1.951	300.2	300.0	299.9	300.0	300.5	300.3	302.2	301.2	302.2	302.2	301.2	298.7	300.2				
80 ***	***	1.950	300.0	299.7	299.7	299.8	299.7	300.2	302.2	301.2	302.2	302.2	301.2	299.2	300.2				
85 ***	***	1.949	299.9	299.7	299.7	299.7	299.6	299.7	302.2	301.2	302.2	302.2	301.2	300.2	300.2				

Table 19A — Scaling Run 247: Cluttered 324-m³ Chamber, South 3.279-cm Nozzle

Time (s)	Press P (atm)	Cyl <i>T_s</i> (K)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES				
				1	2	3	4	5	6	7	8	9	10	11	12	13	I (cm)	R (cm)	Theta (deg)	Z (cm)	
-5	***	***	1.000	291.8	291.4	291.3	291.7	291.7	291.5	292.2	291.2	293.2	293.2	292.2	292.2	292.2	1	0.000	0.0	-0.586	
-4	***	***	1.000	291.8	291.4	291.3	291.7	291.7	291.6	292.2	291.2	293.2	293.2	292.2	292.2	292.2	2	0.000	0.0	-0.293	
-3	***	***	1.000	291.8	291.4	291.3	291.7	291.7	291.6	292.2	291.2	293.2	293.2	292.2	292.2	292.2	3	0.000	0.0	0.000	
-2	***	***	1.000	291.9	291.4	291.3	291.7	291.7	291.6	292.2	291.2	293.2	293.2	292.2	292.2	292.2	4	0.000	0.0	0.293	
-1	***	***	1.000	291.8	291.4	291.3	291.7	291.7	291.6	292.2	291.2	293.2	293.2	292.2	292.2	292.2	5	0.000	0.0	0.586	
0.98	3.06	311.3	1.000	292.1	291.8	291.3	291.8	291.8	291.9	292.0	292.2	291.2	293.2	293.2	292.7	292.2	292.2	6	0.000	0.0	0.678
1.96	6.08	291.9	1.016	295.0	293.8	293.0	293.8	294.4	295.0	292.2	292.2	293.2	293.2	293.2	292.2	292.2	7	0.000	0.0	2.049	
2.98	24.8	285.5	1.073	299.0	297.8	297.1	296.6	297.6	298.3	294.7	294.2	296.2	295.7	296.7	295.2	295.2	8	0.000	0.0	2.342	
3.95	6.94	275.7	1.126	302.5	301.6	301.0	301.3	302.0	302.3	296.2	297.2	300.2	300.2	301.2	299.2	298.2	9	0.000	0.0	2.635	
4.93	22.1	272.0	1.175	305.1	304.2	303.6	304.2	304.8	305.1	300.7	299.7	302.2	302.7	301.2	300.7	300.7	10	0.000	0.0	2.928	
5.90	7.48	268.3	1.221	306.1	305.7	305.8	306.1	306.5	303.2	302.2	303.2	304.2	304.2	303.2	303.2	303.2	11	0.000	0.0	3.220	
6.88	3.67	267.6	1.266	306.8	306.8	307.5	308.5	308.1	304.7	304.7	306.2	306.2	306.7	305.7	304.7	12	0.000	0.0	3.513		
7.75	9.93	265.4	1.308	307.9	307.1	306.9	308.4	309.8	308.1	307.2	306.2	308.2	308.2	307.2	306.2	306.2	13	0.000	0.0	3.606	
8.74	4.49	265.6	1.335	309.0	308.5	308.8	309.3	309.8	309.5	308.2	307.2	309.2	308.2	309.2	307.2	307.2					
9.72	1.97	264.9	1.374	311.0	310.1	310.2	310.6	311.0	311.2	310.2	308.7	310.2	310.2	310.7	307.7	307.7					
10.69	9.73	263.1	1.412	310.2	309.6	309.9	309.4	309.6	309.5	312.2	310.2	312.2	312.2	312.2	309.2	309.2					
11.67	9.39	262.5	1.449	309.5	309.2	309.2	310.1	310.8	312.0	312.7	311.2	312.7	312.2	311.2	309.7	309.2					
12.65	8.64	261.2	1.483	309.7	309.3	310.4	310.2	311.2	310.3	314.2	311.2	312.2	313.2	312.2	309.2	309.2					
13.63	9.29	261.1	1.517	309.7	308.8	310.0	310.7	310.7	312.0	311.7	316.2	313.7	313.7	314.2	311.2	311.7					
14.62	0.48	260.4	1.550	311.2	310.7	310.7	311.2	312.0	312.0	317.2	313.2	313.2	314.2	313.2	313.2						
15.60	2.58	259.5	1.582	314.0	312.8	312.6	311.6	311.4	311.5	318.7	316.7	314.7	314.7	313.7	311.7	311.7					
16.58	5.24	258.3	1.613	310.7	309.7	310.0	311.2	311.0	312.0	321.2	317.2	315.2	314.2	314.2	311.2	310.2					
17.57	3.61	257.9	1.632	310.4	310.2	310.3	311.4	313.1	314.2	321.2	316.2	315.2	315.2	314.2	310.2	310.2					
18.55	7.99	257.0	1.661	311.6	311.2	310.2	312.7	314.1	314.0	321.2	318.2	315.2	315.2	314.7	311.2	311.2					
19.54	2.31	256.1	1.689	310.8	311.1	311.4	311.8	311.5	311.5	321.2	320.2	316.2	315.2	316.2	314.2	314.2					
20.52	4.72	255.7	1.717	312.0	311.7	312.4	312.0	311.5	311.3	321.7	317.2	314.7	314.7	314.2	312.7	312.2					
21.51	3.33	254.7	1.743	312.4	311.3	310.9	311.2	310.9	311.2	320.2	315.2	314.2	313.2	312.2	311.2	311.2					
22.49	4.59	254.5	1.769	311.6	311.2	310.2	310.9	311.3	311.6	311.3	320.2	315.7	314.2	313.2	312.7	310.7	310.7				
23.48	6.53	253.5	1.794	309.7	310.0	309.5	310.6	310.1	310.2	321.2	315.2	314.2	313.2	310.2	311.2						
24.47	7.09	252.9	1.810	310.9	310.8	310.2	310.9	310.7	311.0	320.2	315.2	313.2	313.2	312.2	312.2						
25.46	5.48	252.2	1.834	309.5	309.4	309.4	310.1	309.5	309.0	320.2	316.7	314.2	314.2	312.7	313.2						
26.45	3.54	251.4	1.857	309.7	308.9	308.5	310.5	310.2	310.5	320.5	318.2	315.2	315.2	316.2	314.2	313.2					
27.44	2.24	251.2	1.880	310.2	309.5	309.6	309.7	310.0	310.0	319.7	318.7	315.7	314.7	314.7	313.2	312.7					
28.43	1.16	250.2	1.902	311.6	311.0	310.9	310.7	310.9	310.3	320.2	317.2	315.2	314.2	314.2	313.2	311.2					
29.42	4.08	249.7	1.917	311.7	311.7	311.3	311.2	311.9	312.1	320.2	317.2	314.2	314.2	313.2	312.2	311.2					
30.41	1.592	244.6	1.937	311.0	310.5	310.5	311.2	310.9	309.4	319.2	317.2	314.2	313.7	312.7	310.7	309.7					
31.40	0.755	231.2	1.952	310.7	310.4	310.6	310.3	308.8	309.1	320.2	315.2	314.2	313.2	312.2	312.2	310.2	309.2				
32.	***	***	1.960	310.5	310.2	309.6	309.3	308.5	308.7	317.2	314.2	313.2	312.2	312.2	309.7	309.7					
33.	***	***	1.964	309.8	308.4	309.3	309.2	308.7	308.5	314.2	313.2	312.2	312.2	311.2	310.2	310.2					
34.	***	***	1.966	309.0	308.7	308.8	308.8	308.4	308.1	313.2	312.7	312.2	312.2	310.7	309.2	310.2					
35.	***	***	1.967	308.6	308.3	308.3	308.5	308.4	308.2	313.2	312.2	312.2	312.2	311.2	309.2	309.2					
36.	***	***	1.968	308.3	308.1	308.1	308.3	308.2	308.1	313.2	312.2	312.2	312.2	311.2	309.2	309.2					
37.	***	***	1.968	308.0	307.6	307.9	308.1	307.8	307.6	312.7	311.7	310.7	311.2	311.2	309.2	309.2					
38.	***	***	1.967	308.0	307.7	307.7	308.0	307.6	307.6	311.2	310.2	310.2	310.2	310.2	309.2	309.2					
39.	***	***	1.966	307.5	307.5	307.6	307.6	307.5	307.2	311.2	311.2	309.7	309.7	310.2	308.7	308.7					
44.	***	***	1.963	306.7	306.7	306.8	307.2	306.7	306.1	308.7	309.2	306.7	306.7	306.7	304.7	306.2					
49.	***	***	1.960	305.4	305.2	304.6	305.4	305.2	305.1	307.2	307.2	305.2	306.2	306.2	303.2	305.2					
54.	***	***	1.958	304.2	303.4	303.2	303.8	303.8	303.3	307.2	306.2	306.2	306.2	306.2	303.2	305.2					
59.	***	***	1.956	303.4	302.9	302.8	302.9	303.3	303.0	306.2	305.2	305.2	305.2	304.2	301.2	304.2					
64.	***	***	1.954	303.1	302.7	302.9	302.9	303.0	302.8	306.2	304.2	305.2	305.2	305.2	302.2	303.2					
69.	***	***	1.953	303.1	302.6	302.7	303.1	303.1	302.8	305.2	304.2	305.2	305.2	305.2	303.2	304.2					
74.	***	***	1.951	303.2	302.7	302.7	303.1	303.1	302.9	305.2	304.2	304.2	304.2	304.2	303.2	304.2					
79.	***	***	1.950	303.5	302.9	302.8	303.1	303.0	302.5	304.2	304.2	304.2	304.2	304.2	302.2	303.2					
84.	***	***	1.949	303.9	303.1	303.1	303.0	302.7	302.3	304.2	303.2	304.2	304.2	304.2	302.2	303.2					
89.	***	***	1.947	303.8	303.3	303.0	303.1	302.5	302.1	304.2	303.2	304.2	304.2	304.2	302.2	303.2					

</div

Table 20A — Scaling Run 248: Cluttered 324-m³ Chamber, South 3.279-cm Nozzle

Time (s)	Press <i>t</i> (atm)	Cyl <i>P</i> (K)	Chamber <i>P</i> (atm)	Chamber Absolute Temperatures (K) at Locations /													COORDINATES		
				1	2	3	4	5	6	7	8	9	10	11	12	13	I (M)	R (DEG)	Z (M)
-5 ***	***	.996	295.7 295.2 295.2 295.6 295.5 295.4 296.2 295.2 296.2 296.2 296.2 296.2 296.2 296.2 296.2 295.2	1	0.000	00	-0.586												
-4 ***	***	.996	295.7 295.2 295.2 295.6 295.5 295.4 296.2 295.2 296.2 296.2 296.2 296.2 296.2 296.2 295.2	2	0.000	00	-0.293												
-3 ***	***	.996	295.7 295.2 295.2 295.6 295.5 295.4 296.2 295.2 296.2 296.2 296.2 296.2 296.2 295.2	3	0.000	00	0.000												
-2 ***	***	.996	295.7 295.2 295.2 295.6 295.5 295.4 296.2 295.2 296.2 296.2 296.2 296.2 296.2 295.2	4	0.000	00	0.293												
-1 ***	***	.996	295.7 295.2 295.2 295.6 295.5 295.4 296.2 295.2 296.2 296.2 296.2 296.2 296.2 295.2	5	0.000	00	0.586												
098.190	331.1	.996	296.4 295.6 295.2 295.7 295.9 296.2 296.2 295.2 296.2 296.2 296.2 296.2 296.2 295.2	6	0.000	00	0.878												
188.690	288.8	1.026	303.1 302.3 301.3 302.0 302.9 303.1 296.7 296.2 297.2 297.2 297.2 296.7 296.2	7	0.000	00	2.049												
287.878	281.7	1.082	305.1 304.5 304.2 304.4 305.1 305.1 299.2 298.2 301.2 301.2 302.2 300.2 300.2	8	0.000	00	2.342												
385.395	277.8	1.134	306.7 305.9 305.9 306.1 307.0 307.1 301.7 301.7 303.7 304.2 304.2 302.7 302.7	9	0.000	00	2.635												
482.871	273.9	1.182	309.5 308.6 308.4 308.7 309.3 309.3 304.2 304.2 306.2 306.2 306.2 305.2 305.2	10	0.000	00	2.926												
580.452	271.8	1.220	310.5 309.5 309.5 309.6 309.8 310.2 307.2 306.2 308.7 309.2 309.2 306.7 308.2	11	0.000	00	3.220												
677.932	271.0	1.272	311.6 310.9 310.4 311.3 311.7 311.6 309.2 308.2 310.2 311.2 312.2 310.2 311.2	12	0.000	00	3.513												
775.684	269.5	1.313	312.2 311.8 311.5 312.3 313.0 313.0 311.7 310.7 312.7 313.2 313.7 312.7 312.2	13	0.000	00	3.806												
873.293	268.9	1.354	312.9 312.9 313.5 314.2 314.6 314.2 313.2 311.2 313.2 314.2 314.2 314.2 313.2																
971.610	268.0	1.380	313.6 313.5 313.8 314.4 314.9 314.7 314.2 313.2 314.2 314.2 315.2 313.2 314.2																
1069.619	267.0	1.417	314.3 314.0 314.0 314.5 315.2 315.1 314.7 314.7 315.7 315.7 314.7 313.7 313.7																
1167.476	266.0	1.454	314.9 315.2 314.7 314.9 314.3 314.2 317.2 316.2 316.2 316.2 316.2 314.2 313.2																
1265.442	265.1	1.488	315.2 314.0 313.9 314.7 314.6 315.1 316.7 315.7 316.2 316.7 317.2 314.7 314.7																
1363.510	264.8	1.522	314.6 314.3 314.5 315.1 315.6 315.4 318.2 316.2 316.2 317.2 317.2 315.2 315.2																
1461.650	263.6	1.554	315.2 314.5 313.8 314.4 314.9 314.7 318.7 318.7 317.2 317.2 316.2 314.2 314.2																
1559.830	262.6	1.586	315.1 314.9 314.0 314.2 313.6 315.2 320.2 317.2 318.2 318.2 317.2 314.2 315.2																
1658.673	261.8	1.606	316.1 315.6 315.4 315.5 315.5 315.6 320.2 316.2 318.2 317.2 316.2 315.2 315.2																
1757.910	261.7	1.636	315.2 316.4 316.6 316.7 316.7 317.2 320.2 317.7 318.2 317.2 317.2 315.7 316.2																
1855.381	260.8	1.665	315.8 315.4 315.2 315.4 315.0 315.7 321.2 318.2 320.2 317.2 317.2 315.2 315.2																
1953.850	260.6	1.692	315.2 314.6 314.1 313.8 313.8 313.2 314.2 322.7 319.7 318.7 317.7 316.7 315.7 316.2																
2052.395	259.3	1.719	314.7 313.8 313.8 313.1 312.8 313.1 324.2 321.2 320.2 319.2 318.2 317.2 318.2																
2150.963	258.8	1.745	315.0 314.2 313.8 314.0 314.0 314.7 323.2 320.2 319.2 318.7 318.2 318.2 317.7																
2249.626	257.8	1.771	315.8 315.6 315.5 315.1 315.2 315.8 322.2 319.2 319.2 318.2 319.2 318.2 317.2																
2348.735	257.6	1.788	316.1 315.2 315.1 315.1 315.1 315.1 321.2 319.2 318.2 319.2 317.2 316.2 315.2																
2447.469	256.8	1.812	315.2 314.5 316.5 315.5 315.3 314.6 321.7 319.2 318.7 318.7 318.7 317.2 317.2																
2546.218	255.6	1.835	314.6 314.5 314.4 315.1 314.6 314.6 319.2 319.2 319.2 318.2 318.2 318.2 317.2																
2645.071	255.3	1.858	314.6 314.2 314.6 315.2 315.2 315.3 320.2 319.2 319.7 318.7 319.7 318.2 316.2																
2743.932	254.0	1.880	314.4 313.6 313.4 313.8 313.6 314.0 320.2 319.2 318.2 318.2 319.2 318.2 316.2																
2843.177	254.2	1.894	312.0 312.3 312.8 313.4 313.4 314.6 321.2 319.2 318.2 318.2 319.2 317.2 315.2																
2942.102	253.8	1.915	312.9 313.6 314.4 314.6 315.2 315.4 321.7 319.2 318.2 318.2 317.7 316.2 314.7																
3041.102	248.6	1.936	312.7 312.3 313.5 313.7 313.8 314.1 322.2 319.2 318.2 318.2 318.2 316.2 316.2																
3140.544	240.1	1.952	312.9 312.3 312.4 312.2 313.2 313.1 321.2 318.2 318.2 317.7 317.7 315.2 315.2																
3240.782	235.5	1.964	313.1 312.6 312.7 313.0 312.3 312.0 321.2 318.2 318.2 317.2 317.2 316.2 316.2																
33 ***	***	1.970	313.3 312.5 312.6 312.7 312.5 311.9 321.2 317.7 316.7 316.2 316.2 315.2 315.2																
34 ***	***	1.973	313.0 312.3 312.5 312.8 312.8 312.6 321.2 317.2 316.2 316.2 315.2 315.2 314.2																
35 ***	***	1.974	312.0 311.9 312.0 311.8 312.0 312.2 319.2 317.2 316.2 316.2 315.2 314.2 314.2																
36 ***	***	1.975	311.9 311.6 311.5 311.5 311.6 312.2 319.2 316.7 315.7 315.2 315.2 313.7 313.2																
37 ***	***	1.975	310.8 310.6 310.7 311.4 311.6 312.3 318.2 315.2 314.2 314.2 315.2 314.2 313.2																
38 ***	***	1.974	310.7 310.4 310.9 312.0 311.9 312.1 317.2 315.2 314.2 314.2 314.2 313.2 312.7																
39 ***	***	1.974	310.9 310.5 311.1 311.6 311.6 311.8 316.2 315.2 314.2 313.2 313.2 312.2 312.2																
40 ***	***	1.973	310.9 310.7 310.8 311.5 311.2 311.6 316.2 315.2 314.2 313.2 313.2 312.2 312.2																
45 ***	***	1.970	310.2 309.9 309.3 310.2 310.0 309.5 313.7 312.2 312.7 312.7 312.7 311.2 311.2																
50 ***	***	1.967	308.4 308.0 307.8 307.8 307.6 307.6 312.2 310.2 310.7 311.7 311.2 310.2 310.2																
55 ***	***	1.965	308.1 307.3 307.6 307.0 306.9 307.1 311.2 310.2 309.2 311.2 310.2 309.2 309.2																
60 ***	***	1.963	307.5 307.2 307.2 307.3 307.5 306.7 310.2 309.2 309.2 309.2 309.2 308.2 308.2																
65 ***	***	1.962	307.3 306.9 306.6 306.8 307.0 306.9 309.2 308.2 308.2 308.2 308.2 307.2 307.2																
70 ***	***	1.960	306.8 306.2 306.6 307.0 306.8 307.0 308.2 307.2 308.2 308.2 308.2 307.2 307.2																
75 ***	***	1.958	307.0 306.1 305.9 306.4 307.1 307.0 308.2 306.2 308.2 308.2 307.2 305.2 306.2																
80 ***	***	1.957	306.7 306.6 306.1 306.2 306.3 306.7 307.2 306.2 308.2 308.2 308.2 306.2 307.2																
85 ***	***	1.956	306.7 306.4 305.9 306.2 306.2 306.2 307.2 306.2 307.2 307.2 306.2 306.2 307.2																

B-Tables

Tables 2B to 20B, called B-tables, present the pressurant mole fraction histories as inferred from the *I*-location temperature histories from the A-tables. The basis of this data reduction program (see Appendix B) is the transient thermodynamic analysis by Corlett et al. [2]. Reference 5 gives this analysis in more detail.

In addition to pressurant concentrations at each *I*-location corresponding to those in the matching A-tables, values of the mean pressurant concentration \bar{X} are given. These values represent theoretical perfect mixing; they are determined from the known amount of resident gas initially in the chamber and the estimated amount of pressurant gas injected during any given time interval. Further, in the first six columns of the table, variables are given, respectively, as follows:

- (1) time t in seconds,
- (2) mean temperature of chamber contents \bar{T} in °C,
- (3) mean temperature of resident air \bar{T}_a in °C,
- (4) mean temperature of pressurant gas \bar{T}_p in °C,
- (5) dimensionless parameter-characterizing molar heat-transfer coefficient β , and
- (6) the ratio β/θ , where θ is a characteristic time in seconds.

Table 2B — Inferred Pressurant Distribution, Scaling Run 230; Three 3.279-cm Nozzles

t (s)	\bar{T} (°C)	\bar{T}_g (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	I = 1	Pressurant Fractions (X) at Locations i												
								2	3	4	5	6	7	8	9	10	11	12	13	
COMMENCE VALVE OPENING																				
0.0	16.1	16.1	15.9	1.6	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	21.9	24.9	-7.4	9.5	.9120	.092	.102	.095	.071	.077	.083	.117	.102	.117	.086	.086	.102	.086	.071	
2.0	25.5	31.4	-4.3	6.1	.5051	.165	.187	.179	.142	.159	.173	.195	.134	.176	.176	.161	.176	.168	.134	
3.0	27.7	36.3	-2.1	5.7	.4124	.223	.251	.248	.204	.230	.248	.290	.175	.214	.188	.227	.214	.201		
4.0	29.1	40.0	-4	5.7	.3489	.269	.319	.289	.264	.282	.304	.331	.232	.257	.232	.257	.245	.232		
5.0	30.5	43.7	-5	3.6	.1802	.307	.357	.338	.306	.329	.359	.382	.234	.292	.269	.280	.269	.280		
6.0	31.1	46.3	1.2	4.7	.2232	.339	.391	.352	.325	.354	.383	.409	.283	.338	.327	.305	.338	.305		
7.0	31.0	47.9	1.9	6.4	.2801	.367	.410	.389	.354	.384	.413	.434	.310	.343	.343	.343	.376	.343		
8.0	31.2	49.3	2.0	3.9	.0967	.383	.421	.404	.378	.400	.429	.450	.332	.385	.364	.342	.374	.342		
COMMENCE VALVE CLOSURE																				
9.0	31.3	51.1	2.0	4.3	.1525	.404	.444	.426	.408	.418	.444	.471	.347	.398	.387	.357	.398	.377	.377	
10.0	31.0	52.3	2.0	1.7	.1673	.423	.469	.444	.416	.438	.471	.495	.372	.422	.422	.382	.412	.382	.372	
VALVE FULLY CLOSED																				
11.0	30.1	52.9	.8	1.4	.1464	.437	.478	.461	.428	.451	.480	.499	.399	.428	.428	.409	.418	.409	.399	
12.0	31.6	56.2	.1	-2.6	-0.2610	.437	.480	.467	.439	.458	.483	.505	.392	.419	.419	.401	.428	.401	.392	
13.0	31.5	55.9	.1	.2	.0249	.437	.488	.475	.450	.465	.488	.510	.391	.427	.409	.391	.418	.391	.382	
14.0	31.2	55.2	.3	.5	.0506	.437	.488	.472	.446	.461	.492	.508	.397	.425	.425	.388	.416	.388	.379	
15.0	30.9	54.5	.4	.5	.0517	.437	.487	.471	.447	.465	.495	.513	.393	.421	.421	.402	.412	.384	.375	
16.0	30.7	54.2	.5	.3	.0262	.437	.493	.479	.449	.467	.493	.519	.387	.415	.415	.397	.406	.376	.387	
17.0	30.6	53.9	.6	.3	.0265	.437	.501	.477	.450	.469	.495	.516	.381	.409	.409	.396	.418	.396	.381	
18.0	30.3	53.2	.7	.5	.0539	.437	.494	.473	.443	.460	.490	.523	.389	.418	.418	.389	.409	.389	.389	
19.0	30.1	52.9	.8	.3	.0274	.437	.500	.475	.448	.467	.490	.523	.400	.410	.410	.391	.400	.391	.381	
20.0	29.9	52.5	.9	.3	.0277	.437	.502	.477	.458	.479	.497	.516	.375	.404	.404	.384	.413	.384	.394	
21.0	29.8	52.2	1.0	.3	.0280	.437	.505	.483	.458	.479	.497	.512	.374	.403	.403	.383	.413	.383	.393	
22.0	29.6	51.8	1.1	.3	.0283	.437	.504	.480	.453	.474	.492	.510	.378	.417	.407	.378	.407	.388	.398	
23.0	29.5	51.5	1.2	.3	.0286	.437	.504	.482	.456	.472	.490	.514	.387	.417	.397	.377	.407	.397	.387	
24.0	29.3	51.2	1.2	.3	.0290	.437	.508	.484	.454	.466	.486	.504	.382	.412	.402	.392	.412	.402	.382	
25.0	29.2	50.8	1.3	.3	.0293	.437	.505	.483	.451	.465	.477	.503	.380	.431	.410	.390	.400	.390	.400	
26.0	29.0	50.5	1.4	.3	.0296	.437	.500	.482	.443	.458	.472	.507	.401	.431	.431	.390	.401	.390	.380	
27.0	28.9	50.1	1.5	.3	.0300	.437	.503	.485	.450	.464	.476	.503	.396	.427	.407	.386	.417	.386	.386	
28.0	28.7	49.8	1.6	.3	.0304	.437	.503	.472	.441	.461	.482	.507	.391	.422	.401	.412	.401	.391		
29.0	28.7	49.8	1.6	0.0	0.0000	.437	.499	.472	.441	.464	.486	.515	.391	.422	.422	.401	.412	.391	.370	
30.0	28.6	49.5	1.7	.3	.0308	.437	.499	.473	.444	.465	.492	.515	.388	.419	.419	.398	.409	.377	.388	
31.0	28.4	49.1	1.8	.3	.0311	.437	.497	.472	.445	.466	.497	.514	.386	.417	.417	.386	.407	.396	.386	
32.0	28.2	48.8	1.8	.3	.0315	.437	.497	.478	.450	.471	.501	.522	.386	.418	.397	.375	.407	.397	.386	
33.0	28.2	48.8	1.8	0.0	0.0000	.437	.499	.476	.448	.472	.506	.531	.384	.416	.395	.374	.406	.395	.384	
34.0	28.1	48.4	1.9	.3	.0319	.437	.504	.482	.452	.473	.506	.523	.383	.415	.394	.372	.405	.394	.383	

Table 3B — Inferred Pressurant Distribution, Scaling Run 231; Three 3.279-cm Nozzles

<i>t</i> (s)	<i>T</i> (°C)	<i>T_o</i> (°C)	<i>T_p</i> (°C)	<i>β</i>	<i>β/θ</i>	<i>X̄</i>	Pressurant Fractions (<i>X</i>) at Locations /													
							1	1 + 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																				
0.0	13.5	13.5	18.7	1.7	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	18.3	18.5	13.4	-1.6	-0.235	0.043	-0.494	-0.299	-0.025	-0.201	-0.338	-0.299	0.385	0.190	0.190	0.385	0.190	0.403	0.385	
VALVE FULLY OPEN																				
2.0	23.5	25.7	8.9	3.1	0.4921	0.131	-0.000	-0.000	0.006	0.006	0.101	0.279	0.190	0.190	0.279	0.220	0.250	0.190	0.190	
3.0	27.5	32.5	7.5	2.0	0.1588	0.199	0.135	0.131	0.127	0.147	0.135	0.179	0.279	0.239	0.279	0.239	0.219	0.199	0.199	
4.0	29.6	37.5	6.3	3.7	0.2589	0.253	0.218	0.202	0.205	0.221	0.212	0.228	0.288	0.288	0.304	0.288	0.272	0.288	0.272	0.272
5.0	31.1	41.9	5.4	3.5	0.2116	0.296	0.268	0.268	0.276	0.271	0.271	0.306	0.312	0.284	0.312	0.339	0.339	0.329	0.284	
6.0	31.9	45.8	4.1	3.8	0.2043	0.333	0.307	0.324	0.317	0.331	0.331	0.353	0.343	0.343	0.343	0.343	0.331	0.343	0.319	0.319
7.0	32.0	48.9	2.6	5.0	0.2451	0.365	0.346	0.355	0.344	0.350	0.357	0.389	0.376	0.376	0.376	0.376	0.376	0.368	0.385	0.368
8.0	32.4	51.5	2.7	3.2	0.1323	0.390	0.389	0.389	0.375	0.382	0.422	0.389	0.389	0.389	0.399	0.399	0.399	0.399	0.379	0.379
9.0	32.2	53.1	2.7	4.6	0.1782	0.414	0.412	0.402	0.404	0.410	0.436	0.388	0.428	0.428	0.428	0.428	0.428	0.418	0.388	0.388
COMMENCE VALVE CLOSURE																				
10.0	32.1	54.6	2.7	4.1	0.1397	0.433	0.437	0.429	0.423	0.429	0.423	0.439	0.429	0.435	0.445	0.445	0.434	0.435	0.416	0.416
11.0	31.7	55.8	2.4	3.1	0.1366	0.450	0.443	0.441	0.432	0.447	0.458	0.481	0.436	0.454	0.454	0.454	0.436	0.464	0.454	0.454
VALVE FULLY CLOSED																				
12.0	31.0	56.9	.9	1.1	-0.0470	0.461	0.480	0.460	0.449	0.455	0.462	0.480	0.453	0.462	0.462	0.462	0.462	0.462	0.462	0.453
13.0	31.9	58.8	.6	-2.9	-0.1285	0.461	0.475	0.468	0.463	0.462	0.468	0.491	0.462	0.462	0.462	0.444	0.444	0.453	0.444	0.444
14.0	31.6	58.1	.7	.9	0.0421	0.461	0.464	0.474	0.464	0.458	0.472	0.490	0.455	0.455	0.455	0.455	0.455	0.455	0.446	0.446
15.0	31.3	57.5	.8	1.0	0.0428	0.461	0.466	0.473	0.461	0.463	0.479	0.500	0.465	0.465	0.467	0.467	0.467	0.447	0.447	0.447
16.0	31.2	57.2	.8	.5	0.0217	0.461	0.466	0.466	0.461	0.466	0.472	0.500	0.470	0.461	0.461	0.443	0.443	0.443	0.443	0.443
17.0	30.9	56.6	.9	1.0	0.0440	0.461	0.467	0.463	0.456	0.465	0.468	0.492	0.459	0.459	0.459	0.459	0.459	0.459	0.459	0.459
18.0	30.7	56.2	.9	.5	0.0223	0.461	0.473	0.464	0.455	0.455	0.466	0.487	0.471	0.453	0.471	0.453	0.453	0.444	0.453	0.453
19.0	30.6	55.9	1.0	.5	0.0225	0.461	0.472	0.463	0.458	0.452	0.461	0.479	0.464	0.464	0.455	0.455	0.455	0.464	0.464	0.464
20.0	30.3	55.3	1.1	1.0	0.0456	0.461	0.474	0.465	0.448	0.454	0.459	0.474	0.459	0.459	0.459	0.459	0.459	0.459	0.459	0.459
21.0	30.1	54.9	1.1	.5	0.0231	0.461	0.477	0.469	0.456	0.460	0.465	0.478	0.456	0.456	0.456	0.456	0.456	0.456	0.456	0.456
22.0	29.9	54.6	1.1	.5	0.0233	0.461	0.478	0.468	0.457	0.467	0.467	0.483	0.455	0.455	0.455	0.455	0.455	0.455	0.455	0.455
23.0	29.8	54.3	1.2	.5	0.0235	0.461	0.473	0.468	0.460	0.470	0.466	0.485	0.453	0.453	0.453	0.453	0.453	0.452	0.453	
24.0	29.6	54.0	1.2	.5	0.0237	0.461	0.471	0.467	0.455	0.469	0.465	0.484	0.453	0.453	0.453	0.453	0.453	0.453	0.453	
25.0	29.6	54.0	1.2	0.6	0.0040	0.461	0.469	0.463	0.456	0.465	0.469	0.488	0.456	0.456	0.456	0.456	0.456	0.456	0.456	
26.0	29.5	53.7	1.3	.5	0.0240	0.461	0.462	0.460	0.458	0.464	0.465	0.490	0.452	0.452	0.452	0.452	0.452	0.462	0.452	
27.0	29.3	53.3	1.3	.5	0.0242	0.461	0.472	0.469	0.463	0.471	0.476	0.490	0.455	0.455	0.455	0.455	0.455	0.455	0.455	
28.0	29.2	53.0	1.4	.5	0.0244	0.461	0.478	0.476	0.468	0.474	0.480	0.493	0.457	0.457	0.457	0.457	0.457	0.447	0.457	
29.0	29.0	52.7	1.4	.6	0.0247	0.461	0.479	0.476	0.466	0.472	0.483	0.489	0.456	0.456	0.456	0.456	0.456	0.446	0.456	
30.0	29.0	52.6	1.5	0.6	0.0000	0.461	0.481	0.477	0.461	0.469	0.479	0.493	0.455	0.455	0.455	0.455	0.455	0.436	0.446	
31.0	28.9	51.3	2.7	.6	0.0249	0.461	0.483	0.474	0.462	0.468	0.474	0.491	0.454	0.454	0.454	0.454	0.454	0.444	0.454	
32.0	28.7	50.1	3.0	.6	0.0252	0.461	0.479	0.475	0.464	0.469	0.475	0.494	0.453	0.453	0.453	0.453	0.453	0.442	0.452	
33.0	28.7	49.5	4.5	0.0	0.0090	0.461	0.478	0.472	0.461	0.465	0.472	0.492	0.450	0.450	0.450	0.450	0.450	0.441	0.450	
34.0	28.6	48.5	5.3	.6	0.0254	0.461	0.480	0.473	0.462	0.467	0.473	0.494	0.448	0.448	0.448	0.448	0.448	0.448	0.448	

Table 4B — Inferred Pressurant Distribution, Scaling Run 232; Three 3.279-cm Nozzles

t (s)	\bar{T} (°C)	\bar{T}_a (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	Pressurant Fractions (X) at Locations /													
							1	1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																				
0.0	8.7	8.7	21.1	1.5	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	14.1	15.1	-1.2	10.1	.6784	.065	-.049	.007	.099	.062	-.036	-.030	.148	.086	.056	.117	.086	.179	.117	
VALVE FULLY OPEN																				
2.0	19.7	24.1	-5.3	1.9	.1649	.148	.093	.104	.121	.114	.097	.124	.182	.182	.182	.216	.182	.182	.149	
3.0	22.8	29.7	-6.0	.8	-.0398	.192	.148	.139	.142	.167	.153	.181	.223	.195	.195	.251	.223	.251	.223	
4.0	24.4	34.3	-5.3	4.6	.3423	.249	.217	.212	.212	.222	.243	.280	.268	.268	.293	.280	.293	.280		
5.0	26.1	39.1	-4.7	2.7	.1707	.295	.282	.280	.259	.275	.273	.289	.305	.305	.305	.326	.305	.328	.305	
6.0	26.0	42.1	-4.1	4.0	.2190	.333	.329	.316	.308	.319	.325	.338	.323	.344	.344	.355	.355	.323		
7.0	27.3	45.1	-3.7	3.2	.1548	.364	.375	.363	.349	.359	.355	.377	.357	.357	.377	.377	.377	.357		
8.0	27.1	46.8	-3.4	5.0	.2204	.392	.386	.386	.376	.374	.406	.380	.390	.410	.410	.410	.420	.380		
9.0	27.6	49.3	-3.3	2.3	.0865	.414	.409	.403	.394	.400	.401	.420	.392	.411	.411	.430	.430	.468	.411	
COMMENCE VALVE CLOSURE																				
10.0	27.4	50.9	-3.2	3.9	.1344	.434	.435	.426	.404	.411	.424	.465	.437	.456	.437	.432	.437	.447	.419	
11.0	26.8	51.9	-3.6	2.1	.1464	.452	.446	.441	.421	.441	.455	.473	.453	.472	.472	.453	.453	.453	.435	
VALVE FULLY CLOSED																				
12.0	26.1	52.2	-4.7	.8	.0547	.459	.462	.444	.427	.441	.457	.478	.448	.465	.483	.483	.465	.465	.448	
13.0	26.8	53.8	-5.0	-1.5	-.1068	.459	.461	.461	.442	.459	.467	.481	.455	.455	.464	.455	.455	.455	.455	
14.0	26.7	53.5	-4.9	.3	.0210	.459	.467	.463	.453	.467	.479	.486	.448	.465	.465	.448	.448	.448	.431	
15.0	26.4	52.9	-4.8	.6	.0425	.459	.465	.462	.455	.457	.469	.478	.445	.453	.453	.471	.462	.453	.445	
16.0	26.2	52.5	-4.8	.3	.0215	.459	.468	.456	.451	.458	.472	.486	.449	.449	.466	.449	.466	.449		
17.0	25.9	51.9	-4.7	.6	.0436	.459	.480	.473	.454	.468	.480	.487	.445	.445	.445	.445	.445	.445	.454	
18.0	25.8	51.6	-4.6	.3	.0221	.459	.473	.473	.462	.464	.471	.485	.441	.441	.441	.441	.459	.459		
19.0	25.5	51.0	-4.6	.6	.0448	.459	.467	.471	.460	.464	.473	.485	.449	.449	.458	.440	.458	.440		
20.0	25.3	50.6	-4.5	.3	.0227	.459	.463	.459	.455	.461	.468	.483	.454	.454	.454	.454	.454	.454	.434	
21.0	25.2	50.3	-4.5	.3	.0229	.459	.470	.463	.450	.461	.476	.490	.467	.448	.448	.448	.448	.448	.448	
22.0	25.0	50.0	-4.4	.3	.0231	.459	.476	.469	.456	.462	.476	.493	.445	.445	.445	.445	.454	.454		
23.0	24.9	49.7	-4.4	.3	.0234	.459	.468	.462	.455	.462	.472	.488	.457	.457	.457	.457	.438	.438		
24.0	24.7	49.4	-4.3	.3	.0236	.459	.470	.464	.461	.468	.479	.494	.461	.442	.442	.442	.442	.461	.442	
25.0	24.6	49.0	-4.3	.3	.0238	.459	.470	.462	.457	.470	.481	.492	.445	.445	.445	.445	.445	.445		
26.0	24.4	48.7	-4.2	.3	.0240	.459	.468	.460	.449	.464	.475	.488	.453	.453	.453	.443	.462	.443		
27.0	24.3	48.4	-4.2	.4	.0243	.459	.465	.461	.446	.457	.474	.488	.459	.459	.459	.440	.459	.440		
28.0	24.3	48.4	-4.2	0.0	0.0000	.459	.466	.459	.449	.457	.470	.485	.457	.457	.457	.457	.457	.438		
29.0	24.1	48.1	-4.1	.4	.0245	.459	.470	.459	.449	.457	.468	.486	.457	.457	.457	.457	.457	.438		
30.0	24.0	47.7	-4.1	.4	.0247	.459	.470	.459	.451	.462	.470	.491	.455	.455	.455	.455	.455	.435		
31.0	23.8	47.4	-4.0	.4	.0250	.459	.471	.457	.457	.469	.477	.492	.452	.452	.452	.452	.452	.432		
32.0	23.8	47.4	-4.0	0.0	0.0000	.459	.476	.468	.456	.470	.476	.489	.450	.450	.450	.450	.450	.431		
33.0	23.7	47.1	-4.0	.4	.0252	.459	.474	.476	.461	.469	.476	.490	.457	.447	.447	.447	.447	.427		
34.0	23.5	46.8	-3.9	.4	.0255	.459	.475	.473	.459	.473	.479	.488	.443	.443	.443	.443	.463	.443		

Table 5B — Inferred Pressurant Distribution, Scaling Run 233; Three 3.279-cm Nozzles

STONE, ALEXANDER, SIREE, SI. AUBIN, AND WILLIAMS

Table 6B — Inferred Pressurant Distribution, Scaling Run 234; Three 3.279-cm Nozzles

t (s)	\bar{T} (°C)	\bar{T}_o (°C)	\bar{T}_p (°C)	β	β/θ	Pressurant Fractions (X) at Locations /													
						1	2	3	4	5	6	7	8	9	10	11	12	13	
COMMENCE VALVE OPENING																			
0.0	9.0	9.0	21.4	1.5	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	14.3	15.4	-2.2	0.9	.5668	.064	.016	.010	.044	.056	.022	.041	.136	.050	.079	.136	.079	.136	.107
VALVE FULLY OPEN																			
2.0	19.6	23.9	-5.3	3.0	.2971	.148	.097	.111	.118	.118	.111	.115	.203	.203	.169	.203	.169	.169	.135
3.0	22.6	29.3	-5.6	2.2	.0114	.192	.147	.147	.141	.164	.170	.170	.239	.239	.239	.210	.210	.182	
4.0	24.7	34.4	-4.8	3.8	.2680	.248	.222	.220	.205	.220	.230	.240	.253	.266	.278	.276	.266	.278	.266
5.0	26.1	38.6	-4.1	3.5	.2227	.294	.286	.277	.261	.275	.284	.296	.319	.296	.319	.296	.319	.296	
6.0	27.0	42.2	-3.6	3.3	.1804	.331	.326	.324	.311	.315	.322	.330	.332	.354	.332	.343	.332	.354	.332
7.0	27.7	45.2	-3.2	3.1	.1434	.362	.360	.364	.339	.350	.362	.379	.356	.356	.376	.356	.376	.356	
8.0	27.9	47.6	-3.0	3.5	.1496	.389	.409	.405	.375	.391	.405	.405	.387	.387	.387	.387	.387	.348	
9.0	28.3	50.1	-3.0	2.5	.0940	.411	.430	.432	.417	.424	.428	.434	.398	.398	.398	.398	.417	.379	
COMMENCE VALVE CLOSURE																			
10.0	27.8	51.1	-2.9	5.1	.1794	.432	.434	.448	.428	.434	.434	.447	.419	.428	.428	.428	.428	.400	
11.0	27.5	52.6	-3.3	1.6	.1079	.449	.462	.462	.446	.453	.465	.474	.440	.440	.440	.440	.458	.422	
VALVE FULLY CLOSED																			
12.0	27.2	54.3	-4.8	-3	-0.0212	.458	.480	.468	.457	.467	.480	.489	.443	.445	.445	.445	.462	.428	
13.0	28.4	56.8	-5.1	-2.4	-0.1623	.458	.480	.466	.450	.466	.484	.492	.438	.446	.446	.446	.455	.438	
14.0	28.4	56.8	-5.1	0.0	0.0000	.458	.485	.474	.461	.474	.479	.482	.438	.438	.438	.438	.454	.438	
15.0	28.1	56.2	-5.1	.6	.0396	.458	.482	.478	.469	.492	.491	.476	.445	.437	.437	.437	.445	.429	
16.0	28.0	55.8	-5.0	.3	.0200	.458	.479	.467	.462	.469	.477	.476	.451	.434	.451	.451	.451	.434	
17.0	27.7	55.2	-4.9	.6	.0406	.458	.484	.474	.461	.474	.474	.474	.444	.444	.444	.444	.444	.444	
18.0	27.5	54.9	-4.9	.3	.0206	.458	.487	.480	.467	.479	.482	.482	.442	.442	.442	.442	.442	.425	
19.0	27.2	54.3	-4.8	.6	.0416	.458	.481	.475	.468	.481	.490	.486	.430	.439	.439	.439	.439	.439	
20.0	27.1	53.9	-4.8	.3	.0211	.458	.470	.463	.463	.469	.473	.482	.433	.435	.432	.432	.452	.452	
21.0	27.1	53.9	-4.8	0.0	0.0000	.458	.472	.464	.452	.466	.478	.483	.432	.449	.449	.449	.449	.449	
22.0	26.9	53.6	-4.7	.3	.0212	.458	.474	.464	.460	.467	.479	.486	.446	.446	.446	.446	.455	.438	
23.0	26.7	53.3	-4.7	.3	.0214	.458	.485	.476	.464	.473	.473	.482	.445	.445	.445	.445	.445	.428	
24.0	26.6	53.0	-4.6	.3	.0216	.458	.487	.475	.465	.466	.473	.478	.445	.445	.445	.445	.445	.437	
25.0	26.4	52.7	-4.6	.3	.0218	.458	.488	.476	.459	.464	.472	.483	.445	.445	.445	.445	.445	.445	
26.0	26.3	52.3	-4.5	.3	.0220	.458	.490	.475	.459	.464	.471	.476	.443	.443	.443	.443	.461	.443	
27.0	26.1	52.0	-4.5	.3	.0222	.458	.486	.475	.457	.464	.473	.477	.443	.443	.443	.443	.461	.443	
28.0	26.0	51.7	-4.4	.3	.0224	.458	.483	.472	.461	.465	.474	.479	.443	.443	.443	.443	.461	.443	
29.0	26.0	51.7	-4.4	0.0	0.0000	.458	.480	.471	.457	.464	.476	.480	.444	.444	.444	.444	.462	.444	
30.0	25.8	51.4	-4.4	.3	.0226	.458	.480	.475	.460	.466	.477	.480	.443	.443	.443	.443	.460	.443	
31.0	25.7	51.1	-4.3	.3	.0228	.458	.485	.474	.462	.467	.478	.480	.440	.440	.440	.440	.458	.449	
32.0	25.7	51.1	-4.3	0.0	0.0000	.458	.482	.475	.460	.466	.480	.482	.439	.439	.439	.439	.457	.457	
33.0	25.5	50.7	-4.3	.3	.0230	.458	.485	.474	.460	.469	.482	.482	.438	.438	.438	.438	.456	.456	
34.0	25.5	50.7	-4.3	0.0	0.0000	.458	.483	.477	.461	.470	.484	.483	.437	.437	.437	.437	.455	.455	

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Table 7B — Inferred Pressurant Distribution, Scaling Run 235; Three 3.279-cm Nozzles

Pressurant Fractions (X) at Locations /												
CONNCE VALVE OPENING												
0.0	10.4	10.4	10.4	1.6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.0	15.6	15.6	15.6	5.6	0.2831	0.49	-0.359	-0.152	-0.036	-0.077	-0.109	-0.265
VALVE FULLY OPEN												
2.0	21.4	24.0	5.3	2.5	2.369	1.35	0.049	0.055	0.055	0.071	0.049	0.243
3.0	24.5	29.5	4.6	5.0	4.057	2.03	-1.36	-1.28	-1.32	-1.44	-1.08	1.89
4.0	26.5	34.3	4.1	4.6	3.264	2.57	-2.04	-2.11	-2.04	-2.04	-2.04	2.24
5.0	28.6	40.1	1.6	2.3	1.316	2.99	-2.87	-2.79	-2.87	-2.01	-2.34	2.64
6.0	29.3	43.1	1.8	4.2	2.216	3.35	-3.19	-3.12	-3.19	-2.87	-2.93	2.93
7.0	29.3	44.5	1.9	5.3	1.663	3.56	-3.51	-3.41	-3.49	-3.70	-3.02	3.02
8.0	29.7	47.0	1.9	3.4	1.116	3.63	-3.67	-3.61	-3.69	-3.61	-3.69	3.26
9.0	29.6	48.6	1.8	4.3	1.705	4.07	-4.01	-4.03	-3.96	-3.92	-4.32	3.28
CONNCE VALVE CLOSURE												
10.0	29.5	50.3	1.6	4.3	1.494	4.27	-4.09	-4.11	-4.09	-4.24	-4.38	4.38
11.0	29.3	51.7	1.3	2.3	1.192	4.45	-4.44	-4.44	-4.28	-4.42	-4.62	4.42
VALVE FULLY CLOSED												
12.0	28.3	52.5	1.3	1.9	0.993	4.98	-4.55	-4.37	-4.40	-4.50	-4.61	4.65
13.0	29.8	53.5	1.6	1.6	-2.061	4.96	-4.63	-4.63	-4.46	-4.47	-4.87	4.63
14.0	29.7	53.2	1.5	1.5	-0.199	4.98	-4.63	-4.63	-4.55	-4.67	-4.81	4.62
15.0	29.4	54.6	1.5	1.6	-0.492	4.98	-4.58	-4.58	-4.61	-4.78	-4.92	4.62
16.0	29.2	54.3	1.4	1.4	-0.204	4.98	-4.73	-4.56	-4.64	-4.82	-4.89	4.58
17.0	28.9	53.7	1.4	1.8	-0.412	4.99	-4.79	-4.81	-4.73	-4.75	-4.81	4.51
18.0	28.6	53.4	1.4	1.4	-0.209	4.98	-4.83	-4.78	-4.72	-4.72	-4.78	4.50
19.0	28.6	53.1	1.4	1.4	-0.211	4.98	-4.86	-4.79	-4.67	-4.65	-4.79	4.50
20.0	28.3	52.5	1.3	1.8	-0.426	4.98	-4.84	-4.82	-4.71	-4.65	-4.76	4.50
21.0	28.1	52.2	1.3	1.4	-0.216	4.98	-4.88	-4.81	-4.69	-4.62	-4.77	4.48
22.0	28.0	51.9	1.3	1.4	-0.218	4.98	-4.80	-4.87	-4.57	-4.59	-4.66	4.44
23.0	27.9	51.6	1.2	1.4	-0.220	4.98	-4.68	-4.70	-4.64	-4.70	-4.81	4.41
24.0	27.8	51.3	1.2	0.0	-0.0000	4.98	-4.64	-4.60	-4.53	-4.66	-4.78	4.39
25.0	27.7	51.3	1.2	0.0	-0.0222	4.98	-4.59	-4.59	-4.49	-4.63	-4.74	4.37
26.0	27.5	51.0	1.2	0.0	-0.0224	4.98	-4.57	-4.57	-4.48	-4.63	-4.75	4.36
27.0	27.4	50.7	1.2	0.0	-0.0224	4.98	-4.56	-4.56	-4.47	-4.62	-4.72	4.35
28.0	27.2	50.4	1.1	0.0	-0.0228	4.98	-4.55	-4.57	-4.47	-4.63	-4.73	4.34
29.0	27.1	50.0	1.1	0.0	-0.0230	4.98	-4.58	-4.59	-4.43	-4.61	-4.75	4.33
30.0	27.1	50.0	1.1	0.0	-0.0049	4.98	-4.59	-4.59	-4.50	-4.61	-4.75	4.32
31.0	26.9	49.7	1.1	0.0	-0.232	4.98	-4.57	-4.49	-4.59	-4.64	-4.74	4.31
32.0	26.8	49.4	1.0	0.0	-0.234	4.98	-4.56	-4.58	-4.50	-4.62	-4.72	4.30
33.0	26.8	49.4	1.0	0.0	-0.0090	4.98	-4.57	-4.57	-4.59	-4.62	-4.71	4.29
34.0	26.6	49.0	1.5	0.0	-0.236	4.98	-4.58	-4.58	-4.52	-4.63	-4.73	4.28

Table 8B — Inferred Pressurant Distribution, Scaling Run 236; Three 3.279-cm Nozzles

<i>t</i> (s)	\bar{T} (°C)	\bar{T}_a (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	Pressurant Fractions (<i>X</i>) at Locations /												
							1 = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	17.4	17.4	23.7	1.6	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	23.1	24.2	6.9	5.1	.3268	.062	-.051	-.016	.030	.013	-.033	-.033	.157	.100	.129	.157	.100	.129	.129
VALVE FULLY OPEN																			
2.0	28.0	32.0	5.9	7.2	.7105	.151	.132	.128	.124	.139	.155	.178	.174	.174	.136	.174	.136	.136	.174
3.0	31.4	38.0	7.2	4.8	.3806	.215	.200	.213	.178	.210	.210	.226	.246	.262	.230	.230	.197	.197	.197
4.0	34.2	43.6	8.3	2.9	.1948	.267	.263	.277	.235	.260	.280	.305	.260	.260	.288	.260	.260	.260	.260
5.0	35.4	46.5	8.9	3.6	.1461	.296	.307	.302	.270	.294	.310	.334	.267	.320	.294	.294	.267	.294	.294
6.0	35.8	49.0	9.4	5.5	.3069	.334	.331	.333	.323	.336	.346	.368	.343	.331	.343	.331	.331	.318	.318
7.0	36.5	52.0	9.6	3.7	.1750	.364	.378	.376	.347	.371	.395	.402	.366	.343	.366	.343	.343	.343	.343
8.0	36.4	53.7	9.6	5.3	.2291	.392	.427	.396	.366	.382	.389	.414	.368	.391	.403	.403	.380	.368	.368
9.0	36.4	55.4	9.6	4.7	.1813	.415	.431	.429	.400	.420	.433	.470	.392	.413	.413	.413	.392	.392	.392
COMMENCE VALVE CLOSURE																			
10.0	36.6	57.4	9.4	3.2	.1079	.434	.464	.456	.418	.441	.462	.477	.427	.427	.427	.416	.416	.406	.406
11.0	36.0	58.0	9.2	2.8	.1887	.451	.483	.468	.438	.460	.470	.479	.442	.442	.442	.442	.442	.421	.421
VALVE FULLY CLOSED																			
12.0	34.9	58.2	7.7	1.4	.0953	.461	.487	.477	.451	.471	.483	.504	.451	.451	.451	.451	.451	.431	.431
13.0	35.7	59.7	7.6	-1.7	-1.096	.461	.499	.481	.451	.468	.479	.495	.447	.437	.447	.456	.447	.447	.437
14.0	35.6	59.4	7.7	-3	.0215	.461	.510	.494	.452	.465	.487	.504	.442	.442	.442	.442	.442	.423	.423
15.0	35.3	58.8	7.7	-7	.0436	.461	.513	.505	.458	.468	.485	.507	.436	.436	.436	.436	.436	.436	.436
16.0	34.9	58.2	7.7	-7	.0444	.461	.506	.496	.458	.474	.488	.504	.452	.452	.452	.452	.452	.432	.432
17.0	34.8	57.9	7.8	-3	.0225	.461	.500	.494	.460	.480	.498	.510	.446	.446	.446	.446	.446	.426	.426
18.0	34.5	57.3	7.8	-7	.0456	.461	.498	.496	.468	.484	.498	.508	.440	.440	.440	.440	.440	.419	.419
19.0	34.3	57.0	7.8	-3	.0231	.461	.502	.498	.473	.483	.498	.512	.435	.435	.435	.435	.435	.424	.424
20.0	34.0	56.3	7.9	-7	.0469	.461	.507	.499	.470	.483	.497	.507	.429	.450	.429	.429	.429	.429	.429
21.0	33.8	56.0	7.9	-4	.0238	.461	.504	.496	.479	.491	.498	.506	.446	.446	.446	.446	.446	.425	.425
22.0	33.7	55.7	7.9	-4	.0240	.461	.505	.494	.465	.480	.500	.513	.448	.448	.448	.448	.448	.427	.427
23.0	33.5	55.4	7.9	-4	.0243	.461	.494	.488	.465	.477	.494	.513	.446	.446	.446	.446	.446	.425	.425
24.0	33.4	55.1	8.0	-4	.0245	.461	.486	.482	.456	.473	.488	.512	.442	.442	.442	.442	.442	.422	.422
25.0	33.2	54.8	8.0	-4	.0247	.461	.488	.475	.456	.475	.490	.509	.436	.438	.436	.436	.436	.436	.436
26.0	33.1	54.5	8.0	-4	.0250	.461	.491	.476	.458	.476	.489	.512	.432	.432	.432	.432	.430	.430	.441
27.0	33.1	54.5	8.0	0.0	0.0000	.461	.491	.485	.467	.482	.493	.506	.450	.450	.450	.450	.429	.429	.429
28.0	32.9	54.1	8.0	-4	.0252	.461	.492	.488	.468	.490	.496	.509	.451	.429	.429	.429	.429	.429	.429
29.0	32.7	53.8	8.1	-4	.0255	.461	.492	.492	.470	.490	.503	.516	.440	.440	.429	.429	.429	.429	.429
30.0	32.7	53.8	8.1	0.0	0.0000	.461	.497	.488	.462	.488	.501	.521	.449	.449	.427	.427	.427	.427	.427
31.0	32.6	53.5	8.1	-4	.0258	.461	.500	.489	.469	.491	.504	.522	.449	.427	.427	.427	.427	.427	.427
32.0	32.4	53.2	8.1	-4	.0260	.461	.499	.492	.470	.492	.501	.519	.450	.428	.428	.428	.428	.428	.428
33.0	32.3	52.9	8.2	-4	.0263	.461	.501	.490	.477	.495	.501	.515	.430	.430	.430	.430	.430	.430	.430
34.0	32.3	52.9	8.2	0.0	0.0000	.461	.502	.493	.473	.493	.502	.509	.431	.431	.431	.431	.431	.431	.431
XXX																			

Table 9B — Inferred Pressurant Distribution, Scaling Run 237; Three 3.279-cm Nozzles

<i>t</i> (s)	\bar{T} (°C)	\bar{T}_c (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	Pressurant Fractions (<i>X</i>) at Locations <i>I</i>												
							1 = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.4	7.4	7.4	35.0	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	10.9	11.6	-1.0	36.4	1.9066	0.051	-0.232	-0.046	0.742	0.065	-0.143	-0.150	0.051	-0.061	-0.133	-0.061	0.088	-0.311	-0.236
VALVE FULLY OPEN																			
2.0	15.5	18.6	-3.9	11.3	1.0988	0.139	-0.078	0.047	0.657	0.078	0.002	0.033	0.096	0.051	0.006	0.051	0.056	0.541	0.229
3.0	18.3	23.8	-2.4	7.9	0.6480	0.207	0.023	0.176	0.684	0.126	0.084	0.077	0.126	0.107	0.088	0.107	0.241	0.603	0.241
4.0	20.7	28.4	-1.4	5.3	0.3692	0.260	0.116	0.254	0.733	0.177	0.163	0.197	0.167	0.167	0.133	0.133	0.200	0.670	0.267
5.0	21.8	31.7	-0.8	6.0	0.3612	0.303	0.143	0.251	0.769	0.245	0.245	0.269	0.268	0.208	0.161	0.177	0.254	0.716	0.300
6.0	22.6	34.4	-0.4	5.6	0.3035	0.340	0.208	0.294	0.797	0.248	0.260	0.297	0.257	0.257	0.198	0.198	0.314	0.717	0.372
7.0	22.7	36.2	-0.2	6.2	0.2939	0.370	0.252	0.310	0.836	0.296	0.274	0.280	0.296	0.269	0.241	0.241	0.337	0.762	0.419
8.0	23.1	38.4	-0.2	4.5	0.1843	0.395	0.286	0.367	0.812	0.330	0.317	0.369	0.335	0.284	0.258	0.256	0.361	0.776	0.387
9.0	22.8	38.8	-0.2	7.8	0.2061	0.411	0.289	0.360	0.852	0.342	0.342	0.378	0.291	0.342	0.266	0.291	0.394	0.803	0.394
COMMENCE VALVE CLOSURE																			
10.0	22.3	39.5	-0.3	7.3	0.2636	0.432	0.318	0.411	0.850	0.348	0.368	0.398	0.353	0.353	0.315	0.315	0.391	0.805	0.391
11.0	22.3	41.0	-0.5	2.5	0.1354	0.449	0.369	0.403	0.841	0.365	0.386	0.422	0.398	0.374	0.326	0.350	0.446	0.784	0.374
VALVE FULLY CLOSED																			
12.0	21.5	42.0	-2.3	2.1	0.1105	0.463	0.380	0.491	0.809	0.385	0.412	0.414	0.396	0.385	0.339	0.339	0.441	0.791	0.441
13.0	23.3	45.7	-2.7	-5.7	-0.3069	0.463	0.434	0.483	0.568	0.391	0.413	0.428	0.434	0.413	0.393	0.393	0.455	0.640	0.378
14.0	23.3	45.7	-2.7	0.0	0.0000	0.463	0.471	0.467	0.512	0.430	0.457	0.477	0.432	0.432	0.422	0.422	0.453	0.453	0.304
15.0	23.0	45.1	-2.6	.9	0.0487	0.463	0.489	0.466	0.512	0.445	0.479	0.500	0.447	0.447	0.426	0.426	0.447	0.466	0.468
16.0	22.8	44.0	-2.6	.5	0.0247	0.463	0.495	0.474	0.514	0.459	0.490	0.503	0.444	0.444	0.423	0.423	0.444	0.453	0.435
17.0	22.5	44.2	-2.5	.9	0.0501	0.463	0.492	0.468	0.509	0.462	0.498	0.511	0.440	0.440	0.419	0.419	0.462	0.462	0.462
18.0	22.4	43.9	-2.5	.5	0.0254	0.463	0.499	0.465	0.506	0.461	0.493	0.506	0.439	0.461	0.417	0.417	0.439	0.461	0.461
19.0	22.2	43.6	-2.5	.5	0.0257	0.463	0.501	0.468	0.505	0.459	0.488	0.501	0.451	0.451	0.429	0.429	0.451	0.451	0.440
20.0	22.1	43.2	-2.4	.5	0.0260	0.463	0.511	0.469	0.504	0.460	0.491	0.500	0.447	0.447	0.425	0.425	0.447	0.447	0.447
21.0	21.9	42.9	-2.4	.5	0.0262	0.463	0.505	0.470	0.499	0.457	0.485	0.499	0.446	0.446	0.424	0.424	0.446	0.446	0.446
22.0	21.8	42.6	-2.4	.5	0.0265	0.463	0.496	0.461	0.496	0.454	0.483	0.494	0.461	0.461	0.439	0.439	0.461	0.461	0.439
23.0	21.6	42.3	-2.3	.9	0.0269	0.463	0.492	0.459	0.497	0.459	0.483	0.497	0.454	0.454	0.432	0.432	0.454	0.466	0.442
24.0	21.5	42.0	-2.3	.5	0.0271	0.463	0.493	0.454	0.504	0.464	0.491	0.493	0.448	0.448	0.425	0.425	0.448	0.471	0.448
25.0	21.3	41.7	-2.3	.5	0.0274	0.463	0.492	0.461	0.513	0.470	0.488	0.495	0.447	0.447	0.424	0.424	0.447	0.470	0.447
26.0	21.2	41.4	-2.2	.5	0.0277	0.463	0.495	0.462	0.504	0.462	0.485	0.497	0.449	0.449	0.426	0.426	0.449	0.472	0.449
27.0	21.2	41.4	-2.2	0.0	0.0000	0.463	0.490	0.460	0.501	0.460	0.488	0.499	0.446	0.446	0.423	0.423	0.446	0.469	0.446
28.0	21.0	41.0	-2.2	.5	0.0280	0.463	0.496	0.461	0.505	0.463	0.491	0.502	0.447	0.447	0.424	0.424	0.447	0.470	0.447
29.0	20.9	40.7	-2.2	.5	0.0283	0.463	0.496	0.471	0.505	0.471	0.489	0.501	0.445	0.445	0.422	0.422	0.445	0.466	0.445
30.0	20.7	40.4	-2.1	.5	0.0287	0.463	0.496	0.467	0.519	0.475	0.496	0.498	0.442	0.442	0.418	0.418	0.442	0.465	0.442
31.0	20.7	40.4	-2.1	0.0	0.0000	0.463	0.492	0.463	0.513	0.473	0.499	0.499	0.437	0.437	0.417	0.417	0.437	0.461	0.437
32.0	20.5	40.1	-2.1	.5	0.0290	0.463	0.490	0.462	0.509	0.467	0.485	0.502	0.436	0.436	0.416	0.416	0.448	0.459	0.448
33.0	20.4	39.8	-2.0	.5	0.0293	0.463	0.492	0.457	0.502	0.461	0.492	0.502	0.435	0.435	0.414	0.414	0.448	0.459	0.459
34.0	20.4	39.8	-2.0	0.0	0.0000	0.463	0.498	0.462	0.505	0.465	0.489	0.498	0.434	0.434	0.417	0.417	0.437	0.457	0.457

Table 10B — Inferred Pressurant Distribution, Scaling Run 238; Three 3.279-cm Nozzles

<i>t</i> (s)	<i>T</i> (°C)	<i>T_a</i> (°C)	<i>T_p</i> (°C)	<i>β</i>	<i>β/θ</i>	<i>X̄</i>	Pressurant Fractions (<i>X</i>) at Locations <i>I</i>												
							1 = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	7.4	7.4	35.8	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	10.9	11.6	-1.8	36.4	1.9066	.051	-.232	-.046	.742	.065	-.143	-.150	.051	-.061	-.135	-.061	.068	.311	.236
VALVE FULLY OPEN																			
2.0	15.5	18.6	-3.9	11.3	1.0988	.139	-.078	.047	.657	.078	.002	.033	.096	.051	.006	.051	.096	.541	.229
3.0	18.3	23.9	-2.4	7.9	.6480	.207	.023	.176	.684	.126	.084	.077	.126	.107	.088	.107	.241	.603	.241
4.0	20.7	28.4	-1.4	5.3	.3692	.260	.116	.254	.733	.177	.163	.197	.167	.167	.133	.133	.200	.670	.267
5.0	21.8	31.7	-1.8	6.0	.3612	.303	.143	.251	.769	.245	.245	.269	.208	.208	.161	.177	.254	.716	.300
6.0	22.6	34.4	-1.4	5.6	.3035	.340	.208	.294	.797	.248	.260	.297	.257	.257	.199	.199	.314	.717	.372
7.0	22.7	36.2	-1.2	6.2	.2939	.370	.252	.310	.836	.296	.274	.280	.296	.269	.241	.241	.337	.762	.419
8.0	23.1	38.4	-1.2	4.5	.1843	.395	.286	.367	.812	.330	.317	.369	.335	.284	.258	.258	.361	.776	.387
9.0	22.8	38.8	-1.2	7.8	.2061	.411	.289	.360	.852	.342	.342	.378	.291	.342	.266	.291	.394	.803	.394
COMMENCE VALVE CLOSURE																			
10.0	22.3	39.5	-1.3	7.3	.2636	.432	.318	.411	.850	.348	.368	.398	.353	.353	.315	.315	.391	.605	.391
11.0	22.3	41.0	-1.3	2.3	.1354	.449	.369	.403	.841	.365	.386	.422	.398	.374	.326	.350	.446	.784	.374
VALVE FULLY CLOSED																			
12.0	21.5	42.0	-2.3	2.1	.1105	.463	.380	.491	.809	.385	.412	.414	.396	.385	.339	.339	.441	.791	.441
13.0	23.3	43.7	-2.7	-5.7	-.3069	.463	.434	.483	.568	.391	.413	.428	.434	.413	.393	.393	.455	.640	.578
14.0	23.3	45.7	-2.7	0.0	0.0000	.463	.471	.467	.512	.430	.457	.477	.432	.432	.422	.422	.453	.545	.504
15.0	23.6	45.1	-2.6	.9	.0487	.463	.489	.466	.512	.445	.479	.500	.447	.447	.426	.426	.447	.468	.462
16.0	22.8	44.8	-2.6	.5	.0247	.463	.493	.474	.514	.459	.499	.505	.444	.444	.423	.423	.444	.455	.453
17.0	22.5	44.2	-2.5	.9	.0501	.463	.492	.468	.509	.462	.498	.511	.440	.440	.419	.419	.440	.462	.462
18.0	22.4	43.9	-2.5	.5	.0254	.463	.499	.465	.506	.461	.493	.506	.439	.461	.417	.417	.439	.461	.461
19.0	22.2	43.6	-2.5	.5	.0257	.463	.501	.468	.505	.459	.488	.501	.451	.451	.429	.429	.451	.451	.440
20.0	22.1	43.2	-2.4	.5	.0260	.463	.511	.469	.504	.460	.491	.506	.447	.447	.425	.425	.447	.447	.447
21.0	21.9	42.9	-2.4	.5	.0262	.463	.505	.470	.499	.457	.485	.499	.446	.446	.424	.424	.446	.479	.446
22.0	21.8	42.6	-2.4	.5	.0265	.463	.496	.461	.496	.454	.483	.494	.461	.461	.439	.439	.461	.439	
23.0	21.6	42.3	-2.3	.5	.0268	.463	.492	.459	.497	.459	.483	.497	.454	.454	.432	.432	.454	.466	.443
24.0	21.5	42.0	-2.3	.5	.0271	.463	.493	.464	.504	.464	.491	.493	.448	.448	.425	.425	.448	.471	.448
25.0	21.3	41.7	-2.3	.5	.0274	.463	.492	.461	.513	.470	.488	.495	.447	.447	.424	.424	.447	.470	.447
26.0	21.2	41.4	-2.2	.5	.0277	.463	.495	.462	.504	.462	.485	.497	.449	.449	.426	.426	.449	.472	.449
27.0	21.2	41.4	-2.2	0.0	0.0000	.463	.490	.460	.501	.460	.488	.499	.446	.446	.423	.423	.446	.469	.446
28.0	21.0	41.0	-2.2	.5	.0280	.463	.496	.461	.505	.463	.491	.502	.447	.447	.424	.424	.447	.470	.447
29.0	20.9	40.7	-2.2	.5	.0283	.463	.496	.471	.505	.471	.489	.501	.445	.445	.422	.422	.445	.468	.445
30.0	20.7	40.4	-2.1	.5	.0287	.463	.496	.467	.519	.479	.496	.498	.442	.442	.418	.418	.442	.465	.442
31.0	20.7	40.4	-2.1	0.0	0.0000	.463	.492	.463	.513	.473	.499	.499	.437	.437	.437	.437	.461	.437	
32.0	20.5	40.1	-2.1	.5	.0290	.463	.490	.462	.509	.467	.493	.502	.436	.436	.436	.436	.448	.455	.448
33.0	20.4	39.8	-2.0	.5	.0293	.463	.492	.457	.502	.461	.492	.502	.435	.435	.435	.435	.459	.459	
34.0	20.4	39.8	-2.0	0.0	0.0000	.463	.498	.462	.505	.465	.489	.498	.434	.434	.434	.434	.457	.457	

Table 11B — Inferred Pressurant Distribution, Scaling Run 239; Three 3.279-cm Nozzles

<i>t</i> (s)	<i>T</i> (°C)	\bar{T}_a (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	Pressurant Fractions (<i>X</i>) at Locations <i>l</i>												
							1 = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	21.1	21.1	37.2	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	4.5	5.2	-9.3	78.8	4.0103	.050	-.284	-.077	.500	-.064	-.139	-.119	.005	-.098	-.064	.005	.005	.863	.108
VALVE FULLY OPEN																			
2.0	9.1	12.5	-12.1	9.9	.9388	.136	-.064	.054	.425	.066	.617	.034	.095	.034	.034	.054	.095	.747	.176
3.0	11.8	17.4	-9.8	8.8	.7338	.205	.003	.073	.493	.176	.114	.165	.121	.103	.084	.121	.158	.839	.213
4.0	13.7	21.3	-8.1	7.2	.4989	.258	.091	.247	.567	.217	.183	.224	.142	.142	.125	.142	.159	.891	.227
5.0	14.7	24.2	-7.3	6.9	.4208	.302	.156	.267	.657	.251	.242	.277	.194	.210	.163	.163	.194	.940	.210
6.0	15.4	26.9	-7.1	5.9	.3134	.338	.199	.278	.694	.258	.275	.311	.228	.228	.199	.228	.258	.920	.317
7.0	15.6	28.8	-7.0	6.2	.2899	.368	.235	.280	.704	.291	.263	.294	.299	.313	.271	.243	.355	.927	.313
8.0	16.0	31.0	-7.1	4.6	.1897	.394	.281	.325	.734	.286	.310	.383	.312	.299	.286	.273	.325	.955	.351
9.0	16.1	32.7	-7.3	5.0	.1874	.416	.325	.357	.747	.352	.365	.397	.340	.327	.315	.315	.340	.927	.302
10.0	16.0	33.7	-7.5	4.9	.1152	.429	.335	.367	.748	.364	.359	.384	.354	.342	.330	.330	.379	.950	.342
COMMENCE VALVE CLOSURE																			
11.0	15.9	34.9	-7.7	5.3	.1654	.447	.349	.389	.744	.375	.408	.436	.347	.358	.347	.347	.394	.946	.382
12.0	15.4	36.4	-9.2	1.3	.0696	.461	.396	.455	.723	.390	.425	.464	.357	.368	.357	.357	.401	.916	.390
VALVE FULLY CLOSED																			
13.0	15.2	36.9	-9.9	-.3	-.0165	.464	.451	.474	.542	.408	.442	.459	.380	.402	.391	.391	.423	.773	.467
14.0	15.2	36.9	-9.9	0.0	0.0000	.464	.470	.459	.457	.433	.472	.495	.423	.433	.423	.423	.444	.647	.455
15.0	15.0	36.6	-9.9	.5	.0285	.464	.480	.450	.422	.437	.480	.497	.441	.452	.441	.441	.430	.635	.430
16.0	14.7	36.0	-9.8	1.1	.0580	.464	.487	.457	.420	.441	.476	.498	.420	.452	.441	.441	.441	.627	.431
17.0	14.6	35.6	-9.7	.6	.0295	.464	.491	.460	.416	.445	.485	.505	.421	.454	.443	.443	.443	.608	.421
18.0	14.3	35.0	-9.6	1.2	.0601	.464	.500	.464	.408	.444	.484	.505	.437	.448	.437	.437	.437	.626	.494
19.0	14.1	34.6	-9.5	.6	.0306	.464	.507	.471	.412	.455	.498	.514	.430	.441	.430	.430	.430	.622	.396
20.0	14.0	34.3	-9.4	.6	.0310	.464	.503	.480	.418	.459	.505	.528	.432	.443	.432	.421	.409	.603	.398
21.0	13.9	34.0	-9.4	.6	.0314	.464	.493	.467	.412	.463	.509	.527	.430	.442	.430	.430	.430	.603	.396
22.0	13.7	33.6	-9.3	.6	.0318	.464	.492	.464	.401	.453	.497	.518	.450	.450	.439	.439	.439	.578	.415
23.0	13.6	33.3	-9.3	.6	.0322	.464	.494	.458	.400	.451	.494	.512	.449	.461	.426	.449	.449	.578	.414
24.0	13.4	33.0	-9.2	.6	.0326	.464	.500	.455	.393	.446	.488	.507	.443	.455	.443	.443	.443	.597	.419
25.0	13.4	33.0	-9.2	0.0	0.0000	.464	.496	.460	.394	.443	.488	.512	.441	.453	.441	.441	.441	.595	.429
26.0	13.3	32.6	-9.1	.6	.0330	.464	.499	.461	.398	.446	.489	.511	.439	.451	.439	.439	.439	.595	.427
27.0	13.1	32.3	-9.0	.6	.0335	.464	.497	.461	.396	.452	.495	.517	.437	.449	.437	.437	.437	.594	.425
28.0	13.0	32.0	-9.0	.6	.0339	.464	.504	.465	.397	.450	.497	.514	.436	.448	.436	.436	.436	.594	.423
29.0	12.8	31.6	-8.9	.7	.0344	.464	.506	.469	.395	.452	.496	.514	.433	.447	.435	.435	.435	.593	.422
30.0	12.8	31.6	-8.9	0.0	0.0000	.464	.506	.469	.397	.449	.496	.516	.434	.447	.434	.434	.434	.593	.422
31.0	12.7	31.3	-8.8	.7	.0349	.464	.509	.469	.409	.457	.494	.514	.432	.444	.432	.432	.432	.594	.419
32.0	12.7	31.3	-8.8	0.0	0.0000	.464	.505	.468	.416	.458	.490	.515	.426	.456	.426	.426	.426	.590	.416
33.0	12.5	31.0	-8.8	.7	.0354	.464	.501	.471	.418	.460	.493	.513	.438	.463	.425	.425	.425	.589	.413
34.0	12.4	30.6	-8.7	.7	.0359	.464	.498	.465	.421	.462	.503	.513	.444	.457	.419	.419	.419	.610	.406

Table 12B — Inferred Pressurant Distribution, Scaling Run 240; Three 3.279-cm Nozzles

<i>t</i> (s)	\bar{T} (°C)	\bar{T}_g (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	Pressurant Fractions (<i>X</i>) at Locations <i>I</i>												
							1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	2.6	2.6	43.4	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	5.0	5.4	-4.7	75.6	3.2002	.041	-.436	-.077	.829	-.008	-.336	-.356	-.018	-.167	-.167	-.067	.032	1.127	.182
VALVE FULLY OPEN																			
2.0	9.6	12.3	-8.4	13.3	1.2869	.130	-.141	-.413	.689	.892	-.141	-.150	.034	.010	.010	.058	.058	.882	.301
3.0	12.7	17.6	-7.0	8.2	.6831	.199	-.069	.098	.668	.139	.009	.049	.082	.102	.062	.102	.956	.326	
4.0	14.3	21.0	-5.4	8.7	.6146	.254	-.002	.221	.735	.153	.066	.093	.131	.131	.112	.131	.206	.981	.338
5.0	15.9	24.6	-4.9	5.5	.3262	.296	.005	.218	.771	.201	.150	.167	.170	.187	.153	.187	.255	.935	.374
6.0	16.2	26.6	-4.6	7.5	.4107	.334	.124	.262	.799	.255	.185	.201	.210	.210	.210	.210	.258	.979	.434
7.0	16.5	28.6	-4.6	6.3	.2968	.364	.183	.318	.827	.261	.228	.267	.273	.228	.228	.258	.318	1.011	.333
8.0	16.9	30.6	-4.6	5.3	.2210	.390	.223	.365	.841	.303	.269	.280	.286	.286	.271	.271	.356	.980	.342
9.0	16.6	31.5	-4.7	7.5	.2882	.413	.239	.397	.847	.295	.275	.328	.303	.317	.317	.317	.372	1.007	.359
10.0	17.1	33.3	-4.8	1.4	.0297	.425	.268	.355	.833	.336	.315	.339	.334	.347	.347	.347	.373	1.004	.334
COMMENCE VALVE CLOSURE																			
11.0	16.9	34.2	-5.0	6.1	.1901	.443	.310	.379	.854	.356	.341	.338	.349	.361	.336	.336	.412	.974	.412
12.0	16.3	35.3	-6.1	3.5	.1500	.459	.331	.418	.820	.346	.336	.370	.380	.367	.367	.367	.416	.972	.476
VALVE FULLY CLOSED																			
13.0	17.1	38.3	-7.4	-4.8	-.2083	.464	.389	.434	.690	.393	.393	.399	.389	.410	.410	.410	.443	.793	.476
14.0	17.4	39.0	-7.5	-1.2	-.0506	.464	.416	.440	.513	.452	.427	.453	.446	.457	.435	.457	.457	.651	.468
15.0	17.3	39.7	-7.4	.6	.0232	.464	.434	.443	.491	.426	.441	.454	.434	.456	.456	.456	.456	.629	.476
16.0	17.0	38.0	-7.4	1.2	.0512	.464	.443	.449	.489	.438	.443	.458	.443	.454	.454	.454	.432	.630	.443
17.0	16.7	37.4	-7.3	1.2	.0522	.464	.440	.453	.491	.444	.451	.462	.438	.449	.449	.449	.449	.617	.438
18.0	16.5	37.1	-7.3	.6	.0265	.464	.446	.457	.484	.452	.452	.461	.434	.446	.446	.446	.446	.626	.434
19.0	16.4	36.8	-7.2	.6	.0268	.464	.445	.457	.482	.454	.464	.461	.429	.441	.441	.441	.441	.645	.429
20.0	16.2	36.5	-7.2	.6	.0271	.464	.452	.459	.482	.464	.466	.464	.429	.441	.441	.441	.441	.624	.429
21.0	16.1	36.2	-7.2	.6	.0274	.464	.452	.459	.479	.459	.461	.465	.447	.459	.435	.435	.435	.620	.424
22.0	15.9	35.9	-7.1	.6	.0277	.464	.452	.457	.482	.464	.461	.471	.440	.452	.440	.440	.415	.417	
23.0	15.8	35.6	-7.1	.6	.0280	.464	.454	.461	.485	.464	.461	.473	.440	.452	.452	.428	.616	.417	
24.0	15.6	35.3	-7.0	.7	.0283	.464	.455	.459	.485	.459	.462	.474	.440	.452	.452	.429	.618	.417	
25.0	15.5	34.9	-7.0	.7	.0287	.464	.457	.464	.483	.457	.459	.471	.437	.449	.449	.426	.616	.437	
26.0	15.3	34.6	-7.0	.7	.0290	.464	.462	.467	.488	.455	.457	.469	.431	.443	.443	.431	.611	.431	
27.0	15.3	34.6	-7.0	0.0	0.0000	.464	.470	.473	.494	.453	.465	.475	.424	.437	.437	.437	.605	.424	
28.0	15.2	34.3	-6.9	.7	.0293	.464	.465	.479	.499	.453	.455	.472	.424	.436	.436	.436	.618	.424	
29.0	15.0	34.0	-6.9	.7	.0297	.464	.462	.467	.486	.452	.454	.468	.447	.455	.435	.435	.631	.423	
30.0	15.0	34.0	-6.9	0.0	0.0000	.464	.460	.463	.485	.455	.455	.467	.448	.436	.436	.436	.631	.423	
31.0	14.9	33.7	-6.8	.7	.0300	.464	.465	.463	.483	.458	.456	.470	.423	.436	.436	.436	.633	.436	
32.0	14.7	33.4	-6.8	.7	.0304	.464	.468	.460	.485	.463	.455	.470	.420	.433	.433	.433	.632	.445	
33.0	14.7	33.4	-6.8	0.0	0.0000	.464	.463	.458	.481	.458	.458	.466	.428	.453	.428	.428	.640	.441	
34.0	14.6	33.1	-6.8	.7	.0308	.464	.458	.461	.479	.453	.453	.461	.436	.448	.423	.423	.674	.436	

XXX

Table 13B — Inferred Pressurant Distribution, Scaling Run 241; South 3.279-cm Nozzle

<i>t</i> (s)	<i>T</i> (°C)	<i>T_a</i> (°C)	<i>T_p</i> (°C)	<i>β</i>	<i>β/θ</i>	<i>X</i>	Pressurant Fractions (<i>X</i>) at Locations /												
							1	1 + 1	2	3	4	5	6	7	8	9	10	11	12
COMMENCE VALVE OPENING																			
0.0	16.7	16.7	22.4	.4	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	18.4	18.3	23.1	97.3	1.8892	.019	.472	.325	.073	.178	.283	.514	.348	.138	.138	.138	.138	.348	.348
VALVE FULLY OPEN																			
2.0	22.2	22.3	20.5	9.1	.3523	.057	-1.380	-1.156	.989	-1.933	-1.268	-1.604	1.472	1.472	.633	.913	.633	1.472	1.472
3.0	25.0	26.0	14.9	2.6	.0957	.091	-.136	-.100	.082	-.082	-.127	-.145	.392	.303	.124	.213	.213	.303	.303
4.0	27.5	29.6	12.2	.6	.0212	.121	.002	.019	.019	.013	.007	-.004	.225	.254	.197	.197	.168	.254	.225
5.0	29.3	32.5	10.6	2.2	.0692	.148	.135	.117	.085	.076	.094	.090	.176	.176	.222	.176	.176	.222	.176
6.0	31.2	35.6	9.7	-.4	-.0113	.172	.196	.173	.150	.154	.123	.111	.212	.193	.212	.173	.135	.212	.193
7.0	32.4	38.0	9.4	3.1	.0883	.195	.215	.194	.194	.176	.169	.176	.222	.187	.187	.187	.187	.222	.222
8.0	33.3	39.9	9.3	4.4	.1196	.217	.233	.237	.256	.210	.214	.220	.204	.220	.188	.188	.188	.220	.237
9.0	34.4	42.1	9.3	2.0	.0482	.236	.236	.242	.230	.236	.236	.233	.196	.227	.227	.227	.227	.257	.268
10.0	34.4	42.7	9.4	7.4	.1289	.249	.266	.269	.230	.260	.272	.272	.182	.212	.242	.242	.242	.272	.272
11.0	35.0	44.2	9.5	4.2	.0966	.266	.287	.273	.270	.261	.267	.270	.204	.218	.261	.261	.276	.304	.304
12.0	35.7	46.0	9.6	2.4	.0518	.281	.284	.281	.262	.270	.294	.294	.229	.284	.284	.284	.338	.338	
13.0	35.2	46.0	9.7	10.0	.2359	.298	.332	.318	.293	.315	.340	.354	.202	.230	.285	.285	.285	.312	.326
14.0	35.7	47.3	9.9	3.3	.0639	.311	.333	.349	.365	.344	.333	.330	.258	.232	.312	.285	.285	.312	.312
15.0	36.6	49.2	10.0	-.2	-.0029	.323	.400	.354	.349	.341	.318	.360	.282	.321	.308	.308	.262	.333	.308
16.0	36.7	50.0	10.1	5.2	.0947	.336	.396	.396	.393	.373	.340	.318	.285	.285	.310	.310	.285	.335	.335
17.0	36.8	50.9	10.2	4.8	.0859	.347	.375	.372	.370	.365	.360	.358	.276	.289	.326	.350	.326	.363	.367
18.0	36.8	51.6	10.3	5.5	.0948	.359	.400	.393	.366	.381	.383	.376	.265	.289	.337	.337	.410	.410	.410
19.0	36.3	51.3	10.4	10.6	.1296	.366	.411	.404	.418	.413	.401	.387	.259	.259	.357	.333	.333	.382	.406
20.0	36.6	52.3	10.4	2.8	.0420	.376	.438	.426	.426	.424	.417	.434	.278	.290	.350	.314	.326	.374	.386
21.0	36.3	52.4	10.5	7.9	.1315	.386	.426	.438	.436	.448	.443	.407	.281	.328	.328	.328	.328	.400	.400
22.0	35.8	52.2	10.6	9.5	.1488	.396	.420	.420	.432	.441	.446	.437	.302	.302	.374	.374	.422	.398	
23.0	36.5	53.9	10.7	-.3	-.0364	.402	.427	.429	.436	.427	.422	.411	.307	.376	.399	.376	.376	.422	.422
24.0	36.4	54.3	10.8	6.0	.0812	.410	.435	.432	.430	.416	.423	.412	.313	.347	.405	.416	.428	.439	.439
25.0	36.5	55.0	10.8	3.5	.0445	.418	.411	.411	.422	.402	.406	.406	.325	.347	.438	.438	.461	.483	.483
26.0	36.2	54.8	10.8	9.8	.0909	.423	.428	.430	.428	.428	.451	.321	.344	.412	.435	.435	.481	.481	
27.0	35.5	54.2	10.9	10.9	.1570	.431	.444	.456	.456	.451	.460	.463	.313	.347	.428	.428	.474	.463	
COMMENCE VALVE CLOSURE																			
28.0	35.1	54.0	10.9	9.3	.1152	.438	.460	.463	.467	.463	.467	.472	.356	.356	.425	.425	.425	.449	.472
29.0	35.0	54.3	10.9	3.4	.0664	.445	.496	.471	.494	.464	.473	.467	.361	.361	.441	.441	.436	.441	.441
VALVE FULLY CLOSED																			
30.0	34.8	54.5	10.8	3.5	.0690	.451	.512	.503	.487	.494	.505	.519	.386	.386	.409	.409	.409	.432	.409
31.0	36.9	58.2	10.9	-13.6	-.2668	.451	.504	.494	.493	.479	.473	.490	.382	.382	.413	.424	.424	.456	.456
32.0	38.0	60.1	11.0	-6.8	-.1320	.451	.489	.493	.499	.477	.462	.450	.391	.391	.432	.432	.432	.452	.452
33.0	38.5	61.0	11.0	-2.8	-.0548	.451	.489	.489	.481	.465	.461	.455	.391	.391	.431	.431	.451	.471	
34.0	38.8	61.5	11.1	-1.8	-.0359	.452	.490	.494	.480	.470	.460	.452	.381	.401	.430	.440	.440	.460	
35.0	38.9	61.6	11.1	-.9	-.0177	.451	.491	.483	.481	.457	.457	.463	.390	.390	.430	.430	.449	.469	
36.0	39.1	62.1	11.1	-.9	-.0176	.451	.481	.478	.468	.462	.464	.466	.385	.385	.434	.444	.444	.483	
37.0	39.1	62.1	11.1	0.0	0.0000	.451	.480	.480	.466	.464	.464	.458	.403	.403	.442	.442	.423	.481	
38.0	38.9	61.8	11.1	-.9	-.0176	.451	.471	.471	.465	.461	.463	.467	.400	.419	.459	.459	.429	.459	
39.0	38.9	61.8	11.1	0.0	0.0000	.451	.458	.460	.472	.472	.476	.468	.386	.425	.445	.445	.445	.464	
40.0	38.9	61.8	11.1	0.0	0.0000	.451	.456	.462	.471	.469	.481	.479	.381	.420	.440	.440	.440	.460	
41.0	38.8	61.5	11.1	-.9	-.0177	.451	.460	.464	.472	.474	.476	.476	.395	.425	.435	.435	.435	.455	
42.0	38.6	61.2	11.0	-.9	-.0179	.451	.457	.464	.476	.468	.470	.470	.405	.425	.445	.425	.445	.445	
43.0	38.5	61.0	11.0	-.9	-.0180	.451	.459	.463	.471	.467	.463	.473	.403	.443	.433	.443	.463	.443	
44.0	38.3	60.7	11.0	-.9	-.0181	.451	.463	.463	.469	.467	.463	.475	.403	.423	.443	.443	.463	.443	
45.0	38.3	60.7	11.0	0.0	0.0000	.451	.465	.461	.465	.465	.461	.469	.400	.441	.441	.441	.461	.441	
46.0	38.1	60.4	11.0	-.9	-.0183	.451	.464	.460	.462	.458	.460	.466	.418	.438	.456	.438	.438	.438	
47.0	38.1	60.4	11.0	0.0	0.0000	.451	.466	.466	.458	.456	.456	.472	.425	.435	.445	.456	.435	.435	
48.0	38.0	60.1	11.0	-.9	-.0184	.451	.465	.467	.457	.451	.455	.472	.433	.433	.453	.453	.453	.433	
49.0	38.0	60.1	11.0	0.0	0.0000	.451	.473	.465	.463	.449	.459	.467	.430	.430	.451	.430	.461	.430	
50.0	37.8	59.9	11.0	-.9	-.0185	.451	.472	.464	.460	.452	.452	.466	.448	.427	.448	.448	.427	.468	

Table 14B — Inferred Pressurant Distribution, Scaling Run 242; South 3.279-cm Nozzle

<i>t</i> (s)	<i>T</i> (°C)	<i>T_a</i> (°C)	<i>T_b</i> (°C)	<i>β</i>	<i>β/θ</i>	Pressurant Fractions (<i>X</i>) at Locations /													
						<i>X</i>	I = 1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	19.7	19.7	65.1	1.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	22.3	21.9	35.8	92.5	2.6874	.029	.201	.165	.020	.049	.143	.230	-.052	-.052	-.088	-.088	-.016	-.088	-.032
VALVE FULLY OPEN																			
2.0	25.9	25.5	31.2	2.2	.0843	.065	.418	.418	.418	.401	.472	.450	-.329	-.240	-.151	-.329	-.151	-.329	-.240
3.0	28.8	28.9	28.0	1.1	.0379	.098	-2.431	-2.201	-2.087	-2.087	-2.316	-2.316	3.087	1.937	1.363	2.512	1.363	2.512	1.937
4.0	30.9	31.6	25.8	2.9	.0963	.127	-.140	-.103	-.122	-.122	-.227	-.227	.393	.331	.157	.244	.244	.393	.331
5.0	32.9	34.2	25.9	.6	.0193	.134	.035	-.014	-.026	.011	-.026	-.026	.240	.240	.301	.301	.301	.422	.240
6.0	34.1	36.0	25.2	.2	.0032	.170	.129	.083	.129	.110	.101	.027	.166	.166	.213	.213	.213	.398	.259
7.0	35.4	37.8	25.2	3.4	.0945	.192	.230	.222	.175	.230	.238	.238	.127	.127	.206	.206	.206	.246	.206
8.0	36.8	40.0	24.8	1.1	.0278	.213	.311	.251	.251	.205	.172	.146	.185	.185	.218	.218	.152	.284	.185
9.0	37.5	41.6	23.9	4.6	.1173	.232	.277	.232	.186	.158	.181	.249	.192	.192	.277	.249	.249	.333	.249
10.0	37.5	42.3	23.5	7.7	.2013	.252	.249	.239	.249	.239	.265	.249	.217	.217	.244	.244	.244	.351	.271
11.0	38.3	43.9	23.0	2.8	.0636	.269	.270	.280	.261	.275	.280	.275	.179	.231	.299	.251	.231	.347	.275
12.0	38.4	44.6	22.8	7.0	.1589	.285	.317	.298	.294	.335	.349	.335	.110	.248	.271	.271	.223	.362	.294
13.0	38.9	45.9	22.5	3.8	.0760	.299	.358	.350	.358	.337	.337	.341	.158	.201	.286	.263	.263	.350	.286
14.0	39.3	47.2	21.9	3.9	.0721	.312	.316	.375	.344	.371	.375	.304	.158	.157	.296	.296	.375	.316	
15.0	39.1	47.4	21.8	7.9	.1093	.322	.351	.362	.339	.347	.355	.390	.202	.241	.300	.300	.300	.378	.319
16.0	39.3	48.3	21.4	4.9	.0887	.334	.351	.343	.328	.343	.343	.331	.228	.247	.339	.358	.339	.432	.339
17.0	39.8	49.8	20.8	2.8	.0452	.345	.378	.365	.354	.354	.361	.392	.261	.296	.347	.347	.279	.416	.330
18.0	39.8	50.4	20.6	3.4	.0939	.356	.371	.364	.371	.360	.381	.377	.277	.310	.360	.360	.327	.427	.344
19.0	39.9	51.2	20.2	5.4	.0891	.367	.398	.382	.366	.388	.401	.404	.291	.291	.372	.372	.340	.404	.356
20.0	39.4	51.2	20.0	9.1	.1523	.377	.409	.393	.397	.416	.429	.429	.272	.288	.368	.384	.336	.400	.384
21.0	39.2	51.7	19.3	6.9	.1059	.387	.438	.429	.410	.432	.447	.460	.265	.296	.373	.373	.342	.404	.358
22.0	39.6	52.5	19.4	.7	.0038	.392	.472	.454	.427	.424	.409	.388	.312	.312	.357	.388	.337	.388	.403
23.0	38.9	52.2	19.0	10.7	.1727	.401	.480	.453	.429	.405	.372	.360	.392	.333	.393	.408	.408	.453	.423
24.0	38.8	52.7	18.7	6.5	.0886	.409	.469	.425	.419	.401	.398	.395	.310	.339	.413	.413	.413	.301	.427
25.0	39.3	54.2	18.5	-.6	-.0068	.416	.439	.425	.419	.419	.419	.419	.321	.377	.419	.405	.419	.489	.433
26.0	39.2	54.7	18.1	6.2	.0787	.423	.451	.440	.427	.440	.418	.413	.315	.342	.437	.410	.410	.319	.478
27.0	39.6	56.1	17.5	.8	.0089	.429	.439	.421	.410	.431	.428	.444	.335	.348	.463	.439	.426	.317	.478
COMMENCE VALVE CLOSURE																			
28.0	38.8	55.4	17.4	12.0	.1620	.437	.474	.445	.430	.459	.474	.487	.322	.322	.440	.440	.416	.493	.480
29.0	37.9	54.6	17.0	5.7	.1682	.443	.487	.479	.476	.476	.484	.487	.330	.303	.423	.423	.503	.463	
VALVE FULLY CLOSED																			
30.0	38.1	57.2	14.6	.6	.0183	.448	.495	.481	.465	.479	.481	.484	.352	.340	.434	.434	.434	.491	.458
31.0	40.4	61.1	14.8	-9.7	-.2872	.448	.488	.484	.475	.468	.466	.473	.350	.371	.447	.447	.447	.468	.436
32.0	41.5	63.0	14.9	-4.5	-.1322	.448	.486	.465	.444	.454	.469	.484	.384	.373	.457	.446	.446	.477	.436
33.0	42.1	64.1	15.0	-2.5	-.0725	.448	.502	.471	.449	.457	.467	.469	.371	.392	.463	.443	.443	.463	.432
34.0	42.4	64.7	15.0	-1.2	-.0355	.448	.498	.482	.460	.458	.464	.478	.365	.385	.456	.436	.426	.476	.436
35.0	42.6	65.0	15.0	-.6	-.0176	.448	.483	.475	.465	.463	.473	.481	.375	.465	.445	.425	.425	.465	.435
36.0	42.6	65.0	15.0	0.0	0.0000	.448	.479	.473	.467	.471	.473	.473	.367	.367	.457	.437	.437	.477	.447
37.0	42.6	65.0	15.0	0.0	0.0000	.448	.469	.463	.459	.461	.461	.465	.375	.385	.445	.445	.445	.495	.455
38.0	42.6	65.0	15.0	0.0	0.0000	.448	.465	.459	.453	.455	.463	.465	.371	.391	.461	.441	.441	.481	.471
39.0	42.4	64.7	15.0	.6	.0176	.448	.453	.451	.457	.455	.465	.475	.393	.393	.453	.453	.433	.483	.453
40.0	42.3	64.4	15.0	.6	.0177	.448	.457	.453	.457	.461	.477	.485	.398	.398	.449	.449	.429	.469	.439
41.0	42.1	64.1	15.0	.6	.0178	.448	.456	.454	.456	.462	.476	.478	.401	.391	.462	.452	.441	.462	.431
42.0	42.1	64.1	15.0	0.0	0.0000	.448	.453	.451	.451	.461	.469	.473	.406	.385	.457	.457	.436	.477	.446
43.0	42.0	63.1	15.9	.6	.0179	.448	.462	.457	.451	.464	.474	.477	.379	.379	.453	.453	.453	.474	.443
44.0	42.0	62.6	16.5	0.0	0.0000	.448	.456	.449	.447	.462	.469	.473	.388	.388	.443	.453	.453	.486	.453
45.0	41.8	61.6	17.3	.6	.0181	.448	.466	.448	.443	.461	.466	.475	.382	.392	.439	.461	.439	.507	.450
46.0	41.6	60.7	18.2	.6	.0182	.448	.474	.446	.453	.462	.471	.479	.398	.398	.434	.434	.434	.493	.446
47.0	41.6	60.0	19.0	0.0	0.0000	.448	.476	.447	.449	.471	.474	.483	.393	.393	.430	.430	.430	.503	.442
48.0	41.5	59.1	19.7	.6	.0183	.448	.475	.457	.449	.472	.480	.493	.399	.386	.424	.424	.424	.500	.437
49.0	41.5	58.7	20.3	0.0	0.0000	.448	.470	.454	.451	.464	.477	.490	.430	.378	.417	.417	.417	.496	.437
50.0	41.5	58.2	20.9	0.0	0.0000	.448	.477	.464	.466	.469	.472	.498	.402	.375	.415	.415	.415	.496	.456

Table 15B -- Inferred Pressurant Distribution, Scaling Run 243; South 3.279-cm Nozzle

<i>t</i> (s)	<i>T</i> (°C)	<i>T_a</i> (°C)	<i>T_p</i> (°C)	<i>B</i>	<i>B/θ</i>	<i>X</i>	Pressurant Fractions (<i>X</i>) at Locations /													
							1	2	3	4	5	6	7	8	9	10	11	12	13	
COMMENCE VALVE OPENING																				
0.0	16.7	16.7	16.6	.4	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
1.0	18.5	18.4	21.2	95.5	2.0351	.021	.771	.518	.046	.336	.626	.944	.280	.280	.643	.643	.280	.461	.280	
VALVE FULLY OPEN																				
2.0	22.5	22.7	19.4	1.7	.0631	.057	.654	.592	.529	.529	.747	.716	.622	.622	.778	.778	.467	.776	.467	
3.0	25.5	26.7	14.1	.1	.0043	.091	.079	.055	.024	.055	.103	.127	.238	.238	.159	.276	.238			
4.0	27.7	30.0	10.8	1.6	.0551	.122	.005	.046	.051	.020	.005	.015	.254	.202	.228	.176	.176	.226	.176	
5.0	29.4	33.0	9.0	2.8	.0896	.150	.089	.097	.135	.110	.085	.064	.181	.181	.101	.222	.181	.243	.181	
6.0	31.1	35.9	8.1	.5	.0143	.174	.136	.136	.143	.133	.115	.107	.226	.172	.226	.208	.190	.262	.208	
7.0	32.9	39.0	7.6	-1.2	-.0311	.196	.155	.171	.164	.177	.171	.148	.202	.202	.234	.234	.202	.250	.234	
8.0	33.4	40.6	7.5	5.6	.1584	.218	.235	.211	.193	.202	.203	.208	.196	.226	.226	.211	.271	.226	.226	
9.0	34.1	42.4	7.6	4.0	.1002	.238	.240	.252	.249	.243	.249	.223	.223	.252	.223	.223	.266	.223		
10.0	34.3	43.2	7.7	6.3	.1078	.251	.272	.278	.286	.272	.272	.258	.213	.213	.241	.241	.213	.255	.241	
11.0	35.2	45.2	7.8	1.6	.0359	.267	.282	.293	.306	.301	.280	.274	.242	.229	.242	.242	.242	.282	.256	
12.0	36.3	47.5	7.9	.7	-.0137	.282	.284	.279	.289	.277	.274	.249	.274	.274	.274	.274	.337	.299		
13.0	35.8	47.6	8.2	9.3	.2273	.299	.285	.302	.300	.300	.315	.333	.239	.290	.302	.302	.290	.328	.302	
14.0	36.1	48.8	8.3	4.0	.0796	.313	.324	.324	.324	.339	.344	.327	.250	.275	.300	.324	.300	.312	.324	
15.0	35.9	49.3	8.3	7.1	.1443	.327	.346	.346	.368	.334	.316	.324	.248	.272	.309	.334	.334	.370	.346	
16.0	36.9	51.2	8.6	-1.7	-.0261	.337	.408	.356	.354	.314	.323	.316	.248	.272	.342	.366	.342	.377	.366	
17.0	36.5	51.2	8.7	9.1	.1230	.346	.396	.375	.361	.337	.335	.337	.248	.271	.366	.366	.366	.377	.366	
18.0	36.2	51.5	8.9	7.3	.1302	.358	.390	.397	.380	.324	.362	.343	.254	.289	.371	.371	.371	.418	.383	
19.0	36.0	51.9	9.0	6.6	.1141	.369	.383	.383	.364	.385	.403	.285	.285	.378	.378	.378	.413	.378		
20.0	35.9	52.3	9.1	6.3	.1021	.379	.387	.392	.390	.390	.411	.411	.269	.316	.385	.374	.362	.443	.397	
21.0	36.1	53.2	9.2	3.3	.0471	.388	.394	.403	.417	.399	.392	.394	.285	.330	.399	.399	.399	.433	.399	
22.0	37.0	55.1	9.2	-3.6	-.0433	.395	.406	.402	.397	.404	.406	.406	.408	.293	.347	.402	.413	.413	.434	.413
23.0	36.4	54.6	9.3	9.0	.1412	.405	.435	.435	.406	.417	.419	.426	.290	.356	.400	.400	.422	.433	.422	
24.0	36.0	54.6	9.4	10.0	.1021	.411	.438	.439	.430	.414	.412	.421	.308	.330	.419	.419	.419	.452	.419	
25.0	35.9	54.9	9.3	5.7	.0736	.418	.470	.459	.435	.411	.415	.420	.325	.347	.424	.424	.424	.446	.435	
26.0	35.9	55.4	9.3	5.3	.0676	.426	.447	.454	.441	.426	.417	.415	.343	.365	.430	.430	.430	.463	.432	
27.0	35.8	55.0	9.6	5.0	.0624	.433	.458	.443	.425	.436	.434	.428	.361	.350	.447	.447	.447	.501	.456	
COMMENCE VALVE CLOSURE																				
28.0	35.5	55.0	9.6	7.7	.0975	.440	.454	.452	.458	.448	.465	.458	.350	.328	.458	.437	.437	.513	.458	
29.0	35.6	56.5	9.6	1.7	.0357	.446	.464	.457	.449	.451	.451	.444	.380	.370	.455	.444	.444	.506	.476	
VALVE FULLY CLOSED																				
30.0	35.2	56.3	9.3	4.1	.0874	.451	.493	.486	.478	.476	.476	.465	.356	.356	.463	.441	.441	.473	.463	
31.0	36.3	58.3	9.3	-6.0	-.1458	.451	.491	.485	.467	.473	.479	.477	.362	.342	.465	.444	.465	.475	.444	
32.0	37.3	60.1	9.3	-5.5	-.1185	.451	.476	.470	.478	.472	.474	.470	.361	.361	.460	.460	.460	.470	.450	
33.0	37.7	60.9	9.5	-2.7	-.0572	.451	.468	.468	.468	.466	.470	.478	.365	.384	.462	.462	.462	.472	.443	
34.0	38.1	61.5	9.5	-1.7	-.0374	.451	.470	.470	.468	.464	.468	.470	.376	.395	.463	.453	.453	.482	.434	
35.0	38.1	61.5	9.5	0.0	0.0000	.451	.474	.468	.468	.462	.466	.466	.370	.389	.466	.447	.447	.495	.442	
36.0	38.1	61.5	9.5	0.0	0.0000	.451	.464	.460	.458	.462	.462	.462	.371	.381	.468	.458	.458	.497	.468	
37.0	38.1	61.5	9.5	0.0	0.0000	.451	.459	.461	.455	.459	.461	.461	.374	.374	.471	.471	.471	.480	.471	
38.0	37.9	61.2	9.5	.9	.0186	.451	.454	.460	.460	.460	.460	.462	.392	.373	.469	.469	.469	.479	.460	
39.0	37.9	61.2	9.5	0.0	0.0000	.451	.454	.458	.460	.456	.458	.462	.389	.369	.466	.466	.466	.495	.466	
40.0	37.7	60.9	9.5	.9	.0188	.451	.456	.456	.456	.456	.460	.468	.384	.384	.462	.462	.462	.492	.462	
41.0	37.6	60.6	9.5	.9	.0189	.451	.465	.459	.453	.457	.461	.469	.389	.389	.457	.457	.467	.487	.457	
42.0	37.6	60.6	9.5	0.0	0.0000	.451	.464	.460	.456	.454	.458	.474	.395	.395	.454	.454	.454	.483	.454	
43.0	37.4	60.4	9.5	.9	.0181	.451	.470	.466	.460	.462	.460	.472	.393	.393	.452	.452	.452	.482	.452	
44.0	37.4	60.4	9.5	0.0	0.0000	.451	.472	.465	.459	.457	.465	.465	.390	.390	.459	.459	.459	.478	.449	
45.0	37.3	60.1	9.5	.9	.0192	.451	.469	.469	.456	.454	.454	.465	.406	.396	.465	.446	.465	.475	.446	
46.0	37.1	59.8	9.5	.9	.0194	.451	.463	.461	.451	.453	.457	.463	.401	.401	.461	.461	.461	.471	.461	
47.0	37.1	59.8	9.5	0.0	0.0000	.451	.464	.462	.454	.458	.458	.460	.400	.400	.460	.460	.460	.470	.460	
48.0	36.9	59.5	9.5	.9	.0195	.451	.465	.469	.455	.453	.461	.397	.402	.457	.457	.457	.477	.457		
49.0	36.9	59.5	9.5	0.0	0.0000	.451	.460	.466	.452	.460	.452	.458	.412	.412	.452	.452	.452	.482	.452	
50.0	36.8	59.2	9.5	.9	.0197	.451	.462	.466	.458	.452	.452	.467	.402	.458	.448	.448	.448	.486	.448	

Table 16B — Inferred Pressurant Distribution, Scaling Run 244; South 3.279-cm Nozzle

<i>t</i> (s)	\bar{T} (°C)	\bar{T}_a (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	Pressurant Fractions (<i>X</i>) at Locations <i>i</i>													
							1 = 1	2	3	4	5	6	7	8	9	10	11	12	13	
COMMENCE VALVE OPENING																				
0.0	17.6	17.6	18.9	.4	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	19.6	19.5	24.6	92.0	2.0273	.022	.378	.262	.029	.126	.281	.358	.164	.164	.164	.164	.164	.164	.164	
VALVE FULLY OPEN																				
2.0	23.5	23.5	23.0	6.9	.2637	.059	-4.174	-3.985	-3.417	-3.039	-4.363	-5.308	3.578	3.578	3.578	3.578	2.633	4.523	3.578	
3.0	26.5	27.5	17.3	.8	.0279	.093	-	-0.93	-0.93	-0.93	-0.84	-1.43	-1.62	.282	.282	.183	.282	.183	.380	.282
4.0	28.7	30.8	14.1	2.5	.0843	.123	-	-0.08	-0.02	.034	.034	.004	-0.08	.251	.281	.191	.221	.161	.251	.191
5.0	30.6	33.8	12.6	2.1	.0652	.150	.093	.084	.103	.093	.084	.070	.197	.244	.197	.197	.150	.244	.197	
6.0	32.0	36.3	11.8	3.6	.1067	.175	.163	.138	.138	.146	.126	.130	.171	.252	.191	.171	.191	.232	.232	
7.0	33.7	39.2	11.2	.1	-0.0025	.197	.161	.161	.175	.175	.143	.200	.236	.200	.200	.200	.272	.272		
8.0	35.1	41.8	11.0	.7	.0172	.218	.204	.204	.214	.220	.201	.201	.217	.217	.217	.217	.249	.266		
9.0	35.6	43.4	10.9	5.1	.1342	.238	.244	.251	.241	.238	.235	.214	.177	.238	.208	.238	.238	.300	.269	
10.0	36.2	44.7	10.9	2.3	.0357	.249	.244	.250	.247	.238	.220	.232	.208	.267	.238	.238	.327	.297		
11.0	36.4	45.8	10.9	6.1	.1490	.268	.285	.265	.251	.268	.280	.320	.191	.234	.263	.263	.248	.306		
12.0	37.2	47.5	11.0	2.3	.0495	.283	.301	.299	.307	.301	.301	.326	.217	.244	.271	.271	.244	.299		
13.0	37.5	48.8	11.0	4.4	.0931	.298	.319	.297	.290	.298	.301	.325	.229	.295	.282	.295	.295	.335		
14.0	38.1	50.2	11.2	2.7	.0518	.311	.323	.312	.310	.325	.326	.320	.271	.323	.297	.297	.323	.323		
15.0	37.8	50.7	11.3	7.2	.1488	.325	.349	.349	.334	.329	.331	.323	.253	.280	.318	.306	.331	.369		
16.0	37.5	50.8	11.4	8.4	.1681	.339	.340	.350	.350	.347	.360	.365	.259	.284	.335	.335	.335	.360		
17.0	37.5	51.6	11.5	5.3	.0894	.350	.378	.376	.376	.373	.388	.396	.261	.273	.323	.336	.336	.373		
18.0	38.0	52.9	11.6	2.0	.0323	.360	.402	.394	.397	.399	.387	.358	.249	.297	.346	.346	.346	.370		
19.0	38.2	53.6	11.7	2.9	.0296	.367	.426	.412	.391	.393	.376	.364	.262	.286	.357	.333	.357	.405		
20.0	38.1	54.0	11.8	6.1	.0996	.377	.400	.395	.412	.398	.372	.360	.270	.341	.365	.365	.377	.412		
21.0	37.7	54.1	11.8	8.0	.1303	.387	.394	.404	.387	.397	.399	.397	.295	.342	.366	.390	.390	.437		
22.0	38.0	55.1	11.9	2.8	.0398	.396	.402	.402	.402	.411	.420	.397	.311	.358	.381	.392	.392	.450		
23.0	38.3	56.1	11.9	1.6	.0202	.403	.410	.412	.410	.426	.419	.414	.306	.374	.396	.396	.396	.441		
24.0	38.5	57.0	12.0	2.9	.0376	.411	.408	.413	.419	.433	.417	.404	.319	.386	.442	.419	.408	.442		
25.0	39.0	58.3	12.1	-.9	-0.103	.417	.413	.400	.415	.415	.408	.415	.339	.404	.426	.426	.469	.447		
26.0	38.4	57.7	12.1	11.4	.1229	.423	.436	.436	.431	.444	.453	.488	.352	.374	.410	.416	.396	.440		
27.0	37.7	57.2	12.1	10.3	.1435	.431	.456	.458	.458	.476	.491	.356	.389	.411	.411	.411	.422			
28.0	36.9	56.4	12.1	11.8	.1619	.439	.469	.460	.469	.469	.478	.489	.379	.401	.424	.401	.424	.424		
COMMENCE VALVE CLOSURE																				
29.0	37.0	56.9	12.1	4.4	.0484	.445	.468	.466	.489	.491	.497	.486	.386	.397	.431	.408	.431	.431		
30.0	37.1	57.7	12.1	.9	.0192	.451	.473	.471	.469	.495	.482	.475	.396	.413	.440	.446	.418	.440		
VALVE FULLY CLOSED																				
31.0	37.2	58.1	12.0	.4	.0100	.454	.475	.473	.466	.479	.481	.477	.401	.423	.466	.445	.423	.445		
32.0	38.8	60.9	12.1	-.8	-0.1961	.454	.466	.454	.470	.472	.472	.476	.399	.440	.460	.450	.440	.450		
33.0	39.7	62.6	12.2	-5.0	-0.1107	.454	.457	.451	.451	.461	.467	.470	.395	.455	.455	.455	.474	.455		
34.0	40.1	63.2	12.2	-1.6	-0.0359	.454	.470	.464	.458	.458	.464	.473	.407	.446	.446	.446	.466	.456		
35.0	40.2	63.5	12.3	-.8	-0.0177	.454	.489	.462	.450	.456	.462	.469	.391	.430	.450	.450	.469	.469		
36.0	40.4	63.7	12.3	-.8	-0.0176	.454	.483	.456	.448	.450	.458	.462	.402	.431	.460	.460	.479	.460		
37.0	40.4	63.7	12.3	0.0	0.0000	.454	.477	.467	.460	.456	.464	.467	.399	.419	.458	.458	.477	.458		
38.0	40.4	63.7	12.3	0.0	0.0000	.454	.485	.461	.444	.448	.455	.457	.409	.428	.457	.457	.448	.457		
39.0	40.2	63.5	12.3	.8	.0176	.454	.473	.459	.457	.457	.457	.461	.403	.422	.461	.461	.442	.461		
40.0	40.1	63.2	12.2	.8	.0177	.454	.468	.460	.458	.460	.462	.466	.399	.419	.458	.458	.477	.458		
41.0	39.9	62.9	12.2	.8	.0179	.454	.464	.457	.455	.461	.463	.466	.415	.425	.455	.455	.474	.455		
42.0	39.9	62.9	12.2	0.0	0.0000	.454	.462	.454	.456	.462	.464	.470	.413	.413	.452	.472	.472	.452		
43.0	39.7	62.6	12.2	.8	.0180	.454	.459	.451	.455	.467	.469	.472	.407	.417	.467	.467	.467	.447		
44.0	39.6	62.3	12.2	.8	.0181	.454	.454	.446	.458	.464	.468	.480	.418	.418	.458	.458	.458	.458		
45.0	39.6	62.3	12.2	0.0	0.0000	.454	.452	.450	.458	.464	.464	.480	.414	.424	.454	.454	.474	.454		
46.0	39.4	62.1	12.2	.8	.0182	.454	.453	.449	.461	.465	.463	.475	.405	.425	.465	.465	.465	.445		
47.0	39.4	62.1	12.2	0.0	0.0000	.454	.466	.458	.462	.470	.464	.472	.418	.418	.458	.458	.458	.438		
48.0	39.3	61.8	12.2	.8	.0184	.454	.469	.463	.461	.465	.461	.463	.409	.419	.469	.469	.469	.449		
49.0	39.3	61.8	12.2	0.0	0.0000	.454	.473	.467	.467	.471	.459	.463	.402	.423	.463	.463	.463	.443		
50.0	39.1	61.5	12.2	.8	.0185	.454	.471	.471	.471	.477	.465	.467	.400	.420	.461	.441	.471	.441		

Table 17B — Inferred Pressurant Distribution, Scaling Run 245; South 3.279-cm Nozzle

<i>t</i> (s)	\bar{T}_1 (°C)	\bar{T}_2 (°C)	\bar{T}_P (°C)	β	β/θ	\bar{X}	<i>I</i>	Pressurant Fractions (<i>X</i>) at Locations /												
								1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																				
0.0	26.1	26.1	54.8	1.2	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	28.5	28.1	44.2	76.0	1.7000	.022	.170	.153	.091	.109	.153	.184	.127	.065	.065	.065	.065	.127	.065	
2.0	32.5	32.2	38.2	.4	.0142	.060	.346	.496	.496	.546	.629	.536	.516	.433	.267	.267	.267	.433	.330	
3.0	35.3	35.3	35.8	5.3	.2047	.095	5.730	5.321	4.298	3.684	4.911	4.707	-6.547	-4.501	-2.455	-2.455	-4.501	-4.501		
4.0	37.8	38.4	33.5	1.7	.0590	.125	-.265	-.306	-.223	-.182	-.265	-.389	.291	.584	.273	.170	.273	.584	.584	
5.0	39.6	40.7	32.9	.8	.0217	.147	-.134	-.032	-.198	-.070	-.070	-.019	.493	.429	.211	.173	.211	.493	.429	
6.0	41.4	43.4	32.0	3.5	.1263	.178	.048	.048	.091	.109	.065	.074	.293	.337	.162	.162	.425	.337		
7.0	42.9	45.7	31.3	2.2	.0608	.201	.137	.137	.109	.137	.109	.109	.328	.328	.186	.186	.328	.328		
8.0	43.3	46.8	30.7	5.8	.1081	.215	.188	.175	.132	.173	.212	.237	.293	.293	.231	.169	.169	.293	.231	
9.0	43.9	48.1	30.5	5.5	.1495	.236	.263	.291	.201	.212	.212	.224	.258	.258	.201	.229	.229	.286	.258	
10.0	44.5	49.4	30.2	5.5	.1380	.255	.266	.261	.234	.253	.261	.266	.120	.224	.224	.224	.276	.381	.328	
11.0	45.6	51.4	30.0	1.1	.0237	.272	.263	.272	.286	.286	.272	.291	.109	.296	.225	.225	.225	.413	.366	
12.0	46.3	53.4	28.8	2.6	.0554	.287	.301	.301	.301	.326	.314	.306	.175	.297	.257	.257	.257	.338	.297	
13.0	47.1	55.0	28.9	1.8	.0352	.301	.344	.341	.318	.306	.318	.321	.149	.264	.245	.264	.283	.379	.379	
14.0	46.9	55.3	28.5	7.2	.1564	.316	.326	.319	.304	.311	.330	.374	.200	.274	.274	.274	.311	.423	.385	
15.0	47.0	56.1	28.0	5.8	.0759	.325	.386	.372	.329	.336	.354	.368	.179	.286	.286	.286	.286	.393	.358	
16.0	46.9	56.9	27.3	6.6	.1697	.342	.437	.400	.369	.369	.349	.342	.267	.301	.301	.301	.369	.369		
17.0	47.4	58.2	27.4	.2	-.0026	.349	.438	.431	.389	.376	.363	.341	.263	.263	.328	.295	.295	.392	.360	
18.0	47.8	59.7	26.6	2.9	.0490	.360	.427	.413	.400	.391	.369	.381	.215	.261	.381	.336	.306	.381	.412	
19.0	48.5	61.3	26.3	.6	-.0063	.369	.410	.404	.393	.415	.401	.413	.240	.296	.381	.353	.325	.381	.381	
20.0	48.0	61.3	26.3	8.3	.1483	.380	.429	.386	.401	.418	.449	.481	.235	.249	.321	.349	.378	.433	.406	
21.0	48.3	62.6	25.7	2.7	.0377	.388	.462	.457	.454	.459	.470	.476	.259	.232	.286	.313	.367	.421	.394	
22.0	48.0	62.8	25.3	8.2	.0861	.395	.464	.459	.467	.467	.472	.483	.232	.232	.312	.339	.392	.419	.392	
23.0	48.1	63.4	25.4	4.2	.0592	.403	.495	.479	.445	.466	.477	.479	.232	.245	.351	.351	.390	.429	.403	
24.0	48.0	64.2	24.8	5.3	.0716	.411	.485	.463	.465	.460	.460	.432	.283	.283	.359	.359	.384	.435	.460	
25.0	47.9	65.0	24.2	5.1	.0667	.419	.479	.470	.455	.460	.492	.499	.318	.318	.342	.367	.426	.453		
26.0	47.8	65.5	24.0	5.3	.0672	.426	.488	.479	.474	.474	.483	.462	.325	.349	.373	.397	.373	.421	.445	
COMMENCE VALVE CLOSURE																				
22.0	48.1	66.7	23.5	2.0	.0223	.432	.507	.470	.465	.460	.451	.428	.351	.363	.375	.409	.432	.467	.444	
28.0	46.8	65.6	23.0	9.2	.2088	.441	.534	.520	.494	.487	.450	.457	.365	.341	.341	.388	.412	.482	.459	
VALVE FULLY CLOSED																				
29.0	46.9	67.3	21.5	.7	.0147	.445	.525	.505	.481	.481	.488	.492	.355	.333	.355	.376	.420	.485	.485	
30.0	49.4	71.6	21.7	-12.4	-.2802	.445	.495	.487	.489	.459	.463	.467	.377	.357	.387	.397	.437	.487	.477	
31.0	50.9	74.1	21.9	-6.8	-.1543	.445	.496	.482	.469	.461	.469	.463	.333	.352	.428	.428	.448	.486	.467	
32.0	51.6	75.2	22.0	-2.9	-.0636	.445	.483	.481	.475	.462	.458	.471	.372	.372	.428	.428	.438	.475		
33.0	51.9	75.7	22.1	-1.4	-.0322	.445	.471	.473	.469	.462	.465	.469	.387	.387	.424	.424	.443	.462		
34.0	52.1	76.0	22.1	-.7	-.0159	.445	.469	.463	.467	.462	.465	.465	.410	.391	.428	.437	.428	.456	.437	
35.0	52.1	76.0	22.1	0.0	0.0000	.445	.473	.469	.466	.466	.471	.473	.397	.397	.434	.415	.415	.452	.453	
36.0	52.1	76.0	22.1	0.0	0.0000	.445	.471	.469	.458	.462	.465	.465	.406	.406	.425	.425	.425	.452		
37.0	52.1	76.0	22.1	0.0	0.0000	.445	.468	.468	.471	.462	.464	.468	.405	.405	.423	.423	.423	.460		
38.0	51.9	75.7	22.1	.7	.0159	.445	.467	.465	.476	.467	.468	.481	.401	.401	.420	.420	.420	.457	.439	
39.0	51.7	75.5	22.1	.7	.0160	.445	.465	.467	.477	.467	.462	.478	.396	.396	.415	.415	.433	.452		
40.0	51.6	75.2	22.0	.7	.0161	.445	.467	.464	.467	.466	.467	.471	.396	.405	.424	.424	.424	.462		
41.0	51.4	74.9	22.0	.7	.0163	.445	.473	.473	.465	.463	.469	.476	.399	.418	.418	.418	.418	.436		
42.0	51.4	74.9	22.1	0.0	0.0000	.445	.473	.473	.469	.467	.471	.476	.395	.414	.414	.414	.433	.452		
43.0	51.2	73.8	23.0	.7	.0164	.445	.472	.472	.468	.466	.468	.472	.393	.403	.422	.422	.422	.432		
44.0	51.1	72.9	23.8	.7	.0165	.445	.468	.468	.466	.470	.468	.474	.395	.415	.415	.415	.497	.435		
45.0	51.1	72.3	24.3	0.0	0.0000	.445	.468	.468	.468	.473	.473	.479	.389	.410	.410	.410	.493	.431		
46.0	50.9	71.6	25.1	.7	.0166	.445	.464	.464	.467	.469	.471	.482	.402	.424	.402	.402	.488	.445		
47.0	50.7	70.7	25.8	.7	.0167	.445	.459	.461	.461	.463	.467	.483	.396	.418	.396	.407	.418	.432		
48.0	50.7	70.4	26.2	0.0	0.0000	.445	.453	.465	.458	.466	.465	.478	.390	.424	.390	.406	.424	.462		
49.0	50.2	69.9	26.8	0.0	0.0000	.445	.453	.458	.455	.471	.460	.476	.383	.430	.407	.430	.499	.476		
50.0	50.6	69.1	27.4	.7	.0168	.445	.449	.456	.456	.473	.459	.475	.396	.420	.420	.420	.492	.468		

Table 18B — Inferred Pressurant Distribution, Scaling Run 246; South 3.279-cm Nozzle

<i>t</i> (s)	\bar{T} (°C)	\bar{T}_g (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	Pressurant Fractions (X) at Locations <i>I</i>													
							1	=	1	2	3	4	5	6	7	8	9	10	11	12
COMMENCE VALVE OPENING																				
0.0	16.2	16.2	25.3	.5	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	18.0	17.9	22.0	93.4	1.8204	.019	.519	.324	.079	.177	.275	.397	.409	.165	.165	.165	.165	.165	.165	.165
VALVE FULLY OPEN																				
2.0	21.6	21.8	19.2	10.7	.4138	.056	.957	.685	.259	.453	.724	.918	.980	.787	.399	.593	.593	.787	.593	
3.0	25.0	26.0	14.4	-4.8	-1.1662	.089	-0.078	-0.027	-0.018	-0.044	-0.112	-0.112	-0.324	-0.239	-0.153	-0.153	-0.196	-0.239	-0.239	
4.0	27.3	29.4	11.5	1.2	.0402	.118	.002	.030	.030	.030	.019	.025	.204	.260	.176	.148	.148	.232	.232	
5.0	28.9	32.2	9.9	3.2	.1028	.146	.088	.097	.106	.110	.083	.056	.222	.222	.177	.133	.155	.222	.222	
6.0	30.6	35.0	9.1	.8	.0234	.169	.115	.127	.127	.135	.135	.131	.204	.224	.166	.166	.165	.262	.224	
7.0	32.0	37.5	8.8	2.6	.0740	.192	.183	.190	.172	.169	.155	.162	.218	.218	.183	.183	.165	.252	.252	
8.0	32.6	39.0	8.7	6.1	.1658	.214	.225	.228	.221	.215	.198	.208	.225	.208	.175	.175	.208	.258	.241	
9.0	33.4	40.8	8.8	4.0	.1002	.234	.259	.244	.247	.231	.222	.219	.206	.206	.206	.206	.222	.306	.269	
10.0	34.2	42.0	8.8	2.4	.0544	.251	.307	.289	.275	.245	.245	.230	.177	.222	.222	.222	.216	.310	.281	
11.0	35.0	44.5	8.9	2.5	.0535	.267	.297	.297	.281	.275	.264	.244	.205	.205	.261	.261	.275	.317	.269	
12.0	36.1	46.4	9.0	-5.0	-0.0502	.275	.303	.314	.319	.303	.292	.255	.191	.164	.271	.271	.264	.325	.298	
13.0	36.8	48.0	9.1	2.0	.0402	.290	.295	.300	.303	.303	.287	.272	.226	.213	.290	.303	.316	.341	.316	
14.0	36.9	49.1	9.2	4.8	.0372	.304	.334	.344	.339	.326	.326	.319	.196	.221	.296	.296	.309	.321	.321	
15.0	36.7	49.5	9.3	7.2	.1489	.318	.344	.354	.364	.352	.354	.359	.217	.205	.292	.305	.317	.342	.329	
16.0	36.2	49.5	9.4	8.7	.1784	.332	.366	.378	.366	.364	.378	.381	.231	.231	.306	.306	.319	.356	.331	
17.0	36.0	49.9	9.5	7.0	.1254	.344	.381	.378	.381	.363	.378	.388	.227	.240	.314	.326	.351	.376	.363	
18.0	36.3	50.9	9.7	4.0	.0644	.354	.387	.389	.396	.382	.374	.374	.258	.282	.331	.331	.367	.379	.359	
19.0	36.4	51.5	9.8	3.8	.0350	.361	.391	.384	.375	.382	.375	.384	.293	.293	.341	.341	.353	.389	.389	
20.0	37.2	53.2	9.9	-2.0	-0.0267	.369	.387	.399	.389	.392	.387	.382	.299	.322	.346	.346	.357	.403	.392	
21.0	37.3	54.0	9.9	3.8	.0557	.379	.419	.393	.388	.406	.394	.397	.380	.313	.358	.358	.352	.403	.403	
22.0	37.0	54.2	10.0	7.3	.1111	.388	.435	.403	.383	.392	.424	.437	.281	.338	.360	.372	.394	.417	.406	
23.0	36.6	54.1	10.0	8.5	.1278	.397	.445	.445	.434	.439	.448	.448	.291	.268	.359	.359	.416	.427	.382	
24.0	36.4	54.4	10.1	6.0	.0792	.405	.466	.459	.457	.450	.457	.459	.263	.297	.364	.364	.410	.432	.382	
25.0	36.8	55.4	10.1	1.2	.0138	.412	.470	.463	.450	.450	.448	.452	.247	.291	.379	.401	.434	.445	.423	
26.0	36.0	54.7	10.1	13.2	.1331	.418	.472	.474	.467	.472	.463	.428	.234	.301	.391	.413	.425	.456	.436	
27.0	36.5	55.9	10.2	-1.1	-0.0122	.424	.457	.465	.468	.470	.470	.479	.262	.321	.398	.398	.409	.474	.441	
28.0	37.0	57.2	10.2	-1.0	-0.0177	.430	.459	.465	.463	.476	.462	.463	.297	.340	.425	.425	.414	.446	.446	
COMMENCE VALVE CLOSURE																				
29.0	36.1	56.2	10.2	12.4	.1739	.438	.512	.497	.476	.465	.473	.510	.315	.358	.391	.402	.413	.434	.440	
30.0	36.0	56.7	10.2	2.5	.0489	.444	.497	.495	.481	.485	.485	.487	.332	.353	.418	.418	.407	.439	.461	
VALVE FULLY CLOSED																				
31.0	35.8	56.7	10.1	3.2	.0638	.449	.516	.512	.489	.491	.489	.512	.332	.364	.407	.418	.418	.439	.450	
32.0	37.4	59.6	10.1	-9.9	-0.1951	.449	.519	.500	.494	.490	.492	.492	.324	.385	.426	.426	.416	.426	.446	
33.0	38.0	60.7	10.2	-3.8	-0.0740	.449	.499	.497	.487	.483	.471	.477	.357	.398	.436	.436	.426	.436	.436	
34.0	38.5	61.5	10.2	-2.7	-0.0541	.449	.497	.492	.489	.487	.482	.483	.349	.378	.417	.426	.436	.436	.437	
35.0	38.8	62.1	10.2	-1.8	-0.0354	.449	.500	.494	.485	.479	.481	.467	.359	.379	.417	.437	.446	.456	.437	
36.0	39.0	62.4	10.2	-0.9	-0.0175	.449	.489	.489	.483	.479	.481	.454	.370	.370	.427	.427	.446	.466	.446	
37.0	39.0	62.4	10.2	0.0	0.0000	.449	.485	.483	.482	.478	.474	.472	.359	.378	.416	.436	.448	.474	.455	
38.0	39.0	62.4	10.2	0.0	0.0000	.449	.472	.475	.475	.477	.479	.475	.379	.370	.427	.427	.447	.475	.456	
39.0	38.8	62.1	10.2	.9	.0175	.449	.465	.469	.470	.476	.474	.472	.382	.363	.420	.440	.449	.497	.459	
40.0	38.8	62.1	10.2	0.0	0.0000	.449	.465	.467	.458	.467	.463	.456	.390	.381	.438	.438	.458	.458	.458	
41.0	38.6	61.8	10.2	.9	.0176	.449	.464	.458	.444	.452	.452	.456	.410	.390	.448	.448	.458	.487	.468	
42.0	38.5	61.5	10.2	.9	.0178	.449	.468	.462	.453	.451	.459	.459	.406	.406	.445	.445	.455	.484	.445	
43.0	38.5	61.5	10.2	0.0	0.0000	.449	.471	.467	.461	.443	.455	.465	.404	.395	.443	.443	.463	.482	.443	
44.0	38.3	61.2	10.2	.9	.0179	.449	.476	.476	.471	.457	.447	.453	.465	.402	.441	.411	.451	.480	.441	
45.0	38.3	61.2	10.2	0.0	0.0000	.449	.467	.459	.465	.449	.447	.453	.412	.402	.451	.431	.461	.490	.451	
46.0	38.2	61.0	10.2	.9	.0180	.449	.475	.471	.463	.457	.453	.453	.408	.408	.447	.428	.438	.487	.447	
47.0	38.0	60.2	10.2	.9	.0182	.449	.475	.473	.469	.465	.459	.449	.420	.400	.439	.426	.449	.479	.439	
48.0	38.0	60.7	10.2	0.0	0.0000	.449	.475	.471	.469	.467	.467	.467	.413	.394	.433	.433	.443	.475	.439	
49.0	38.0	60.2	10.2	0.0	0.0000	.449	.472	.468	.466	.464	.466	.466	.426	.406	.426	.426	.436	.486	.426	
50.0	37.8	60.4	10.2	.9	.0183	.449	.476	.472	.470	.476	.462	.462	.422	.402	.442	.422	.442	.482	.442	

Table 19B — Inferred Pressurant Distribution, Scaling Run 247; South 3.279-cm Nozzle

<i>t</i> (s)	\bar{T} (°C)	\bar{T}_o (°C)	\bar{T}_x (°C)	β	β/θ	\bar{X}	Pressurant Fractions (<i>X</i>) at Locations <i>i</i>												
							1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPERATING																			
0.0	18.9	18.9	77.3	.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1.0	20.1	20.0	28.4	106.2	1.2449	.012	.213	.129	.070	.106	.165	.225	.134	.014	.134	.134	.074	.134	.134
VALVE FULLY OPEN																			
2.0	23.3	23.2	25.2	33.7	1.4809	.054	1.308	.962	.764	.271	.715	1.011	-.865	-.618	-.618	-.865	-.124	-.618	-.618
3.0	27.0	27.7	20.3	-4.4	-1.1564	.007	-.220	-.166	-.139	-.099	-.180	-.193	.641	.372	.237	.237	.036	.237	.372
4.0	29.6	31.1	18.5	1.4	.0473	.118	-.062	-.031	-.007	-.015	-.055	-.070	.293	.292	.253	.214	.174	.253	.292
5.0	31.4	33.9	16.6	4.3	.1395	.146	.059	.053	.030	.042	.030	.030	.232	.232	.200	.232	.203	.232	.232
6.0	33.2	36.7	16.3	2.0	.0613	.172	.151	.126	.121	.102	.058	.062	.258	.269	.234	.234	.185	.209	.258
7.0	34.5	38.1	15.2	3.7	1.045	.195	.184	.196	.192	.151	.096	.171	.217	.217	.217	.156	.217	.217	.259
8.0	35.4	40.7	15.3	1.9	.0324	.209	.191	.191	.167	.151	.167	.226	.226	.226	.268	.296	.268	.268	.268
9.0	36.8	43.2	14.9	.6	.0130	.228	.190	.204	.190	.194	.183	.184	.223	.246	.257	.257	.222	.316	.310
10.0	37.2	44.8	14.0	6.1	.1587	.240	.252	.255	.265	.268	.272	.190	.223	.223	.223	.297	.288	.288	
11.0	37.5	46.2	13.7	5.7	.1335	.266	.304	.287	.288	.276	.257	.223	.208	.223	.254	.270	.300	.316	
12.0	37.9	47.2	13.7	8.2	.1386	.282	.319	.316	.274	.295	.268	.298	.188	.248	.277	.248	.262	.337	.337
13.0	38.9	49.4	13.8	-7	-.0142	.296	.363	.374	.332	.326	.292	.304	.193	.225	.281	.291	.233	.323	.309
14.0	39.7	51.2	14.0	1.9	.0184	.309	.355	.359	.347	.347	.325	.301	.137	.223	.331	.304	.290	.304	.301
15.0	40.3	52.7	14.1	2.3	.0421	.322	.309	.322	.324	.363	.371	.371	.190	.215	.319	.315	.332	.371	.371
16.0	39.7	52.7	14.1	9.2	.1955	.336	.393	.406	.390	.372	.386	.357	.123	.201	.305	.331	.338	.409	.409
17.0	40.0	53.5	14.2	2.3	.0251	.343	.414	.407	.397	.381	.341	.315	.142	.244	.320	.326	.333	.422	.422
18.0	40.7	55.1	14.3	.4	.0065	.355	.409	.406	.424	.375	.343	.348	.176	.225	.348	.348	.348	.421	.421
19.0	41.1	56.3	14.4	2.4	.0377	.362	.445	.426	.412	.414	.424	.426	.198	.198	.343	.367	.331	.367	.367
20.0	40.5	56.2	14.4	8.5	.1555	.375	.415	.410	.386	.408	.422	.429	.183	.268	.372	.377	.377	.491	.413
21.0	39.5	59.3	14.4	11.7	.2137	.386	.383	.408	.419	.415	.425	.420	.205	.303	.376	.400	.412	.425	.425
22.0	39.6	55.9	14.4	5.0	.0732	.395	.422	.420	.420	.422	.417	.427	.205	.302	.386	.410	.410	.446	.446
23.0	39.0	53.7	14.4	9.7	.1529	.404	.464	.445	.450	.435	.450	.450	.188	.309	.382	.406	.394	.454	.430
24.0	39.4	56.6	14.5	-1.6	-.0120	.409	.449	.439	.446	.442	.449	.449	.230	.325	.426	.426	.468	.420	.420
25.0	39.3	57.0	14.5	6.1	.0832	.417	.487	.472	.470	.465	.482	.496	.237	.296	.402	.402	.390	.413	.407
26.0	39.8	58.3	14.6	-1.4	-.0146	.423	.499	.506	.508	.480	.483	.501	.261	.283	.388	.388	.384	.398	.421
27.0	39.8	50.7	14.7	5.4	.0676	.430	.492	.497	.488	.497	.494	.494	.279	.279	.392	.415	.404	.426	.438
COMMENCE VALVE CLOSURE																			
28.0	39.9	59.5	14.7	2.5	.0280	.436	.470	.472	.468	.484	.481	.497	.280	.325	.414	.437	.426	.437	.481
29.0	40.1	60.0	14.7	1.6	.0189	.441	.474	.463	.466	.479	.466	.463	.289	.333	.444	.444	.455	.466	.468
VALVE FULLY CLOSED																			
30.0	39.2	53.2	14.6	13.5	.1582	.448	.478	.478	.472	.467	.476	.512	.292	.319	.431	.442	.454	.482	.510
31.0	41.6	63.3	14.8	-23.9	-.2818	.448	.472	.467	.457	.474	.507	.503	.278	.360	.422	.443	.453	.484	.503
32.0	42.9	63.5	15.0	-21.7	-.1383	.448	.461	.452	.463	.479	.496	.494	.336	.370	.429	.465	.439	.479	.476
33.0	43.5	66.6	15.1	-5.6	-.0664	.448	.464	.462	.478	.481	.497	.480	.360	.439	.439	.440	.456	.456	
34.0	43.9	67.1	15.2	-2.8	-.0326	.448	.471	.467	.459	.469	.478	.486	.392	.382	.430	.421	.450	.450	
35.0	44.0	67.4	15.2	-1.4	-.0161	.448	.474	.470	.464	.474	.470	.480	.380	.388	.426	.426	.436	.464	
36.0	44.2	67.7	15.2	-1.4	-.0160	.448	.475	.469	.463	.469	.473	.477	.383	.383	.421	.440	.431	.466	.479
37.0	44.2	67.7	15.2	0.0	0.0000	.448	.476	.474	.462	.468	.474	.478	.388	.388	.445	.439	.426	.455	.450
38.0	44.0	67.4	15.2	1.4	.0160	.448	.465	.461	.456	.459	.469	.471	.406	.406	.444	.444	.435	.464	.463
39.0	43.9	67.1	15.2	1.4	.0161	.448	.472	.462	.454	.464	.468	.475	.402	.383	.450	.450	.431	.450	.460
40.0	43.3	67.1	15.2	0.0	0.0000	.448	.464	.462	.456	.458	.462	.469	.377	.473	.454	.444	.454	.454	
41.0	43.7	66.9	15.1	1.4	.0162	.448	.466	.459	.453	.455	.460	.470	.389	.379	.466	.466	.437	.457	
42.0	43.5	66.6	15.1	1.4	.0163	.448	.453	.453	.443	.445	.453	.463	.418	.379	.476	.457	.447	.457	
43.0	43.5	66.6	15.1	0.0	0.0000	.448	.448	.446	.436	.438	.450	.460	.409	.390	.467	.467	.459	.487	
44.0	43.4	66.3	15.1	1.4	.0164	.448	.450	.441	.433	.435	.447	.460	.413	.384	.472	.472	.462	.462	
45.0	43.2	66.0	15.1	1.4	.0165	.448	.445	.437	.430	.431	.439	.451	.416	.398	.477	.477	.467	.457	
46.0	43.2	66.0	15.1	0.0	0.0000	.448	.446	.436	.432	.440	.442	.451	.416	.398	.475	.475	.466	.455	
47.0	43.0	65.8	15.1	1.4	.0167	.448	.447	.439	.435	.445	.449	.452	.411	.398	.471	.471	.461	.451	
48.0	43.0	65.6	15.1	0.0	0.0000	.448	.451	.443	.449	.445	.455	.460	.408	.464	.464	.464	.455	.455	
49.0	42.9	65.5	15.0	1.4	.0168	.448	.449	.443	.449	.449	.453	.455	.415	.396	.475	.475	.465	.455	
50.0	42.9	65.5	15.0	0.0	0.0000	.448	.454	.450	.450	.454	.454	.456	.417	.391	.470	.470	.460	.455	

Table 20B — Inferred Pressurant Distribution, Scaling Run 248; South 3.279-cm Nozzle

<i>t</i> (s)	\bar{T} (°C)	\bar{T}_a (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	Pressurant Fractions (<i>X</i>) at Locations /												
							1	2	3	4	5	6	7	8	9	10	11	12	13
COMMENCE VALVE OPENING																			
0.0	24.7	22.7	49.6	.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
1.0	26.2	23.9	39.9	-86.0	-1.5370	.018	.246	.246	.203	.217	.266	.260	.198	.163	.163	.163	.163	.163	
2.0	29.2	28.9	33.2	14.8	.6401	.059	.575	.621	.645	.575	.691	.621	.756	.756	.289	.289	.056	.522	.289
3.0	31.4	31.4	31.3	10.6	.4209	.096	-10.601	-10.60	-13.29	-11.27	-15.97	-14.63	14.926	8.208	4.850	4.850	14.926	8.208	
4.0	33.8	34.5	29.3	2.0	.0656	.126	-.250	-.231	-.269	-.231	-.307	-.250	.727	.535	.344	.344	.535	.344	
5.0	35.6	36.9	28.3	3.9	.1251	.153	.019	.042	-.004	.042	.042	.030	.376	.376	.263	.146	.146	.433	.146
6.0	37.6	39.7	27.9	.5	.0133	.178	.151	.142	.151	.117	.100	.134	.337	.337	.253	.165	.165	.253	.083
7.0	39.2	42.2	27.1	1.0	.0277	.199	.244	.218	.211	.192	.158	.178	.264	.198	.165	.132	.198	.165	.165
8.0	40.3	44.1	26.8	3.1	.0842	.221	.286	.240	.182	.171	.159	.200	.257	.315	.257	.200	.200	.200	.200
9.0	40.9	45.4	26.3	3.9	.0667	.234	.287	.251	.214	.209	.193	.219	.246	.246	.246	.246	.193	.298	.193
10.0	41.4	46.7	25.9	5.3	.1320	.253	.293	.269	.250	.250	.226	.245	.264	.216	.216	.216	.264	.312	.264
11.0	42.0	48.2	25.4	4.4	.1060	.270	.306	.258	.263	.276	.311	.328	.197	.197	.241	.241	.241	.328	.281
12.0	42.1	49.1	24.9	6.5	.1473	.287	.314	.331	.318	.306	.316	.310	.244	.244	.264	.244	.223	.326	.281
13.0	42.6	50.3	24.7	4.5	.0956	.302	.367	.348	.324	.321	.309	.328	.219	.258	.297	.258	.258	.336	.297
14.0	42.3	50.7	24.2	8.2	.1767	.316	.349	.345	.256	.352	.341	.360	.209	.247	.266	.266	.363	.375	.341
15.0	42.8	52.1	23.2	3.8	.0728	.329	.378	.357	.374	.385	.413	.367	.192	.262	.262	.262	.297	.402	.352
16.0	43.1	53.2	23.2	2.4	.0269	.337	.362	.352	.345	.358	.365	.372	.218	.318	.285	.318	.352	.385	.352
17.0	43.8	54.8	23.2	.8	.0133	.346	.422	.356	.339	.352	.356	.352	.257	.305	.320	.302	.352	.400	.352
18.0	43.5	55.2	22.7	2.9	.1478	.360	.403	.361	.365	.394	.412	.400	.231	.292	.261	.354	.354	.415	.385
19.0	43.1	55.2	22.7	8.3	.1416	.371	.422	.416	.419	.443	.466	.446	.185	.247	.308	.339	.376	.400	.356
20.0	43.7	57.0	22.9	1.0	.0135	.379	.457	.460	.449	.483	.497	.497	.189	.237	.294	.323	.351	.386	.323
21.0	43.8	57.8	21.8	4.6	.0668	.388	.459	.454	.459	.467	.472	.461	.226	.261	.337	.351	.364	.364	.351
22.0	44.2	59.3	21.3	1.7	.0225	.397	.453	.437	.429	.453	.455	.448	.279	.332	.356	.385	.385	.385	.365
23.0	43.5	58.7	21.2	12.0	.1411	.404	.434	.437	.429	.442	.464	.456	.293	.320	.373	.347	.400	.426	.426
24.0	43.9	60.0	20.7	1.8	.0216	.411	.472	.469	.408	.447	.457	.482	.327	.340	.378	.378	.378	.416	.391
25.0	43.5	60.4	20.2	8.1	.1123	.419	.484	.467	.460	.455	.472	.479	.365	.340	.365	.390	.390	.390	.390
26.0	43.8	61.4	20.0	1.8	.0212	.426	.496	.487	.467	.465	.470	.474	.356	.356	.368	.382	.388	.405	.429
27.0	43.1	61.3	19.4	10.6	.1481	.434	.492	.492	.467	.490	.499	.497	.349	.349	.387	.397	.373	.397	.420
28.0	42.8	61.9	19.5	10.1	.0964	.438	.546	.520	.498	.496	.486	.479	.320	.344	.392	.392	.368	.416	.440
COMMENCE VALVE CLOSURE																			
29.0	43.1	62.2	19.3	.6	.0056	.444	.536	.501	.473	.480	.470	.473	.326	.361	.407	.407	.419	.454	.466
30.0	42.9	62.7	18.6	4.7	.0845	.450	.538	.529	.493	.499	.502	.502	.318	.364	.409	.409	.409	.454	.432
VALVE FULLY CLOSED																			
31.0	42.1	62.1	18.3	6.8	.1220	.456	.524	.519	.508	.524	.506	.515	.330	.376	.398	.416	.410	.467	.444
32.0	44.1	65.5	18.5	-13.2	-0.2371	.456	.516	.510	.499	.503	.522	.535	.339	.382	.403	.425	.425	.466	.423
33.0	45.1	67.2	18.7	-6.1	-0.1107	.456	.501	.501	.491	.498	.507	.526	.334	.386	.427	.437	.437	.453	.437
34.0	45.5	68.0	18.7	-3.0	-0.0536	.456	.502	.500	.480	.492	.496	.506	.331	.392	.433	.433	.453	.453	.453
35.0	45.7	68.3	18.7	-1.0	-0.0176	.456	.511	.497	.486	.501	.501	.503	.361	.382	.422	.442	.462	.442	.442
36.0	45.9	68.6	18.8	-1.0	-0.0175	.456	.505	.495	.489	.499	.497	.495	.354	.384	.425	.435	.465	.455	.455
37.0	45.9	68.6	18.8	0.0	0.0000	.456	.514	.502	.494	.488	.484	.480	.361	.401	.442	.421	.442	.462	.442
38.0	45.7	68.3	18.7	1.0	.0175	.456	.513	.503	.485	.473	.479	.481	.378	.398	.438	.438	.438	.448	.448
39.0	45.7	69.3	18.7	0.0	0.0000	.456	.501	.493	.473	.473	.477	.479	.390	.390	.431	.451	.451	.471	.451
40.0	45.5	68.0	18.7	1.0	.0176	.456	.500	.488	.478	.474	.484	.482	.389	.389	.429	.449	.449	.470	.443
41.0	45.4	67.8	18.7	1.0	.0177	.456	.495	.487	.481	.470	.479	.477	.401	.411	.442	.442	.442	.462	.442
42.0	45.4	67.8	18.7	0.0	0.0000	.456	.489	.483	.475	.475	.485	.493	.395	.416	.436	.436	.436	.456	.456
43.0	45.2	67.5	18.7	1.0	.0179	.456	.488	.482	.470	.472	.488	.502	.392	.412	.433	.433	.443	.462	.453
44.0	45.1	66.3	19.7	1.0	.0180	.456	.490	.479	.472	.474	.493	.492	.404	.425	.425	.425	.447	.466	.447
45.0	45.1	65.7	20.5	0.0	0.0000	.456	.490	.479	.483	.474	.483	.501	.408	.419	.430	.430	.430	.463	.441
46.0	44.9	64.9	21.0	1.0	.0181	.456	.489	.478	.471	.480	.485	.492	.408	.430	.453	.430	.430	.453	.430
47.0	44.9	64.4	21.6	0.0	0.0000	.456	.492	.480	.466	.478	.485	.487	.424	.424	.448	.424	.424	.446	.446
48.0	44.7	63.7	22.2	1.0	.0183	.456	.493	.483	.474	.488	.491	.488	.418	.418	.442	.416	.416	.455	.442
49.0	44.7	63.2	22.7	0.0	0.0000	.456	.495	.483	.475	.492	.495	.500	.406	.431	.431	.431	.431	.455	.431
50.0	44.6	62.5	23.2	1.0	.0184	.456	.498	.488	.483	.496	.496	.514	.397	.422	.435	.409	.422	.446	.428

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C-Tables

Each of the four sets of experiments has a C-table. These tables give mean values for replicate runs in each set. Otherwise, they are similar to the B-tables, with two exceptions: Dimensionless time τ is added in the last column of the table, and all values in the table have been extrapolated to correspond to equal τ -increments of 0.05 (see Appendix C for program).

Set 1, Table C — Mean Values of All Quantities, Scaling Runs 230-236

MEAN VALUES OF ALL QUANTITIES

t (s)	\bar{T} (°C)	\bar{T}_a (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	1	2	MEAN PRESSURANT FRACTIONS AT LOCATIONS E										TAU		
									3	4	5	6	7	8	9	10	11	12	13		
0.0	12.5	12.5	27.4	1.6	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
.4	14.6	14.9	18.1	5.5	2499	.023	-.104	-.053	.622	-.008	-.057	-.055	.124	.054	.046	.089	.048	.104	.085	.05	
.8	16.6	17.2	9.1	9.2	4892	.046	-.196	-.098	.042	-.012	-.106	-.102	.239	.103	.091	.172	.093	.201	.164	.16	
1.1	18.2	19.4	5.0	9.0	3521	.069	-.140	-.061	.054	-.011	-.070	-.061	.243	.122	.115	.188	.108	.208	.173	.15	
1.4	19.7	21.5	3.3	7.6	5315	.091	-.063	-.012	.063	-.038	-.017	-.003	.227	.142	.134	.190	.121	.194	.168	.20	
1.6	21.1	23.7	2.4	5.9	4725	.114	-.019	-.038	.073	.065	.036	.067	.209	.161	.153	.193	.134	.180	.164	.25	
1.9	22.4	25.8	1.7	4.6	4163	.137	-.074	-.081	.087	.093	.084	.123	.198	.182	.171	.199	.150	.172	.164	.30	
2.3	23.7	28.0	1.5	4.0	3621	.159	-.106	-.109	.109	.120	.116	.155	.212	.203	.192	.214	.173	.185	.179	.35	
2.7	25.0	30.3	1.5	3.4	2945	.182	-.137	-.135	.130	.148	.145	.182	.229	.223	.214	.230	.197	.203	.197	.40	
3.1	26.0	32.4	1.5	3.5	2786	.205	-.167	-.164	.155	.175	.174	.209	.245	.242	.235	.244	.220	.222	.216	.45	
3.5	27.0	34.5	1.6	3.8	2842	.228	-.198	-.196	.183	.200	.202	.233	.256	.256	.253	.259	.241	.246	.241	.50	
3.9	27.9	36.7	1.6	4.0	2848	.251	-.230	-.226	.212	.226	.230	.257	.268	.270	.270	.275	.261	.270	.265	.55	
4.4	28.7	39.0	1.6	3.7	2400	.274	-.262	-.257	.243	.254	.261	.286	.281	.284	.285	.293	.283	.290	.279	.60	
5.0	29.6	41.4	1.5	3.4	1954	.297	-.293	-.287	.274	.285	.293	.316	.291	.302	.302	.308	.303	.307	.293	.65	
5.6	30.1	43.5	1.4	3.7	1992	.319	-.319	-.314	.302	.315	.324	.344	.309	.323	.324	.323	.319	.321	.312	.70	
6.3	30.5	43.6	1.4	4.1	2029	.342	-.345	-.339	.326	.340	.349	.370	.332	.343	.345	.343	.342	.343	.331	.75	
7.1	30.8	47.6	1.4	4.1	1839	.365	-.372	-.366	.347	.362	.372	.393	.354	.362	.364	.367	.365	.366	.351	.80	
8.0	30.8	49.4	1.6	4.3	1784	.387	-.399	-.392	.370	.382	.393	.414	.375	.387	.392	.391	.392	.364	.366	.85	
9.0	30.9	51.3	1.6	4.0	1472	.410	-.418	-.414	.400	.409	.419	.440	.393	.414	.409	.408	.411	.408	.391	.90	
10.2	30.7	53.0	1.5	3.6	1428	.433	-.445	-.438	.419	.429	.442	.463	.421	.437	.436	.427	.432	.429	.413	.95	
11.9	29.6	54.6	-1	1.2	0757	.456	-.474	-.462	.443	.455	.463	.487	.445	.454	.456	.451	.446	.449	.437	1.00	
47	13.1	30.7	56.7	-4	-1.8	-1098	.456	-.476	-.468	.450	.461	.474	.493	.444	.448	.448	.444	.445	.443	.436	1.05
14.4	30.4	56.2	-3	.6	0331	.456	-.477	-.472	.456	.464	.479	.493	.441	.448	.447	.440	.442	.438	.432	1.10	
15.7	30.1	55.5	-2	.6	0341	.456	-.478	-.470	.457	.465	.481	.496	.445	.446	.446	.441	.436	.435	.432	1.15	
16.9	29.8	55.0	-1	.6	0342	.456	-.483	-.475	.459	.470	.482	.495	.442	.446	.441	.435	.437	.431	.433	1.20	
18.2	29.6	54.4	-1	.5	0321	.456	-.484	-.477	.461	.469	.481	.496	.441	.443	.442	.434	.438	.433	.433	1.25	
19.4	29.3	53.9	-6	.5	0296	.456	-.484	-.475	.461	.469	.478	.494	.438	.442	.442	.438	.436	.437	.437	1.30	
20.7	29.1	53.4	-1	.4	0256	.456	-.484	-.474	.458	.468	.478	.493	.437	.443	.442	.436	.439	.437	.442	1.35	
22.0	28.9	53.0	-2	.4	0236	.456	-.484	-.475	.457	.467	.479	.495	.441	.445	.438	.433	.438	.437	.440	1.40	
23.2	28.7	52.6	-2	.4	0239	.456	-.483	-.474	.457	.467	.476	.493	.441	.445	.445	.436	.436	.439	.437	1.45	
24.5	28.5	52.3	-3	.3	0199	.456	-.480	-.471	.455	.465	.474	.494	.443	.447	.445	.436	.438	.441	.440	1.50	
25.7	28.3	51.9	-3	.4	0234	.456	-.479	-.469	.455	.464	.474	.492	.441	.445	.446	.437	.441	.442	.435	1.55	
27.0	28.2	51.6	-3	.3	0183	.456	-.478	-.468	.453	.465	.476	.493	.444	.447	.447	.440	.439	.442	.437	1.60	
28.3	28.1	51.3	-4	.3	0189	.456	-.478	-.469	.455	.466	.478	.493	.444	.449	.449	.437	.438	.441	.435	1.65	
29.5	27.9	50.9	-3	.4	0221	.456	-.479	-.470	.455	.465	.479	.495	.444	.448	.446	.437	.436	.442	.434	1.70	
30.8	27.8	50.4	-8	.2	0116	.456	-.481	-.470	.455	.467	.482	.500	.443	.446	.440	.433	.438	.440	.435	1.75	
27.1	23.6	42.9	1.0	.3	0159	.394	-.410	-.403	.394	.402	.412	.426	.384	.382	.382	.378	.382	.382	.380	1.80	
28.2	23.5	42.4	1.3	.2	0132	.394	-.411	-.405	.395	.403	.412	.426	.384	.382	.381	.377	.379	.384	.381	1.85	
14.5	11.8	21.3	.6	.1	0081	.197	-.205	-.204	.199	.205	.209	.214	.190	.190	.189	.186	.185	.192	.189	1.90	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45	

Set 2, Table C — Mean Values of All Quantities, Scaling Runs 237-240

MEAN VALUES OF ALL QUANTITIES

(S)	\bar{T} (°C)	\bar{T}_s (°C)	\bar{T}_e (°C)	β	β/θ	\bar{X}	MEAN PRESSURANT FRACTIONS AT LOCATIONS I														TRU
							1	2	3	4	5	6	7	8	9	10	11	12	13		
0.0	17.7	17.7	30.6	.8	0.0000	0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1.0	19.7	19.6	27.6	.657	1.9414	.023	.364	.242	.006	.119	.252	.380	-.138	-.090	-.202	-.196	-.195	-.162	-.140	.05	
1.6	22.1	22.0	24.7	.401	1.0014	.045	-.797	-.766	-.739	-.625	-.061	-.1006	.814	.840	.697	.725	.536	.969	.798	.10	
2.3	24.2	24.5	22.2	.3.9	.1489	.068	-.1.079	-.987	-.838	-.765	-.1.101	-.1.327	1.058	1.052	.926	.965	.700	1.250	1.026	.15	
2.9	26.2	26.3	18.9	1.3	.0480	.090	-.580	-.518	-.474	-.474	-.574	-.604	.844	.814	.442	.691	.427	.765	.613	.20	
3.7	27.9	29.4	16.7	1.6	.0529	.113	-.354	-.304	-.281	-.289	-.339	-.359	.666	.481	.344	.513	.336	.597	.456	.25	
4.5	29.5	31.8	15.1	2.1	.0671	.135	.017	.025	.029	.021	.011	-.014	.285	.244	.201	.213	.192	.317	.219	.30	
5.3	31.1	34.2	14.3	1.5	.0495	.158	.108	.089	.092	.091	.074	.063	.201	.209	.224	.217	.193	.281	.206	.35	
6.3	32.6	36.8	13.6	1.2	.0354	.180	.170	.153	.153	.156	.143	.126	.191	.192	.201	.196	.180	.263	.225	.40	
7.4	34.0	39.3	13.3	1.8	.0492	.203	.211	.201	.196	.195	.192	.180	.192	.198	.198	.209	.184	.251	.231	.45	
8.5	35.0	41.4	13.0	3.5	.0935	.226	.246	.233	.223	.211	.212	.213	.196	.219	.224	.223	.214	.273	.244	.50	
9.9	35.6	43.1	12.9	5.5	.1117	.248	.258	.257	.247	.245	.250	.251	.204	.228	.243	.241	.235	.300	.268	.55	
11.2	36.4	45.2	12.0	3.1	.0730	.271	.282	.280	.275	.278	.279	.287	.208	.237	.270	.259	.257	.315	.290	.60	
12.7	36.8	46.8	12.9	5.8	.1337	.293	.314	.303	.299	.308	.318	.328	.203	.257	.284	.284	.274	.334	.310	.65	
14.3	37.4	48.6	12.8	4.0	.0767	.316	.345	.345	.339	.344	.342	.321	.236	.262	.304	.305	.301	.341	.320	.70	
16.2	37.6	50.2	12.9	4.4	.0814	.338	.375	.363	.358	.346	.345	.343	.256	.274	.333	.344	.325	.363	.352	.75	
16.3	37.7	51.7	12.8	5.4	.0884	.361	.395	.390	.381	.371	.381	.370	.265	.292	.357	.349	.346	.410	.381	.80	
20.6	37.4	52.7	12.8	6.9	.1112	.383	.403	.411	.407	.414	.418	.413	.280	.319	.365	.369	.363	.418	.401	.85	
23.4	37.5	54.5	12.7	5.6	.0846	.406	.439	.431	.421	.419	.409	.403	.306	.358	.408	.405	.409	.443	.427	.90	
26.6	37.2	55.6	12.6	7.5	.0986	.428	.451	.447	.460	.442	.443	.449	.336	.360	.430	.424	.424	.473	.453	.95	
30.3	36.3	56.5	11.7	2.2	.0462	.451	.454	.486	.474	.482	.486	.486	.374	.376	.443	.432	.427	.458	.444	1.00	
34.3	39.9	62.0	12.0	-1.4	-.0306	.451	.483	.475	.466	.461	.465	.470	.382	.402	.450	.445	.443	.471	.450	1.05	
38.4	39.9	62.9	12.0	3	.0081	.451	.464	.459	.457	.459	.465	.465	.393	.404	.457	.452	.449	.472	.460	1.10	
42.5	39.5	61.0	12.2	5	.0114	.451	.462	.458	.458	.463	.465	.473	.398	.405	.451	.453	.453	.475	.450	1.13	
46.3	39.1	60.5	13.1	5	.0126	.451	.465	.460	.455	.461	.463	.472	.411	.411	.449	-.7	.445	.475	.444	1.20	
50.6	38.8	59.5	13.7	3	.0067	.451	.466	.464	.460	.465	.461	.466	.411	.422	.439	.433	.445	.478	.451	1.25	
54.7	38.5	58.6	14.1	5	.0106	.451	.462	.464	.461	.469	.462	.464	.410	.423	.436	.439	.441	.467	.436	1.30	
58.7	38.3	57.9	14.4	2	.0049	.451	.469	.464	.460	.461	.457	.463	.414	.439	.438	.442	.436	.483	.437	1.35	
62.7	38.1	57.3	14.6	3	.0060	.451	.466	.463	.456	.464	.464	.467	.417	.425	.434	.440	.444	.484	.436	1.40	
66.8	37.8	56.7	14.9	5	.0103	.451	.467	.464	.462	.468	.467	.473	.413	.418	.434	.436	.444	.477	.439	1.45	
70.9	37.7	56.3	15.0	3	.0065	.451	.467	.464	.460	.468	.464	.472	.420	.436	.425	.436	.446	.485	.439	1.50	
75.0	37.5	56.0	15.1	0	.0007	.451	.458	.453	.450	.459	.461	.463	.437	.441	.429	.432	.452	.464	.442	1.55	
79.0	37.3	55.5	15.1	6	.0112	.451	.453	.458	.452	.461	.453	.459	.433	.439	.428	.445	.450	.493	.436	1.60	
83.1	37.1	55.2	15.1	3	.0065	.451	.456	.456	.450	.458	.452	.458	.437	.445	.439	.439	.439	.495	.438	1.65	
87.2	37.0	54.9	15.1	2	.0045	.451	.453	.453	.453	.458	.455	.457	.445	.450	.439	.440	.444	.487	.431	1.70	
91.2	36.9	54.6	15.1	5	.0094	.451	.454	.454	.448	.459	.453	.459	.441	.447	.447	.447	.447	.477	.429	1.75	
44.8	18.0	28.4	5.4	3	.0061	.226	.226	.228	.226	.229	.226	.227	.226	.226	.226	.223	.221	.229	.226	1.80	
46.7	18.0	28.4	5.4	1	.0029	.226	.225	.227	.226	.229	.223	.225	.223	.223	.223	.229	.226	.240	.223	1.85	
48.5	17.9	28.2	5.4	0	0.0000	.226	.224	.225	.227	.229	.224	.225	.222	.222	.222	.228	.226	.242	.224	1.90	
24.7	9.2	14.4	3.0	0	0.0000	.113	.112	.112	.113	.114	.114	.115	.112	.112	.112	.112	.112	.118	.112	1.95	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40	
0.0	0.0	0.0	0.0	0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45	

Set 3, Table C — Mean Values of All Quantities, Scaling Runs 241-244

MEAN VALUES OF ALL QUANTITIES

<i>t</i> (s)	\bar{T} (°C)	\bar{T}_o (°C)	\bar{T}_p (°C)	β	β/θ	\bar{X}	1	2	3	4	5	6	7	8	9	10	11	12	13	TAU	
0.0	5.9	5.9	35.8	2.1	0.0044	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	
.5	7.2	7.6	17.1	27.2	1.3294	.023	-.118	-.021	.272	.001	-.075	-.075	.007	-.040	-.044	-.014	.015	.319	.071	.05	
.9	8.4	9.2	-.1	48.9	2.5245	.046	-.217	-.038	.314	.004	-.136	-.136	.016	-.071	-.080	-.023	.036	.587	.137	.10	
1.1	9.6	11.0	-4.5	43.6	2.4937	.069	-.104	-.020	.535	.021	-.108	-.104	.032	-.047	-.057	-.005	.040	.633	.161	.15	
1.4	10.7	12.0	-7.3	35.0	2.3039	.092	-.136	-.003	.527	.040	-.070	-.062	.047	-.017	-.027	.016	.048	.649	.176	.20	
1.6	11.9	14.6	-8.1	23.7	1.8117	.115	-.089	-.026	.516	.063	-.031	-.020	.063	.016	.004	.039	.060	.074	.650	.196	.25
1.9	13.0	16.4	-8.3	13.7	1.3012	.138	-.049	-.050	.510	.086	.007	.024	.078	.048	.033	.060	.074	.659	.213	.30	
2.3	13.9	18.1	-7.7	11.1	1.0137	.161	-.026	-.076	.526	.112	.041	.062	.090	.072	.053	.075	.100	.685	.225	.35	
2.6	14.8	19.8	-7.1	9.4	0.8071	.184	.000	.105	.541	.134	.075	.101	.102	.096	.072	.089	.125	.713	.234	.40	
3.0	15.7	21.5	-6.5	8.5	0.6056	.207	.030	.140	.560	.152	.105	.134	.115	.118	.089	.103	.162	.741	.236	.45	
3.4	16.6	23.2	-5.8	7.8	0.5899	.230	.066	.190	.589	.166	.133	.166	.129	.138	.105	.117	.179	.766	.241	.50	
3.8	17.3	25.0	-5.3	7.1	0.4947	.253	.099	.234	.618	.185	.162	.196	.145	.157	.128	.137	.187	.787	.250	.55	
4.4	18.1	26.8	-4.9	6.3	0.4047	.276	.131	.244	.649	.212	.200	.228	.163	.183	.152	.159	.204	.799	.261	.60	
4.9	18.7	28.6	-4.3	6.1	0.3588	.295	.161	.249	.678	.237	.233	.260	.191	.210	.173	.179	.227	.813	.277	.65	
5.6	19.1	30.2	-4.2	6.2	0.3438	.322	.191	.266	.698	.251	.253	.260	.219	.230	.199	.201	.253	.821	.322	.70	
6.2	19.4	31.7	-4.0	6.3	0.3225	.345	.222	.289	.714	.264	.270	.294	.255	.256	.226	.226	.287	.832	.346	.73	
7.0	19.5	33.2	-3.8	6.3	0.2894	.368	.253	.308	.732	.284	.283	.308	.290	.289	.260	.253	.326	.847	.350	.80	
7.9	19.8	34.9	-3.7	5.4	0.2226	.391	.287	.348	.742	.305	.319	.362	.308	.307	.284	.274	.340	.859	.348	.85	
9.1	19.7	36.2	-3.7	6.0	0.2039	.414	.314	.367	.761	.335	.356	.391	.322	.341	.312	.314	.367	.868	.337	.90	
10.5	19.6	37.7	-3.9	5.7	0.1886	.437	.351	.381	.782	.350	.386	.408	.354	.386	.338	.336	.397	.867	.369	.95	
12.5	19.4	41.0	-6.1	-1.3	-0.0881	.460	.428	.449	.617	.414	.432	.442	.392	.407	.386	.381	.432	.751	.449	1.00	
14.1	19.9	42.1	-6.2	-.7	-0.0364	.460	.470	.450	.456	.429	.466	.484	.429	.445	.429	.429	.435	.598	.457	1.05	
15.6	19.5	41.3	-6.1	.9	-0.0503	.460	.488	.455	.441	.446	.484	.503	.433	.452	.439	.434	.432	.543	.431	1.10	
17.2	19.2	40.6	-6.0	.7	-0.0386	.460	.493	.459	.433	.451	.491	.506	.434	.450	.437	.434	.434	.539	.419	1.15	
18.7	18.9	40.0	-5.8	.5	-0.0330	.460	.499	.460	.431	.457	.490	.511	.432	.452	.434	.427	.425	.537	.418	1.20	
20.3	18.7	39.4	-5.8	.5	-0.0317	.460	.499	.459	.429	.457	.497	.512	.436	.454	.437	.431	.429	.524	.415	1.25	
21.8	18.5	38.9	-5.7	.5	-0.0303	.460	.500	.459	.426	.455	.494	.509	.438	.457	.438	.432	.429	.530	.415	1.30	
23.4	18.2	38.5	-5.6	.4	-0.0246	.460	.498	.456	.422	.451	.492	.506	.440	.459	.445	.434	.427	.528	.420	1.35	
24.9	18.1	38.1	-5.5	.4	-0.0200	.460	.501	.460	.426	.454	.497	.514	.434	.453	.439	.434	.428	.524	.419	1.40	
26.5	17.9	37.6	-5.4	.6	-0.0119	.460	.502	.461	.429	.456	.497	.511	.432	.450	.436	.431	.431	.528	.420	1.45	
28.0	17.7	37.3	-5.3	.2	-0.0125	.460	.502	.458	.423	.453	.495	.511	.437	.450	.439	.428	.429	.532	.421	1.50	
29.6	17.6	36.9	-5.3	.4	-0.0200	.460	.503	.459	.427	.458	.494	.511	.432	.455	.432	.427	.427	.531	.423	1.55	
31.1	17.4	36.6	-5.2	.5	-0.0280	.460	.503	.460	.430	.460	.496	.508	.435	.460	.428	.422	.422	.535	.420	1.60	
32.2	10.5	20.4	-1.3	.1	-0.0062	.228	.262	.227	.204	.230	.260	.263	.216	.230	.219	.213	.209	.222	.206	1.65	
36.0	10.4	20.2	-1.2	.2	-0.0167	.228	.265	.227	.202	.228	.259	.266	.215	.229	.218	.212	.212	.221	.209	1.70	
38.1	5.3	10.1	-.7	.1	-0.0069	.112	.144	.114	.075	.113	.135	.141	.105	.120	.109	.103	.097	.107	.094	1.75	
38.4	5.3	10.0	-.7	.1	-0.0067	.112	.144	.114	.074	.113	.136	.141	.104	.119	.109	.102	.096	.112	.093	1.80	
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.85		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.90		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45		

Set 4, Table C -- Mean Values of All Quantities, Scaling Runs 245-248

MEAN VALUES OF ALL QUANTITIES

<i>t</i> (s)	<i>T</i> (°C)	<i>T_a</i> (°C)	<i>T_b</i> (°C)	<i>ρ</i>	<i>B/θ</i>	<i>X̄</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	TAU	
0.0	21.0	21.0	51.8	.9	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00	
1.1	23.6	23.4	33.2	43.8	.8498	.022	.333	.232	.160	.159	.239	.296	.247	.135	.153	.163	.127	.174	.148	.05	
1.7	25.5	25.4	30.5	24.6	.7239	.045	.354	.313	.322	.199	.290	.312	.268	.208	.179	.193	.015	.164	.157	.10	
2.3	27.6	27.6	27.8	9.7	.4189	.067	-.169	-.188	-.360	-.368	-.561	-.494	-.937	-.597	.305	.086	.224	.627	.242	.15	
2.9	29.6	30.0	25.5	1.8	.0804	.090	-3.148	-1.207	-1.995	-1	6.600	-2.478	-2.234	3.539	2.423	1.355	.623	.594	2.399	.980	.20
3.7	31.4	32.4	23.9	2.3	.0852	.112	-.504	-.536	-.910	-.768	-1.138	-1.038	1.777	1.277	.734	.370	.368	1.257	.571	.25	
4.5	33.0	34.7	22.5	2.4	.0782	.135	-.073	-.058	-.072	-.041	-.076	-.088	.434	.372	.247	.200	.214	.327	.318	.30	
5.4	34.5	37.0	21.7	2.5	.0795	.157	.042	.044	.026	.050	.044	.052	.315	.303	.213	.176	.173	.331	.250	.35	
6.3	36.0	39.3	21.2	2.1	.0660	.180	.131	.127	.137	.127	.098	.118	.268	.273	.202	.183	.155	.264	.233	.40	
7.3	37.4	41.6	20.6	2.7	.0734	.202	.195	.190	.171	.168	.141	.161	.238	.260	.200	.195	.181	.256	.253	.45	
8.6	38.4	43.7	20.2	3.8	.0871	.225	.234	.221	.194	.197	.194	.208	.242	.251	.228	.216	.205	.281	.248	.50	
9.8	39.2	45.6	19.8	4.8	.1203	.247	.275	.262	.247	.245	.239	.244	.208	.226	.219	.222	.237	.310	.279	.53	
11.1	40.1	47.7	19.5	3.3	.0828	.270	.295	.286	.281	.280	.277	.273	.181	.226	.245	.246	.256	.339	.322	.60	
12.7	41.0	50.1	19.1	3.0	.0633	.292	.326	.327	.312	.315	.301	.302	.202	.248	.278	.271	.269	.336	.310	.65	
14.3	41.5	51.9	19.0	5.2	.1083	.315	.342	.343	.341	.342	.344	.353	.199	.238	.288	.287	.306	.365	.344	.70	
16.1	41.5	53.2	18.6	6.3	.1244	.337	.391	.381	.363	.361	.368	.369	.203	.256	.302	.318	.324	.360	.367	.75	
18.3	42.1	53.4	18.3	3.8	.0610	.359	.415	.406	.399	.395	.391	.399	.229	.259	.322	.312	.341	.393	.384	.80	
20.7	42.3	57.2	18.1	6.6	.1113	.382	.428	.414	.411	.425	.435	.442	.236	.285	.350	.363	.380	.403	.394	.85	
23.4	41.9	58.3	17.7	6.0	.0825	.404	.470	.460	.441	.449	.459	.467	.253	.295	.366	.373	.394	.432	.403	.90	
26.6	41.9	60.4	17.1	3.7	.0510	.427	.483	.484	.479	.478	.484	.486	.305	.324	.390	.398	.383	.423	.435	.93	
30.3	41.0	61.3	16.1	6.1	.0898	.450	.511	.503	.488	.491	.490	.508	.329	.348	.398	.412	.426	.472	.472	1.00	
34.7	42.4	68.4	16.6	-1.5	-	.0251	.450	.486	.482	.475	.478	.480	.479	.375	.381	.425	.427	.442	.465	.449	1.05
39.2	43.1	68.2	16.6	.7	.0111	.450	.476	.470	.463	.464	.468	.469	.401	.394	.438	.441	.440	.466	.454	1.10	
43.6	44.6	67.0	17.0	.4	.0080	.450	.470	.464	.461	.457	.462	.472	.407	.407	.443	.437	.440	.474	.448	1.13	
46.1	44.1	65.3	18.2	.6	.0111	.450	.473	.468	.467	.472	.470	.479	.405	.408	.434	.422	.433	.479	.438	1.20	
52.6	43.8	63.9	19.1	.1	.0023	.450	.468	.472	.467	.479	.475	.481	.401	.405	.427	.420	.430	.475	.443	1.23	
57.0	43.5	62.7	20.0	.3	.0043	.450	.467	.465	.464	.475	.469	.484	.399	.403	.430	.428	.442	.474	.444	1.30	
61.5	43.3	61.5	20.8	.7	.0107	.450	.457	.458	.458	.467	.469	.471	.407	.418	.432	.432	.439	.494	.441	1.33	
63.9	43.0	60.5	21.6	.3	.0043	.450	.463	.459	.451	.459	.458	.460	.425	.425	.429	.434	.444	.489	.450	1.40	
70.4	42.8	59.5	22.2	.6	.0089	.450	.462	.462	.453	.459	.452	.464	.421	.435	.431	.427	.442	.493	.442	1.45	
74.9	42.6	58.8	22.7	.7	.0105	.450	.462	.456	.454	.461	.457	.464	.435	.435	.426	.428	.443	.480	.442	1.50	
79.3	42.4	58.2	22.8	.3	.0047	.450	.460	.456	.451	.459	.462	.466	.437	.431	.424	.435	.436	.487	.437	1.55	
83.8	42.2	57.8	23.0	.0	.0010	.450	.452	.448	.444	.456	.460	.473	.432	.437	.434	.438	.438	.487	.445	1.60	
88.2	42.0	57.4	23.1	.1	.0018	.450	.448	.443	.439	.451	.460	.473	.432	.438	.438	.438	.442	.492	.453	1.65	
92.7	41.9	57.1	23.2	.1	.0026	.450	.444	.443	.433	.446	.454	.468	.436	.436	.437	.445	.442	.489	.469	1.70	
45.9	22.3	29.7	13.2	.0	.0007	.223	.220	.218	.216	.222	.223	.218	.218	.222	.218	.228	.215	.234	.234	1.75	
22.8	12.1	14.9	8.6	.0	.0001	.111	.103	.108	.106	.111	.111	.116	.107	.117	.107	.117	.117	.117	.117	1.80	
23.7	12.1	14.8	8.7	.0	0.0000	.111	.108	.110	.114	.110	.112	.108	.118	.118	.108	.108	.118	.118	.108	1.85	
24.7	12.0	14.7	9.7	.0	0.0000	.111	.109	.105	.110	.117	.109	.112	.116	.116	.116	.105	.116	.108	1.90		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40		
0.0	0.0	0.0	0.0	0.0	0.0000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45		

STONE, ALEXANDER, STREET, ST. AUBIN, AND WILLIAMS

D-Tables

The D-tables give the standard-deviation history of each local mean pressurant mole fraction, according to experimental set, for values of dimensionless time τ from 0.00 to 2.45 (see Appendix C for program). Each experimental set is treated in a separate D-table.

STONE, ALEXANDER, STREET, ST. AUBIN, AND WILLIAMS

Set 1, Table D — Standard Deviation of Mean Local Pressurant Fractions, Scaling Runs 230-236

LOCATIONS I														
1	2	3	4	5	6	7	8	9	10	11	12	13	TAU	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.271	.160	.051	.059	.157	.142	.203	.085	.100	.133	.096	.172	.138	.05	
.505	.297	.096	.184	.290	.264	.384	.158	.193	.245	.181	.318	.253	.10	
.380	.228	.088	.153	.219	.195	.294	.118	.169	.197	.147	.246	.197	.15	
.270	.172	.078	.125	.164	.142	.215	.078	.132	.158	.116	.186	.134	.20	
.162	.120	.076	.096	.114	.097	.145	.056	.100	.121	.094	.129	.115	.25	
.092	.084	.075	.072	.081	.069	.107	.064	.078	.095	.084	.084	.091	.30	
.084	.077	.052	.058	.075	.061	.100	.060	.072	.084	.067	.069	.081	.35	
.072	.071	.040	.042	.065	.053	.094	.061	.064	.075	.051	.059	.072	.40	
.063	.069	.032	.042	.057	.049	.089	.058	.059	.072	.040	.053	.064	.45	
.054	.061	.024	.038	.055	.056	.085	.049	.053	.071	.035	.048	.063	.50	
.052	.051	.020	.037	.055	.058	.078	.041	.050	.065	.032	.050	.067	.55	
.050	.039	.013	.027	.046	.050	.063	.032	.038	.064	.039	.056	.056	.60	
.043	.028	.014	.021	.038	.044	.060	.036	.032	.062	.047	.063	.042	.65	
.038	.025	.013	.019	.035	.042	.069	.033	.031	.032	.040	.059	.032	.70	
.035	.016	.012	.014	.030	.035	.062	.024	.032	.047	.028	.054	.040	.75	
.032	.014	.011	.013	.031	.028	.057	.025	.039	.044	.023	.049	.041	.80	
.036	.014	.013	.013	.029	.028	.056	.033	.044	.045	.028	.046	.033	.85	
.026	.026	.018	.021	.027	.038	.057	.031	.044	.057	.033	.066	.030	.90	
.032	.025	.017	.021	.029	.027	.054	.030	.031	.052	.028	.051	.040	.95	
.023	.021	.024	.021	.024	.022	.043	.028	.035	.046	.031	.044	.043	1.00	
.028	.016	.014	.013	.019	.017	.049	.029	.034	.044	.021	.043	.048	1.05	
.036	.028	.016	.018	.017	.024	.043	.028	.030	.050	.028	.045	.030	1.10	
.033	.029	.015	.013	.016	.028	.051	.031	.030	.043	.032	.052	.049	1.15	
.026	.020	.014	.011	.021	.031	.055	.035	.032	.040	.031	.043	.052	1.20	
.021	.020	.020	.021	.024	.034	.049	.027	.032	.042	.033	.050	.030	1.25	
.028	.023	.017	.022	.030	.035	.054	.037	.036	.051	.029	.053	.049	1.30	
.033	.029	.017	.022	.028	.032	.059	.035	.038	.053	.032	.055	.049	1.35	
.028	.025	.015	.020	.025	.027	.051	.026	.038	.053	.038	.043	.052	1.40	
.031	.021	.012	.013	.021	.025	.054	.031	.039	.045	.029	.042	.053	1.45	
.027	.019	.010	.010	.015	.027	.048	.021	.024	.042	.037	.049	.051	1.50	
.033	.020	.008	.012	.018	.026	.043	.026	.041	.047	.026	.054	.052	1.55	
.032	.016	.016	.013	.017	.020	.049	.028	.036	.039	.030	.047	.052	1.60	
.031	.022	.020	.022	.024	.031	.051	.031	.036	.039	.031	.039	.048	1.65	
.026	.026	.019	.026	.032	.030	.057	.036	.042	.054	.032	.046	.046	1.70	
.030	.023	.013	.022	.030	.036	.054	.030	.046	.057	.035	.043	.052	1.75	
.368	.362	.353	.361	.369	.382	.344	.343	.343	.339	.343	.342	.342	1.80	
.369	.363	.353	.362	.369	.382	.345	.342	.342	.338	.339	.344	.342	1.85	
.519	.516	.505	.520	.528	.541	.481	.480	.479	.472	.479	.482	.479	1.90	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45	

Set 2, Table D — Standard Deviation of Mean Local Pressurant Fractions, Scaling Runs 237-240

LOCATIONS 1													
1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.202	.051	.334	.047	.162	.175	.027	.081	.083	.043	.034	.474	.078	.05
.348	.093	.591	.093	.280	.303	.050	.137	.145	.076	.068	.822	.149	.10
.304	.091	.345	.079	.255	.278	.049	.109	.122	.061	.069	.695	.152	.15
.254	.086	.479	.055	.231	.254	.048	.080	.093	.039	.067	.554	.146	.20
.203	.083	.421	.035	.211	.234	.048	.060	.071	.026	.059	.446	.142	.25
.166	.076	.372	.026	.191	.209	.050	.047	.053	.017	.053	.375	.134	.30
.152	.062	.339	.028	.172	.180	.043	.043	.050	.024	.074	.377	.122	.35
.151	.072	.307	.033	.152	.156	.038	.039	.041	.036	.093	.374	.120	.40
.157	.086	.283	.043	.139	.152	.031	.040	.029	.039	.102	.364	.128	.45
.160	.051	.273	.044	.137	.150	.026	.046	.018	.023	.055	.342	.137	.50
.156	.020	.263	.052	.139	.147	.025	.050	.028	.011	.043	.330	.133	.55
.137	.032	.244	.046	.125	.130	.025	.037	.039	.017	.054	.298	.145	.60
.131	.034	.232	.036	.110	.119	.023	.034	.044	.024	.058	.281	.154	.65
.133	.021	.226	.014	.109	.118	.028	.045	.043	.014	.048	.279	.141	.70
.120	.015	.239	.010	.105	.090	.023	.055	.036	.021	.052	.281	.087	.75
.107	.035	.249	.021	.088	.087	.021	.074	.044	.021	.052	.269	.087	.80
.099	.042	.221	.032	.086	.099	.036	.058	.041	.024	.043	.246	.062	.85
.105	.024	.217	.034	.101	.096	.028	.031	.042	.023	.047	.233	.081	.90
.084	.035	.200	.014	.080	.099	.025	.030	.025	.008	.035	.214	.062	.95
.093	.080	.315	.073	.072	.084	.018	.036	.060	.057	.021	.134	.081	1.00
.077	.036	.137	.033	.071	.073	.023	.030	.034	.041	.038	.104	.121	1.05
.070	.018	.144	.014	.068	.071	.023	.006	.021	.031	.043	.173	.065	1.10
.071	.023	.156	.013	.060	.067	.015	.016	.021	.020	.029	.193	.063	1.15
.069	.031	.157	.015	.048	.068	.009	.025	.025	.019	.033	.179	.063	1.20
.071	.020	.155	.010	.058	.070	.029	.017	.016	.017	.036	.179	.041	1.25
.070	.019	.157	.012	.058	.063	.028	.019	.027	.021	.047	.153	.049	1.30
.067	.018	.159	.012	.062	.060	.028	.022	.015	.012	.043	.170	.053	1.35
.064	.021	.168	.012	.067	.071	.024	.027	.020	.012	.049	.173	.056	1.40
.064	.028	.174	.014	.073	.072	.027	.025	.016	.012	.036	.177	.051	1.45
.071	.025	.168	.010	.067	.075	.023	.027	.008	.015	.039	.182	.040	1.50
.064	.021	.167	.015	.064	.069	.020	.040	.014	.013	.040	.182	.052	1.55
.071	.022	.175	.023	.064	.073	.013	.034	.018	.007	.037	.196	.051	1.60
.572	.494	.471	.501	.567	.578	.470	.502	.476	.464	.455	.483	.430	1.65
.579	.493	.465	.496	.564	.580	.468	.500	.474	.462	.464	.481	.459	1.70
.543	.429	.282	.426	.509	.531	.397	.452	.409	.386	.364	.404	.354	1.75
.542	.430	.279	.428	.511	.531	.393	.448	.412	.382	.360	.423	.349	1.80
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.85
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.90
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

STONE, ALEXANDER, STREET, ST. AUBIN, AND WILLIAMS

Set 3, Table D — Standard Deviation of Mean Local Pressurant Fractions, Scaling Runs 241-244

LOCATIONS I														
1	2	3	4	5	6	7	8	9	10	11	12	13	TRU	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.461	.297	.055	.232	.409	.519	.171	.210	.487	.496	.194	.303	.176	.05	
2.345	2.254	1.930	1.717	2.446	3.016	1.969	1.949	1.975	1.990	1.418	2.497	1.980	.10	
2.737	2.643	2.292	2.031	2.895	3.524	2.310	2.305	2.298	2.330	1.696	2.944	2.339	.15	
1.457	1.321	1.268	1.266	1.346	1.313	1.769	1.004	.718	1.425	.719	1.347	1.006	.20	
1.243	1.133	1.090	1.087	1.175	1.213	1.558	.874	.561	1.158	.624	1.267	.903	.25	
.141	.138	.163	.138	.137	.202	.271	.098	.015	.063	.089	.294	.112	.30	
.086	.114	.118	.082	.100	.103	.035	.065	.082	.095	.114	.177	.052	.35	
.049	.036	.017	.014	.022	.020	.063	.078	.041	.038	.036	.097	.036	.40	
.082	.051	.039	.031	.022	.032	.051	.061	.051	.035	.061	.039	.058	.45	
.059	.016	.020	.042	.045	.018	.016	.039	.039	.025	.018	.059	.045	.50	
.017	.031	.043	.042	.043	.027	.027	.030	.014	.007	.026	.082	.048	.55	
.017	.014	.036	.025	.011	.045	.052	.024	.039	.018	.028	.044	.044	.60	
.040	.028	.031	.037	.039	.023	.095	.062	.012	.021	.040	.031	.033	.65	
.029	.040	.030	.032	.040	.007	.092	.075	.011	.028	.025	.049	.023	.70	
.056	.037	.044	.043	.031	.047	.040	.026	.027	.041	.043	.069	.023	.75	
.031	.029	.019	.054	.017	.024	.020	.020	.026	.047	.037	.021	.049	.80	
.036	.032	.035	.043	.041	.040	.018	.040	.046	.058	.049	.045	.048	.85	
.054	.026	.020	.022	.039	.045	.018	.038	.026	.014	.018	.030	.010	.90	
.021	.021	.031	.024	.049	.063	.038	.039	.031	.018	.022	.076	.057	.95	
.029	.024	.020	.016	.025	.045	.045	.020	.052	.031	.027	.044	.047	1.00	
.019	.022	.021	.007	.008	.018	.025	.047	.029	.016	.024	.013	.030	1.05	
.027	.009	.019	.017	.013	.014	.019	.050	.018	.035	.029	.024	.009	1.10	
.005	.008	.017	.006	.010	.006	.027	.042	.011	.024	.014	.018	.012	1.15	
.018	.016	.008	.018	.022	.022	.028	.041	.032	.028	.035	.037	.017	1.20	
.010	.006	.017	.034	.032	.028	.044	.027	.056	.047	.029	.018	.024	1.25	
.022	.011	.020	.038	.043	.039	.038	.024	.068	.045	.044	.030	.017	1.30	
.027	.026	.017	.032	.033	.038	.023	.030	.051	.060	.062	.019	.033	1.35	
.039	.034	.020	.019	.019	.028	.027	.026	.037	.034	.034	.038	.043	1.40	
.030	.017	.020	.025	.036	.020	.021	.028	.021	.025	.036	.034	.054	1.45	
.048	.026	.024	.025	.019	.018	.042	.021	.026	.032	.050	.033	.053	1.50	
.023	.012	.009	.018	.023	.018	.024	.033	.044	.046	.028	.066	.039	1.55	
.015	.015	.012	.038	.024	.023	.029	.040	.052	.025	.031	.051	.042	1.60	
.015	.007	.007	.031	.022	.027	.030	.013	.029	.029	.029	.032	.057	1.65	
.020	.014	.012	.021	.027	.019	.008	.019	.042	.016	.041	.035	.052	1.70	
.010	.013	.030	.013	.006	.021	.016	.028	.035	.009	.009	.034	.063	1.75	
.500	.505	.506	.508	.501	.503	.502	.502	.494	.489	.506	.501	.500	1.80	
.499	.503	.502	.507	.495	.499	.495	.495	.495	.507	.501	.532	.495	1.85	
.497	.500	.503	.509	.497	.499	.493	.493	.493	.505	.505	.536	.493	1.90	
.430	.430	.435	.439	.437	.442	.432	.432	.432	.432	.453	.432	.432	1.95	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45	

Set 4, Table D — Standard Deviation of Mean Local Pressurant Fractions, Scaling Runs 245-248

LOCATIONS I														
1	2	3	4	5	6	7	8	9	10	11	12	13	TAU	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.251	.150	.202	.132	.158	.185	.156	.151	.158	.215	.122	.165	.164	.05	
1.257	.955	.655	.621	.926	1.127	1.103	.938	.592	.845	.448	.894	.716	.10	
3.208	3.014	3.441	2.905	4.132	3.890	5.483	3.670	2.161	1.515	1.534	3.841	2.452	.15	
11.231	11.012	12.643	10.747	15.074	13.098	20.263	13.954	7.671	5.018	5.062	21.400	6.702	.20	
5.498	5.357	6.103	5.189	7.248	6.629	9.751	6.689	3.702	2.535	2.563	6.714	4.174	.25	
.242	.240	.266	.205	.233	.250	.447	.282	.095	.108	.101	.323	.267	.30	
.166	.100	.193	.112	.111	.067	.202	.183	.078	.075	.061	.232	.219	.35	
.109	.102	.061	.036	.072	.064	.096	.126	.076	.060	.082	.185	.190	.40	
.097	.075	.083	.049	.060	.069	.096	.104	.041	.059	.041	.106	.121	.45	
.080	.046	.062	.033	.039	.044	.057	.068	.055	.063	.027	.040	.083	.50	
.045	.026	.044	.024	.029	.030	.070	.021	.011	.009	.042	.032	.031	.55	
.040	.034	.019	.005	.046	.077	.089	.069	.031	.032	.040	.085	.050	.60	
.049	.047	.015	.013	.029	.035	.054	.064	.030	.042	.060	.014	.023	.65	
.020	.022	.046	.044	.026	.016	.022	.055	.057	.043	.011	.076	.051	.70	
.032	.041	.042	.017	.027	.026	.103	.093	.012	.035	.047	.023	.056	.75	
.036	.032	.030	.028	.060	.044	.079	.065	.067	.030	.052	.020	.020	.80	
.045	.060	.062	.057	.057	.057	.073	.051	.041	.035	.031	.051	.050	.85	
.021	.025	.040	.025	.023	.031	.109	.078	.038	.048	.025	.029	.038	.90	
.033	.032	.033	.019	.022	.024	.073	.057	.041	.022	.037	.054	.025	.95	
.043	.035	.030	.047	.024	.020	.046	.051	.061	.053	.038	.043	.060	1.00	
.033	.025	.024	.032	.027	.028	.030	.012	.004	.008	.007	.003	.013	1.05	
.029	.024	.026	.011	.021	.020	.006	.018	.022	.023	.030	.035	.019	1.10	
.032	.029	.037	.031	.032	.039	.011	.027	.040	.042	.035	.033	.024	1.15	
.038	.037	.027	.040	.038	.048	.025	.020	.045	.057	.038	.040	.025	1.20	
.035	.031	.015	.035	.045	.043	.020	.029	.053	.039	.018	.040	.034	1.25	
.042	.027	.011	.018	.018	.042	.023	.020	.015	.032	.019	.022	.029	1.30	
.036	.021	.010	.019	.020	.027	.025	.022	.015	.015	.021	.051	.030	1.35	
.024	.022	.006	.018	.008	.025	.027	.008	.016	.017	.039	.072	.028	1.40	
.015	.031	.017	.018	.020	.025	.018	.029	.021	.027	.045	.058	.030	1.45	
.016	.011	.019	.021	.010	.028	.031	.031	.041	.047	.049	.032	.014	1.50	
.029	.018	.011	.019	.027	.026	.020	.035	.048	.052	.040	.029	.030	1.55	
.025	.010	.012	.015	.017	.031	.012	.024	.037	.023	.015	.051	.021	1.60	
.019	.010	.016	.007	.017	.021	.017	.028	.024	.024	.019	.056	.015	1.65	
.012	.011	.019	.012	.006	.023	.021	.021	.027	.012	.025	.052	.035	1.70	
.489	.486	.481	.494	.497	.511	.487	.495	.487	.508	.479	.521	.521	1.75	
.419	.415	.407	.427	.427	.446	.411	.450	.412	.449	.411	.450	.450	1.80	
.414	.422	.418	.440	.426	.433	.414	.454	.454	.416	.414	.454	.416	1.85	
.419	.421	.425	.449	.421	.432	.445	.445	.445	.405	.405	.445	.414	1.90	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45	

E-Tables

These tables give the local mean pressurant fraction deviations for dimensionless-time values 0.00 to 2.45. By pressurant-fraction deviation, we mean the ratio of the difference between the local pressurant and the mean pressurant fraction at time t to the mean pressurant fraction at the time of valve closure, $t = t_c$. As in the D-tables, these values are given at equal intervals of dimensionless time τ (see Appendix C for program).

Set 1, Table E — Deviations of Mean Local Pressurant Fractions,
Scaling Runs 230-236

LOCATIONS 1														TAU
1	2	3	4	5	6	7	8	9	10	11	12	13		
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
- .278	- .163	- .003	- .067	- .175	- .170	.221	.067	.051	.144	.053	.179	.137	.05	
- .329	- .315	- .008	- .127	- .333	- .325	.425	.127	.100	.277	.103	.340	.260	.10	
- .458	- .284	- .033	- .126	- .304	- .285	.382	.118	.102	.261	.087	.306	.229	.15	
- .343	- .227	- .062	- .117	- .238	- .193	.297	.112	.093	.217	.066	.226	.169	.20	
- .227	- .168	- .090	- .107	- .170	- .102	.208	.102	.085	.173	.044	.146	.109	.25	
- .138	- .122	- .108	- .096	- .115	- .029	.135	.101	.076	.137	.029	.078	.061	.30	
- .117	- .111	- .111	- .087	- .096	- .011	.115	.096	.072	.121	.030	.056	.044	.35	
- .100	- .103	- .114	- .075	- .081	- .001	.102	.088	.070	.105	.033	.045	.033	.40	
- .083	- .090	- .110	- .066	- .068	- .008	.086	.080	.066	.086	.032	.037	.024	.45	
- .066	- .070	- .098	- .060	- .057	- .012	.061	.061	.055	.068	.028	.040	.028	.50	
- .047	- .054	- .085	- .055	- .045	- .013	.039	.041	.043	.053	.023	.041	.031	.55	
- .027	- .038	- .067	- .043	- .027	- .028	.016	.022	.026	.042	.019	.035	.011	.60	
- .007	- .021	- .050	- .026	- .007	- .042	- .012	.011	.012	.026	.013	.024	- .007	.65	
- .002	- .013	- .038	- .010	- .009	- .055	- .023	.008	.010	.008	- .000	.004	- .016	.70	
.006	- .007	- .035	- .004	- .017	- .061	- .022	.003	.007	.002	.001	.002	- .024	.75	
.016	.003	- .039	- .006	- .017	- .061	- .023	- .005	- .001	.005	.002	.004	- .030	.80	
.026	.010	- .038	- .012	- .013	- .059	- .028	- .001	.009	.007	.010	- .007	- .047	.85	
.017	.008	- .023	- .003	- .019	- .064	- .039	- .008	- .003	- .005	.002	- .004	- .042	.90	
.026	.011	- .031	- .008	- .019	- .066	- .026	- .009	.006	- .014	- .003	- .009	- .044	.95	
.040	.013	- .029	- .001	- .028	- .069	- .023	- .005	.001	- .011	- .017	- .013	- .042	1.00	
.044	.027	- .013	.010	- .039	- .080	- .027	- .017	- .017	- .027	- .025	- .028	- .043	1.05	
.047	.034	- .001	.018	- .051	- .081	- .032	- .018	- .019	- .034	- .031	- .039	- .053	1.10	
.048	.031	.002	.020	- .054	- .088	- .025	- .021	- .022	- .034	- .039	- .045	- .053	1.15	
.060	.042	.007	.031	- .057	- .086	- .032	- .023	- .032	- .046	- .042	- .053	- .050	1.20	
.060	.045	.011	.028	- .054	- .087	- .033	- .029	- .030	- .048	- .040	- .051	- .049	1.25	
.061	.042	.010	.028	- .048	- .084	- .040	- .030	- .031	- .040	- .044	- .042	- .041	1.30	
.060	.039	.005	.026	- .048	- .081	- .042	- .028	- .032	- .043	- .036	- .041	- .031	1.35	
.062	.041	.003	.024	- .050	- .086	- .034	- .025	- .039	- .051	- .039	- .041	- .034	1.40	
.059	.039	.003	.025	- .044	- .081	- .033	- .023	- .025	- .043	- .043	- .038	- .041	1.45	
.053	.032	- .002	.020	- .040	- .084	- .029	- .019	- .025	- .044	- .039	- .032	- .034	1.50	
.051	.029	- .003	.018	- .040	- .079	- .032	- .015	- .023	- .042	- .032	- .030	- .037	1.55	
.047	.026	- .006	.019	- .044	- .080	- .025	- .019	- .020	- .035	- .037	- .030	- .041	1.60	
.047	.029	- .002	.021	- .048	- .081	- .027	- .015	- .016	- .042	- .040	- .034	- .046	1.65	
.050	.031	- .003	.021	- .050	- .086	- .026	- .017	- .023	- .043	- .043	- .031	- .049	1.70	
.055	.031	- .002	.025	- .057	- .097	- .029	- .022	- .035	- .050	- .040	- .036	- .047	1.75	
.037	.021	- .000	.018	- .040	- .071	- .021	- .026	- .026	- .034	- .025	- .026	- .029	1.80	
.038	.025	.002	.021	- .039	- .071	- .020	- .026	- .028	- .037	- .032	- .021	- .028	1.85	
.017	.015	.006	.018	- .026	- .037	- .015	- .016	- .017	- .023	- .017	- .010	- .017	1.90	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45	

7 CASES

Set 2, Table E — Deviations of Mean Local Pressurant Fractions,
Scaling Runs 237-240

LOCATIONS I													
1	2	3	4	5	6	7	8	9	10	11	12	13	TRU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
- .303	- .095	.542	- .047	- .213	- .213	- .034	- .135	- .143	- .079	- .016	.644	.104	.03
- .570	- .183	1.019	- .090	.395	- .395	- .065	- .253	- .273	- .148	- .034	1.200	.197	.10
- .549	- .194	1.013	- .103	- .384	- .376	- .082	- .252	- .275	- .162	- .063	1.227	.200	.15
- .496	- .194	.946	- .114	- .353	- .336	- .098	- .237	- .260	- .166	- .095	1.210	.187	.20
- .444	- .194	.873	- .113	- .319	- .293	- .114	- .216	- .241	- .165	- .119	1.164	.177	.35
- .405	- .191	.810	- .112	- .284	- .247	- .130	- .196	- .228	- .170	- .138	1.134	.163	.30
- .406	- .185	.793	- .107	- .260	- .214	- .154	- .194	- .235	- .187	- .132	1.141	.140	.35
- .399	- .172	.775	- .109	- .237	- .181	- .178	- .191	- .245	- .208	- .119	1.151	.108	.40
- .385	- .145	.767	- .120	- .221	- .158	- .201	- .194	- .257	- .226	- .097	1.160	.066	.45
- .357	- .086	.782	- .138	- .210	- .140	- .219	- .201	- .271	- .245	- .110	1.166	.025	.50
- .335	- .040	.796	- .147	- .197	- .125	- .235	- .209	- .271	- .253	- .142	1.162	- .006	.55
- .315	- .070	.812	- .138	- .166	- .103	- .240	- .202	- .270	- .254	- .157	1.138	- .033	.60
- .300	- .105	.823	- .135	- .143	- .086	- .234	- .194	- .274	- .261	- .157	1.117	- .049	.65
- .285	- .121	.818	- .156	- .151	- .092	- .224	- .200	- .266	- .263	- .150	1.085	.001	.70
- .266	- .121	.803	- .176	- .163	- .110	- .196	- .194	- .259	- .239	- .125	1.060	.002	.75
- .245	- .131	.794	- .181	- .184	- .131	- .169	- .171	- .233	- .249	- .090	1.044	- .039	.80
- .227	- .092	.765	- .186	- .156	- .063	- .179	- .183	- .233	- .233	- .110	1.017	- .093	.85
- .218	- .102	.754	- .172	- .126	- .049	- .200	- .158	- .222	- .218	- .112	.987	- .167	.90
- .198	- .122	.717	- .167	- .110	- .064	- .180	- .156	- .216	- .219	- .088	.934	- .147	.95
- .070	- .024	.342	- .100	- .061	- .038	- .148	- .115	- .162	- .172	- .060	.633	- .023	1.00
.023	- .021	- .009	- .066	.013	.052	- .066	- .033	- .067	- .067	- .045	.300	- .006	1.05
.061	- .011	- .041	- .030	.053	.094	- .058	- .017	- .046	- .057	- .061	.181	- .063	1.10
.076	- .003	- .058	- .019	.067	.100	- .056	- .022	- .051	- .056	- .055	.172	- .088	1.15
.084	.001	- .063	- .007	.082	.110	- .061	- .016	- .056	- .071	- .075	.167	- .091	1.20
.084	- .001	- .067	- .006	.082	.114	- .051	- .013	- .049	- .064	- .066	.139	- .097	1.25
.088	- .003	- .074	- .010	.074	.108	- .048	- .007	- .048	- .061	- .067	.152	- .097	1.30
.083	- .008	- .082	- .018	.070	.101	- .044	- .002	- .032	- .057	- .072	.148	- .086	1.35
.090	- .001	- .073	- .013	.082	.109	- .057	- .014	- .045	- .037	- .070	.139	- .088	1.40
.091	.003	- .067	- .009	.080	.110	- .061	- .021	- .052	- .064	- .063	.149	- .088	1.45
.091	- .004	- .080	- .014	.077	.111	- .049	- .022	- .046	- .069	- .067	.156	- .084	1.50
.098	- .001	- .071	- .004	.074	.111	- .061	- .011	- .060	- .072	- .072	.154	- .080	1.55
.093	.001	- .064	.001	.079	.106	- .053	.001	- .070	- .083	- .082	.163	- .087	1.60
.074	- .001	- .052	.005	.071	.081	- .025	.005	- .019	- .032	- .041	.013	- .048	1.65
.080	- .003	- .057	.001	.067	.083	- .028	.003	- .021	- .034	- .034	.013	- .040	1.70
.070	.004	- .081	.002	.050	.063	- .014	.017	- .008	- .021	- .033	.010	- .039	1.75
.069	.005	- .083	.003	.052	.063	- .017	.015	- .006	- .023	- .036	.001	- .042	1.80
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.85
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.90
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45

4 CASES

Set 3, Table E — Deviations of Mean Local Pressurant Fractions,
Scaling Runs 241-244

LOCATIONS I													
1	2	3	4	5	6	7	8	9	10	11	12	13	TAU
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.757	.485	-.065	.214	.508	.793	-.356	-.251	-.499	-.484	-.293	-.455	-.360	.05
-1.867	-1.799	-1.735	-1.486	-2.009	-2.329	1.705	1.763	1.445	1.508	1.088	2.049	1.669	.10
-2.544	-2.339	-2.008	-1.846	-2.591	-3.092	2.195	2.183	1.902	1.989	1.401	2.622	2.124	.15
-1.487	-1.349	-1.251	-1.252	-1.472	-1.540	1.671	1.161	.780	1.332	.747	1.495	1.139	.20
-1.035	-.925	-.873	-.891	-1.002	-1.045	1.227	-.816	.513	.887	.494	1.074	.760	.25
-.263	-.243	-.234	-.252	-.275	-.331	.332	.241	.147	.174	.125	.402	.187	.30
-.110	-.153	-.147	-.147	-.186	-.211	.094	.113	.146	.130	.090	.273	.107	.35
-.024	-.060	-.055	-.084	-.121	.024	.027	.045	.035	.002	.184	.100	.40	
.018	-.004	-.016	-.018	-.025	-.052	-.024	-.011	-.011	.013	-.042	.107	.062	.45
.045	.016	-.006	-.033	-.029	-.027	-.065	-.016	-.004	-.006	-.027	.104	.040	.50
.022	.019	-.003	-.008	.004	.006	-.098	-.045	-.012	-.017	-.029	.115	.044	.55
.025	.021	.008	.017	.019	.036	-.138	-.074	-.001	-.027	-.032	.098	.042	.60
.045	.022	.013	.032	.035	.078	-.201	-.081	-.021	-.021	-.042	.090	.037	.65
.063	.063	.051	.062	.057	.011	-.177	-.120	-.027	-.025	-.034	.053	.016	.70
.081	.055	.043	.018	.015	.011	-.182	-.141	-.012	.013	-.028	.099	.032	.75
.076	.064	.045	.023	.044	.021	-.212	-.153	-.008	-.027	-.029	.110	.045	.80
.056	.060	.053	.068	.076	.065	-.230	-.144	-.039	-.031	-.045	.076	.038	.85
.073	.055	.034	.028	.007	-.006	-.223	-.107	.004	-.003	-.007	.083	.047	.90
.051	.042	.026	.036	.032	.046	-.203	-.151	.003	-.009	-.011	.095	.055	.95
.095	.077	.051	.069	.077	.078	-.171	-.166	-.018	-.042	-.054	.015	-.016	1.00
.071	.054	.033	.023	.030	.041	-.154	-.109	-.002	-.014	-.017	.044	-.003	1.05
.028	.012	.014	.017	.030	.032	-.129	-.104	.013	.001	-.006	.059	.019	1.10
.024	.015	.014	.027	.030	.048	-.118	-.101	-.001	-.004	-.003	.053	-.003	1.15
.030	.019	.008	.021	.027	.057	-.088	-.089	-.004	-.010	-.014	.054	-.016	1.20
.033	.028	.019	.032	.022	.033	-.090	-.065	-.027	-.039	-.013	.060	.001	1.25
.036	.029	.023	.039	.025	.029	-.092	-.063	-.033	-.027	-.023	.079	-.029	1.30
.040	.028	.020	.023	.013	.025	-.083	-.026	-.029	-.021	-.029	.071	-.032	1.35
.034	.026	.011	.028	.028	.034	-.076	-.057	-.038	-.024	-.016	.074	-.030	1.40
.034	.029	.024	.038	.035	.048	-.084	-.073	-.038	-.034	-.015	.057	-.028	1.45
.035	.029	.021	.033	.028	.047	-.069	-.033	-.057	-.034	-.011	.032	-.027	1.50
.014	.004	-.003	.018	.021	.027	-.032	-.022	-.048	-.043	-.003	.074	-.020	1.55
.004	.015	.002	.022	.004	.018	-.041	-.027	-.052	-.014	-.002	.093	-.028	1.60
.010	.011	-.003	.016	.003	.016	-.030	-.014	-.028	-.028	-.028	.098	-.028	1.65
.004	.003	.003	.016	.008	.012	-.014	-.003	-.028	-.024	-.016	.080	-.044	1.70
.007	.006	-.007	.017	.005	.017	-.022	-.010	-.008	-.008	-.008	.058	-.049	1.75
-.002	.003	.004	.006	-.001	.001	.000	.000	.000	-.008	-.012	.006	-.001	1.80
.003	.002	0.000	.005	-.007	-.003	-.007	-.007	-.007	-.005	-.001	.030	-.007	1.85
-.004	-.002	-.002	-.007	-.004	-.003	-.009	-.009	-.009	-.003	-.003	.034	-.009	1.90
-.003	-.003	-.001	.002	.001	.003	-.002	-.002	-.002	-.002	-.010	-.002	1.95	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45	

4 CASES

Set 4, Table E — Deviations of Mean Local Pressurant Fractions,
Scaling Runs 245-248

LOCATIONS I														
1	2	3	4	5	6	7	8	9	10	11	12	13	TRU	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
.690	.512	.305	.304	.483	.608	.598	.349	.389	.413	.331	.436	.379	.05	
.697	.596	.615	.343	.544	.592	.697	.562	.498	.530	.134	.509	.450	.10	
-.526	-.567	-.950	-.968	-1.398	-1.249	1.934	1.178	.528	.043	.349	1.245	.389	.15	
-2.755	-2.887	-4.638	-3.938	-5.712	-5.172	7.674	5.191	2.813	1.185	1.122	5.136	1.981	.20	
-1.370	-1.442	-2.275	-1.959	-2.781	-2.558	3.704	2.591	1.382	.573	.570	2.546	1.020	.25	
-.464	-.430	-.459	-.392	-.470	-.436	.665	.528	.250	.145	.176	.539	.407	.30	
-.256	-.209	-.292	-.221	-.253	-.235	.350	.325	.123	.041	.034	.385	.205	.35	
-.108	-.116	-.096	-.116	-.182	-.137	.195	.207	.048	.007	-.056	.231	.118	.40	
-.017	-.028	-.069	-.077	-.137	-.092	.123	.128	-.005	-.017	-.048	.120	.113	.45	
.020	-.009	-.068	-.061	-.068	-.037	.039	.057	.007	-.019	-.044	.123	.053	.50	
.061	.032	0.000	-.004	-.019	-.007	-.067	-.048	-.063	-.055	-.023	.138	.070	.55	
.055	.036	.025	.023	.017	.007	-.197	-.098	-.055	-.053	-.031	.155	.115	.60	
.075	.078	.043	.051	.019	.023	-.201	-.098	-.032	-.047	-.051	.097	.039	.65	
.061	.062	.059	.061	.065	.086	-.257	-.171	-.060	-.061	-.018	.112	.066	.70	
.121	.098	.058	.053	.068	.061	-.299	-.181	-.078	-.043	-.029	.093	.067	.75	
.123	.104	.087	.078	.071	.066	-.291	-.224	-.062	-.041	-.044	.074	.055	.80	
.102	.071	.068	.095	.118	.132	-.326	-.215	-.071	-.043	-.004	.046	.026	.85	
.145	.123	.081	.100	.122	.138	-.336	-.242	-.086	-.070	-.022	.061	-.003	.90	
.123	.125	.116	.113	.127	.131	-.272	-.230	-.084	-.065	-.098	-.009	.017	.95	
.136	.120	.085	.092	.090	.130	-.269	-.226	-.115	-.085	-.053	.044	.051	1.00	
.080	.072	.058	.062	.067	.065	-.166	-.152	-.054	-.050	-.016	.034	-.002	1.05	
.058	.046	.029	.032	.040	.044	-.107	-.123	-.026	-.020	-.022	.037	-.009	1.10	
.046	.033	.027	.017	.028	.049	-.096	-.096	-.014	-.027	-.021	.053	-.003	1.15	
.052	.041	.038	.050	.045	.065	-.100	-.093	-.035	-.061	-.037	.065	-.026	1.20	
.042	.050	.038	.065	.057	.071	-.107	-.099	-.050	-.056	-.043	.056	-.016	1.25	
.039	.033	.031	.057	.043	.076	-.112	-.104	-.044	-.047	-.017	.055	-.013	1.30	
.017	.018	.019	.039	.043	.048	-.095	-.071	-.038	-.038	-.023	.098	-.019	1.35	
.030	.020	.002	.020	.019	.023	-.055	-.056	-.046	-.034	-.012	.082	-.001	1.40	
.028	.028	.012	.021	.007	.031	-.063	-.033	-.041	-.051	-.018	.096	-.017	1.45	
.028	.014	.009	.026	.017	.031	-.033	-.033	-.052	-.048	-.015	.069	-.016	1.50	
.023	.015	.002	.022	.028	.037	-.027	-.041	-.056	-.033	-.025	.083	-.027	1.55	
.006	-.003	-.012	.013	.023	.052	-.039	-.027	-.035	-.025	-.026	.082	-.011	1.60	
-.004	-.013	-.023	.002	.022	.052	-.039	-.027	-.026	-.026	-.026	.095	-.012	1.65	
-.013	-.014	-.037	-.008	.009	.042	-.029	-.029	.028	-.010	-.017	.088	-.043	1.70	
-.007	-.011	-.016	-.002	0.000	.014	-.011	-.003	.011	-.011	-.018	.024	-.024	1.75	
-.006	-.008	-.012	-.001	-.001	.010	-.010	-.012	-.009	-.012	-.010	.012	-.012	1.80	
-.008	-.004	-.006	.007	-.002	.003	-.008	.014	.014	-.007	-.008	.014	-.007	1.85	
-.006	-.004	-.002	.012	-.004	.002	-.009	.009	-.009	-.014	-.014	.009	-.008	1.90	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.95	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.00	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.05	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.10	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.15	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.20	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.25	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.30	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.35	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.40	
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.45	

4 CASES

DISCUSSION

For convenience of discussion, we have plotted in Figs. 6 through 9 typical data from the four sets of experiments described in Table 1. Mean local pressurant fractions for selected I locations, \bar{X}_I are plotted vs dimensionless times τ . From scale-modeling considerations [2], values of τ are defined for the pressurization period as follows:

$$\tau = \bar{X}/\bar{X}_c \quad (t < t_c)$$

and

$$\tau - 1 = (t - t_c)/\theta_c \quad (t > t_c),$$

where t_c is the time of valve closure, $\bar{X} = \bar{X}_c$ when $t = t_c$, and

$$\theta_c = -[\ln(1 - \bar{X})/dt]_{t=t_c}^{-1}.$$

Typical error bars are given in Figs. 6 to 9 for I location number 8; they show ± 1 standard deviation. In general, these data are statistically meaningless for low values of τ , below 0.5 or 0.6. We attribute this condition at the beginning of each experimental run to the time required for control valves to open (about 2 s) and for flows to become quasi-steady. The analysis that infers local pressurant history from measured local temperature history, called the thermal method [2], assumes quasi-steady flow conditions. Response times for the bare-wire thermocouples, 0.1 mm in diameter, are conservatively 0.2 s or less; bead diameters are 2 to 2.5 times the wire diameter. Thus, these results represent engineering approximations, average values that show no turbulent structure. Even so, the data imply that the gases mix rapidly and that no pockets with large excesses of oxygen or nitrogen gas exist for any appreciable time period.

In Fig. 6, we show typical local mean pressurant mole fractions at three I -locations for experimental set 1, which had seven replicate runs. The solid line represents perfect mixing; at $\tau = 1.0$, $t = t_c$. With pressurant delivered from three 32.79-mm nozzles at Mach-1 velocities, mixing is almost instantaneous when there are no flow obstacles. These I -locations are off center, 0.6 of the distance to the

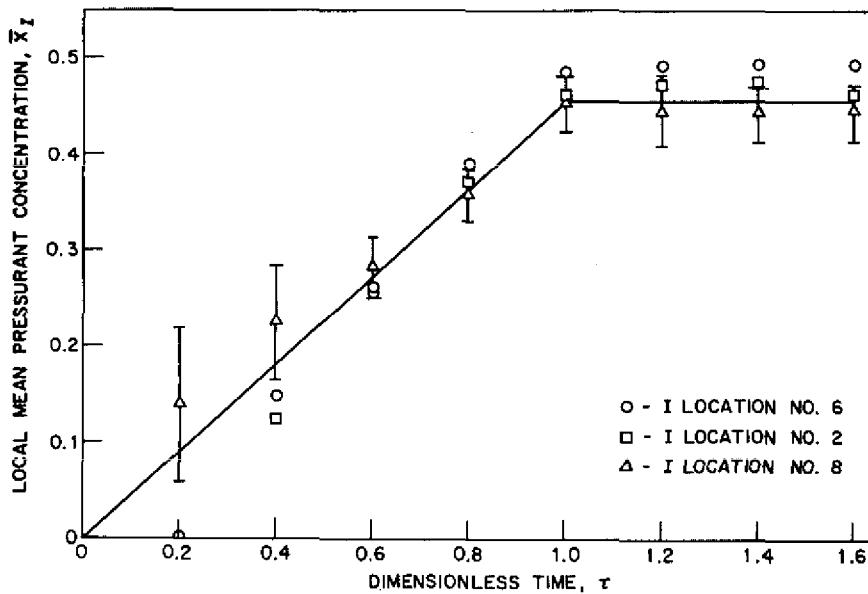


Fig. 6 — Local mean pressurant concentration (mole fraction) vs dimensionless time for three I locations of experimental set 1, off-center thermocouple-array position 1 with three nozzles and no flow obstacle

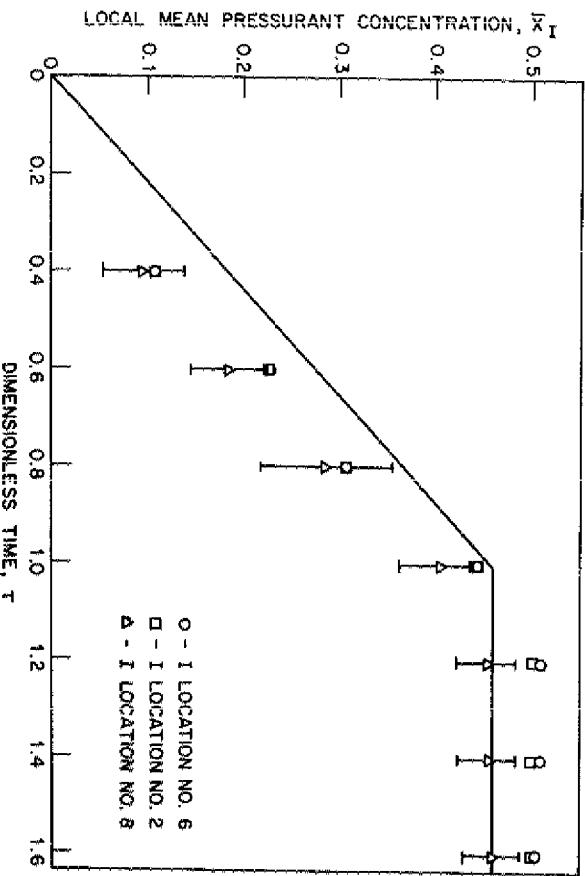


Fig. 7 - Local mean pressurant concentration (mole fraction) vs dimensionless time for three I locations of experimental set 2, chamber-centerline thermocouple-array position 2, with three nozzles and no flow obstacle

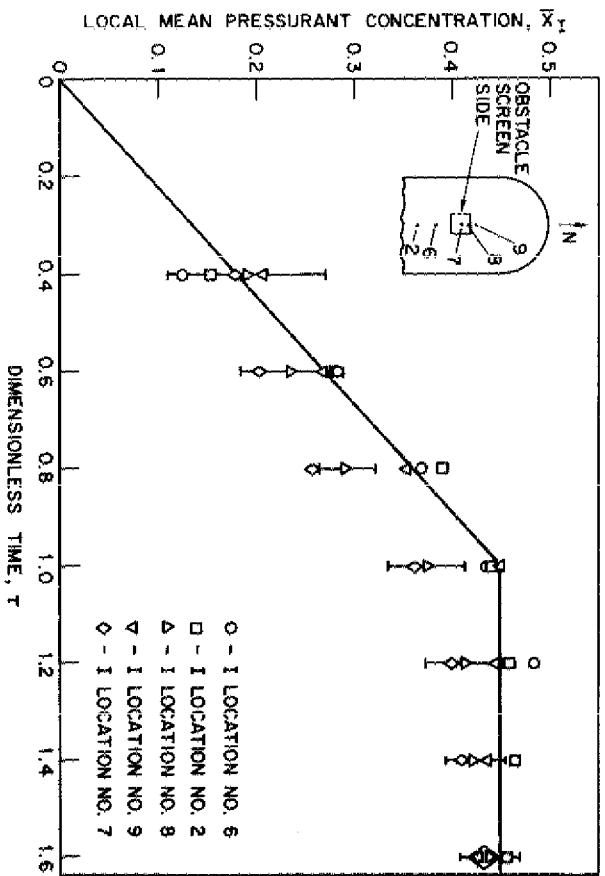


Fig. 8 - Local mean pressurant concentration (mole fraction) vs dimensionless time for five I locations of experimental set 3, centerline thermocouple-array position 2, with the south nozzle and flow obstacle, screen side facing west.

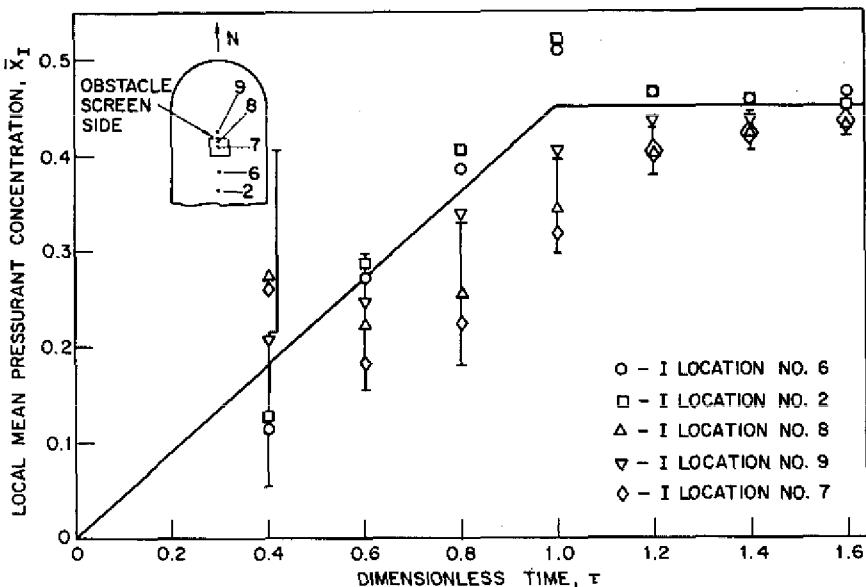


Fig. 9 — Local mean pressurant concentration (mole fraction) vs dimensionless time for five I locations of experimental set 4, centerline thermocouple-array position 2, with the south nozzle and flow obstacle, screen side facing north.

chamber wall. Figure 7 shows the same experimental conditions, but the I -locations are along the chamber centerline. Notice that mixing is less rapid here, and 1.2 injection times pass before complete mixing is indicated. These data represent set 2, which had four replicate runs. Although pressurant deficiencies were small, they were statistically significant. These centerline I -locations were not beneath any of the three nozzles, where pressurant concentrations are high.

Experimental sets 3 and 4 were performed with a flow obstacle; Figs. 8 and 9, respectively, show typical data for them. The obstacle was a cabinetlike enclosure with top, bottom, and three sides closed; the fourth side was covered with a screen wire. As the sketches in Figs. 8 and 9 show, I -locations 7 and 8 are inside the obstacle and I -location 9 is directly behind the obstacle (see Fig. 5), relative to the south-nozzle location. Pressurant was injected only from the south nozzle in sets 3 and 4, thus giving the most severe conditions for mixing; injection times were about 30 s. With the obstacle screen side facing west, Fig. 8 shows that pressurant is mixed inside and behind the obstacle within about 1.4 injection times. With the screen side facing north, Fig. 9 shows that these conditions are met in about 1.6 injection times.

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APPENDIX A

Programs BIGST and PRODF accept raw data tapes and produce the A-tables [6].

```

$BIGST T=00004 IS ON CR00069 USING 00075 BLKS R=0000

0001 FTN4
0002 C-----
0003      PROGRAM BIGST
0004 C
0005 C      VERSION 800721--4   BY STEVE LUSTIG
0006 C
0007 C-----FUNCTIONS-----C
0008 C      1) TO MAKE ASCII DISC FILES FROM EBCDIC DATA
0009 C      LOGGER TAPES
0010 C      2) TO MAKE ASCII DISC FILES FROM ASCII OR
0011 C      EBCDIC MASTER TAPE
0012 C      3) TO BUILD ASCII MASTER TAPE FROM EBCDIC
0013 C      DATA LOGGER TAPES
0014 C      4) TO BUILD A 'PRODA INPUT TAPE' FROM DISC FILES
0015 C      5) TO PRINT DISC FILES ON LINEPRINTER/TERMINAL
0016 C
0017 C-----MISCELLANEOUS-----C
0018 C      1) THIS PROGRAM & ITS SUBROUTINES CALL
0019 C
0020 C      2) DATA LOGGERS WHICH THIS PROGRAM ACCOMODATES:    C
0021 C          DORIC #220 (FIXED,EBCDIC)                         C
0022 C          DORIC #220 (MOBILE,EBCDIC)                        C
0023 C          DORIC #240 (MOBILE,EBCDIC)                        C
0024 C      3) THIS PROGRAM ASSUMES:                            C
0025 C          -MAXIMUM 20 CHANNELS/SCAN                         C
0026 C          ( 0< CHANNEL #'S < 100 )
0027 C          -TAPE DRIVES LU8 & LU18 ARE AVAILABLE           C
0028 C          ON REQUEST                                     C
0029 C          -MASTER TYPE CHARACTER SET IS ASCII             C
0030 C      4) NO FUNCTION IN THIS PROGRAM IS DEPENDENT       C
0031 C          ON THE USER'S RUNNING ANY PREVIOUS FUNCTION    C
0032 C          DURING THE SAME SCHEDULING OF THIS PROGRAM    C
0033 C-----C
0034 COMMON  LU(5),NAME(3,20),NNMCNT,ICR(20),IPAST(3),IBUFR(272),
0035 +IDCB(272),IGCR(214)
0036 INTEGER BWD,IBLANK(384),ANS
0037 DATA IBLANK/384*2H /
0038 C
0039 C      -----DETERMINE LU# OF THE DEVICE-----C
0040 CALL RMPAR(LU)
0041 C      -----ARRAY PAST ACCOUNTS VISITED TASKS-----C
0042 DO 1 I=1,3
0043 1 IPAST(I)=0
0044 NMCNT = 0
0045 C      -----DETERMINE TASK-----C
0046 2 WRITE(LU,5)
0047 5 FORMAT(1X,'ENTER') 0      TO CREATE ASCII DISC FILE'
0048 +/17X,'FROM ONE DATA LOGGER TAPE'
0049 +/17X,'OR MASTER TAPE'
0050 +/11X,'1      TO CREATE ASCII DISC FILES FROM'
0051 +/11X,'FROM 2 DATA LOGGER TAPES'
0052 +/11X,'2      TO CREATE A MASTER TAPE FROM DISC FILES'
0053 +/11X,'3      TO LIST DATA ON A PRODA INPUT TAPE'
0054 +/17X,'OR ON A TERMINAL/LINEPRINTER'
0055 +/11X,'4      TO END PROGRAM'
0056 READ(LU,*)NODE
0057 GO TO (100,100,200,300,400),NODE+1
0058 C

```

```

0059 C
0060 100 IPAST(I)=1
0061 C -----
0062 C      FUNCTION: TO TRANSFER A FILE (EG. DATA) OF ANY RECORD
0063 C      LENGTH FROM HT TO ONE OF THE PLATTERS
0064 C      FORMAT: USER IS REQUIRED TO INPUT RECORD LENGTH
0065 C      THIS FUNCTION USES ONLY AS MUCH SPACE AS FILE
0066 C      REQUIRES. RETURNING THE REST BACK TO FNCR.
0067 C      !MAXIMUM OF 20 CHANNELS/SCAN!!(SOUNDS REASONABLE)
0068 C -----
0069    ? ITAPE=MODE+1
0070 C
0071 C
0072     IF(ITAPE.EQ.1)WRITE(LU,15)
0073     IF(ITAPE.EQ.2)WRITE(LU,16)
0074 15  FORMAT('MOUNT TAPE ON LU 8 .... ENTER "1" WHEN READY')
0075 16  FORMAT('MOUNT TAPE WITH 1ST CHANNELS ON LU 8',
0076 ' /' MOUNT TAPE WITH 2ND CHANNELS ON LU 16',
0077 ' /' ENTER "1" WHEN READY')
0078     READ(LU,*)IANS
0079 C
0080 C-----CHARACTERS/RECORD FOR BUFFER
0081 C
0082     WRITE(LU,35)
0083 35  FORMAT('ENTER # OF CHANNELS PER SCAN')
0084     READ(LU,*)NOCHAN
0085     NCHAR=(NOCHAN*11+23)
0086     NWORDS=(NCHAR+1)/2
0087     IDCBS=256
0088     NHTEG=NOCHAN*8+6
0089 C
0090 C-----SKIP FILES
0091 C
0092     WRITE(LU,17)
0093 17  FORMAT('ENTER # OF TAPE FILES TO SKIP')
0094     READ(LU,*)NSKIP
0095     IF(NSKIP.GT.0)CALL SKIP(IANS,ITAPE,NWORDS)
0096 C
0097 C-----FILE NAME
0098 C
0099     WRITE(LU,20)
0100 20  FORMAT('ENTER A DISC FILE NAME - 6 ASCII CHARS')
0101     NAMCHT = NAMCHT + 1
0102     READ(LU,30)(NAME(I,I,NAMCHT),II=1,3)
0103 30  FORMAT(3A2)
0104     WRITE(LU,40)
0105 40  FORMAT('ENTER PREFERRED CARTRIDGE (0 IF NO PREFERENCE)')
0106     READ(LU,*)ICCR(NAMCHT)
0107 C
0108 C      DEFINE FILE PARAMETERS FOR EXCLUSIVE OPEN, STANDARD
0109 C      SEQUENTIAL ACCESS,WITH FILE TYPE DEFINED AT CREATION
0110 C      (OR DEFAULT TO TYPE 3)
0111 C
0112     ISIZE=-1
0113     IOPTN=0
0114     ITYPE = 3
0115     ISECU = 0
0116 C
0117 C-----CALL CREAT: CREATE DISC FILE USING INFO SUPPLIED BY USER
0118 C

```

```

0119      CALL CREAT(IDCB,IERR,NAME(1,MANCHT),ISIZE,
0120      + ITYPE,ISECU,ICR(MANCHT),IDCBS)
0121      WRITE(LU,21)IERR
0122      21  FORMAT('**CREAT MESSAGE IER=',I6)
0123      IF(IERR.LT.0)CALL ERR(IERR)
0124      C
0125      C-----CALL OPEN: EXCLUSIVE OPEN, WITH STANDARDSEQUENTIAL ACCESS
0126      C      SEARCH ALL CARTRIDGES FOR FILE, RETURNING SUCCESS OF OPEN
0127      C      IN IER
0128      C
0129      CALL OPEN(IDCB,IERR,NAME(1,MANCHT),IOPTH,ISECU,ICR(MANCHT),
0130      + IDCBS)
0131      WRITE(LU,22)IERR
0132      22  FORMAT('**OPEN MESSAGE IER=',I3)
0133      IF(IERR.LT.0)CALL ERR(IERR)
0134      C
0135      C-----THIS LOOP WILL READ IN DATA FROM TAPE,
0136      C      TRANSFER IT TO THE DISC, AND TEST RECORD
0137      C
0138      IRHO = 0
0139      ITPHO = 0
0140      C
0141      C-----TYPE TAPE CHARACTER SET
0142      C
0143      ICHVRT=0
0144      IF (ITAPE.NE.1) GOTO 31
0145      28  WRITE(LU,29)
0146      29  FORMAT(' FOR SINGLE TAPE CHARACTER SET:'/
0147      +'/2X,"ENTER '0' FOR EBCDIC "
0148      +'/8X,"'1' FOR ASCII")
0149      READ(LU,* )ICHVRT
0150      IF((ICHVRT.NE.0).AND.(ICHVRT.NE.1))GOT028
0151      31  WRITE(LU,86)
0152      86  FORMAT('**WAIT FOR TAPE READ')
0153      C
0154      C
0155      DO 97 LOOP=1,ITAPE
0156      IF(LOOP.EQ.2)ITPHO=1B
0157      C
0158      C-----GET A RECORD OF SIZE IDCBS
0159      C
0160      44      CALL EXEC(1,ITPHO,IBUFR,NWORDS)
0161      C
0162      C-----CHECK IF END OF TAPE FILE
0163      C
0164      CALL EXEC(13,ITPHO,ISTAT)
0165      ISTAT = IAND(ISTAT,40000B)
0166      IF(ISTAT.NE.200B)GO TO 47
0167      IF(ITAPE.EQ.1.ORLOOP.EQ.2)GO TO 97
0168      CALL WRITE(IDCB,IERR,IBLANK,NWORDS)
0169      GO TO 97
0170      C
0171      C-----CONVERT SCAN TO ASCII
0172      C
0173      47      IF(ICHVRT.NE.0) GOTO 32
0174      CALL EBCRS(IBUFR,NWORDS)
0175      C-----CHECK IF RECORD IS A GOOD ONE
0176      C
0177      32      CALL CODE(NCHAR)
0178      READ(IBUFR,41)(ISCR(j),J=1,NINTEG)

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```

0179      CONTINUE
0180      41      FORMAT(13X,3(2I1,1X),20(2X,2I1,1X,6I1),1X)
0181          DO 14 K=1,NINTEG
0182          BAD=1
0183          DO 95 J=0,9
0184          IF(ISCRC(K).EQ.J)BAD=0
0185      95      CONTINUE
0186      C          IF BAD=1, THROW AWAY SCAN
0187          IF(BAD.NE.1) GO TO 14
0188          WRITE(LU,50)(IBUFR(IJ),IJ=1,NWORDS)
0189      50      FORMAT('**BAD INPUT*LINE BEING DISCARDED',/,249A2))
0190          GO TO 44
0191      :4      CONTINUE
0192      C
0193      C
0194      C-----WRITE RECORD TO DISC FILE
0195      C
0196      60      CALL WRITE(IDCB,IERR,IBUFR,NWORDS)
0197          IF(IERR.LT.0) CALL ERR(IERR)
0198          IRNO = IRNO + 1
0199          GO TO 44
0200      97      CONTINUE
0201      C
0202      C
0203      C-----CALL LOCF: EXECUTION OF THE NEXT STATEMENTS RELEASES THE UNUSED
0204      C          PORTION OF THE CR HELD BY THIS ROUTINE
0205      C
0206          CALL LOCF(IDCB,IERR,IREC,IPB,IOFF,JSEC)
0207          WRITE(LU,98)IERR
0208      98      FORMAT('**LOCF MESSAGE IER= ',I6)
0209          IF(IERR.LT.0)CALL ERR(IERR)
0210          ITRUM=JSEC/2-IRB-1
0211      C
0212      C-----CALL CLOSE: TRUNCATING THE UNUSED PORTION OF THE CR.
0213      C
0214          CALL CLOSE(IDCB,IERR,ITRUM)
0215          WRITE(LU,66)IERR
0216      66      FORMAT('**CLOSE MESSAGE IER= ',I6)
0217          IF(IERR.LT.0)CALL ERR(IERR)
0218      C
0219          WRITE(LU,65)IRNO,(NAME(N),NAMCNT),N=1,3)
0220      65      FORMAT('**',I6,' RECORDS WRITTEN TO FILE ',3A2)
0221      C
0222          WRITE(LU,70)
0223      70      FORMAT(' TRANSFER ANOTHER FILE ? (Y\N)?')
0224          READ(LU,201)IANS
0225          IF(IANS.EQ.1)GO TO 7
0226      C
0227          GOT02
0228      200  IPAST(2)=1
0229      C-----C
0230      C          OLD MASTR          C
0231      C          THIS SECTION ALLOWS THE USER TO SAVE DISC          C
0232      C          FILES ONTO A MASTER TAPE.  THIS MASTER TAPE          C
0233      C          CAN LATER BE USED AS INPUT TO THIS PROGRAM.          C
0234      C          DISC FILES NEED NOT HAVE BEEN CREATED DURING          C
0235      C          THIS SCHEDULE OF BIGST.  MASTER TAPE ASSUMED ASCII          C
0236      C-----C
0237          IF(IPAST(1).EQ.0) GOTO 23
0238      C

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```

0239 C
0240      WRITE(LU,3)
0241      3   FORMAT('TO TRANSFER DISC FILES MOUNT MASTER TAPE ON LU8'
0242      + '/IX, /AND ENTER AN INTEGER WHEN READY')
0243      READ(LU,*)IANS
0244 C
0245 C
0246      DO 101 I=1,NAMCHT
0247 C
0248 C-----PROMPT WITH NAMES OF FILES CREATED SO FAR
0249 C
0250      WRITE(LU,11)(NAME(II,I),II=1,3)
0251      11  FORMAT('TRANSFER FILE ',JAZ,' ? (Y/N)') 
0252      READ(LU,201)AHS
0253      IF(AHS.EQ.'HN') GOTO 101
0254 C
0255 C-----TRANSFER THE I'TH FILE ON THE LIST
0256 C
0257      CALL TRANS(I)
0258 C
0259 101  CONTINUE
0260 C
0261 C
0262      WRITE(LU,27)
0263      27  FORMAT('XFER A PREVIOUS FILE? (Y/N)') 
0264      READ(LU,201)AHS
0265      201 FORMAT(A1)
0266      IF (AHS.NE.'HY') GOTO 202
0267 C
0268 C---TRANSFER FILES CREATED PREVIOUSLY OUTSIDE THIS SCHEDULE
0269 C FILES ARE ASSUMED ALL READY EDITED & CONVERTED
0270 C
0271      23  WRITE(LU,13)
0272      13  FORMAT(IX,'MASTER TAPE SHOULD BE ON LU 8')
0273      NAMCHT=NAMCHT+1
0274      WRITE(LU,24)
0275      24  FORMAT('ENTER FILE NAME--6 ASCII CHARACTERS')
0276      READ(LU,30)(NAME(II,NAMCHT),II=1,3)
0277      WRITE(LU,25)
0278      25  FORMAT('ENTER CARTRIDGE #')
0279      READ(LU,*)ICR(NAMCHT))
0280      WRITE(LU,26)
0281      CALL TRANS(NAMCHT)
0282      26  FORMAT('TRANSFER ANOTHER FILE? (Y/N)') 
0283      READ(LU,201)AHS
0284      IF(AHS.NE.'HN') GOTO 23
0285 C
0286 C
0287      GO TO 2
0288      300  IPAST(3)=1
0289 C-----THIS SECTION ALLOWS THE USER TO MAKE A
0290 C PRODA INPUT TAPE FROM DISC FILES CREATED          C
0291 C DURING PAST AND CURRENT RUNS OF THE PROGRAM.      C
0292 C THE USER MAY USE EITHER TAPE DRIVES FOR OUTPUT.    C
0293 C THE USER MAY ALSO SIMPLY PRINT THE OUTPUT ON      C
0294 C ANY TERMINAL OR PRINTER                          C
0295 C-----                                         C
0296      4   WRITE(LU,4)
0297      4   FORMAT(' TO CREATE PRODA INPUT TAPE FROM DISC FILES')

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0298      + /5X,'MOUNT PRODA TAPE ON A TAPE DRIVE &'
0299      + /5X,'ENTER THE LU# OF THE TAPE WHEN READY.'
0300      + /1X,'TO LIST THE OUTPUT ELSEWHERE:'
0301      + /5X,'ENTER THE LU NUMBER WHEN READY.')
0302
0303      READ(LU,*))IOUTDV
0304      C
0305      IF((IPAST(1),EQ,0),AND,(IPAST(2),EQ,0)) GOTO 19
0306      39      DO 103 I=1,NAMCNT
0307      C
0308      C-----PROMPT WITH NAMES OF FILES CREATED SO FAR
0309      C
0310      WRITE(LU,6)(NAME(II,I),II=1,3)
0311      6       FORMAT('TRANSFER FILE ',3A2,' ? (Y/N)') 
0312      READ(LU,201) AHS
0313      IF(AHS,EQ,1HN) GO TO 103
0314      C
0315      C-----WRITE OUT THE I'TH FILE ON THE LIST
0316      C
0317      CALL OUTPR(I,IOUTDV)
0318      C
0319      C-----OPEN & THEN PURGE THIS DISC FILE
0320      C
0321      CALL OPEN(IDCB,IERR,NAME(1,I),0,0,ICRC())
0322      IF(IERR,LT,0)CALL ERR(IERR)
0323      D      CALL PURGE(IDCB,IERR,NAME(1,I),0,ICRC())
0324      D      IF(IERR,LT,0) CALL ERR(IERR)
0325      C
0326      103  CONTINUE
0327      C
0328      C----TRANSFER FILES WHICH WERE NOT CREATED DURING THIS
0329      C      SCHEDULE
0330      C
0331      19      NAMCNT=0
0332      WRITE(LU,34)
0333      34      FORMAT('TRANSFER PREVIOUSLY CREATED FILE? (Y/N)') 
0334      READ(LU,201) AHS
0335      IF(AHS,EQ,1HN) GOTO 36
0336      NAMCNT=NAMCNT+1
0337      WRITE(LU,37)
0338      37      FORMAT('ENTER FILE NAME--6 ASCII CHARACTERS')
0339      READ(LU,30) (NAME(II,NAMCNT),II=1,3)
0340      WRITE(LU,38)
0341      38      FORMAT('ENTER CARTRIDGE #')
0342      READ(LU,*) (TCR(NAMCNT))
0343      GOTO 39
0344      C
0345      C
0346      36      IF ((IOUTDV,NE,8),AND,(IOUTDV,NE,18)) GOTO 2
0347      C
0348      C----WRITE OUT 'END OF TAPE' MARK (WILL BE USED BY PRODA).
0349      C
0350      WRITE(IOUTDV,75)
0351      ENDFILE IOUTDV
0352      C      CALL EXEC(3,10,IOUTDV)
0353      75      FORMAT('XXXX')
0354      C
0355      GOTO 2
0356      C
0357      C
0358      C-----C

```



```

0419    37    CALL READF(IDCB,IERR,ICHAR,SS0,LEN)
0420          IF(IERR.LT.0)CALL ERR(IERR)
0421          IF(LEN.EQ.-1)GO TO 70
0422 C
0423          IF(ICHAR.NE.ISBLANK)GO TO 39
0424 C
0425          WRITE(IOUTDV,75)
0426          WRITE(LU,38)
0427          C38      FORMAT('SECOND GROUP OF CHANNELS WILL BE'
0428          1           //' PROCESSED NOW.'//FOR SECOND GROUP OF'
0429          2           //' CHANNELS.. PLEASE')
0430          GO TO 9
0431 C
0432          CONVERT ASCII STRING TO INTEGERS AND REALS
0433 C
0434          J9      CONTINUE
0435          CALL CODEC(2*LEN)
0436          READ(ICHAR,40)HTIME,MTIME,STINE,(KCHAN(I),STORE(I),
0437          IPOW(I), I = 1, NCHAN)
0438          40      FORMAT(13X,3(1Z,IX),20(2X,I2,1X,F5.5,I1),IX)
0439 C
0440          MULTIPLY BY APPROPRIATE POWER OF 10
0441 C
0442          DO 50 I = 1 , NCHAN
0443          50      STORE(I) = STORE(I)*(10.0***(3-IPOW(I)))
0444 C
0445          WRITE DATA OUT TO RIGHT LU
0446 C
0447          WRITE(IOUTDV,66)HTIME,MTIME,STINE,(STORE(JK), JK = 1, NCHAN)
0448          66      FORMAT(1H /2X,I2,';',I2,';',I2,20(3X,F7.1))
0449 C
0450 C
0451          70      WRITE(IOUTDV,75)
0452          75      FORMAT(1H1,1I0X)
0453 C
0454          CALL CLOSE(IDCB,IERR)
0455          IF(IERR.LT.0)CALL ERR(IERR)
0456 C
0457          RETURN
0458 END
0459 ****=  

0460          SUBROUTINE SKIP(NUM,ITAPE,NWDS)
0461          INTEGER NUM,ITAPE,IBUFR(384)
0462 C
0463          ITPNO = 0
0464 C
0465          DO 100 I = 1 , ITAPE
0466          IF(I.EQ.2)ITPNO = 18
0467          DO 50 J = 1 , NUM
0468          21      REG = EXEC(1,ITPNO,IBUFR,NWDS)
0469          REG = EXEC(13,ITPNO,ISTAT)
0470          ISTAT = IAND(ISTAT,0402000B)
0471          IF(ISTAT.EQ.0) GO TO 25
0472          50      CONTINUE
0473          100     CONTINUE
0474 C
0475          RETURN
0476 END
0477 ****=  

0478          SUBROUTINE ERR(IERR)

```

```

0479 C
0480 C      THIS SUBROUTINE PRINTS THE ERROR CODE PASSED TO IT
0481 C
0482 COMMON LU(5),NAME(3,20),NANCHT,ICR(20),IPAST(3)
0483 INTEGER ANS
0484 WRITE(LU,10)IERR
0485 10 FORMAT(' IERR = ',I6,'ABORT PROGRAM? (Y/N) ')
0486 READ(LU,201) ANS
0487 201 FORMAT(A1)
0488 IF(ANS.EQ.'NY') RETURN
0489 STOP
0490 END
0491 C
0492 *****C*****SUBROUTINE TRANS(NUM)*****
0493 C
0494 C      THIS SUBROUTINE TRANSFERS THE N'TH FILE ON THE
0495 C      LIST TO THE MASTER TAPE
0496 C
0497 C
0498 DIMENSION IDC8(272),IBUFR(272),ISCR(166)
0499 COMMON LU(5),NAME(3,20),NANCHT,ICR(20),IPAST(3)
0500 C
0501 C      OPEN THE FILE
0502 C
0503 CALL OPEN(IDC8,IERR,NAME(1,NUM),IDUM,IDUM,ICR(NUM),256)
0504 IF(IERR.LT.0) CALL ERR(IERR)
0505 C
0506 C      READ A RECORD
0507 C
0508 5   CALL READF(IDC8,IERR,IBUFR,256,LEN)
0509     IF(IERR.LT.0)CALL ERR(IERR)
0510     IF(LEN.LT.0) GOTO 50
0511 C
0512 C      CHECK IF RECORD IS GOOD
0513 C
0514 NCHAN=(LEN-23)/11
0515 NINTEG=NCHAN*8+6
0516 CALL CODE(LEN)
0517 READ(IBUFR,41)(ISCR(J),J=1,NINTEG)
0518 41  FORMAT(13X,3(2I1,1X),20(2X,2I1,1X,6I1),1X)
0519 DO 14 K=1,NINTEG
0520 IBAD=1
0521 DO 95 I=0,9
0522 IF(ISCR(K).EQ.I) IBAD=0
0523 95  CONTINUE
0524 IF (IBAD.EQ.1) GO TO 5
0525 14  CONTINUE
0526 C
0527 C      WRITE IT OUT
0528 C
0529     REC=EXEC(2,8,IBUFR,LEN)
0530     GOTO 5
0531 C
0532 C      WRITE EOF ON TAPE 8 AND CLOSE THE DISC FILE
0533 C
0534 50  REC=EXEC(3,0110B)
0535     CALL CLOSE(IDC8)
0536     RETURN
0537 END
0538 *****C*****

```

```
0539      SUBROUTINE EBCAS(ICHAR,LEN)
0540      C
0541      C      THIS SUBROUTINE CONVERTS A BUFFER OF EBCDICIC
0542      C      CHARACTERS ( CONTAINED IN AN INTEGER ARRAY),
0543      C      FROM THE DATA LOGGER, INTO ASCII.
0544      C
0545      DIMENSION ICHAR(550)
0546      INTEGER RCHAR,LCHAR
0547      C
0548      C
0549      DO 100 I = 1 , LEN
0550      C
0551      C      GET RIGHT BYTE & CONVERT IT
0552      C
0553      RCHAR = IAND(ICHAR(I),077B)
0554      IF(RCHAR.EQ.040B)RCHAR = 055B
0555      IF(RCHAR.EQ.0)RCHAR = 040B
0556      C
0557      C      GET LEFT BYTE & CONVERT IT
0558      C
0559      LCHAR = IAND(ICHAR(I),037400B)
0560      IF(LCHAR.EQ.020000B)LCHAR = 026400B
0561      IF(LCHAR.EQ.0)LCHAR = 020000B
0562      C
0563      C      PACK THE TWO BYTES BACK TOGETHER AGAIN
0564      C
0565      ICHAR(I) = IOR(LCHAR , RCHAR)
0566      C
0567 100   CONTINUE
0568      C
0569      C
0570      RETURN
0571  *****C
0572      END
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SPRDF T=00003 IS ON CR00056 USING 00074 BLKS R=0000

0001  FTN4
0002  C   NOTE!! THIS IS A MODIFIED FORM OF PRD9 TO HANDLE LONGER DUMP TIME
0003  C   IT SHOULD BE USED WITH &CINFF AND &CINSF.
0004  C
0005  C   THIS IS THE FIRST OF THREE PROGRAM FOR REDUCING
0006  C   EXPERIMENTAL DATA. INPUT IS ON TAPE UNIT 18.
0007  C   OUTPUT IS TO A DISK FILE. SOME OUTPUT IS ALSO
0008  C   SENT TO THE LINE PRINTER AND TAPE UNIT 8
0009  C   SIMULTANEOUSLY. THIS PROGRAM'S OUTPUT (DISK FILE)
0010  C   IS USED AS INPUT TO CINFER.
0011  C   THIS PROGRAM IS CONSTRUCTED TO HANDLE A MAXIMUM OF 20
0012  C   CHANNELS WITH A TOTAL OF 350 SCANS OF DATA PER CHANNEL.
0013  C   THIS IS AVERAGED DATA SO IT CORRESPONDS TO 350 SECONDS.
0014  C   IN ORDER TO PUT THE FULL 350 SCANS INTO THE OUTPUT DISC FILE,
0015  C   THE VARIABLE NTH MUST BE CHANGED(SEE LINE 725).
0016  C
0017  C   NOTE!!!! THIS PROGRAM HAS TO BE MODIFIED DEPENDING WHETHER THE
0018  C   DATA IS FROM THE 200 OR 10000 CU FT CHAMBER. SEE LINES
0019  C   296, 301 AND 306. THE LOGIC FUNCTION SWITCH, CHANNEL
0020  C   63 IS DIFFERENT,LINE 306. THE PRESSURE TRANSDUCERS
0021  C   OUTPUT IS DIFFERENT IN THE TWO CHAMBERS.
0022  C
0023  C   THE CONSTANTS FOR NOZZLE DIAMETER AND CHAMBER VOLUME
0024  C   AN AND VT RESPECTIVELY MUST BE MODIFIED.
0025  C
0026  C   DOCUMENTED BY ALAN BRODER 3/3/80
0027  C   COMMENTED BY ANDREA HUNTER 7-30-80
0028  C   MODIFIED BY FRED W WILLIAMS 810408
0029  C
0030  C   PROGRAM PRDF
0031  DOUBLE PRECISION A
0032  REAL HT1,HT2,NT(350)
0033  INTEGER AK2(140)
0034  DIMENSION AK(70),IBUF(144),NAME(3),ISIZE(2),X(350,20)
0035  INTEGER AC(5),IBUF(100)
0036  DIMENSION AC(40),NC(20),X1(20),X2(20),IS(50
0037  10),XT(20),NCT(20)
0038  LOGICAL F,FLAG,F2
0039  COMMON IPAR(5)
0040  EQUIVALENCE (AK2,AK)
0041  DATA XES/4HXXXX/
0042  DATA IBLANK/2H /
0043  C
0044  C***** VARIABLE DEFINITIONS *****
0045  C*          A-TITLE OF FILE           *
0046  C*          AC-CHANNEL'                 *
0047  C*          IS-FUNCTION SWITCH        *
0048  C*          NAME-UNIQUE NAME ISSUED TO OUTPUT FILE *
0049  C*          NC-CHANNEL NUMBERS       *
0050  C*          NT-TIMES FOR EACH SCAN      *
0051  C*          NT1-BEGINNING TIME OF RUN    *
0052  C*          NT2-TIME OF CURRENT SCAN     *
0053  C*          X,X1,X2-DATA PER SCAN      *
0054  C*          XES-EXTRA SPACE           *
0055  C*          IBLANK-BLANK SPACE        *
0056  C***** ****
0057  C
0058  C

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0059      IOUT=8
0060      C
0061      C
0062      C
0063  C  READ IN AND WRITE OUT FILE LABEL AND CHANNEL NUMBERS
0064  C
0065      CALL RMPAR(IPAR)
0066      WRITE(IPAR(1),1000)
0067  1000  FORMAT('GIVE CARTRIDGE #,OUTPUT FILE NAME
0068      1,('I5,1H#')
0069      READ(IPAR(1),1002)ICR,NAME
0070  1002  FORMAT(I5,1X,3A2)
0071      ISIZE(1) = -1
0072      ITYPE = 3
0073  C
0074  C  CREATE A DISK FILE
0075  C
0076      CALL CREAT(IBUF,IERR,NAME,ISIZE,ITYPE,IDUM,ICR)
0077      IF(IERR.LE.0)CALL ERR(IERR,37)
0078      CALL OPEN(IBUF,IERR,NAME)
0079  1005  READ(1B,1)(AC(I),I=1,20)
0080  C
0081  C  CHECK IF WE HAVE REACHED THE END OF FILE
0082  C
0083      IF(AC(1).EQ.XES)GO TO 9090
0084  1  FORMAT(20A4)
0085      READ(1B,2)AC,(X1(I),I=1,10)
0086  2  FORMAT(1X,5A2,10F10.1)
0087      DO 3 I=1,10
0088  3  NC(I)=X1(I)
0089  C  WRITE(1007,4)(C(I),I=1,20),AC,(NC(I),I=1,10)
0090  4  FORMAT(1H1,20A4//1H ,5A2,10I6/1H   I   TIME)
0091  C
0092  C  SKIP A LINE OF INPUT
0093  C
0094      READ(1B,55)CAR1,CAR2,CAR3
0095  55  FORMAT(3A4)
0096  C
0097  C  READ IN TIME AND 1ST 10 COLUMNS OF DATA FOR THAT TIME
0098  C
0099      READ(1B,51MH,AH,NM,AM,MS,(X1(I),I=1,10)
0100  5  FORMAT(1M,14,A1,I2,A1,I2,F10.1)
0101  C
0102  C  CONVERT TIME TO TIME IN SECONDS
0103  C
0104      NT1=MS+MM*60.+HH*3600.
0105  C
0106  C  F WILL BE SET WHEN THERE IS NO DATA LEFT
0107  C
0108      F=.FALSE.
0109  C
0110  C  J WILL POINT TO CURRENT LINE OF DATA IN THE X ARRAY
0111  C
0112      J=0
0113  C
0114  C  READ IN DATA, CONVERT TIME TO SECONDS
0115  C
0116  6  READ(1B,5)HH,AH,NM,AM,MS,(X2(I),I=1,10)
0117      NT2=MS+MM*60.+HH*3600.
0118      IF(NT2.EQ.0.0)F=.TRUE.

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0113 C
0120 C IF BAD DATA GO BACK FOR MORE
0121 C
0122 C IF(NT2.GT.NT1+2.OR.(NT2.LT.NT1.AND..NOT.F))GO TO 6
0123 C
0124 C GO TO 8 IF YOU HAVE TO INTERPOLATE
0125 C
0126 C IF(NT2.NE.NT1)GO TO 8
0127 C
0128 C AVERAGE DATA AND GO BACK FOR NEXT LINE IF NOT EOF
0129 C
0130 DO 7 I=1,10
0131 7 X1(I)=0.5*(X1(I)+X2(I))
0132 IF(F)GO TO 100
0133 GO TO 6
0134 C
0135 C STORE GOOD LINE OF DATA IN X ARRAY,CREATE NEXT GOOD LINE,
0136 C (INTERPOLATING IF NECESSARY), WRITE OUT LINE JUST STORED
0137 C IN X ARRAY. THIS IS DATA ONLY, TIME IS STORED IN NT.
0138 C
0139 8 J=J+1
0140 NTC(J)=NT1
0141 C
0142 C DT=DIFFERENCE IN BEGINNING TIME AND CURRENT SCAN TIME
0143 C
0144 DT=NT2-NT1
0145 DO 9 I=1,10
0146 K(J,I)=X1(I)
0147 9 X1(I)=X1(I)+(X2(I)-X1(I))/DT
0148 NT1=NT1+1
0149 C WRITE(IOUT,10)J,NTC(J),(X(J,I),I=1,10)
0150 10 FORMAT(1H ,I3,F7.0,10F6.1)
0151 IF(NT2.GT.NT1)GO TO 8
0152 IF(F)GO TO 100
0153 GO TO 6
0154 C
0155 C HJ WILL POINT TO BOTTOM OF DATA IN X ARRAY
0156 C
0157 100 HJ=J
0158 C
0159 C HOW DO SAME THINGS TO 2ND 10 COLUMNS OF DATA FOR
0160 C THE SAME TIMES.
0161 C
0162 READ(18,1)(A(I),I=21,40)
0163 READ(18,2)AC,(X1(I),I=11,20)
0164 DO 101 I=11,20
0165 101 NC(I)=X1(I)
0166 C WRITE(IOUT,4)(A(I),I=21,40),AC,(NC(I),I=11,20)
0167 C
0168 C SKIP A LINE OF INPUT
0169 C
0170 READ(18,55)GAR1,GAR2,GAR3
0171 C
0172 C READ IN TIME AND 2ND 10 COLUMNS OF DATA FOR THAT TIME
0173 C
0174 102 READ(18,5)HH,AH,MM,AM,MS,(X1(I),I=11,20)
0175 C
0176 C CONVERT TIME TO TIME IN SECONDS
0177 C
0178 NT1=HS+MM*60.+HH*3600.

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0179      IF(NT1.LT.NTC)GO TO 102
0180  C
0181  C   F WILL BE SET WHEN THERE IS NO DATA LEFT ALSO F2
0182  C   F=.FALSE.
0183  C   F2 = .FALSE.
0184  C   J=NT1-NT(1)
0185  C   NJ0=J+1
0186  C
0187  C   READ IN DATA , CONVERT TIME TO SECONDS
0188  C
0189  103  READ(18,5)HH,AM,MM,MS,(X2(I),I=11,20)
0190  C   NT2=MS+MM*60.+MM*3600.
0191  C   IF(NT2.GT.NT1+2)GO TO 103
0192  C   IF(NT2.EQ.0)F2=.TRUE.
0193  C
0194  C   GO TO 105  IF YOU HAVE TO INTERPOLATE
0195  C
0196  C   IF(NT2.NE.NT1)GO TO 105
0197  C
0198  C   AVERAGE DATA AND GO BACK FOR NEXT LINE IF NOT EOF
0199  C
0200  DO 104 I=11,20
0201  104  X1(I)=0.5*(X1(I)+X2(I))
0202  C   GO TO 103
0203  C
0204  C   STORE GOOD LINE OF DATA IN X ARRAY, CREATE NEXT GOOD LINE,
0205  C   (INTERPOLATING IF NECESSARY), WRITE OUT LINE JUST STORED
0206  C   IN X ARRAY.
0207  C
0208  105  J=J+1
0209  C   IF(J.GT.NJ)F=.TRUE.
0210  C   NTC(J)=NT1
0211  C   DT=NT2-NT1
0212  DO 106 I=11,20
0213  C   X(J,I)=X1(I)
0214  106  X1(I)=X1(I)+(X2(I)-X1(I))/DT
0215  C   NT1=NT1+1
0216  C   WRITE(101,J,NT(J),(X(J,I),I=11,20)
0217  C   IF(NT2.GT.NT1)GO TO 105
0218  C   IF(.NOT.(F.OR.F2))GO TO 103
0219  C   IF(F2)GO TO 108
0220  107  READ(18,5)HH,AM,MM,MS
0221  C   IF(HH.NE.0.OR.MM.NE.0.OR.MS.NE.0)GO TO 107
0222  C
0223  C   NJM WILL NOW POINT TO BOTTOM OF LAST COMPLETE SET OF DATA
0224  C   (COMPLETE = ALL 20 COLUMNS OF DATA). IT IS DETERMINED WHETHER CHANNELS
0225  C   60-69 OR 70-79 HAS THE LEAST NUMBER OF SCANS AND IS RETURNED TO NJM.
0226  C
0227  108  NJM=NJ
0228  C   IF(J.LT.NJ)NJM=J
0229  C
0230  C   PRINT OUT HEADINGS AND COLUMN HEADINGS WITH
0231  C   CHANNEL NUMBERS REARRANGED.
0232  C
0233  C*****DEFINITION OF CHANNELS*****
0234  C* THIS IS THE ARRANGEMENT OF CHANNEL NUMBERS IN ONE ARRAY, THE *
0235  C* SECOND ARRAY CONTAINS THE CHANNEL NUMBERS REARRANGED IN A *
0236  C* PRE-DETERMINED ORDER. *
0237  C-----*
0238  C*           DEFINITION OF HEADERS *

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0239 C* CHANNEL NUMBERS-CHANNELS 60-79
0240 C* ARRAY #1-(HC) THE ORIGINAL ORDER OF CHANNEL NUMBERS IN *
0241 C* ASCENDING ORDER *
0242 C* ARRAY #2-(NCT) ALTERED ORDER OF CHANNEL NUMBERS *
0243 C* LOCATION- THE POSITION OF PURPOSE OF CHANNEL NUMBERS *
0244 C*-----*
0245 C*-----*
0246 C*   ARRAY #1      CHANNEL NUMBER      ARRAY #2      LOCATION    *
0247 C*   -----      -----      -----      -----      *
0248 C*   HC(1)          60            NCT(1)        PRESSURE    *
0249 C*   HC(2)          61            NCT(3)        PRESSURE    *
0250 C*   HC(3)          62            NCT(10)       TEMPERATURE(C) *
0251 C*   HC(4)          63            "             FUNCTION    *
0252 C*   HC(5)          64            NCT(16)       TEMPERATURE(CC) *
0253 C*   HC(6)          65            NCT(15)       TEMPERATURE(CC) *
0254 C*   HC(7)          66            NCT(14)       TEMPERATURE(CC) *
0255 C*   HC(8)          67            NCT(13)       TEMPERATURE(CC) *
0256 C*   HC(9)          68            NCT(12)       TEMPERATURE(CC) *
0257 C*   HC(10)         69            NCT(11)       TEMPERATURE(CC) *
0258 C*   HC(11)         70            NCT(2)        NOZZLE ENTRANCE *
0259 C*   HC(12)         71            NCT(6)        TEMPERATURE(CC) *
0260 C*   HC(13)         72            *             TANK 1 EXIT   *
0261 C
0262 C*   HC(14)         73            *             NOZZLE THROAT  *
0263 C*   HC(15)         74            NCT(7)        TEMPERATURE(CC) *
0264 C*   HC(16)         75            NCT(5)        TEMPERATURE(CC) *
0265 C*   HC(17)         76            NCT(8)        TEMPERATURE(CC) *
0266 C*   HC(18)         77            NCT(4)        TEMPERATURE(CC) *
0267 C*   HC(19)         78            NCT(9)        TEMPERATURE(CC) *
0268 C*   HC(20)         79            *             TANK 1           *
0269 C*-----*
0270 C*NOTE:*****NOTE:*****NOTE:*****NOTE:*****NOTE:*****NOTE:*****
0271 C* (*1 INDICATES NO CORRESPONDENCE TO THIS LOCATION    *
0272 C*-----*
0273 C*-----*
0274 C
0275     NCT(1)=HC(1)
0276     NCT(2)=HC(11)
0277     NCT(3)=HC(2)
0278     NCT(4)=HC(18)
0279     NCT(5)=HC(16)
0280     NCT(6)=HC(12)
0281     NCT(7)=HC(15)
0282     NCT(8)=NC(17)
0283     NCT(9)=HC(19)
0284     NCT(10)=HC(3)
0285     NCT(11)=HC(10)
0286     NCT(12)=NC(9)
0287     NCT(13)=HC(8)
0288     NCT(14)=HC(7)
0289     NCT(15)=HC(6)
0290     NCT(16)=NC(5)
0291 C   WRITE(IOUT,200)(A(I),I=1,20),(NCT(I),I=1,16),(I,I=1,16)
0292 200  FORMAT(1H1,9X,20A4/10HCHANNEL OF ORIGIN,I4,15I6/1H ,5XI1I,9X,16I6
0293 1.6H VALVE?10H J TIME)
0294 C
0295 C REARRANGE THE ORDER OF THE COLUMNS OF DATA.
0296 C ALSO MOVE THE FIRST GOOD ROW OF DATA TO THE
0297 C TOP OF THE ARRAY. THEN DUMP OUT DATA TO THE
0298 C LINE PRINTER. (THE DC 202 LOOP SCALES

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0299 C CHANNELS 60 AND 61 AND SETS ARRAY IS(N) WHEN
0300 C THE NOZZLE IS ON.)
0301 C
0302 C
0303 C WRITE THE VALUE OF NJ0
0304 C
0305      WRITE(IPAR(1),1111)NJ0,NJM
0306 1111  FORMAT("NJ0=",I8,"NJM=",I8)
0307      DO 206 K=NJ0,NJM
0308      J=K+1-NJ0
0309      HT(J)=HT(K)
0310      IS(J)=0
0311      DO 202 I=1,20
0312 C
0313 C CONVERT TANK 1 (CHANNEL 60) TRANSDUCER TO PASCAL'S
0314 C PER SQUARE METER PRESSURE. FOR THE 200 CU FT CHAMBER THE MULT
0315 C FACTOR IS 0.15 WHERE AS FOR THE 10,000 CU FT CHAMBER THE FACTOR
0316 C IS 0.1
0317 C
0318 IF(NC(I).EQ.60)X(K,I)=X(K,I)*0.15/14.7
0319 C
0320 C CONVERT CHAMBER(CHANNEL 61) TRANSDUCER TO PASCAL'S
0321 C PER SQUARE METER PRESSURE. FOR THE 200 CU FT CHAMBER THE MULT
0322 C FACTOR IS 0.05 WHERE AS FOR THE 10,000 CU FT CHAMBER THE FACTOR
0323 C IS 0.001
0324 C
0325 IF(NC(I).EQ.61)X(K,I)=X(K,I)*0.05/14.7
0326 C
0327 C DETERMINE IF THE FUNCTION SWITCH(CHANNEL 63) IS
0328 C ON OR OFF. FOR THE 200 CU FT CHAMBER THE TRIGGER LEVEL SHOULD BE
0329 C 5.0 WHERE AS FOR THE 10,000 CU FT CHAMBER THE LEVEL IS 1000.0.
0330 C
0331 IF(NC(I).EQ.63.AND.ABS(X(K,I)).GT.5.0000)IS(J)=1
0332 C
0333 C THE FIRST SUBSCRIPT OF X ARRAY J=THE NTH SCAN #
0334 C AND THE SECOND SUBSCRIPT HOLD THE CHANNEL NUMBER
0335 C
0336 202 X(J,I)=X(K,I)
0337 X(J,1)=X(J,1)
0338 X(J,2)=X(J,11)
0339 X(J,3)=X(J,2)
0340 X(J,4)=X(J,18)
0341 X(J,5)=X(J,16)
0342 X(J,6)=X(J,12)
0343 X(J,7)=X(J,15)
0344 X(J,8)=X(J,17)
0345 X(J,9)=X(J,19)
0346 X(J,10)=X(J,3)
0347 X(J,11)=X(J,10)
0348 X(J,12)=X(J,9)
0349 X(J,13)=X(J,8)
0350 X(J,14)=X(J,7)
0351 X(J,15)=X(J,6)
0352 X(J,16)=X(J,5)
0353 DO 204 I=1,16
0354 204 X(J,I)=XT(I)
0355 C WRITE(IDOUT,208)J,HT(J),(X(J,I),I=1,16),IS(J)
0356 206 CONTINUE
0357 200 FORMAT(1H ,I3,F7.0,6X,F6.3,F6.1,F6.3,13F6.1,I6)
0358 C

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0359 C WRITE OUT NEW PAGE HEADERS, AND DUMP OUT CHART OF DATA
0360      WRITE(100,700)(A(I),I=1,20),(I,I=1,13)
0361      700  FORMAT(1H1,2H04//7X10HPRESSURANT   FILL-,5X13RTHERMOCOUPLES/6X12HFL
0362      1CH - TOTAL,3X4HTAHY,5X10HLOCATION 1,77X11HC09RDINATES/1X4HTIME,3X1
0363      2XH,3X1NT,7X1HP,7X1HT(BEG K),74X1HTI   R   THETA  Z/1X24H(SEC)(BAR)
0364      J(OEG K),1BAR),2X1316,10X14H(H) (BEG) (M))
0365      CALL CODE
0366 C
0367 C INITIALIZE TABLE OF OUTPUT CONSTANTS
0368 C
0369      WRITE(CK2,209)
0370      209  FORMAT(10H 1 0.000 ,10H 00 -0.586,10H 2 0.000 ,10H 00 -0.293,10
0371      1H 3 0.000 ,10H 00 0.000,10H 4 0.000 ,10H 00 0.293,10H 5 0.000
0372      2 10H 00 0.586,10H 6 0.000 ,10H 00 0.878,10H 7 0.000 ,10H 00
0373      12.049,10H 8 0.000 ,10H 00 2.342,10H 9 0.000 ,10H 00 2.635,10H1
0374      49 0.000 ,10H 00 2.928,10H11 0.000 ,10H 00 3.220,10H12 0.000 ,
0375      310H 00 3.513,10H13 0.000 ,10H 00 3.806,5<4H 00
0376      DATA AG/6H *** /
0377      701  FORMAT(1X,14,F6.3,F6.1,F8.3,4X,13F6.1,4X,5A4)
0378      702  FORMAT(1X,14,246,F8.3,4X,13F6.1,4X,5A4)
0379      FLAG=.TRUE.
0380 C
0381 C FIND WHERE NOZZLE WAS TURNED ON AND OFF.
0382 C KO POINTS TO ON POSITION
0383 C KP POINTS TO OFF+1 POSITION
0384 C
0385      DO 300 K=1,J
0386      IF((IS(K).EQ.1.AND.FLAG)K0=K
0387      IF((IS(K).EQ.1.AND.FLAG)FLAG=.FALSE.
0388      IF((IS(K).EQ.0.AND..NOT.FLAG)KP=K
0389      300 IF((IS(K).EQ.0.AND..NOT.FLAG)FLAG=.TRUE.
0390      T0=10
0391      TP=T0+KP-K0+1
0392 C
0393 C SHOW EVERY SECOND OF DATA TILL KP+10 SECONDS
0394 C THEN SHOW EVERY 5 SECONDS OF DATA TILL KP+60 SECONDS
0395 C THEN SHOW EVERY 10 SECONDS OF DATA PAST KP+60 SECONDS
0396 C NOTE!!!! THIS SECTION MAY TAKE A LITTLE WORK TO GET ALL THE
0397 C SCANS OUT.
0398 C
0399      K1=K0-10
0400      K2=K1+49
0401      JMAX=NJM-K1
0402      J=K1+4
0403      0      WRITE(IPAR(1),606) JMAX,KP,K0,K1,K2
0404      606      FORMAT(" JMAX=",14,"KP=",14,"K0=",14,"K1=",14,"K2=",14)
0405      L=0
0406      710  L=L+1
0407      IF(L.GT.JMAX)GO TO 725
0408      J=J+1
0409      IF(J.LE.KP+10)GO TO 715
0410      J=J+4
0411      IF(J.LE.KP+60)GO TO 715
0412      J=J+5
0413      715  IF(J.GT.JMAX)GO TO 725
0414      TTN=RT(J)-NT(K0)
0415      XT(1)=X(J,1)
0416      XT(2)=X(J,2)+273.2
0417      XT(3)=X(J,3)
0418      GO 717 I=4,16

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0419    717  XT(I)=X(J,I)+273.2
0420      IF(J.LT.K0.OR.J.GT.KP+2)GO TO 720
0421      L2=5*L-4
0422      IF(L.GT.13)L2=66
0423      WRITE(10UT,701)ITM,(XT(I),I=1,16),(AK(I),I=L2,L2+4)
0424      GO TO 710
0425 720  L2=5*L-4
0426      IF(L.GT.13)L2=66
0427      WRITE(10UT,702)ITM,AC,AC,(XT(I),I=3,16),(AK(I),I=L2,L2+4)
0428      GO TO 710
0429 C
0430 C   DUMP OUT DATA TO DISK THAT WILL BE USED AS INPUT
0431 C   TO CINFER.
0432 C
0433 C   NOTE!! IF NTH IS SET TO JMAX ALL THE DATA THAT IS ON THE PRODA
0434 C   TAPE WILL OUTPUT TO THE PRODA OUTPUT DISC FILE. THE TAPE OUTPUT
0435 C   REFLECTS ALL THE DATA, BUT FOR THE LONGER TIMES, NOT ALL THE DATA
0436 C   IS SHOWN AS SOME SCANS ARE SKIPPED.
0437 C   OTHERWISE SET NTH TO A SPECIFIC NUMBER, REMEMBER TO MODIFY THE NEXT
0438 C   PROGRAM FOR THE PROPER NUMBER OF SCANS.
0439 C
0440 725  FLAG=.TRUE.
0441      NTH=JMAX
0442      IF(JMAX.GE. 149) NTH=149
0443 C   NTH REPRESENTS NT IN PROGRAM CINFER
0444 C   HTI= NUMBER OF THERMOCOUPLES
0445 C   DT= TIME SERIES NOMINAL INCREMENT (SEC)
0446 C   AN= NOZZLE NOMINAL AREA(CM**2)
0447 C   VT= TANK VOLUME(M**3)
0448 C   CF= FLOW COEFICIENT (SEE NOTES IN CINFR)
0449 C   GA= SPECIFIC HEAT RATIO(C " " " ")
0450 C   MA= MOL WT OF AIR (" " " " )
0451 C   MP= MOL WT OF PRESSURANT(" " " " )
0452 C
0453      HTI=13
0454      DT=1.0
0455      AN=0.010
0456      VT=5.1
0457      CF=0.0
0458      GA=0.0
0459      MA=0.0
0460      MP=0.0
0461      NUM=40
0462 C
0463 C   POSITION RECORD IN REFERENCE TO FILE
0464 C
0465      CALL WRITFC(IBUF,IERR,A,NUM)
0466      IF(IERR.LT.0)CALL ERR(IERR,304)
0467      CALL CODE
0468 C
0469 C   WRITE DATA TO DISK
0470 C
0471      WRITE(10BUF,302)HTI,NTH,DT,TO,TP,AN,VT,CF,GA,MA,MP
0472 302  FORMAT(2I4,9F7.3,1H )
0473      NUM = 36
0474      CALL WRITFC(IBUF,IERR,10BUF,NUM)
0475      IF(IERR.LT.0)CALL ERR(IERR,310)
0476 C   NOTE!!!! THIS STATEMENT MAY STILL NEED WORK!!!!
0477      K4=NTH+K1-1
0478      GO 303 J=K1,K4

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0479      CALL CODE
0480  C
0481  C      WRITE OUT DATA TO DISK
0482  C
0483      WRITE(10BUF,304)X(J,3),X(J,1),X(J,2),(X(J,I),I=4,16)
0484  304. FORMAT(F8.3,F7.3,14F5.1,' ')
0485      NUM = 43
0486      CALL WRITEC(1BUF,IERR,10BUF,NUM)
0487      IF(IERR.LT.0)CALL ERR(IERR,317)
0488  303  CONTINUE
0489  C
0490  C      CHECK TO SEE IF EOF
0491  C
0492      GO TO 1005
0493  9090  DO 9091 I=1,100
0494  C
0495  C      WRITE OUT A LINE OF BLANKS
0496  C
0497  9091  10BUF(I)=IBLANK
0498  C
0499  C      LOOKING FOR THE EOF MARKER
0500  C
0501      CALL WRITEC(1BUF,IERR,XES,2)
0502      IF(IERR.LT.0)CALL ERR(IERR,323)
0503      DO 9092 I=1,4
0504      CALL WRITEC(1BUF,IERR,10BUF,100)
0505  9092  IF(IERR.LT.0)CALL ERR(IERR,326)
0506  C
0507  C      DETERMINE THE ACTUAL LOCATION OF THE RECORD POINTER
0508  C
0509      CALL LOCFC(1BUF,IERR,1DUM,IRB,1DUM,JSEC)
0510      IF(IERR.LT.0)CALL ERR(IERR,328)
0511      ITRUN = JSEC/2 - (IRB +1)
0512  C
0513  C      CLOSE THE DISK FILE
0514  C
0515      CALL CLOSEC(1BUF,IERR,ITRUN)
0516      IF(IERR.LT.0)CALL ERR(IERR,331)
0517  C
0518      WRITE(IPAR(1),2000)NAME
0519  2000  FORMAT('AT THIS POINT PRODA IS FINISHED WITH ',382)
0520      STOP
0521  1919  FORMAT('DANGER IERR=',I6)
0522      END
0523  C
0524 *****SUBROUTINE TO PRINT OUT FMP ERRORS AS THEY OCCUR*****
0525  C      SUBROUTINE TO PRINT OUT FMP ERRORS AS THEY OCCUR
0526  C      FMP ERROR DESCRIPTIONS ARE LOCATED IN
0527  C      'RTE 48 PROGRAMMER'S REF SPoolING MANUAL'
0528  C
0529      SUBROUTINE ERR(IER,LINE)
0530      COMMON IPAR(5)
0531      WRITE (IPAR(1),9999)IER,LINE
0532  9999  FORMAT ('IER=',I8,'LINE NUMBER =',I8)
0533      RETURN
0534      END
0535 *****ENDS*****
0536
0537

```

APPENDIX B

Program CINFR accepts data from PRODF and produces the B-tables [6].

```

&CINFF T=00004 IS ON CR00056 USING 00062 BLKS R=0000

0001  FTN4
0002      PROGRAM CINFR
0003  C
0004  C      NOTE!!! THIS IS A MODIFIED FORM OF CINFR TO HANDLE LONGER DUMP TI
0005  C      IT SHOULD BE USED WITH &PROOF AND &CINSF.
0006  C      THIS PROGRAM IS THE SECOND OF THREE IN THE SERIES OF DATA
0007  C      REDUCING PROGRAMS. INPUT IS THE OUTPUT DISC FILE
0008  C      FROM PROGRAM PRODA AND OUTPUT IS TO A DISC FILE.
0009  C
0010 C      IF THE NUMBER OF INPUT SCANS FOR THIS PROGRAM CHANGES, THE FOLLOWI
0011 C      BUFFERS MUST BE REVISED: TIC(NT),TIM(NT),PCNT,PS(NT),TS(NT),
0012 C      FLIN(NT),TB(NT),CH(NT),BTAC(NT),TRR(NT),TPRS(NT),PB(NT),BTS(NT).
0013 C
0014 C      NOTE!!!! THE AREA OF THE NOZZLES MUST BE VARIED ALONG WITH THE
0015 C      VOLUME OF THE CHAMBER IF IT IS CHANGED.
0016 C          PROGRAM WRITTEN BY PROF R. C. CORLETT
0017 C          ADAPTED FOR USE AT NRL BY ALLEN BRODER
0018 C          MODIFIED AND COMMENTED BY F.W.WILLIAMS 810408
0019 C
0020 DIMENSION TIC(13,150),TIM(150),PC(150),PS(150),TS(150),AC(10),XP(20),
0021 1FLIN(150),TB(150),CH(150),BTAC(150),TAIR(150),TPRS(150),XPB(150),BT
0022 2TS(150)
0023      INTEGER IPAR(5),IBUF(144),OBUF(144),10BUF(100),ISIZE(2)
0024      INTEGER NAME(3),NAME2(3)
0025      INTEGER CBUF1(32),CBUF2(61),CBUF3(12),CBUF4(9),CBUF5(12),CBUF6(10)
0026      LOGICAL FI
0027      DATA XES/4HXXXX/
0028      DATA IBLANK/2H  /
0029 C
0030      CALL RMPAR(IPAR)
0031 1011 FORMAT('0 TIME TEMP(DEG C)',9X,'BETA BETA'
0032 1,'/TSTAR PRESSURANT FRACTION ')
0033 CC1012 FORMAT('0MAXIMUM OVERESTIMATE OF PRESSURANT FRACTION'
0034 CC 1' DUE TO PLACEMENT IN INLET JET IS (TMERAN - TPRESS)/'
0035 CC 2'(TAIR - TPRESS) * 3/20.   ')
0036 1013 FORMAT('0COMMENCE VALVE OPENING ')
0037 1014 FORMAT(' VALVE FULLY OPEN ')
0038 1015 FORMAT(' COMMENCE VALVE CLOSURE ')
0039 1016 FORMAT(' VALVE FULLY CLOSED ')
0040 C
0041 C      WRITE OUT HEADINGS TO DISC
0042 C
0043      CALL CODE
0044      WRITE(CBUF1,1011)
0045 CC      CALL CODE
0046 CC      WRITE(CBUF2,1012)
0047      CALL CODE
0048      WRITE(CBUF3,1013)
0049      CALL CODE
0050      WRITE(CBUF4,1014)
0051      CALL CODE
0052      WRITE(CBUF5,1015)
0053      CALL CODE
0054      WRITE(CBUF6,1016)
0055      WRITE(IPAR(1),1000)
0056 C
0057 C      INPUT NAME IS THE PRODA OUTPUT FILE NAME
0058 C

```

```

0059      CALL CINAV(TBUF,TBUF)
0060  C
0061  C  REWIND TEMPORARY FILE SO THAT IT CAN BE USED FOR
0062  C  INPUT BY CINFV
0063  C
0064      CALL RWNDF(TBUF,IERR)
0065      IF(IERR.LT.0)CALL ERR(IERR)
0066  C
0067  C  CINFV IS A SUBROUTINE THAT AVERAGES THE CASES FOR THE STATISTICAL ,
0068  C  ANALYSIS AND PERFORMS THE STATISTICS, MEAN VALUE OF ALL QUANTITIES
0069  C  NORMALIZED MEAN LOCAL PRESSURANT FRACTIONS, VARIANCES OF MEAN
0070  C  LOCAL PRESSURANT FRACTIONS AND DEVIATIONS OF MEAN LOCAL PRESSURANT
0071  C  FRACTIONS.
0072  C
0073      CALL CINFV(TBUF,OBUF)
0074  C
0075  C  DELETE TEMPORARY FILE
0076  C
0077      CALL PURGE(TBUF,IERR,TNAME)
0078      IF(IERR.LT.0)CALL ERR(IERR)
0079  C
0080  C  INITIALIZE AND WRITE OUT PADDING BUFFER TO END OF OUTPUT FILE
0081  C
0082  CC      TBUF(101)=13
0083      DO 5 I=1,100
0084      5   TBUF(I)=IBLANK
0085      DO 10 I=1,4
0086          CALL WRITF(OBUF,IERR,TBUF,100)
0087      *0  IF(IERR.LT.0) CALL ERR(IERR)
0088  C
0089  C  CLOSE AND TRUNCATE OUTPUT FILE TO CORRECT SIZE
0090  C
0091      CALL LOCF(OBUF,IERR,1DUM,IRB,1DUM,ISEC)
0092      IF(IERR.LT.0)CALL ERR(IERR)
0093      ITRUN = ISEC/2 - (IRB + 1)
0094      CALL CLOSE(OBUF,IERR,ITRUN)
0095      IF(IERR.LT.0)CALL ERR(IERR)
0096  C
0097  C  WRITE OUT MESSAGE THAT CINST HAS FINISHED.
0098  C
0099      WRITE(IPAR(1),2000) DNAME
0100  2000 FORMAT(" AT THIS POINT CINST IS FINISHED WITH ",3A2)
0101      STOP
0102      END
0103  C
0104      CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
0105  C
0106      SUBROUTINE ERR(IERR,LINE)
0107  C  THIS SUBROUTINE WRITES OUT THE ERROR # PASSED TO
0108  C  IT, AND THEN HALTS THE PROGRAM. THESE ERRORS ARE FOR FMP
0109  C  CALLS. IN SOME CASES THE LINE NUMBER IS GIVEN.
0110  C
0111      INTEGER IERR,IPAR(5)
0112      COMMON IPAR
0113      WRITE(IPAR(1),10)IERR,LINE
0114      10 FORMAT(' IERR = ',I6,' LINE NUMBER=',I8)
0115      STOP
0116      END
0117  C
0118      CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC

```

```

0119 C
0120      SUBROUTINE CINAV(INBUF,DUTBUF)
0121      INTEGER INBUF(144),DUTBUF(144),IOBUF(100)
0122      DIMENSION D(101,25),DI(50,21)
0123      DATA IBLANK/2H /
0124      DATA NC/99/
0125      DATA IXES/2HXX/
0126      DATA ICO/2H V/
0127      C READ IN THE FIRST RECORD FROM OPEN INPUT DISC FILE
0128      C THE LARGEST INPUT RECORD IS CONTROLLED BY THE SIZE OF IOBUF,
0129      C WHICH CURRENTLY IS 100, SEE DIMENSION STATEMENT.
0130      1      CALL READF(INBUF,IERR,IOBUF)
0131      IF(IERR.LT.0)CALL ERR(IERR,1)
0132      C SET THE DATA ARRAY EQUAL TO 0'S
0133      DO 3 NTK=1,50
0134      DO 3 I=1,21
0135      DI(NTK,I)=0.0
0136      3      CONTINUE
0137      C TEST TO SEE IF YOU ARE AT THE END OF THE FILE(LOOKING FOR "XX")
0138      IF(IOBUF(1).EQ.IXES)GO TO 3030
0139      C READ THE NEXT THREE RECORDS FROM THE OPEN INPUT DISC FILE
0140      DO 101 I=1,3
0141      CALL READF(INBUF,IERR,IOBUF,101)
0142      101  IF(IERR.LT.0)CALL ERR(IERR)
0143      C READS IN 101 LINES OF DATA, STORING ONLY DATA AND DISREGARDING
0144      C TITLE LINES. TO CHANGE THE AMOUNT OF DATA INPUT THE DIMENSION
0145      C STATEMENT D(101,25) MUST BE CHANGED ALONG WITH DO LOOP 20,30
0146      C LINE AFTER 210.
0147      DO 10 NT=1,101
0148      9      CALL READF(INBUF,IERR,IOBUF)
0149      IF(IERR.LT.0)CALL ERR(IERR,9)
0150      IF(IOBUF(1).EQ.ICO)NTC=NT-1
0151      C TEST THIRD CHARACTER TO BE A NUMBER
0152      ITEST=(IAND(IOBUF(2),177B))-60B
0153      IF(ITEST.LT.0.OR.ITEST.GT.9) GOTO 9
0154      CALL COBE
0155      READ(IOBUF,110)(D(NT,I),I=1,20)
0156      110    WRITE(6,110)(DCNT,I),I=1,20)
0157      10      FORMAT(4F6.1,F8.1,F8.4,F12.3,F8.3,12F6.3)
0158      10      CONTINUE
0159      C
0160      C CREATE A NEW COLUMN OF DATA(25TH) WHICH IS DERIVED FROM N/HG
0161      C WHERE HG=NO. OF MOLES AT TIME T AND HG= INITIAL NO. OF MOLES.
0162      C
0163      DO 20 NT=1,101
0164      D(NT,25)=1.0/(1.0-D(NT,7))
0165      20      CONTINUE
0166      C
0167      C CALCULATE TC CONSIDERING TAU 7 AND TAU 5 . NTC=9
0168      C
0169      TC=2.0/ALOG(D(NTC-2,25)/D(NTC-4,25))
0170      C CALCULATE A TAU, CREATES A NEW COLUMN OF DATA(24TH) WHICH IS TIME
0171      C NORMALIZED. IT IS NORMALIZED TO FULL VALVE CLOSURE AS 1.00.
0172      C TAU=XBAR/XBAR SBB C.
0173      C
0174      DO 30 NT=1,101
0175      D(NT,24)=D(NT,7)/D(35,7)
0176      DTC=NT-NTC-1
0177      IF(NT.GT.NTC)D(NT,24)=1.0+DTC/TC
0178      30      CONTINUE

```

```

0179 C
0180 C   CREATES A NEW ARRAY,DI(50,21)
0181 C
0182   DO 200 I=1,20
0183     DI(I,I)=D(I,I)
0184 200  CONTINUE
0185 C
0186 C   CONSTANTS
0187 C
0188   HT=1
0189   HTK=2
0190   TAUk=0.05
0191 210  HT=HT+1
0192   IF(HT.GT.101)GO TO 300
0193 215  IF(D(HT,24).LT.TAUk)GO TO 210
0194 C
0195 C   SIZE OF THE TIME INCREMENT IN THE TAU TABLE.
0196 C
0197   DD24=D(HT,24)-D(HT-1,24)
0198 C
0199 C   INTERPOLATES FOR THE NEW TABLE NORMALIZED TO TAU AND
0200 C   BUILDS A NEW ARRAY, DI(50,21)
0201 C
0202   DO 220 I=1,20
0203     DI(HTK,I)=D(HT-1,I)
0204     IF(DD24.GT.0.0001)DI(HTK,I)=DI(HTK,I)+(D(HT,I)-D(HT-1,I))
0205     1   *(TAUk-D(HT-1,24))/DD24
0206 220  CONTINUE
0207   IF(HTK.GE.50)GO TO 300
0208   HTK=HTK+1
0209   TAUk=TAUk+0.05
0210   GO TO 215
0211 300  TAUkH=TAUk-0.05
0212 D   WRITE(6,150)TC,TAUKH,NC,HTC
0213 C   WRITE      VALUES TO THE TEMPORARY DISC FILE
0214 150  FORMAT(1H1,2F10.2,2I10,1H )
0215 C
0216 C   WRITE OUT SELECTED VALUES TO THE TEMPORARY DISC FILE,TMPBUF
0217 C     TC=
0218 C     TAUkH=
0219 C     NC=
0220 C     NTC= SCAN WHERE THE VALVE IS FULLY CLOSED.
0221 C
0222 CALL CODE
0223 WRITE(10BUF,150)TC,TAUKH,NC,HTC
0224 CALL WRITF(OUTBUF,IERR,10BUF,21)
0225 IF(IERR.LT.0)CALL ERR(IERR,160)
0226 C   WRITE THE DATA TO THE TEMPORARY DISC FILE "TMPBUF"
0227   DO 310 HTK=1,50
0228     DHTK=HTK-1
0229     DI(HTK,21)=0.05*DHTK
0230 160   FORMAT(1H,F5.1,3F6.1,F8.1,F8.4,F6.3,F8.3,12F6.3,F5.2,1H )
0231   CALL CODE
0232   WRITE(10BUF,160)(DI(HTK,I),I=1,21)
0233   CALL WRITF(OUTBUF,IERR,10BUF,66)
0234   IF(IERR.LT.0)CALL ERR(IERR,310)
0235 310   CONTINUE
0236 C
0237 C   PICK UP THE NEXT CASE TO PROCESS
0238 C

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```

0239      GO TO 1
0240 C
0241 C   WRITE OUT A LINE OF BLANKS AT THE END OF TEMPORARY FILE.
0242 C
0243 9090 IOBUF(101)=13
0244      DO 9091 I=1,100
0245 9091 IOBUF(I)=IBLANK
0246      CALL WRITE(OUTBUF,IERR,IOBUF,101)
0247      IF(IERR.LT.0)CALL ERR(IERR,9091)
0248      RETURN
0249      END
0250 C
0251 CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
0252 C
0253 SUBROUTINE CINHV(INBUF,OUTBUF)
0254 INTEGER INBUF(144),OUTBUF(144),IOBUF(100),CBUF1(63),CBUF2(63)
0255 DIMENSION S1(50,21),S2(50,21),SG(50,21),DS(50,21)
0256 C
0257 C   ZEROS ALL THE ARRAYS WHERE S1 WILL BE SUMS,S2 SUM OF SQUARES,SG
0258 C           ,AND DS
0259 C
0260 1      DO 10 NT=1,50
0261      DO 10 I=1,21
0262      S1(NT,I)=0.0
0263      S2(NT,I)=0.0
0264      SG(NT,I)=0.0
0265      DS(NT,I)=0.0
0266 10    CONTINUE
0267 C
0268 C   COUNTER FOR THE NUMBER OF CASES PROCESSED
0269 C
0270      CH=-1.0
0271 12    CH=CH+1.0
0272 C
0273 C   READ IN THE FIRST LINE OF DATA FROM TEMPORARY FILE.
0274 C
0275      CALL READF(INBUF,IERR,IOBUF)
0276      IF(IERR.LT.0)CALL ERR(IERR,12)
0277      CALL CODE
0278      READ(IOBUF,100)TC,TAUM,NC
0279 100    FORMAT(2F10.2,110)
0280      IF(NC.EQ.0)GO TO 500
0281 C
0282 C   READ IN 50 LINES OF DATA FROM THE TEMPORARY FILE, WRITE THEM INTO
0283 C   BUFFER SG(NT,I) AND ADD THEM TO BUFFER S1 AND STORE IN BUFFER S1.
0284 C   ALSO SQUARE SG,AND ADD TO BUFFER S2 AND STORE IN S2.
0285 C
0286      DO 20 NT=1,50
0287      CALL READF(INBUF,IERR,IOBUF)
0288      IF(IERR.LT.0)CALL ERR(IERR,110)
0289      CALL CODE
0290      READ(IOBUF,110)(SG(NT,I),I=1,21)
0291 110    FORMAT(4F6.1,F8.1,F8.4,F6.3,F8.3,12F6.3,F5.2)
0292      DO 20 I=1,21
0293      S1(NT,I)=S1(NT,I)+SG(NT,I)
0294      S2(NT,I)=S2(NT,I)+SG(NT,I)**2
0295 20    CONTINUE
0296 C
0297 C   REPEAT FOR ALL THE CASES IN THE TEMPORARY FILE.
0298 C

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0299      GO TO 12
0300 C
0301 C   CALCULATE THE AVERAGE MEAN PRESSURANT AT THE 21ST TIME FROM
0302 C   WELL AFTER VALVE CLOSURE.
0303 C
0304 500 XBARAV=S1(23,7)/CN
0305 C
0306 C   CALCULATE THE AVERAGE VALUES FOR THE X NO. OF CASES FOR ARRAY S1
0307 C   (SUMS), S2(SUM OF SQUARES), AND SSG(SUM OF DIFFERENCE OF SQUARES)
0308 C
0309      DO 520 NT=1,50
0310      DO 510 I=1,21
0311      S1(NT,I)=S1(NT,I)/CN
0312      S2(NT,I)=S2(NT,I)/CN
0313 C   REINITIALIZE ARRAY SG
0314      SG(NT,I)=0.0
0315      SGG=S2(NT,I)-S1(NT,I)**2
0316      IF(SGG.GT.0.0)SG(SG(NT,I))=SQRT(SGG)
0317      IF(I.GT.7.AND.I.LT.21)DS(NT,I)=S1(NT,I)-S1(NT,7)
0318      S2(NT,I)=0.0
0319      IF(I.GT.7.AND.I.LT.21)S2(NT,I)=S1(NT,I)/XBARAV
0320      DS(NT,I)=DS(NT,I)/XBARAV
0321      IF(I.GT.7.AND.I.LT.21)SG(NT,I)=SG(NT,I)/XBARAV
0322      IF(I.EQ.21)S2(NT,I)=S1(NT,I)
0323      IF(I.EQ.21)SG(NT,I)=S1(NT,I)
0324      IF(I.EQ.21)DS(NT,I)=S1(NT,I)
0325 510  CONTINUE
0326      IF(NT.GT.20.OR.NT.LT.5)GO TO 520
0327      TBAR=S1(NT,2)+273.2
0328      T0=S1(1,2)+273.2
0329      DTBAR=S1(NT,2)-S1(NT-1,2)
0330      SH=L_0/(1.0-S1(NT,7))
0331      SH1=1.0/(1.0-S1(NT-1,7))
0332      DLH= ALOG(SH/SH1)
0333      IF(DLH.LE.0.00001)GO TO 520
0334      BETA=S1(NT,5)
0335      TS=(0.4*BETA*(TBAR-T0)+TBAR+DTBAR/DLN)/1.4
0336      S2(NT,2)=TS-273.2
0337      S2(NT,6)=(S1(NT,4)-S2(NT,2))/(S1(NT,3)-S1(NT,4))/XBARAV
0338      D  WRITE(6,997)TBAR,T0,DTBAR,SH,SH1,DLH,BETA,TS
0339 997    FORMAT(1H ,3F8.1,3F8.4,2F8.1)
0340 520  CONTINUE
0341 120  FORMAT(1H ,F5.1,3F6.1,F8.1,F8.4,F6.3,F8.3,12F6.3,F5.2)
0342 D  WRITE(6,120)((S1(NT,I),I=1,21),NT=1,50)
0343 C
0344 C   WRITE A HEADING FOR THE FIRST STAT TABLE,S1
0345 C
0346      CALL CODE
0347      WRITE(IOBUF,65)
0348 65      FORMAT('0 MEAN VALUES OF ALL QUANTITIES ',/)
0349      CALL WRITE(OUTBUF,IERR,IOBUF,17)
0350      IF(IERR.LT.0)CALL ERR(IERR,65)
0351      CALL CODE
0352      WRITE(CBUFI,1010)
0353 1010  FORMAT("0 TIME",1X,"TMP,C",1X,"TMP,C",1X,"TMP,C",3X,"BETA",
0354 1 2X,"BETA/",3X," X ",20X,"MEAN PRESSURANT FRACTIONS AT"
0355 2 " LOCATIONS I",22X,"TAU")
0356      CALL CODE
0357      WRITE(CBUF2,1020)
0358 1020  FORMAT(" SEC",2X,"INIT",2X,"     ",1X,"      ",9X,"THETA",

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STONE, ALEXANDER, STREET, ST. AUBIN, AND WILLIAMS

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0359      1      3X,"BAR",6X,"1",5X,"2",5X,"3",5X,"4",5X,"5",5X,"6",
0360      2      5X,"7",5X,"8",5X,"9",5X,"10",4X,"11",4X,"12",4X,"13 ")
0361      CALL WRITF(OUTBUF,IERR,CBUF1,65)
0362      IF(IERR.LT.0) CALL ERR(IERR)
0363      CALL WRITF(OUTBUF,IERR,CBUF2,63)
0364      IF(IERR.LT.0) CALL ERR(IERR)
0365      CALL WRITI(S1,OUTBUF)
0366 C
0367 C   WRITE A HEADING FOR THE SECOND STAT TABLE,S2
0368 C
0369      CALL CODE
0370      WRITE(IOBUF,70)
0371      70  FORMAT('1 NORMALIZED MEAN LOCAL',
0372      1,' PRESSURANT FRACTIONS ',/)
0373      CALL WRITF(OUTBUF,IERR,IOBUF,23)
0374      IF(IERR.LT.0)CALL ERR(IERR)
0375      CALL WRIT2(S2,OUTBUF)
0376 C
0377 C   WRITE A HEADING FOR THE THIRD STAT TABLE,SG
0378 C
0379 C
0380      CALL CODE
0381      WRITE(IOBUF,75)
0382      75  FORMAT('1 STANDARD DEVIATION OF MEAN LOCAL',
0383      1,' PRESSURANT FRACTIONS ')
0384      CALL WRITF(OUTBUF,IERR,IOBUF,29)
0385      IF(IERR.LT.0)CALL ERR(IERR),
0386      CALL WRIT2(SG,OUTBUF)
0387 C
0388 C   WRITE A HEADING FOR THE FORTH STAT TABLE,DS
0389 C
0390      CALL CODE
0391      WRITE(IOBUF,80)
0392      80  FORMAT('1 DEVIATIONS OF MEAN LOCAL',
0393      1,' PRESSURANT FRACTION ')
0394      CALL WRITF(OUTBUF,IERR,IOBUF,24)
0395      IF(IERR.LT.0)CALL ERR(IERR)
0396      CALL WRIT2(DS,OUTBUF)
0397 C
0398 C   WRITE THE NUMBER OF CASES TREATED
0399 C
0400      NCH=CH
0401      CALL CODE
0402      WRITE(IOBUF,130)NCH
0403      CALL WRITF(OUTBUF,IERR,IOBUF,5)
0404      IF(IERR.LT.0)CALL ERR(IERR)
0405      130 FORMAT(1H0,12,7H CASES )
0406      RETURN
0407      END
0408 C
0409      CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
0410 C
0411      SUBROUTINE WRITIKAR(OUTBUF)
0412 C
0413 C   THIS IS A SUBROUTINE THAT OUTPUTS THE DATA TO A DISC FILE,ORNAME
0414 C   FROM ACTINST FOR THE MEAN VALUES OF ALL QUANTITIES.
0415 C
0416      REAL AR(50,21)
0417      INTEGER IOBUF(100),OUTBUF(144)
0418 C

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STONE, ALEXANDER, STREET, ST. AUBIN, AND WILLIAMS

APPENDIX C

Program CINST accepts data from CINFR and produces the C-, D-, and E-tables [6].

STONE, ALEXANDER, STREET, ST. AUBIN, AND WILLIAMS

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&CINSF T=00004 IS ON CR00036 USING 00060 BLKS R=0000

0001 FTH4
0002 C
0003 C      NOTE!!!! THIS IS A MODIFIED FORM OF CINST TO HANDLE LONGER DUMP
0004 C      TIMES. IT DOES NOT CHANGE THE NONDIMENSIONAL TIME TAU AT 2.5.
0005 C      PROGRAM CINST(4,99), FWB VERSION 810213 NO02
0006 C
0007 C
0008 C      THIS PROGRAM DOES STATISTICS ON THE DATA FROM CINFR
0009 C      THE RUNS FROM CINFR ARE GROUPED ACCORDING TO A PARTICULAR
0010 C      TEST CONFIGURATION. THE INPUT DATA IS FROM DISC FILES THAT
0011 C      WERE CREATED FROM CINFR. THE OUTPUT DATA FROM THIS PROGRAM
0012 C      IS STORE IN DISC FILES AND MAYBE TRANSFERRED TO MAGNETIC TAPE
0013 C      WITH STORE COMMANDS FROM THE FILE MANAGER.
0014 C
0015 C
0016 C      THIS PROGRAM WAS WRITTEN BY PROF. R. G. CORLETT, UNIV OF
0017 C      WASHINGTON, SEATTLE WASHINGTON.
0018 C      THIS PROGRAM WAS ADAPTED FOR USE ON THE NRL COMPUTER, CODE
0019 C      6180 BY A. BRODER AND D. INBORITZ.
0020 C      IT HAS BEEN COMMENTED BY F. W. WILLIAMS.
0021 C      PROGRAM MODIFIED BY F.W.WILLIAMS 810404
0022 C
0023 C
0024      INTEGER INAME(3),ISIZE(2),OBUF(144),IBUF(144)
0025      INTEGER TBUF(144),OHANE(3),THANE(3),IPAR(5)
0026      COMMON IPAR
0027      DATA THANE/2HTH,2HPB,2HUF/
0028      DATA IBLANK/2H /
0029      CALL RMPAR(IPAR)
0030      WRITE(IPAR,1)
0031      1 FORMAT('CARTRIDGE #, INPUT FILE NAME : (15,A6)' )
0032      READ(IPAR,2)ICR,INAME
0033      2 FORMAT(15,1X,3A2)
0034      WRITE(IPAR,3)
0035      3 FORMAT('CARTRIDGE #, OUTPUT FILE NAME : (15,A6)' )
0036      READ(IPAR,2)ICR2,OHANE
0037      ISIZE(1)=-1
0038      ITYPE=3
0039 C
0040 C      CREATE OUTPUT FILE
0041 C
0042      CALL CREAT(OBUF,IERR,OHANE,ISIZE,ITYPE,IDUM,ICR2)
0043      IF(IERR.LT.0)CALL ERR(IERR)
0044 C
0045 C      OPEN INPUT FILE
0046 C
0047      CALL OPEN(IBUF,IERR,INAME,IDUM, IDUM,ICR)
0048      IF(IERR.LT.0)CALL ERR(IERR)
0049 C
0050 C      CREATE TEMPORARY FILE FOR STORING INTERMEDIATE RESULTS
0051 C      FROM CINAV
0052 C
0053      CALL CREAT(TBUF,IERR,THANE,ISIZE,ITYPE, IDUM)
0054      IF(IERR.LT.0)CALL ERR(IERR)
0055 C
0056 C      CINAV IS A SUBROUTINE WHICH INTERPOLATES THE DATA, CREATES A
0057 C      NONDIMENSIONAL TIME AND NORMALIZES THE DATA TO IT.
0058 C

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0059 1000 FORMAT('GIVE CARTRIDGE #, NAME FOR INPUT FILE'
0060 1,'(15,A6)')*
0061 READ(IPAR(1),1002)ICR,NAME
0062 1002 FORMAT(15,1X,3A2)
0063 WRITE(IPAR(1),1004)
0064 1004 FORMAT('GIVE CARTRIDGE #, NAME FOR OUTPUT FILE'
0065 1,'(15,A6)')*
0066 READ(IPAR(1),1002)ICR2,NAME2
0067 ISIZE(1)=-1
0068 ITYPE = 3
0069 C
0070 C CREATE A DISK FILE
0071 C
0072 CALL CREAT(0BUF,IERR,NAME2,ISIZE,ITYPE,1DUM,ICR2)
0073 IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0074 C
0075 C OPEN INPUT FILE
0076 C
0077 CALL OPEN(1BUF,IERR,NAME,1DUM,1DUM,ICR)
0078 IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0079 C
0080 10 DO 9 I=1,100
0081 C
0082 C CONSTRUCT A LINE OF BLANKS
0083 C
0084 9 IOBUF(I)=IBLANK
0085 CALL READF(1BUF,IERR,A)
0086 IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0087 C
0088 C CHECK FOR EOF
0089 C
0090 IF(A(1).EQ.XES)GO TO 9090
0091 CALL READF(1BUF,IERR,IOBUF)
0092 IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0093 CALL CODE
0094 READ(IOBUF,20)NTI,NT,DT,T0,TP,AN,VT,CF,GA,WA,WP
0095 C
0096 C DESCRIPTION OF VARIABLE MEANING
0097 C
0098 C NTI= NO. OF THERMOCOUPLES, NT=NO. OF POINTS IN DATA TIME SERIES,
0099 C DT=TIME SERIES NOMINAL INCREMENT (SEC), T0 AND TP RESPECTIVELY
0100 C EQUAL TIMES OF VALVE OPENING AND CLOSURE (SEC), AN=NOMINAL
0101 C AREA (CM**2), VT=TANK VOLUME (M**3), CF=FLOW COEFFICIENT -
0102 C IF CF IS INPUT AS ZERO AND NTI EXCEEDS 5 CF IS DEFAULT CALCULATED
0103 C USING MEAN OF TC DATA AS ESTIMATE OF MEAN TANK TEMPERATURE,
0104 C GA=SPEC. HEATS RATIO - IF INPUT AS ZERO ASSIGNED 1.4 DEFAULT,
0105 C WA=MOL. WT. OF AIR,- IF INPUT AS ZERO ASSIGNED 28.97 DEFAULT,
0106 C WP=MOL. WT. OF PRESSURANT - IF INPUT AS ZERO DEFAULT SET =WA.
0107 C
0108 20 FORMAT(2I4,9F7.3)
0109 C
0110 C IF THERE ARE NO THERMOCOUPLES THE PROGRAM IS FINISHED
0111 C AND A MESSAGE INDICATING COMPLETION WILL BE PRINTED
0112 C
0113 IF(NTI.GT.0.0)GO TO 30
0114 WRITE(IPAR(1),2000)NAME2
0115 2000 FORMAT ('AT THIS POINT CINER IS FINISHED WITH ',3A2)
0116 STOP
0117 C
0118 C INITIALIZING HEAT RATIO, MOL. WEIGHT OF AIR, AND

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0119 C      ROL. WEIGHT OF PRESSURE TO DEFAULT IF APPROPRIATE
0120 C
0121 D 30 IF(GA.EQ.0.0)GA=1.4
0122 D IF(WA.EQ.0.0)WA=28.94
0123 D IF(WP.EQ.0.0)WP=WA
0124 C
0125 C      WRITES TO LINE PRINTER
0126 C
0127 D WRITE(6,40)NTI,HT,DT,TO,TP,AN,VT,GA,WA,WP
0128 D 40 FORMAT(1H120X14HPROGRAM CINFER/71H0 HTI   HT    DT    TO    TP
0129 D     1   AN      VT      GA      WA      WP/1H 14,15,F7.3,ZF8.3)
0130 C
0131 C      IF NUMBER OF THERMOCOUPLES ARE LESS OR EQUAL TO 5
0132 C OR IF FLOW COEFFICIENT EQUALS 0, PRINT MESSAGE INDICATING
0133 C SO AND ALSO PRINT A MESSAGE INDICATING PROGRAM IS
0134 C COMPLETED.
0135 C
0136 D IF(HTI.GT.5.OR.CF.NE.0.0)GO TO 60
0137 D WRITE(IPAR(1),50)
0138 D 50 FORMAT(20H0FLOW COEFFICIENT)
0139 D WRITE(IPAR(1),2000)NAME2
0140 D STOP
0141 C
0142 C
0143 C      PRINT OUT FLOW COEFFICIENT IF ANY
0144 C
0145 D 60 IF(CF.NE.0.0)WRITE(IPAR(1),70)CF
0146 D 70 FORMAT(20H0FLOW COEF. INPUT ASF7.4)
0147 C
0148 C      PRINT OUT NUMBERS UP TO THE TOTAL NUMBER OF
0149 C      THERMOCOUPLES
0150 C
0151 D WRITE(6,80) (I,I=1,NTI)
0152 D 80 FORMAT(21H0RAW TIME SERIES DATA/30H   TIME   P      PS      TS      TI/
0153 D 11H ,26X2H=I1,815/1H ,I29,815)
0154 D DO 100 J=1,HT
0155 D RJ=J-1
0156 D TIM(J)=RJ*DT
0157 C
0158 C      MUST BE MATED TO NRL DATA RECORD.
0159 C
0160 C      CALL READFC(IBUF,IERR,IOBUF)
0161 C      IF(IERR.LT.0) CALL ERR(IPAR(1),IERR)
0162 C      CALL CODE
0163 C      READ(IOBUF,90)P(J),PS(J),TS(J),(TIC(I,J),I=1,NTI)
0164 D 90 FORMAT(F8.3,F7.3,14F5.1)
0165 C
0166 C      DESCRIPTION OF VARIABLES
0167 C      TIM=TIME(SEC), P=TANK PRESS. (ATM), PS=NOZZLE PRESS. (ATM),
0168 C      TS=NOZZLE TOTAL TEMP. (DEG C), AND TI=TEMP. (DEG C) OF ITH TC.
0169 C
0170 D WRITE(6,110)TIM(J),P(J),PS(J),TS(J),(TIC(I,J),I=1,NTI)
0171 D 110 FORMAT(1H0,F6.2,2F6.3,F6.1,9F5.1/1H ,F29.1,8F5.1)
0172 D 100 CONTINUE
0173 C
0174 C
0175 C      CONVERT TEMP. DATA TO DEG. K AND PRESS. DATA TO NEWTONS/N**2.
0176 C
0177 D DO 120 J=1,HT
0178 D P(J)=P(J)*101322.0

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0179      PS(J)=PS(J)*101322.0
0180      TS(J)=TS(J)+273.2
0181      DO 120 I=1,HTI
0182      120  TI(I,J)=TI(I,J)+273.2
0183 C
0184 C      CONVERT AH TO H**2, NOZZLE NOMINAL AREA
0185 C
0186 C      AH=AH*0.0001
0187 C
0188 C      ALTER TIME SERIES TO INCLUDE TO AND TP.
0189 C
0190      L=T0/DT
0191      L=L+1
0192      M=TP/DT
0193      M=M+1
0194      IF(M-L.GT.4)GO TO 140
0195 C
0196 C      IF (M-L) IS LESS OR EQUAL TO 4 PRINT OUT
0197 C      MESSAGE AND STOP PROGRAM
0198 C
0199      WRITE(IPAR(1),130)
0200      130 FORMAT(52HNOT ENOUGH FILLING DATA TO EVALUATE PRESSURANT FLOW)
0201      WRITE(IPAR(1),2000)NAME2
0202      STOP
0203 C
0204      140 CONTINUE
0205 D      DO 916 J=1,NT
0206      916  WRITE(6,917)TIN(J),P(J),PS(J),TS(J),(TI(I,J),I=1,HTI)
0207      917  FORMAT(1H0,F7.2,2F10.1,F7.1/1H ,13F7.1)
0208 C
0209 C      ADJUST TANK TEMPS. TO UNIFORM VALUE AT TIME T0.
0210 C      CALCULATE MEAN TEMPERATURE.
0211 C
0212      NTEF=HTI
0213      CHTI=NTEF
0214      TB(L)=0.0
0215      DO 160 I=1,HTI
0216 C
0217      TB(L)=TB(L)+TI(I,L)/CHTI
0218      160 CONTINUE
0219      DO 170 I=1,HTI
0220      TCOR=TB(L)-TI(I,L)
0221      DO 170 J=1,NT
0222      170  TI(I,J)=TI(I,J)+TCOR
0223 C
0224 C      GAS CONST. RG (JOULE/KGM-MOL/DEG K) AND CRIT. PRESS. RATIO RP
0225 C
0226      RG=8314.5
0227      RP=(2.0/(GA+1.0))**((GA/(GA-1.0)))
0228 C
0229 C      CALCULATE NOMINAL FLOW INTEGRAL ( ARRAY FLIN), MEAN TEMP. ( ARRAY TB),
0230 C      AND NO. MOLES IN TANK ( ARRAY CN).
0231 C
0232      DO 190 J=1,NT
0233      PRAT=AMAX1(RP,P(J)/PS(J))
0234      VEL=SQRT(2.0*GA*RG/MP*TS(J)/(GR-1.0)*(1.0-PRAT)**((GA-1.0)/GA))
0235      DENS=PS(J)/RG/TS(J)*PRAT**((1.0/GA))
0236      FLIN(J)=AH*VEL*DENS
0237      TB(J)=0.0
0238      DO 180 I=1,HTI

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0239      TB(J)=TB(J)+TICI(J)/CNTI
0240      180  CONTINUE
0241      C
0242      CH(J)=P(J)*VT/TB(J)/RG
0243      D  WRITE(6,919)J,PRAT,VEL,DENS,FLIN(J)
0244      9919  FORMAT(1H ,15,4F15.4)
0245      190  CONTINUE
0246      IF(CF.NE.0.0)GO TO 240
0247      C
0248      C      CALCULATE FLOW DATA FROM NOMINAL MEAN TEMP. DATA (THAT IS, FROM
0249      C      MEAN TC. DATA) AS ESTIMATE OF MEAN TANK TEMP. (INPUT VALUE OF CF
0250      C      IS ZERO.) THIS IS BETWEEN TO AND TP.
0251      C      EVALUATE FLOW INTEGRAL FLINT.
0252      C
0253      FLINT=0.0
0254      M1=N-1
0255      DO 200 J=L,M1
0256      200  FLINT=FLINT+(FLIN(J)+FLIN(J+1))/2.0*(TIM(J+1)-TIM(J))
0257      CF=(CH(M)-CH(L))/FLINT
0258      D  WRITE(6,210)CF
0259      D210  FORMAT(4H0CF=F6.4,61H -INFERRED USING MEAN OF TC. DATA TO APPROX.
0260      I MEAN TANK TEMP.)
0261      C
0262      C      DEVELOP CONSISTENT VALUES FOR MEAN TEMP. TB AND NO. MOLES. CH
0263      C      FOR NON-FILLING PERIODS.
0264      C
0265      DO 220 J=1,L
0266      CH(J)=CH(L)
0267      220  TB(J)=P(J)*VT/CH(J)/RG
0268      DO 230 J=N,NT
0269      TBJ=0.0
0270      DO 225 I=1,NTI
0271      TBJ=TBJ+TIC(I,J)/CNTI
0272      225  CONTINUE
0273      CH(J)=CH(N)
0274      TB(J)=P(J)*VT/CH(J)/RG
0275      DO 228 I=1,NTI
0276      228  TIC(I,J)=TIC(I,J)+TB(J)-TBJ
0277      230  CONTINUE
0278      GO TO 260
0279      C
0280      C      INTEGRATE FLOW INTO TANK USING INPUT VALUE OF CF.
0281      C
0282      240  DO 250 J=1,NT
0283      IF(J.LT.L)CH(J)=CH(L)
0284      IF(J.GT.L.AND.J.LE.N)CH(J)=CH(J-1)+CF*(FLIN(J-1)+FLIN(J))/2.0*(TIM
0285      1(J)-TIM(J-1))
0286      IF(J.GT.N)CH(J)=CH(N)
0287      250  TB(J)=P(J)*VT/CH(J)/RG
0288      C
0289      C      INTEGRATION OF TAIR AND TPRS
0290      C
0291      260  CONTINUE
0292      D  WRITE(6,270)N
0293      D270  FORMAT(50H1SUMMARY OF CALCULATIONS THRU ARRAYS TAIR AND TPRS/3H J=
0294      1I2,2X6HNO H=I3/58H0 J TIME TAIR TPRS TSTAR BETA XBAR
0295      D  2 BETA/TSTAR/3
0296      D280  FORMAT(1H ,13,5F7.1,F8.3,E10.2)
0297      NTH1=NT-1
0298      DO 460 J=L,NTH1

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0299      T1=TB(L)
0300      TAIR(J)=T1
0301      TPRS(J)=TS(L)
0302      TSTAR=CH(L)/(CH(L+1)-CH(L))
0303      IF(J.GT.L.AND.TB(J).GT.T1)GO TO 420
0304      TB2=T1
0305      TA2=T1
0306      TS2=TS(J)
0307      P2=P(J)
0308      CH2=CH(J)
0309      CH1=GA-1.0
0310      DLTP=(TB(J+2)-T1)/(0.5*(TB(J+2)+T1))/ ALOG(P(J+2)/P(L))
0311      CHU2=GM1*T1/(GA*(T1-TS(L))+GA*TS(L)-T1)
0312      BTA(J)=((1.00*GA*TS2-TB2-CH2*1.00*(TB(J+2)-T1))/(CH(J+2)-CH(L))/
0313      1*(GM1*1.00+0.5*(TB(J+2)-T1)))
0314      D      WRITE(6,410)J,DLTP,CHU2
0315      D 410  FORMAT(3H0J=I3,10X5HDLT=F6.3,10X4HCHU=F6.3)
0316      GO TO 450
0317      420  TB1=TB2
0318      TS1=TS2
0319      P1=P2
0320      CH1=CH2
0321      TA1=TA2
0322      CHU1=CHU2
0323      TS2=TS(J)
0324      TB2=TB(J)
0325      P2=P(J)
0326      CH2=CH(J)
0327      TB0=0.5*(TB1+TB2)
0328      TSB=0.5*(TS1+TS2)
0329      PB=0.5*(P1+P2)
0330      CHB=0.5*(CH1+CH2)
0331      TAB=TA1
0332      CHUB=CHU1
0333      DP=P2-P1
0334      DH=CH2-CH1
0335      DTB=TB2-TB1
0336      FI=.FALSE.
0337      430  DTA=GM1/GA*TAB*DP/PB-CHUB/GA*((GA*TSB-TBB)/CHB+DH-DTB)
0338      TA2=TA1+DTA
0339      TAB=0.5*(TA1+TA2)
0340      CHU2=(TA2-T1)/(TB2-T1)
0341      CHUB=0.5*(CHU1+CHU2)
0342      IF(FI)GO TO 440
0343      FI=.TRUE.
0344      GO TO 430
0345      440  TAIR(J)=TA2
0346      IF(J.LE.M-2)TSTAR=CHB/DH*DT
0347      BTA(J)=((1.00*GA*TSB-TBB)*DH/CHB-DTB)/GM1/(TBB-T1)*TSTAR/DT
0348      TPRS(J)=(CH2*TB2-CH(L))*TA2)/(CH2-CH(L))
0349      TSAV=0.5*(TS2+TS(L))
0350      IF(TPRS(J).GE.TSAV)GO TO 445
0351      TPRS(J)=TSAV
0352      TAIR(J)=TSAV+CH2/CH(L)*(TB2-TSAV)
0353      445  CONTINUE
0354      D      WRITE(6,448)J,TB1,TS1,P1,CH1,TA1,CHU1,TB2,TS2,P2,CH2,TA2,CHU2,TBB,
0355      D      1TSB,PB,CHB,TAB,CHUB,DP,DTB,DH,DT,TSTAR,TAIR(J),TPRS(J),BTA(J),
0356      D      2TSAV
0357      D 448  FORMAT(3H0J=I3,10X17HTB,TS,P,CH,TA,CHU/
0358      D      15X1H1,2F8.1,F8.0,F8.4,F8.1,F8.4/

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0359 D      25XIH2,2F8.1,F8.0,F8.4,F8.1,F8.4/
0360 D      35X1HB,2F8.1,F8.0,F8.4,F8.1,F8.4/
0361 D      44H DP=F8.0,5X4HDTB=F8.1,5X3HDN=F8.4,5X4HDTR=F8.1,5X3HDT=F6.3/
0362 D      57H TSTAR=F8.1,5X5HTAIR=F8.1,5X5HTPRS=F8.1,5X5HBETA=F8.1,5X5HTSAV=F
0363 D      68.1)
0364 450   XPB(J)=0.0
0365     IF(TAIR(J).NE.TPRS(J))XPB(J)=(TAIR(J)-TB(J))/2(TAIR(J)
0366     1-TPRS(J))
0367     BTTS(J)=BTAC(J)/TSTAR
0368 D      WRITE(6,280)J,TIM(J),TAIR(J),TPRS(J),TSTAR,BTAC(J),XPB(J),BTTS(J)
0369 460   CONTINUE
0370 C
0371     DO 926 J=1,NT
0372 D      WRITE(6,925)TIN(J),TB(J),CH(J),(TIC(I,J),I=1,MT1)
0373 9925 FORMAT(1H0,F10.3,F10.2,F15.4/(1H ,7F10.2))
0374 926   CONTINUE
0375 C
0376 C      CALCULATION AND DISPLAY OF PRESSURANT FRACTIONS
0377 C
0378 800   CALL CODE
0379     WRITE(10BUF,802)(A(I),I=1,10)
0380 802   FORMAT(36H1INFERRED PRESSURANT DISTRIBUTION - ,10E4)
0381     CALL WRITE(0BUF,IERR,10BUF,38)
0382     IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0383     CALL WRITE(0BUF,IERR,CBUF1,32)
0384     IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0385     CALL CODE
0386     WRITE(10BUF,803)(E,I=1,13)
0387 803   FORMAT(28H (SEC) MEAN AIR PRESSURANT,20X9HMEAN I = [1,12I6])
0388     CALL WRITE(0BUF,IERR,10BUF,65)
0389     IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0390 C
0391 C      CONSTRUCT A LINE OF BLANKS
0392 C
0393     DO 804 I=1,100
0394 804   10BUF(I) = 1BLANK
0395 C
0396 C
0397 806   FORMAT(1H ,F5.1,3F6.1,F8.1,F8.4,F12.3,F8.3,12F6.3)
0398     THE=0.0
0399     XPI=0.0
0400     TB(L)=TB(L)-273.2
0401     CALL WRITE(0BUF,IERR,CBUF3,12)
0402     IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0403     CALL CODE
0404     WRITE(10BUF,807)THE,TB(L),TB(L),BTAC(L),BTTS(L),XPB(L),(XRI,I=1,13)
0405     CALL WRITE(0BUF,IERR,10BUF,66)
0406     IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0407 C
0408 C      NOTE!!!! THIS HAS TO BE CHANGED TO COINCIDE WITH WHAT IS AVAILABLE
0409 C      IN SCAMS AND WHAT CTNST IS EXPECTING. THE KB=L+100 THE 100 HAS TO
0410 C      BE CHANGED.
0411 C
0412 C
0413     KA=L+1
0414     KB=L+100
0415 C
0416     DO 850 K=KA,KB
0417     THE=TIM(K)-TEM(L)
0418 C

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0419      DO 830 I=1,13
0420      XP(I)=0.0
0421      IF(TAIR(K).NE.TB(K))XP(I)=1.00*XPB(K)*(TAIR(K)-T(I,K))/
0422      (TAIR(K)-TB(K))
0423 830   CONTINUE
0424      TB(K)=TB(K)-273.2
0425      TAIR(K)=TAIR(K)-273.2
0426      TPRS(K)=TPRS(K)-273.2
0427      IF(K.NE.L+2)GO TO 831
0428      CALL WRTF(0BUF,IERR,CBUF4,9)
0429      IF(IERR.LT.0) CALL ERR(IPAR(1),IERR)
0430 831   IF(K.NE.M-2)GO TO 832
0431      CALL WRTF(0BUF,IERR,CBUF5,12)
0432      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0433 832   IF(K.NE.M)GO TO 833
0434      CALL WRTF(0BUF,IERR,CBUF6,10)
0435      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0436 833   CALL CODE
0437      WRITE(10BUF,806)THE,TB(K),TAIR(K),TPRS(K),BTACK,BTTS(K),XPB(K),
0438      1(XP(I),I=1,13)
0439      CALL WRTF(0BUF,IERR,10BUF,66)
0440 850   IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0441 C
0442 CC   CALL WRTF(0BUF,IERR,CBUF2,61)
0443 CC   IF(IERR.LT.0) CALL ERR(IPAR(1),IERR)
0444 C
0445 C   RETURN TO BEGINNING OF PROGRAM
0446 C
0447 GO TO 10
0448 C
0449 C   CONSTRUCT LINE OF BLANKS
0450 C
0451 9090 DO 9091 I=1,100
0452 9091 IOBUF(I)=IBLANK
0453 C
0454 C   CHECK FOR EOF MARKER
0455 C
0456      CALL WRTF(0BUF,IERR,100,2)
0457      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0458 C
0459 DO 9092 I=1,4
0460      CALL WRTF(0BUF,IERR,10BUF,100)
0461 9092 IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0462 C
0463 C   DETERMINE THE ACTUAL LOCATION OF THE RECORD POINTS
0464 C
0465      CALL LOCF(0BUF,IERR,1DUM,IRB,1DUM,ISEC)
0466      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0467      ITRUN = ISEC/2 - (IRB - 1)
0468 C
0469 C   CLOSE THE DISK FILE
0470 C
0471      CALL CLOSE(0BUF,IERR,ITRUN)
0472      IF(IERR.LT.0)CALL ERR(IPAR(1),IERR)
0473 C
0474 C   PRINT ENDING MESSAGE
0475 C
0476      WRITE(IPAR(1),2000)NAME2
0477      STOP
0478      END

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