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Lawrence Livermore Laboratory

EQUATIONS OF STATE FOR DETONATION PRODUCTS OF HIGH ENERGY PBX EXPLOSIVES*

E. L. Lee, F. H. Helm, M. Finger, and J. R. Walton

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MASTER

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OF HIGH ENERGY PBX EXPLOSIVES*

E. L. Lee, F. H. Helm, M. Finger, and J. R. Walton

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July 7, 1977

ABSTRACT

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This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Energy Research and Development Administration, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

It has become apparent that the accumulated changes in the analysis of cylinder test data, in the material specifications, and in the hydrodynamic code simulation of the cylinder test necessitated an update of our detonation product EOS description for explosives in common use at LLL. The explosives reviewed here are PBX-9404-3, LX-04-1, LX-10-1, LX-14-0 and LX-09-1. In order to maintain the proper relation of predicted performance amongst these standard explosives, we have revised them as a single set.

*Work performed under the auspices of the U. S. Energy Research and Development Administration under contract No. W-7405-Eng-48.

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We have updated the EOS description of the high energy PBX's to conform with our current material specifications and our best evaluation of the performance data. We performed HEMP calculations simulating the cylinder test for PBX-9404-3, LX-09-1, and LX-04-1 using the JWL EOS coefficients published earlier.² We subsequently made adjustments to the JWL coefficients so as to remove discrepancies in time and velocity between the calculations and the experiments. The PBX-9404-3 HEMP calculations were then remade to confirm the revision. The adjustments for the other explosives were thereby confirmed by intercomparison with PBX-9404.

The material specifications are listed in Table 1.0 and a condensed summary of the equation of state parameters is given in Table 1.1. The performance of the listed explosives relative to PBX-9404-3 as measured in the cylinder test is shown in Figure 1 and also tabulated — Table 1.2. The band of performance results from an extensive test series on LX-10-1 is shown to illustrate the range of behavior to be expected from production material.

The supporting HEMP calculations are compared with experimental results in a more detailed listing in Tables 2.1 — 2.4. Experimental results for LX-10 and for LX-14 are listed in Table 2.5 and 2.6. Figure 2 illustrates the computer simulated cylinder test. The EOS comparisons are given as PBX-9404-3 versus LX-N and as LX-N (old) versus LX-N (new) in computer results listed in Tables 3.11 — 3.18.

TABLE 1.0

NOMINAL COMPOSITION^a AND DENSITY^b SPECIFICATIONS

	<u>PBX 9404-03</u>	<u>LX-14-0</u>	<u>LX-10-1</u>	<u>LX-09-1</u>	<u>LX-04-1</u>
HMX	94.0% ±0.5	95.5% ±0.5	94.5% ±.5	93.3% ±.5	85.0% ±.5
NC/CEP (50/50)	6.0% ±0.5				
VITON (A)			5.5% ±0.5		15.0% ±.5
ESTANE (5702F1)		4.5% ±0.5			
DNPA/FEFO (1.9/1.0)				6.7% ±.5	
SPECIFICATION (DENSITY)	1.831+	1.830+	1.860+	1.835+	1.858+
NOMINAL DENSITY	1.84	1.835	1.865	1.84	1.865

^a Weight percent^b Densities = g/cc

TABLE 1.1

C-J Parameters

	<u>PBX-9404-3</u>	<u>LX-14-0</u>	<u>LX-10-1</u>	<u>LX-09-1</u>	<u>LX-04-1</u>	<u>Units*</u>
ρ_o	1.84	1.835	1.865	1.84	1.865	g/cc
D	.88	.88	.882	.884	.847	cm/ μ s
P_{CJ}	.370	.370	.375	.375	.340	Mbar
E_o	.102	.102	.104	.105	.095	Mbar cc/cc
Γ	2.851	2.841	2.868	2.834	2.935	Mbar cc/cc

Revised JWL Coefficients

B1	8.524	8.261	8.807	8.481	8.364
B2	.1802	.1724	.1836	.1710	.1298
R1	4.6	4.55	4.62	4.58	4.62
R2	1.30	1.32	1.32	1.25	1.25
W1	.38	.38	.38	.40	.42
C1	.01207	.01296	.01296	.01308	.01471

*Conversions to S.I.

1.0 g/cc - 1kg/M³1.0 cm/s - 10 mm/ μ s

1.0 Mbar - 100 GPa

1.0 Mbar cc/cc- 100 GPa M³/M³

TABLE 1.2

ENERGY COMPARISON ON THE BASIS OF CYLINDER TEST RESULTS

1 INCH CYLINDER TEST		PBX-9404 AS STANDARD FOR COMPARISON*	LX-14-0	LX-10-1	LX-09-1	LX-04-1
R-R ₀ (mm)	v/v ₀	$\sim \Delta E$	ΔE	ΔE	ΔE	ΔE
6	2.4	-0-	-1.5%	+ .7%	+3.0%	-9.6%
10	3.5	-0-	-1.0	+1.3	5.4	-9.2
15	5.4	-0-	-2.0	+ .0	3.2	-9.4
20	7.4	-0-	-1.3	+ .5	3.6	-9.0
24	9.2	-0-	- .8	+1.1	+4.0	-8.8

* LX-04 is not shown in the figure which follows

JWL COEFFICIENTS

The JWL EOS coefficients from Tables 1.1 and 3.11 through 3.17 are identified by the following JWL EOS equations.

$$P = B1 \cdot \left[1 - \frac{W1}{R1 \cdot V} \right] \cdot e^{-R1 \cdot V}$$

$$+ B2 \cdot \left[1 - \frac{W1}{R2 \cdot V} \right] \cdot e^{-R2 \cdot V}$$

$$+ \frac{W1 \cdot E}{V}$$

$$P_{\text{isentropic}} = B1 \cdot e^{-R1 \cdot V} + B2 \cdot e^{-R2 \cdot V} + \frac{C1}{V(W1 + 1)}$$

C-J PARAMETERS

The Chapman-Jouguet parameters are listed in Tables 1.1, 2, and 3 defined as follows:

Loading Density	g/cm ⁻³	-	RHO
Detonation Velocity	cm/μs	-	D
C-J Pressure	Mbar	-	PCJ
Detonation Energy	Mbar cc/cc	-	EØ
Γ polytropic gas control =	$\left(\frac{d \ln P}{d \ln V} \right)_S$	-	GAM

THE EOS PVE RESULTS

The column headings for Table 3.0 through 3.20 are

R-Ro	-	cylinder expansion in mm
V	-	relative volume expansion
P	-	pressure, Mb, — calculated using coefficients labeled TEST HE:
PREF	-	pressures calculated using the coefficients labeled REF HE
DP	-	P - PREF
E	-	energy in Mbar cc/cc
EREF	-	energy in Mbar cc/cc for the reference HE
DE	-	fractional decrement between E and EREF — This quantity is proportional to the fractional energy difference based on cylinder test wall velocities. (See Table 1.2)

$$\left(V^2 - V_{REF}^2 \right) / V_{REF}^2$$

G	-	the value of
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$$\Gamma = - \left(\frac{d \ln P}{d \ln V} \right)_S$$

GREF	-	the value of
------	---	--------------

$$\Gamma = - \left(\frac{d \ln P}{d \ln V} \right)_S \quad \text{for the reference HE}$$

C	-	the sound velocity
---	---	--------------------

$$C^2 = - V^2 \left(\frac{dP}{dV} \right)_S$$

FIGURE 1

Energies of LX-09-1, LX-10-1, and LX-14-04
Relative to PBX-9404

CYLINDER TEST CONFIGURATION CORRESPONDING TO HEMP CALCULATION

FIGURE 2

TABLE 2.1

*Calculated versus Experimental Cylinder Test Results for PBX-9404
JWL Coefficients from UCID 16189

TIME VALUES FOR CYLINDER WALL TO REACH THE STANDARD R POSITIONS.

NR	R	R-R0	TEXP	NX		16		17		18		19	
				X VALUE	X STD	10.4800	20.0000	9.4800	21.0000	8.4800	22.0000	7.4800	23.0000
				AVT0		23.4707		24.6072		25.7437		26.8803	
						TCALC	DT	TCALC	DT	TCALC	DT	TCALC	DT
0	1.5309	0.00	0.00										
1	1.6309	0.10	1.09			1.0239	0.0661	1.0242	0.0658	1.0247	0.0653	1.0251	0.0649
2	1.6809	0.15	1.48			1.4546	0.0254	1.4547	0.0253	1.4548	0.0252	1.4549	0.0251
3	1.7309	0.20	1.87			1.8534	0.0166	1.8534	0.0166	1.8535	0.0165	1.8534	0.0166
4	1.7809	0.25	2.23			2.2365	-0.0065	2.2366	-0.0066	2.2366	-0.0066	2.2364	-0.0064
5	1.8309	0.30	2.59			2.5950	-0.0050	2.5951	-0.0051	2.5950	-0.0050	2.5950	-0.0050
6	1.8809	0.35	2.93			2.9414	-0.0114	2.9414	-0.0114	2.9413	-0.0113	2.9413	-0.0113
7	1.9309	0.40	3.26			3.2841	-0.0241	3.2840	-0.0240	3.2838	-0.0238	3.2837	-0.0237
8	2.0309	0.50	3.91			3.9381	-0.0281	3.9380	-0.0280	3.9379	-0.0279	3.9379	-0.0279
9	2.1309	0.60	4.56			4.5764	-0.0164	4.5762	-0.0162	4.5761	-0.0161	4.5760	-0.0160
10	2.2309	0.70	5.18			5.1965	-0.0165	5.1963	-0.0163	5.1962	-0.0162	5.1962	-0.0162
11	2.3309	0.80	5.78			5.8068	-0.0268	5.8066	-0.0266	5.8065	-0.0265	5.8065	-0.0265
12	2.4309	0.90	6.38			6.4103	-0.0303	6.4101	-0.0301	6.4099	-0.0299	6.4099	-0.0299
13	2.5309	1.00	6.97			7.0060	-0.0360	7.0058	-0.0358	7.0057	-0.0357	7.0057	-0.0357
14	2.6309	1.10	7.56			7.5977	-0.0377	7.5975	-0.0375	7.5974	-0.0374	7.5974	-0.0374
15	2.7309	1.20	8.14			8.1857	-0.0457	8.1855	-0.0455	8.1854	-0.0454	8.1854	-0.0454
16	2.8309	1.30	8.71			8.7699	-0.0599	8.7697	-0.0597	8.7695	-0.0595	8.7695	-0.0595
17	2.9309	1.40	9.28			9.3515	-0.0715	9.3513	-0.0713	9.3511	-0.0711	9.3510	-0.0710
18	3.0309	1.50	9.85			9.9309	-0.0809	9.9307	-0.0807	9.9305	-0.0805	9.9304	-0.0804
19	3.1309	1.60	10.41			10.5081	-0.0981	10.5078	-0.0978	10.5076	-0.0976	10.5075	-0.0975
20	3.2309	1.70	10.97			11.0831	-0.1131	11.0829	-0.1129	11.0826	-0.1126	11.0826	-0.1126
21	3.3309	1.80	11.53			11.6566	-0.1266	11.6563	-0.1263	11.6561	-0.1261	0.	0.
22	3.4309	1.90	12.08			12.2285	-0.1485	12.2282	-0.1482	12.2280	-0.1480	0.	0.
23	3.5309	2.00	12.64			12.7998	-0.1598	12.7987	-0.1587	0.	0.	0.	0.
24	3.7309	2.20	13.75			13.9358	-0.1858	0.	0.	0.	0.	0.	0.

RADIAL VELOCITY.

NR	R	R-R0	VEXP	NX		16		17		18		19	
				X VALUE	X STD	10.4800	20.0000	9.4800	21.0000	8.4800	22.0000	7.4800	23.0000
						20.0000		21.0000		22.0000		23.0000	
						VCALC	DV	VCALC	DV	VCALC	DV	VCALC	DV
0	1.5309	0.00	0.0000										
1	1.5309	0.10	0.1250			0.1054	0.0196	0.1058	0.0192	0.1052	0.0198	0.1049	0.0201
2	1.6809	0.15	0.1250			0.1227	0.0023	0.1227	0.0023	0.1229	0.0021	0.1230	0.0020
3	1.7309	0.20	0.1250			0.1276	-0.0026	0.1276	-0.0026	0.1278	-0.0028	0.1278	-0.0028
4	1.7809	0.25	0.1430			0.1345	0.0085	0.1346	0.0084	0.1343	0.0087	0.1345	0.0085
5	1.8309	0.30	0.1430			0.1435	-0.0065	0.1436	-0.0066	0.1433	-0.0063	0.1433	-0.0063
6	1.8809	0.35	0.1430			0.1447	-0.0017	0.1447	-0.0017	0.1448	-0.0018	0.1448	-0.0018
7	1.9309	0.40	0.1500			0.1480	0.0080	0.1483	0.0077	0.1482	0.0078	0.1480	0.0080
8	2.0309	0.50	0.1500			0.1551	0.0069	0.1551	0.0069	0.1551	0.0069	0.1551	0.0069
9	2.1309	0.60	0.1611			0.1600	0.0011	0.1599	0.0012	0.1599	0.0012	0.1600	0.0011
10	2.2309	0.70	0.1638			0.1617	0.0021	0.1617	0.0021	0.1617	0.0021	0.1617	0.0021
11	2.3309	0.80	0.1660			0.1655	0.0005	0.1655	0.0005	0.1655	0.0005	0.1655	0.0005
12	2.4309	0.90	0.1680			0.1670	0.0010	0.1670	0.0010	0.1669	0.0011	0.1669	0.0011
13	2.5309	1.00	0.1699			0.1680	0.0019	0.1680	0.0019	0.1680	0.0019	0.1681	0.0018
14	2.6309	1.10	0.1717			0.1699	0.0018	0.1699	0.0018	0.1700	0.0017	0.1700	0.0017
15	2.7309	1.20	0.1734			0.1707	0.0027	0.1707	0.0027	0.1707	0.0027	0.1707	0.0027
16	2.8309	1.30	0.1749			0.1713	0.0036	0.1713	0.0036	0.1713	0.0036	0.1713	0.0036
17	2.9309	1.40	0.1762			0.1724	0.0038	0.1724	0.0038	0.1724	0.0038	0.1724	0.0038
18	3.0309	1.50	0.1773			0.1731	0.0042	0.1731	0.0042	0.1731	0.0042	0.1731	0.0042
19	3.1309	1.60	0.1782			0.1735	0.0047	0.1735	0.0047	0.1735	0.0047	0.1735	0.0047
20	3.2309	1.70	0.1789			0.1740	0.0049	0.1740	0.0049	0.1741	0.0048	0.1741	0.0048
21	3.3309	1.80	0.1794			0.1747	0.0047	0.1747	0.0047	0.1747	0.0047	0.	0.
22	3.4309	1.90	0.1799			0.1752	0.0047	0.1752	0.0047	0.1752	0.0047	0.	0.
23	3.5309	2.00	0.1803			0.1755	0.0048	0.1755	0.0048	0.	0.	0.	0.
24	3.7309	2.20	0.1811			0.1763	0.0045	0.	0.	0.	0.	0.	0.

*EOS from UCID 16189

$$DV = VEXP - VCALC.$$

TIME VALUES FOR CYLINDER WALL TO REACH THE STANDARD R POSITIONS.

$$TCALC = TINT - AVTO. \quad DT = TEXP - TCALC.$$

X VALUE				10.4800		9.4800		8.4800		7.4800	
X STD				20.0000		21.0000		22.0000		23.0000	
AVTO				23.3212		24.4576		25.5944		26.7311	
NR	R	R-R0	TEXP	TCALC	DT	TCALC	DT	TCALC	DT	TCALC	DT
0	1	.5326	0.00								
1	1	.5826	0.05								
2	1	.6326	0.10	0.4800	0.0900	0.4806	0.0894	0.4805	0.0895	0.4804	0.0896
3	1	.6826	0.15	1.0186	0.0714	1.0178	0.0722	1.0177	0.0723	1.0189	0.0711
4	1	.7326	0.20	1.4499	0.0301	1.4500	0.0300	1.4500	0.0300	1.4503	0.0297
5	1	.7826	0.25	1.8481	0.0219	1.8481	0.0219	1.8482	0.0218	1.8483	0.0217
6	1	.8326	0.30	2.2326	-0.0026	2.2323	-0.0023	2.2325	-0.0025	2.2325	-0.0025
7	1	.8826	0.35	2.5918	-0.0018	2.5917	-0.0017	2.5918	-0.0018	2.5919	-0.0019
8	1	.9326	0.40	2.9360	-0.0060	2.9362	-0.0062	2.9361	-0.0061	2.9361	-0.0061
9	2	.0326	0.50	3.2783	-0.0183	3.2783	-0.0183	3.2785	-0.0185	3.2782	-0.0182
10	2	.1326	0.60	3.9294	-0.0194	3.9295	-0.0195	3.9293	-0.0193	3.9294	-0.0194
11	2	.2326	0.70	4.5637	-0.0037	4.5638	-0.0038	4.5637	-0.0037	4.5635	-0.0035
12	2	.3326	0.80	5.1774	-0.0026	5.1774	-0.0026	5.1771	-0.0029	5.1771	-0.0029
13	2	.4326	0.90	5.7813	-0.0013	5.7812	-0.0012	5.7810	-0.0010	5.7809	-0.0009
14	2	.5326	1.00	6.3769	0.0031	6.3769	0.0031	6.3764	0.0036	6.3764	0.0036
15	2	.6326	1.10	6.9632	0.0068	6.9631	0.0069	6.9628	0.0072	6.9627	0.0073
16	2	.7326	1.20	7.5457	0.0143	7.5455	0.0145	7.5451	0.0149	7.5451	0.0149
17	2	.8326	1.30	8.1234	0.0166	8.1231	0.0169	8.1227	0.0173	8.1227	0.0173
18	2	.9326	1.40	8.6961	0.0139	8.6959	0.0141	8.6955	0.0145	8.6953	0.0147
19	3	.0326	1.50	9.2664	0.0136	9.2661	0.0139	9.2657	0.0143	9.2655	0.0145
20	3	.1326	1.60	9.8338	0.0162	9.8334	0.0166	9.8330	0.0170	9.8328	0.0172
21	3	.2326	1.70	10.3981	0.0119	10.3978	0.0122	10.3973	0.0127	10.3971	0.0129
22	3	.3326	1.80	10.9603	0.0097	10.9599	0.0101	10.9594	0.0106	10.9591	0.0109
23	3	.4326	1.90	11.5205	0.0095	11.5201	0.0099	11.5196	0.0104	11.5193	0.0107
24	3	.5326	2.00	12.0788	0.0012	12.0784	0.0016	12.0778	0.0022	12.0775	0.0025
25	3	.6326	2.10	12.6352	0.0048	12.6347	0.0053	12.6341	0.0059	12.6338	0.0062
26	3	.7326	2.20	13.1935	0.0067	13.1927	0.0073	13.1921	0.0079	13.1917	0.0083
27	4	.1326	2.40	13.7433	0.0043	13.7427	0.0049	13.7421	0.0056	13.7417	0.0060
28	4	.2326	2.60	14.8457	-0.0032	14.8451	-0.0025	14.8444	-0.0017	14.8440	-0.0013
29	4	.3326	2.80	15.9432	-0.0063	15.9425	-0.0055	15.9417	-0.0047	15.9413	-0.0042
30	4	.4326	3.00	17.0363	-0.0155	17.0355	-0.0147	17.0347	-0.0138	17.0342	-0.0132
31	4	.5326	3.20	18.1255	-0.0313	18.1247	-0.0304	18.1238	-0.0294	18.1232	-0.0288
32	4	.6326	3.40	19.2113	-0.0080	19.2104	-0.0082	19.2094	-0.0086	19.2088	-0.0087
AVERAGE											

THE HIGH EXPLOSIVE USED IN THE COPPER CYLINDER WAS LX-04.
THE EXPERIMENTAL TIME AND VELOCITY VALUES WERE OBTAINED FROM FRANK HELM.
TIME AND VELOCITY VALUES WERE DATED APRIL 69.

EXPLOSIVE: LX-04 6/24/77 RHO = 1.865 C-J P = 0.340 CYL33

OUTER RADIUS OF CYLINDER: 1.532636 CM.
INNER RADIUS OF CYLINDER: 1.272032 CM.

LENGTH OF CYLINDER: 30.480000 CM.
WALL THICKNESS: 0.260604 CM.

LENGTH VALUES ARE IN CENTIMETERS.

VELOCITY VALUES ARE IN CENTIMETERS / MICROSECOND.

DV = VEXP - VCALC.

NR	R	R-RO	VEXP	16		17		18		19	
				10.4800 20.0000	16	9.4800 21.0000	17	8.4800 22.0000	18	7.4800 23.0000	19
			NX X VALUE X STD	VCALC	DV	VCALC	DV	VCALC	DV	VCALC	DV
0	1.5326	0.00	0.0000								
1	1.5826	0.05	0.0810	0.0861	-0.0051	0.0864	-0.0054	0.0862	-0.0052	0.0864	-0.0054
2	1.6326	0.10	0.1155	0.1002	-0.0153	0.1003	-0.0152	0.1003	-0.0152	0.0999	-0.0156
3	1.6826	0.15	0.1155	0.1161	0.	0.1162	0.	0.1161	0.	0.1163	0.
4	1.7326	0.20	0.1329	0.1198	0.0131	0.1199	0.0130	0.1199	0.0130	0.1199	0.0130
5	1.7826	0.25	0.	0.1281	0.	0.1279	0.	0.1280	0.	0.1279	0.
6	1.8326	0.30	0.	0.1359	0.	0.1358	0.	0.1359	0.	0.1359	0.
7	1.8826	0.35	0.1430	0.1359	0.0071	0.1360	0.0070	0.1359	0.0071	0.1360	0.0070
8	1.9326	0.40	0.	0.1416	0.	0.1417	0.	0.1418	0.	0.1415	0.
9	2.0326	0.50	0.1520	0.1465	0.0055	0.1466	0.0054	0.1465	0.0055	0.1466	0.0054
10	2.1326	0.60	0.1531	0.1532	-0.0001	0.1532	-0.0001	0.1533	-0.0002	0.1532	-0.0001
11	2.2326	0.70	0.1557	0.1547	0.0010	0.1548	0.0009	0.1548	0.0009	0.1548	0.0009
12	2.3326	0.80	0.1580	0.1575	0.0005	0.1574	0.0006	0.1573	0.0005	0.1575	0.0005
13	2.4326	0.90	0.1601	0.1609	-0.0008	0.1610	-0.0009	0.1609	-0.0008	0.1609	-0.0008
14	2.5326	1.00	0.1620	0.1617	0.0003	0.1617	0.0003	0.1616	0.0004	0.1616	0.0004
15	2.6326	1.10	0.1636	0.1629	0.0007	0.1629	0.0007	0.1629	0.0007	0.1629	0.0007
16	2.7326	1.20	0.1651	0.1650	0.0001	0.1650	0.0001	0.1650	0.0001	0.1650	0.0001
17	2.8326	1.30	0.1664	0.1658	0.0006	0.1658	0.0006	0.1658	0.0006	0.1659	0.0005
18	2.9326	1.40	0.1675	0.1663	0.0012	0.1664	0.0011	0.1664	0.0011	0.1664	0.0011
19	3.0326	1.50	0.1684	0.1674	0.0010	0.1675	0.0009	0.1675	0.0009	0.1675	0.0009
20	3.1326	1.60	0.1693	0.1685	0.0008	0.1685	0.0008	0.1685	0.0008	0.1685	0.0008
21	3.2326	1.70	0.1701	0.1690	0.0011	0.1690	0.0011	0.1691	0.0010	0.1690	0.0011
22	3.3326	1.80	0.1710	0.1695	0.0015	0.1695	0.0015	0.1695	0.0015	0.1695	0.0015
23	3.4326	1.90	0.1718	0.1702	0.0016	0.1702	0.0016	0.1702	0.0016	0.1702	0.0016
24	3.5326	2.00	0.1725	0.1708	0.0017	0.1708	0.0017	0.1709	0.0016	0.1709	0.0016
25	3.6326	2.10	0.1738	0.1718	0.0020	0.1718	0.0020	0.1718	0.0020	0.1719	0.0019
26	3.7326	2.20	0.1742	0.1727	0.0022	0.1727	0.0022	0.1727	0.0022	0.1727	0.0022
27	3.8326	2.30	0.1756	0.1735	0.0021	0.1735	0.0021	0.1735	0.0021	0.1735	0.0021
28	3.9326	2.40	0.1761	0.1742	0.0019	0.1742	0.0019	0.1743	0.0018	0.1743	0.0018
29	4.0326	2.50	0.1769	0.1749	0.0020	0.1749	0.0020	0.1749	0.0020	0.1749	0.0020
30	4.1326	2.60	0.1778	0.1755	0.0023	0.1755	0.0023	0.1755	0.0023	0.1755	0.0023

TIME VALUES FOR CYLINDER WALL TO REACH THE STANDARD R POSITIONS.

THE HIGH EXPLOSIVE USED IN THE COPPER CYLINDER WAS LX-04.
THE EXPERIMENTAL TIME AND VELOCITY VALUES WERE OBTAINED FROM FRANK HELM.
TIME AND VELOCITY VALUES WERE DATED APRIL 69.

EXPLOSIVE: LX-04 6/24/77 RHO = 1.865 C-J P = 0.340 CYL33

OUTER RADIUS OF CYLINDER: 1.532636 CM.
INNER RADIUS OF CYLINDER: 1.272032 CM.

LENGTH OF CYLINDER: 30.480000 CM.
WALL THICKNESS: 0.260604 CM.

LENGTH VALUES ARE IN CENTIMETERS.

TIME VALUES ARE IN MICROSECONDS.

TCALC = TINT - AVTO. DT = TEXP - TCALC.

TIME VALUES FOR CYLINDER WALL TO REACH THE STANDARD R POSITIONS.

NR	R	R-RO	TEXP	16		17		18		19	
				10.4800 20.0000 24.2385	16	9.4800 21.0000 25.4193	17	8.4800 22.0000 26.6004	18	7.4800 23.0000 27.7814	19
			NX X VALUE X STD AVTO	TCALC	DT	TCALC	DT	TCALC	DT	TCALC	DT
0	1.5326	0.00	0.00								
1	1.5826	0.05	0.	0.4881	0.	0.4887	0.	0.4886	0.	0.4883	0.
2	1.6326	0.10	1.13	1.0582	0.0718	1.0576	0.0724	1.0573	0.0727	1.0586	0.0714
3	1.6826	0.15	0.	1.5091	0.	1.5094	0.	1.5093	0.	1.5095	0.
4	1.7326	0.20	1.93	1.9337	-0.0037	1.9337	-0.0037	1.9337	-0.0037	1.9338	-0.0038
5	1.7826	0.25	0.	2.3392	0.	2.3388	0.	2.3390	0.	2.3390	0.
6	1.8326	0.30	2.74	2.7154	0.0246	2.7155	0.0245	2.7155	0.0245	2.7156	0.0244
7	1.8826	0.35	0.	3.0833	0.	3.0834	0.	3.0834	0.	3.0834	0.
8	1.9326	0.40	3.45	3.4451	0.0049	3.4450	0.0050	3.4453	0.0047	3.4450	0.0050
9	2.0326	0.50	4.12	4.1332	-0.0132	4.1332	-0.0132	4.1331	-0.0131	4.1331	-0.0131
10	2.1326	0.60	4.79	4.8026	-0.0126	4.8025	-0.0125	4.8024	-0.0124	4.8025	-0.0125
11	2.2326	0.70	5.41	5.4548	-0.0448	5.4547	-0.0447	5.4545	-0.0445	5.4545	-0.0445
12	2.3326	0.80	6.05	6.0915	-0.0415	6.0914	-0.0414	6.0911	-0.0411	6.0912	-0.0412
13	2.4326	0.90	6.68	6.7211	-0.0411	6.7210	-0.0410	6.7207	-0.0407	6.7207	-0.0407
14	2.5326	1.00	7.30	7.3429	-0.0429	7.3427	-0.0427	7.3422	-0.0422	7.3424	-0.0424
15	2.6326	1.10	7.91	7.9570	-0.0470	7.9567	-0.0467	7.9563	-0.0463	7.9563	-0.0463
16	2.7326	1.20	8.52	8.5669	-0.0469	8.5667	-0.0467	8.5662	-0.0462	8.5663	-0.0463
17	2.8326	1.30	9.12	9.1730	-0.0530	9.1727	-0.0527	9.1722	-0.0522	9.1722	-0.0522
18	2.9326	1.40	9.72	9.7746	-0.0546	9.7742	-0.0542	9.7737	-0.0537	9.7737	-0.0537
19	3.0326	1.50	10.32	10.3729	-0.0529	10.3725	-0.0525	10.3720	-0.0520	10.3719	-0.0519
20	3.1326	1.60	10.91	10.9687	-0.0587	10.9683	-0.0583	10.9677	-0.0577	10.9677	-0.0577
21	3.2326	1.70	11.50	11.5619	-0.0619	11.5614	-0.0614	11.5608	-0.0608	11.5607	-0.0607
22	3.3326	1.80	12.09	12.1525	-0.0625	12.1519	-0.0619	12.1513	-0.0613	12.1512	-0.0612
23	3.4326	1.90	12.67	12.7409	-0.0709	12.7403	-0.0703	12.7396	-0.0696	12.7395	-0.0695
24	3.5326	2.00	13.25	13.3273	-0.0773	13.3267	-0.0767	13.3260	-0.0760	13.3259	-0.0759
25	3.6326	2.10	14.41	14.4949	-0.0849	14.4942	-0.0842	14.4934	-0.0834	14.4933	-0.0833
26	3.7326	2.20	15.56	15.6558	-0.0958	15.6550	-0.0950	15.6542	-0.0942	15.6540	-0.0940
27	3.8326	2.30	16.71	16.8111	-0.1011	16.8102	-0.1002	16.8094	-0.0994	16.8091	-0.0991
28	3.9326	2.40	17.85	17.9614	-0.1114	17.9604	-0.1104	17.9596	-0.1096	17.9592	-0.1092
29	4.0326	2.50	18.99	19.1072	-0.1172	19.1061	-0.1161	19.1053	-0.1153	19.1048	-0.1148
30	4.1326	2.60	20.12	20.2490	-0.1290	20.2478	-0.1278	20.2469	-0.1269	20.2464	-0.1264
AVERAGE					-0.0509		-0.0505		-0.0500		-0.0500

16:21:

$$DV = VEXP - V_{CALC.}$$
16:21
$$TCALC = TINT - AVTO, \quad DT = TEXP - TCALC.$$

		NX		16		17		18		19	
		X VALUE		10.4800		9.4800		8.4800		7.4800	
		X STD		20.0000		21.0000		22.0000		23.0000	
		AVTO		23.2374		24.3686		25.5003		26.6319	
NR	K	R-RO	TEXP	TCALC	DT	TCALC	DT	TCALC	DT	TCALC	DT
0	1.5326	0.00	0.00								
1	1.5826	0.05	0.53	0.4610	0.0690	0.4617	0.0683	0.4616	0.0684	0.4614	0.0686
2	1.6326	0.10	1.05	0.9975	0.0525	0.9968	0.0532	0.9966	0.0534	0.9979	0.0521
3	1.6826	0.15	1.45	1.4273	0.0227	1.4275	0.0225	1.4274	0.0226	1.4277	0.0223
4	1.7326	0.20	1.84	1.8235	0.0165	1.8236	0.0164	1.8236	0.0164	1.8237	0.0163
5	1.7826	0.25	2.20	2.2061	-0.0061	2.2058	-0.0058	2.2060	-0.0060	2.2059	-0.0059
6	1.8326	0.30	2.56	2.5636	-0.0036	2.5636	-0.0036	2.5637	-0.0037	2.5637	-0.0037
7	1.8826	0.35	2.91	2.9058	0.0042	2.9060	0.0040	2.9059	0.0041	2.9059	0.0041
8	1.9326	0.40	3.24	3.2461	-0.0061	3.2460	-0.0060	3.2462	-0.0062	3.2459	-0.0059
9	2.0326	0.50	3.88	3.8935	-0.0135	3.8935	-0.0135	3.8934	-0.0134	3.8934	-0.0134
10	2.1326	0.60	4.51	4.5240	-0.0140	4.5240	-0.0140	4.5239	-0.0139	4.5237	-0.0137
11	2.2326	0.70	5.11	5.1339	-0.0239	5.1338	-0.0238	5.1336	-0.0236	5.1336	-0.0236
12	2.3326	0.80	5.70	5.7347	-0.0347	5.7346	-0.0346	5.7343	-0.0343	5.7343	-0.0343
13	2.4326	0.90	6.29	6.3271	-0.0371	6.3270	-0.0370	6.3266	-0.0366	6.3266	-0.0366
14	2.5326	1.00	6.87	6.9108	-0.0408	6.9105	-0.0405	6.9102	-0.0402	6.9101	-0.0401
15	2.6326	1.10	7.45	7.4911	-0.0411	7.4908	-0.0408	7.4904	-0.0404	7.4904	-0.0404
16	2.7326	1.20	8.02	8.0667	-0.0467	8.0663	-0.0463	8.0659	-0.0459	8.0659	-0.0459
17	2.8326	1.30	8.59	8.6379	-0.0479	8.6375	-0.0475	8.6371	-0.0471	8.6370	-0.0470
18	2.9326	1.40	9.16	9.2071	-0.0471	9.2067	-0.0467	9.2062	-0.0462	9.2061	-0.0461
19	3.0326	1.50	9.72	9.7737	-0.0537	9.7732	-0.0532	9.7728	-0.0528	9.7726	-0.0526
20	3.1326	1.60	10.27	10.3376	-0.0676	10.3371	-0.0671	10.3366	-0.0666	10.3364	-0.0664
21	3.2326	1.70	10.83	10.8997	-0.0697	10.8991	-0.0691	10.8986	-0.0686	10.8984	-0.0684
22	3.3326	1.80	11.38	11.4602	-0.0802	11.4596	-0.0796	11.4590	-0.0790	11.4588	-0.0788
23	3.4326	1.90	11.93	12.0189	-0.0889	12.0183	-0.0883	12.0177	-0.0877	12.0175	-0.0875
24	3.5326	2.00	12.47	12.5760	-0.1060	12.5754	-0.1054	12.5747	-0.1047	12.5745	-0.1045
25	3.7326	2.20	13.56	13.6863	-0.1263	13.6856	-0.1256	13.6849	-0.1249	13.6846	-0.1246
26	3.9326	2.40	14.64	14.7918	-0.1518	14.7910	-0.1510	14.7902	-0.1502	14.7899	-0.1499
27	4.1326	2.60	15.71	15.8929	-0.1829	15.8921	-0.1821	15.8912	-0.1812	15.8908	-0.1808
28	4.3326	2.80	16.78	16.9902	-0.2102	16.9893	-0.2093	16.9884	-0.2084	16.9879	-0.2079
29	4.5326	3.00	0.	18.0840	0.	18.0831	0.	18.0821	0.	18.0816	0.
30	4.7326	3.20	0.	19.1748	0.	19.1738	0.	19.1727	0.	19.1721	0.
AVERAGE					-0.0477		-0.0474		-0.0470		-0.0470

TABLE 2.5
Experimental Cylinder Test Results

THE HIGH EXPLOSIVE USED IN THE COPPER CYLINDER WAS LX-14-0.
THE EXPERIMENTAL TIME AND VELOCITY VALUES WERE OBTAINED FROM FRANK HELM.
TIME AND VELOCITY VALUES WERE DATED 3/8/75.

EXPLOSIVE: LX-14-0 RHO = 1.844

OUTER RADIUS OF CYLINDER: 1.532636 CM.
INNER RADIUS OF CYLINDER: 1.272032 CM.

LENGTH OF CYLINDER: 30.480000 CM.
WALL THICKNESS: 0.260604 CM.

LENGTH VALUES ARE IN CENTIMETERS.

TIME VALUES ARE IN MICROSECONDS.

NR	R	R-RO	TEXP	VEXP
0	1.5326	0.00	0.00	0.0000
1	1.5826	0.05	0.	0.
2	1.6326	0.10	0.	0.
3	1.6826	0.15	0.	0.
4	1.7326	0.20	0.	0.
5	1.7826	0.25	0.	0.
6	1.8326	0.30	0.	0.
7	1.8826	0.35	0.	0.
8	1.9326	0.40	0.	0.
9	2.0326	0.50	0.	0.
10	2.1326	0.60	4.60	0.1509
11	2.2326	0.70	5.22	0.1631
12	2.3326	0.80	5.83	0.1666
13	2.4326	0.90	6.43	0.1675
14	2.5326	1.00	7.03	0.1691
15	2.6326	1.10	7.61	0.1705
16	2.7326	1.20	8.20	0.1719
17	2.8326	1.30	8.78	0.1732
18	2.9326	1.40	9.35	0.1744
19	3.0326	1.50	9.93	0.1756
20	3.1326	1.60	10.49	0.1767
21	3.2326	1.70	11.06	0.1776
22	3.3326	1.80	11.62	0.1784
23	3.4326	1.90	12.18	0.1790
24	3.5326	2.00	12.74	0.1796
25	3.7326	2.20	13.85	0.1807
26	3.9326	2.40	14.95	0.1828
27	4.1326	2.60	0.	0.
28	4.3326	2.80	0.	0.

TABLE 2.6

Experimental Cylinder Test Results

THE HIGH EXPLOSIVE USED IN THE COPPER CYLINDER WAS LX-10-1.
 THE EXPERIMENTAL TIME AND VELOCITY VALUES WERE OBTAINED FROM FRANK HELM.
 TIME AND VELOCITY VALUES WERE DATED 12/17/74.

EXPLOSIVE: LX-10-1

RHO = 1.384

OUTER RADIUS OF CYLINDER: 1.532636 CM.
 INNER RADIUS OF CYLINDER: 1.272032 CM.

LENGTH OF CYLINDER: 30.460000 CM.
 WALL THICKNESS: 0.260604 CM.

LENGTH VALUES ARE IN CENTIMETERS.

TIME VALUES ARE IN MICROSECONDS.

NR	R	R-RO	TEXP	VEXP
0	1.5326	0.00	0.00	0.0000
1	1.5826	0.05	0.	0.
2	1.6326	0.10	0.	0.
3	1.6826	0.15	0.	0.
4	1.7326	0.20	0.	0.
5	1.7826	0.25	0.	0.
6	1.8326	0.30	0.	0.
7	1.8826	0.35	0.	0.
8	1.9326	0.40	0.	0.
9	2.0326	0.50	0.	0.
10	2.1326	0.60	4.54	0.1620
11	2.2326	0.70	5.15	0.1654
12	2.3326	0.80	5.75	0.1677
13	2.4326	0.90	6.35	0.1697
14	2.5326	1.00	6.93	0.1714
15	2.6326	1.10	7.51	0.1730
16	2.7326	1.20	8.09	0.1743
17	2.8326	1.30	8.66	0.1754
18	2.9326	1.40	9.23	0.1764
19	3.0326	1.50	9.79	0.1772
20	3.1326	1.60	10.36	0.1779
21	3.2326	1.70	10.92	0.1785
22	3.3326	1.80	11.48	0.1791
23	3.4326	1.90	12.04	0.1798
24	3.5326	2.00	12.59	0.1805
25	3.7326	2.20	13.69	0.1820
26	3.9326	2.40	14.79	0.1836
27	4.1326	2.60	15.87	0.1849
28	4.3326	2.80	16.95	0.1859
29	4.5326	3.00	18.03	0.1864

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JWL EQUATION OF STATE PRESSURE AND ENERGY INTERCOMPARISONS

7.40332E-01	3.70000E-01	3.31893E-02	3.81963E-01	1.51423E+00	3.70000E-01	1.02000E-01
REF PBX 9404 UCID 16189						
B1	B2	R1	R2	W1	C1	GAM
8.54500E+00	2.04930E-01	4.60000E+00	1.35000E+00	2.50000E-01	7.54000E-03	2.85107E+00
RHO	D	EO	VCJ-	PCJ	WR1	WR2
1.34000E+00	8.80000E-01	1.02000E-01	7.40332E-01	3.70000E-01	5.43478E-02	1.85185E-01
TEST PBX 9404-3 1.84 HMX		NC	CEP			
94.0		4.0	2.0	0.		

CONSTANTS TEST PBX 9404-3 1

B1	B2	R1	R2	W1	C1	GAM
8.52401E+00	1.80181E-01	4.60000E+00	1.30000E+00	3.80000E-01	1.20664E-02	2.85107E+00
RHO	D	EO	VCJ-	PCJ	WR1	WR2
1.84000E+00	8.80000E-01	1.02000E-01	7.40332E-01	3.70000E-01	8.26087E-02	2.92308E-01

T		R		S															
6.000E+00		1.3000E+00		3.8000E-01															
R-RO	V	P	PREF	DP	*	E	E REF	DE	G	G REF	C	C REF							
-1.4	0.740	3.700E-01	3.700E-01	-1.362E-05	1.500E-01	1.500E-01	1.500E-01	-0.0001	2.8511	2.8511	0.6515	0.6515							
-1.1	0.800	2.951E-01	2.951E-01	1.515E-05	1.303E-01	1.303E-01	1.303E-01	-0.0001	2.9823	2.9848	0.6186	0.6188							
-0.1	1.000	1.469E-01	1.466E-01	2.944E-04	8.815E-02	8.819E-02	8.819E-02	0.0023	3.2320	3.2496	0.5079	0.5088							
0.4	1.100	1.078E-01	1.073E-01	4.548E-04	7.555E-02	7.562E-02	7.562E-02	0.0026	3.2467	3.2764	0.4574	0.4585							
0.9	1.200	8.139E-02	8.079E-02	6.020E-04	6.618E-02	6.630E-02	6.630E-02	0.0034	3.2006	3.2419	0.4122	0.4135							
1.9	1.400	5.039E-02	4.955E-02	8.345E-04	5.336E-02	5.362E-02	5.362E-02	0.0055	3.0015	3.0786	0.3392	0.3407							
2.8	1.600	3.424E-02	3.326E-02	9.811E-04	4.505E-02	4.550E-02	4.550E-02	0.0080	2.7873	2.8953	0.2881	0.2894							
3.6	1.800	2.488E-02	2.382E-02	1.055E-03	3.922E-02	3.987E-02	3.987E-02	0.0105	2.6491	2.7829	0.2539	0.2547							
4.5	2.000	1.888E-02	1.781E-02	1.074E-03	3.488E-02	3.575E-02	3.575E-02	0.0131	2.6015	2.7570	0.2311	0.2310							
6.4	2.500	1.048E-02	9.497E-03	9.827E-04	2.781E-02	2.920E-02	2.920E-02	0.0191	2.7100	2.9124	0.1964	0.1939							
8.2	3.000	6.305E-03	5.489E-03	8.165E-04	2.372E-02	2.556E-02	2.556E-02	0.0241	2.8547	3.0912	0.1713	0.1663							
9.8	3.500	4.047E-03	3.394E-03	6.528E-04	2.119E-02	2.340E-02	2.340E-02	0.0281	2.8747	3.1152	0.1488	0.1418							
11.4	4.000	2.775E-03	2.259E-03	5.168E-04	1.952E-02	2.201E-02	2.201E-02	0.0312	2.7486	2.9514	0.1288	0.1204							
12.8	4.500	2.033E-03	1.622E-03	4.113E-04	1.833E-02	2.106E-02	2.106E-02	0.0337	2.5210	2.6523	0.1120	0.1026							
14.2	5.000	1.580E-03	1.248E-03	3.317E-04	1.743E-02	2.035E-02	2.035E-02	0.0357	2.2578	2.3071	0.0985	0.0865							
16.8	6.000	1.092E-03	8.651E-04	2.266E-04	1.613E-02	1.932E-02	1.932E-02	0.0385	1.8141	1.7425	0.0804	0.0701							
19.3	7.000	8.430E-04	6.783E-04	1.647E-04	1.517E-02	1.855E-02	1.855E-02	0.0405	1.5643	1.4449	0.0708	0.0611							
21.5	8.000	6.899E-04	5.646E-04	1.253E-04	1.441E-02	1.794E-02	1.794E-02	0.0419	1.4517	1.3207	0.0660	0.0569							
23.6	9.000	5.832E-04	4.848E-04	9.845E-05	1.378E-02	1.741E-02	1.741E-02	0.0430	1.4064	1.2744	0.0633	0.0550							
25.7	10.000	5.034E-04	4.243E-04	7.913E-05	1.324E-02	1.696E-02	1.696E-02	0.0438	1.3894	1.2581	0.0617	0.0539							
29.4	12.000	3.911E-04	3.376E-04	5.353E-05	1.235E-02	1.620E-02	1.620E-02	0.0449	1.3811	1.2508	0.0594	0.0525							
34.5	15.000	2.875E-04	2.554E-04	3.203E-05	1.135E-02	1.533E-02	1.533E-02	0.0459	1.3800	1.2500	0.0569	0.0510							
42.1	20.000	1.933E-04	1.783E-04	1.499E-05	1.017E-02	1.426E-02	1.426E-02	0.0466	1.3800	1.2500	0.0538	0.0492							
48.7	25.000	1.420E-04	1.349E-04	7.163E-06	9.345E-03	1.349E-02	1.349E-02	0.0468	1.3800	1.2500	0.0516	0.0479							
54.7	30.000	1.104E-04	1.074E-04	3.054E-06	8.719E-03	1.289E-02	1.289E-02	0.0468	1.3800	1.2500	0.0499	0.0468							
60.3	35.000	8.928E-05	8.857E-05	7.119E-07	8.223E-03	1.240E-02	1.240E-02	0.0466	1.3800	1.2500	0.0484	0.0459							
65.4	40.000	7.426E-05	7.495E-05	-6.978E-07	7.816E-03	1.199E-02	1.199E-02	0.0464	1.3800	1.2500	0.0472	0.0451							
74.9	50.000	5.458E-05	5.671E-05	-2.134E-06	7.181E-03	1.134E-02	1.134E-02	0.0459	1.3800	1.2500	0.0452	0.0439							
83.4	60.000	4.244E-05	4.515E-05	-2.717E-06	6.700E-03	1.084E-02	1.084E-02	0.0454	1.3800	1.2500	0.0437	0.0429							
91.3	70.000	3.430E-05	3.724E-05	-2.935E-06	6.319E-03	1.043E-02	1.043E-02	0.0449	1.3800	1.2500	0.0424	0.0421							

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7.45883E-01	3.40000E-01	3.18735E-02	3.93626E-01	1.51638E+00	3.40000E-01	9.50000E-02
REF PBX 9404 -3	REVISED					
B1	B2	R1	R2	W1	C1	GAM
8.52400E+00	1.80200E-01	4.60000E+00	1.30000E+00	3.80000E-01	1.20700E-02	2.85107E+00
RHO	D	EO	VCJ-	PCJ	WR1	WR2
1.84000E+00	8.80000E-01	1.02000E-01	7.40332E-01	3.70000E-01	8.26087E-02	2.92308E-01
TEST LX-04-1	HMX	VITON				
	85.0	15.0	0.	0.		
CONSTANTS TEST LX-04-1						
B1	B2	R1	R2	W1	C1	GAM
8.36381E+00	1.29855E-01	4.62000E+00	1.25000E+00	4.20000E-01	1.47074E-02	2.93520E+00
RHO	D	EO	VCJ-	PCJ	WR1	WR2
1.86500E+00	8.47000E-01	9.50000E-02	7.45883E-01	3.40000E-01	9.03091E-02	3.36000E-01
T	R	S				
4.6200E+00	1.2500E+00	4.2000E-01				
R-R0	V	P	PREF	DP	* E	E REF
-1.4	0.746	3.400E-01	3.622E-01	-2.220E-02	1.382E-01	1.480E-01
-1.1	0.800	2.756E-01	2.951E-01	-1.954E-02	1.216E-01	1.303E-01
-0.1	1.000	1.343E-01	1.469E-01	-1.254E-02	8.262E-02	8.817E-02
0.4	1.100	9.760E-02	1.073E-01	-1.020E-02	7.115E-02	7.556E-02
0.9	1.200	7.304E-02	8.140E-02	-8.361E-03	6.270E-02	6.619E-02
1.9	1.400	4.467E-02	5.039E-02	-5.722E-03	5.127E-02	5.337E-02
2.8	1.600	3.027E-02	3.425E-02	-3.972E-03	4.392E-02	4.506E-02
3.6	1.800	2.212E-02	2.488E-02	-2.767E-03	3.875E-02	3.923E-02
4.5	2.000	1.697E-02	1.888E-02	-1.915E-03	3.488E-02	3.489E-02
6.4	2.500	9.790E-03	1.049E-02	-6.921E-04	2.841E-02	2.782E-02
8.2	3.000	6.152E-03	6.306E-03	-1.541E-04	2.452E-02	2.373E-02
9.6	3.500	4.118E-03	4.047E-03	7.088E-05	2.200E-02	2.120E-02
11.4	4.000	2.923E-03	2.776E-03	1.531E-04	2.026E-02	1.952E-02
12.8	4.500	2.206E-03	2.033E-03	1.725E-04	1.899E-02	1.833E-02
14.2	5.000	1.747E-03	1.580E-03	1.664E-04	1.801E-02	1.744E-02
16.8	6.000	1.227E-03	1.092E-03	1.347E-04	1.656E-02	1.613E-02
19.3	7.000	9.485E-04	8.433E-04	1.052E-04	1.548E-02	1.518E-02
21.5	8.000	7.735E-04	6.901E-04	8.342E-05	1.463E-02	1.442E-02
23.6	9.000	6.511E-04	5.834E-04	6.769E-05	1.392E-02	1.378E-02
25.7	10.000	5.596E-04	5.036E-04	5.607E-05	1.331E-02	1.324E-02
29.4	12.000	4.317E-04	3.913E-04	4.039E-05	1.233E-02	1.235E-02
34.5	15.000	3.144E-04	2.875E-04	2.686E-05	1.123E-02	1.135E-02
42.1	20.000	2.090E-04	1.933E-04	1.564E-05	9.951E-03	1.017E-02
48.7	25.000	1.522E-04	1.421E-04	1.013E-05	9.060E-03	9.348E-03
54.7	30.000	1.175E-04	1.105E-04	7.017E-06	8.393E-03	8.722E-03
60.3	35.000	9.440E-05	8.931E-05	5.088E-06	7.866E-03	8.226E-03
65.4	40.000	7.809E-05	7.428E-05	3.814E-06	7.437E-03	7.819E-03
74.9	50.000	5.608E-05	5.459E-05	2.293E-06	6.772E-03	7.183E-03
83.4	60.000	4.391E-05	4.245E-05	1.462E-06	6.273E-03	6.702E-03
91.3	70.000	3.528E-05	3.431E-05	9.633E-07	5.880E-03	6.321E-03

1

B1	B2	R1	R2	W1	C1	GAM
8.48111E+00	1.73958E-01	4.58000E+00	1.25000E+00	4.00000E-01	1.30843E-02	2.83434E+00
RHO	D	E0	VCJ-	PCJ	WR1	WR2
1.84000E+00	8.84000E-01	1.05000E-01	7.39199E-01	3.75000E-01	8.73362E-02	3.20000E-01

[illegible]

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7.41527E-01	3.75000E-01	3.25215E-02	3.75756E-01	1.51086E+00	3.75000E-01	1.04000E-01					
REF PBX 9404-3 REV	B1	B2	R1	R2	W1	C1	GAM				
	8.52400E+00	1.80200E-01	4.60000E+00	1.30000E+00	3.80000E-01	1.20700E-02	2.85107E+00				
	RHS	D	E0	V CJ-	PCJ	WR1	WR2				
1.84000E+00	8.80000E-01	1.02000E-01	7.40332E-01	3.70000E-01	8.26087E-02	2.92308E-01					
TEST LX-10-1 1.865	HMX	VITON									
	94.5	5.5	0.	0.							
CONSTANTS TEST LX-10-1 1.86											
B1	B2	R1	R2	W1	C1	GAM					
8.80758E+00	1.83599E-01	4.62000E+00	1.32000E+00	3.80000E-01	1.29570E-02	2.86888E+00					
RHS	D	E0	V CJ-	PCJ	WR1	WR2					
1.86500E+00	8.82000E-01	1.04000E-01	7.41527E-01	3.75000E-01	8.22511E-02	2.87879E-01					
T	R	S									
4.6200E+00	1.3200E+00	3.8000E-01									
R-R0	V	P	PREF	DP	* E	E REF	DE	G	G REF	C	C REF
-1.4	0.742	3.750E-01	3.683E-01	6.686E-03	1.525E-01	1.496E-01	0.0179	2.8689	2.8539	0.6540	0.6509
-1.1	0.800	3.001E-01	2.951E-01	5.005E-03	1.328E-01	1.303E-01	0.0180	2.9982	2.9822	0.6213	0.6186
-0.1	1.000	1.488E-01	1.469E-01	1.920E-03	9.004E-02	8.817E-02	0.0094	3.2500	3.2319	0.5092	0.5079
0.4	1.100	1.090E-01	1.078E-01	1.218E-03	7.728E-02	7.556E-02	0.0107	3.2650	3.2466	0.4582	0.4574
0.9	1.200	8.219E-02	8.140E-02	7.883E-04	6.781E-02	6.619E-02	0.0107	3.2187	3.2004	0.4126	0.4122
1.9	1.400	5.074E-02	5.039E-02	3.513E-04	5.482E-02	5.337E-02	0.0101	3.0177	3.0013	0.3390	0.3392
2.8	1.600	3.442E-02	3.425E-02	1.699E-04	4.552E-02	4.506E-02	0.0095	2.8005	2.7871	0.2876	0.2881
3.6	1.800	2.497E-02	2.483E-02	8.911E-05	4.066E-02	3.923E-02	0.0090	2.6588	2.6490	0.2531	0.2539
4.5	2.000	1.894E-02	1.888E-02	5.230E-05	3.631E-02	3.489E-02	0.0086	2.6068	2.6014	0.2301	0.2311
6.4	2.500	1.052E-02	1.048E-02	3.359E-05	2.922E-02	2.782E-02	0.0080	2.6985	2.7099	0.1950	0.1965
8.2	3.000	6.353E-03	6.306E-03	4.690E-05	2.511E-02	2.373E-02	0.0079	2.8178	2.8546	0.1697	0.1713
9.8	3.500	4.110E-03	4.047E-03	6.216E-05	2.255E-02	2.120E-02	0.0080	2.8092	2.8746	0.1472	0.1488
11.4	4.000	2.848E-03	2.776E-03	7.182E-05	2.084E-02	1.952E-02	0.0082	2.6609	2.7485	0.1275	0.1288
12.8	4.500	2.109E-03	2.033E-03	7.558E-05	1.832E-02	1.833E-02	0.0085	2.4249	2.5209	0.1111	0.1120
14.2	5.000	1.656E-03	1.580E-03	7.508E-05	1.869E-02	1.744E-02	0.0089	2.1675	2.2577	0.0981	0.0985
16.8	6.000	1.160E-03	1.092E-03	6.772E-05	1.731E-02	1.613E-02	0.0096	1.7562	1.8140	0.0810	0.0804
19.3	7.000	9.015E-04	8.433E-04	5.819E-05	1.629E-02	1.518E-02	0.0102	1.5354	1.5642	0.0721	0.0708
21.5	8.000	7.397E-04	6.901E-04	4.959E-05	1.548E-02	1.442E-02	0.0107	1.4391	1.4517	0.0676	0.0660
23.6	9.000	6.259E-04	5.834E-04	4.254E-05	1.480E-02	1.378E-02	0.0112	1.4013	1.4064	0.0651	0.0634
25.7	10.000	5.405E-04	5.036E-04	3.691E-05	1.421E-02	1.324E-02	0.0116	1.3874	1.3894	0.0634	0.0617
29.4	12.000	4.200E-04	3.913E-04	2.875E-05	1.326E-02	1.235E-02	0.0122	1.3808	1.3811	0.0611	0.0594
34.5	15.000	3.087E-04	2.875E-04	2.113E-05	1.218E-02	1.135E-02	0.0129	1.3600	1.3600	0.0585	0.0569
42.1	20.000	2.075E-04	1.933E-04	1.421E-05	1.092E-02	1.017E-02	0.0136	1.3800	1.3800	0.0554	0.0539
48.7	25.000	1.525E-04	1.421E-04	1.044E-05	1.003E-02	9.348E-03	0.0142	1.3800	1.3800	0.0531	0.0516
54.7	30.000	1.186E-04	1.105E-04	8.119E-06	9.363E-03	8.722E-03	0.0146	1.3800	1.3800	0.0513	0.0499
60.3	35.000	9.587E-05	8.931E-05	6.563E-06	8.830E-03	8.226E-03	0.0149	1.3800	1.3800	0.0498	0.0484
65.4	40.000	7.974E-05	7.428E-05	5.459E-06	8.393E-03	7.819E-03	0.0151	1.3800	1.3800	0.0486	0.0472
74.9	50.000	5.860E-05	5.459E-05	4.012E-06	7.711E-03	7.183E-03	0.0155	1.3800	1.3800	0.0466	0.0452
83.4	60.000	4.557E-05	4.245E-05	3.119E-06	7.195E-03	6.702E-03	0.0158	1.3800	1.3800	0.0450	0.0437
91.3	70.000	3.684E-05	3.431E-05	2.522E-06	6.786E-03	6.321E-03	0.0160	1.3800	1.3800	0.0437	0.0424

TABLE 3.15
JWL EQUATION OF STATE PRESSURE AND ENERGY INTERCOMPARISONS

1
7.29624E-01 3.70000E-01 3.45520E-02 3.76701E-01 1.51623E+00 3.70000E-01 1.02000E-01
REF PBX 9404-3 REV
B1 B2 R1 R2 W1 C1 GAM
8.52400E+00 1.80200E-01 4.60000E+00 1.30000E+00 3.80000E-01 1.20700E-02 2.85107E+00
RHO D EO VCJ PCJ WR1 WR2
1.84000E+00 8.80000E-01 1.02000E-01 7.40332E-01 3.70000E-01 8.26087E-02 2.92308E-01
TEST LX-14 1.835 HMX
95.0 5.0 0. 0.

CONSTANTS TEST LX-14 1.835

B1 B2 R1 R2 W1 C1 GAM
8.26052E+00 1.72367E-01 4.55000E+00 1.32000E+00 3.80000E-01 1.29612E-02 2.84061E+00
RHO D EO VCJ PCJ WR1 WR2
1.83500E+00 8.80000E-01 1.02000E-01 7.39624E-01 3.70000E-01 8.35165E-02 2.87879E-01

T	R	S									
R-R0	V	P	PREF	DP	* E	E REF	DE	G	G REF	C	C REF
-1.4	0.740	3.700E-01	3.710E-01	-1.022E-03	1.502E-01	1.503E-01	-0.0031	2.8406	2.8493	0.6509	0.6519
-1.1	0.800	2.945E-01	2.951E-01	-6.658E-04	1.302E-01	1.303E-01	-0.0035	2.9785	2.9822	0.6183	0.6186
-0.1	1.000	1.463E-01	1.469E-01	-5.650E-04	8.818E-02	8.817E-02	-0.0007	3.2526	3.2319	0.5092	0.5079
0.4	1.100	1.071E-01	1.078E-01	-6.990E-04	7.564E-02	7.556E-02	-0.0027	3.2817	3.2466	0.4590	0.4574
0.9	1.200	8.058E-02	8.140E-02	-8.213E-04	6.634E-02	6.619E-02	-0.0041	3.2487	3.2004	0.4137	0.4122
1.9	1.400	4.945E-02	5.039E-02	-9.445E-04	5.370E-02	5.337E-02	-0.0067	3.0643	3.0013	0.3400	0.3392
2.8	1.600	3.332E-02	3.425E-02	-9.208E-04	4.558E-02	4.506E-02	-0.0091	2.8460	2.7871	0.2876	0.2881
3.6	1.800	2.407E-02	2.488E-02	-8.152E-04	3.992E-02	3.923E-02	-0.0110	2.6912	2.6490	0.2521	0.2539
4.5	2.000	1.820E-02	1.888E-02	-6.802E-04	3.573E-02	3.489E-02	-0.0125	2.6226	2.6014	0.2281	0.2311
6.4	2.500	1.011E-02	1.048E-02	-3.895E-04	2.892E-02	2.782E-02	-0.0148	2.6808	2.7099	0.1922	0.1965
8.2	3.000	6.141E-03	6.306E-03	-1.650E-04	2.496E-02	2.373E-02	-0.0157	2.7798	2.8546	0.1671	0.1713
9.8	3.500	4.000E-03	4.047E-03	-4.760E-05	2.248E-02	2.120E-02	-0.0158	2.7593	2.8746	0.1451	0.1488
11.4	4.000	2.791E-03	2.776E-03	1.526E-05	2.081E-02	1.952E-02	-0.0156	2.6071	2.7485	0.1259	0.1288
12.8	4.500	2.080E-03	2.033E-03	4.655E-05	1.960E-02	1.833E-02	-0.0152	2.3747	2.5209	0.1101	0.1120
14.2	5.000	1.641E-03	1.580E-03	6.026E-05	1.868E-02	1.744E-02	-0.0147	2.1260	2.2577	0.0975	0.0985
16.8	6.000	1.156E-03	1.092E-03	6.399E-05	1.731E-02	1.613E-02	-0.0137	1.7343	1.8140	0.0810	0.0804
19.3	7.000	9.006E-04	8.433E-04	5.739E-05	1.630E-02	1.518E-02	-0.0129	1.5260	1.5642	0.0724	0.0708
21.5	8.000	7.396E-04	6.901E-04	4.954E-05	1.548E-02	1.442E-02	-0.0121	1.4355	1.4517	0.0680	0.0660
23.6	9.000	6.261E-04	5.834E-04	4.267E-05	1.480E-02	1.378E-02	-0.0115	1.4000	1.4064	0.0656	0.0634
25.7	10.000	5.406E-04	5.036E-04	3.706E-05	1.422E-02	1.324E-02	-0.0110	1.3870	1.3894	0.0639	0.0617
29.4	12.000	4.201E-04	3.913E-04	2.888E-05	1.327E-02	1.235E-02	-0.0102	1.3808	1.3811	0.0616	0.0594
34.5	15.000	3.088E-04	2.875E-04	2.123E-05	1.219E-02	1.135E-02	-0.0092	1.3800	1.3800	0.0590	0.0569
42.1	20.000	2.076E-04	1.933E-04	1.427E-05	1.093E-02	1.017E-02	-0.0082	1.3800	1.3800	0.0559	0.0539
48.7	25.000	1.526E-04	1.421E-04	1.049E-05	1.004E-02	9.348E-03	-0.0074	1.3800	1.3800	0.0536	0.0516
54.7	30.000	1.186E-04	1.105E-04	8.157E-06	9.366E-03	8.722E-03	-0.0069	1.3800	1.3800	0.0517	0.0499
60.3	35.000	9.590E-05	8.931E-05	6.594E-06	8.833E-03	8.226E-03	-0.0065	1.3800	1.3800	0.0502	0.0484
65.4	40.000	7.976E-05	7.428E-05	5.485E-06	8.396E-03	7.819E-03	-0.0061	1.3800	1.3800	0.0490	0.0472
74.9	50.000	5.862E-05	5.459E-05	4.031E-06	7.714E-03	7.183E-03	-0.0056	1.3800	1.3800	0.0470	0.0452
83.4	60.000	4.558E-05	4.245E-05	3.134E-06	7.197E-03	6.702E-03	-0.0052	1.3800	1.3800	0.0454	0.0437
91.3	70.000	3.685E-05	3.431E-05	2.534E-06	6.788E-03	6.321E-03	-0.0049	1.3800	1.3800	0.0440	0.0424

TABLE 3.16
JWL EQUATION OF STATE PRESSURE AND ENERGY INTERCOMPARISONS

1	7.45883E-01	3.40000E-01	3.18735E-02	3.93626E-01	1.51638E+00	3.40000E-01	9.50000E-02					
REF LX-04-1	1.865	UCRL 50422	and UCID 16189									
	B1	B2	R1	R2	W1	C1	GAM					
	8.49840E+00	1.52770E-01	4.65000E+00	1.30000E+00	3.50000E-01	1.15850E-02	2.93520E+00					
	RHO	D	EO	VCJ-	PCJ	WR1	WR2					
	1.86500E+00	8.47000E-01	9.50000E-02	7.45883E-01	3.40000E-01	7.52688E-02	2.69231E-01					
TEST LX-04-1		HMX	VITON									
	85.0	15.0	0.	0.								
CONSTANTS TEST LX-04-1												
	B1	B2	R1	R2	W1	C1	GAM					
	8.26381E+00	1.29855E-01	4.62000E+00	1.25000E+00	4.20000E-01	1.47074E-02	2.93520E+00					
	RHO	D	EO	VCJ-	PCJ	WR1	WR2					
	1.86500E+00	8.47000E-01	9.50000E-02	7.45883E-01	3.40000E-01	9.09091E-02	3.36000E-01					
	T	R	S									
	4.6200E+00	1.2500E+00	4.2000E-01									
R-R0	V	P	PREF	DP	* E	E REF	DE	G	G REF	C	C REF	
-1.4	0.746	3.400E-01	3.400E-01	-2.303E-05	1.382E-01	1.382E-01	-0.0001	2.9352	2.9354	0.6318	0.6318	
-1.1	0.800	2.756E-01	2.756E-01	-3.166E-05	1.216E-01	1.216E-01	-0.0001	3.0619	3.0603	0.6016	0.6015	
-0.1	1.000	1.343E-01	1.345E-01	-1.596E-04	8.262E-02	8.260E-02	-0.0013	3.3362	3.3285	0.4902	0.4899	
0.4	1.100	9.760E-02	9.779E-02	-1.903E-04	7.115E-02	7.111E-02	-0.0014	3.3529	3.3451	0.4393	0.4392	
0.9	1.200	7.304E-02	7.322E-02	-1.837E-04	6.270E-02	6.264E-02	-0.0016	3.2987	3.2942	0.3937	0.3940	
1.9	1.400	4.467E-02	4.476E-02	-8.845E-05	5.127E-02	5.110E-02	-0.0019	3.0539	3.0683	0.3200	0.3211	
2.8	1.600	3.027E-02	3.022E-02	5.397E-05	4.392E-02	4.383E-02	-0.0017	2.7733	2.8169	0.2684	0.2702	
3.6	1.800	2.212E-02	2.192E-02	1.910E-04	3.875E-02	3.869E-02	-0.0011	2.5715	2.6450	0.2343	0.2366	
4.5	2.000	1.697E-02	1.667E-02	2.990E-04	3.488E-02	3.487E-02	-0.0002	2.4727	2.5715	0.2121	0.2144	
6.4	2.500	9.790E-03	9.362E-03	4.276E-04	2.841E-02	2.859E-02	0.0027	2.4971	2.6355	0.1810	0.1819	
8.2	3.000	6.152E-03	5.729E-03	4.236E-04	2.452E-02	2.491E-02	0.0056	2.5927	2.7428	0.1602	0.1590	
9.8	3.500	4.118E-03	3.750E-03	3.682E-04	2.200E-02	2.259E-02	0.0082	2.5957	2.7304	0.1416	0.1386	
11.4	4.000	2.929E-03	2.626E-03	3.034E-04	2.026E-02	2.102E-02	0.0103	2.4899	2.5862	0.1251	0.1207	
12.8	4.500	2.206E-03	1.961E-03	2.453E-04	1.899E-02	1.989E-02	0.0120	2.3128	2.3598	0.1110	0.1057	
14.2	5.000	1.747E-03	1.549E-03	1.981E-04	1.801E-02	1.902E-02	0.0133	2.1131	2.1137	0.0995	0.0937	
16.8	6.000	1.227E-03	1.094E-03	1.329E-04	1.656E-02	1.773E-02	0.0152	1.7760	1.7191	0.0837	0.0778	
19.3	7.000	9.485E-04	8.546E-04	9.385E-05	1.548E-02	1.676E-02	0.0164	1.5790	1.5047	0.0750	0.0695	
21.5	8.000	7.735E-04	7.040E-04	6.947E-05	1.463E-02	1.599E-02	0.0173	1.4854	1.4098	0.0702	0.0652	
23.6	9.000	6.511E-04	5.978E-04	5.324E-05	1.392E-02	1.534E-02	0.0179	1.4455	1.3719	0.0674	0.0629	
25.7	10.000	5.596E-04	5.178E-04	4.181E-05	1.331E-02	1.479E-02	0.0183	1.4296	1.3578	0.0655	0.0614	
29.4	12.000	4.317E-04	4.046E-04	2.705E-05	1.233E-02	1.387E-02	0.0190	1.4212	1.3509	0.0628	0.0593	
34.5	15.000	3.144E-04	2.993E-04	1.506E-05	1.123E-02	1.283E-02	0.0195	1.4201	1.3500	0.0599	0.0570	
42.1	20.000	2.090E-04	2.030E-04	5.960E-06	9.951E-03	1.160E-02	0.0198	1.4200	1.3500	0.0564	0.0542	
48.7	25.000	1.522E-04	1.502E-04	2.013E-06	9.060E-03	1.073E-02	0.0198	1.4200	1.3500	0.0538	0.0521	
54.7	30.000	1.175E-04	1.174E-04	6.500E-08	8.393E-03	1.007E-02	0.0197	1.4200	1.3500	0.0518	0.0505	
60.3	35.000	9.440E-05	9.537E-05	-9.713E-07	7.866E-03	9.537E-03	0.0195	1.4200	1.3500	0.0502	0.0492	
65.4	40.000	7.809E-05	7.964E-05	-1.544E-06	7.437E-03	9.101E-03	0.0194	1.4200	1.3500	0.0488	0.0480	
74.9	50.000	5.688E-05	5.892E-05	-2.038E-06	6.772E-03	8.418E-03	0.0190	1.4200	1.3500	0.0465	0.0462	
83.4	60.000	4.391E-05	4.607E-05	-2.158E-06	6.273E-03	7.897E-03	0.0186	1.4200	1.3500	0.0448	0.0447	
91.3	70.000	3.528E-05	3.741E-05	-2.135E-06	5.880E-03	7.482E-03	0.0183	1.4200	1.3500	0.0434	0.0435	

TABLE 3.17
JWL EQUATION OF STATE PRESSURE AND ENERGY INTERCOMPARISONS

1	7.29199E-01	3.75000E-01	3.38596E-02	3.96929E-01	1.52663E+00	3.75000E-01	1.05000E-01
REF LX-09 16189	1.84						
B1	B2	R1	R2	W1	C1	GAM	
8.68400E+00	1.87100E-01	4.60000E+00	1.25000E+00	2.50000E-01	7.29100E-03	2.83434E+00	
RHO	D	E0	VCJ-	PCJ	WR1	WR2	
1.84000E+00	8.84000E-01	1.05000E-01	7.39199E-01	3.75000E-01	5.43478E-02	2.00000E-01	
TEST LX-09	HMX	FEFG	DNPA				
	93.0	2.4	4.6	0.			
CONSTANTS TEST LX-09							
B1	B2	R1	R2	W1	C1	GAM	
8.48111E+00	1.70958E-01	4.58000E+00	1.25000E+00	4.00000E-01	1.30843E-02	2.83434E+00	
RHO	D	E0	VCJ-	PCJ	WR1	WR2	
1.84000E+00	8.84000E-01	1.05000E-01	7.39199E-01	3.75000E-01	8.73362E-02	3.20000E-01	
T	R	S					
4.5800E+00	1.2500E+00	4.0000E-01					
R-R0	V	P	PREF	DP	* E	E REF	DE
-1.4	0.739	3.750E-01	3.746E-01	3.755E-04	1.539E-01	1.538E-01	0.0011
-1.1	0.800	2.981E-01	2.975E-01	6.401E-04	1.335E-01	1.335E-01	0.0007
-0.1	1.000	1.490E-01	1.482E-01	8.512E-04	9.088E-02	9.102E-02	0.0100
0.4	1.100	1.097E-01	1.089E-01	8.060E-04	7.808E-02	7.830E-02	0.0083
0.9	1.200	8.308E-02	8.234E-02	7.423E-04	6.852E-02	6.883E-02	0.0083
1.9	1.400	5.180E-02	5.116E-02	6.368E-04	5.540E-02	5.584E-02	0.0089
2.8	1.600	3.548E-02	3.490E-02	5.862E-04	4.683E-02	4.739E-02	0.0097
3.6	1.800	2.599E-02	2.542E-02	5.750E-04	4.076E-02	4.143E-02	0.0106
4.5	2.000	1.988E-02	1.930E-02	5.820E-04	3.621E-02	3.700E-02	0.0116
6.4	2.500	1.123E-02	1.063E-02	6.015E-04	2.370E-02	2.979E-02	0.0145
8.2	3.000	6.840E-03	6.256E-03	5.845E-04	2.430E-02	2.568E-02	0.0175
9.6	3.500	4.418E-03	3.879E-03	5.388E-04	2.154E-02	2.321E-02	0.0204
11.4	4.000	3.031E-03	2.550E-03	4.811E-04	1.971E-02	2.163E-02	0.0231
12.8	4.500	2.210E-03	1.787E-03	4.225E-04	1.842E-02	2.056E-02	0.0254
14.2	5.000	1.705E-03	1.336E-03	3.683E-04	1.745E-02	1.979E-02	0.0275
16.8	6.000	1.160E-03	8.799E-04	2.796E-04	1.605E-02	1.872E-02	0.0309
19.3	7.000	8.853E-04	6.700E-04	2.153E-04	1.504E-02	1.795E-02	0.0335
21.5	8.000	7.197E-04	5.504E-04	1.693E-04	1.424E-02	1.735E-02	0.0354
23.6	9.000	6.059E-04	4.702E-04	1.358E-04	1.358E-02	1.684E-02	0.0369
25.7	10.000	5.215E-04	4.107E-04	1.108E-04	1.302E-02	1.640E-02	0.0381
29.4	12.000	4.036E-04	3.265E-04	7.710E-05	1.211E-02	1.567E-02	0.0399
34.5	15.000	2.953E-04	2.470E-04	4.828E-05	1.107E-02	1.482E-02	0.0415
42.1	20.000	1.974E-04	1.724E-04	2.500E-05	9.869E-03	1.379E-02	0.0430
48.7	25.000	1.444E-04	1.304E-04	1.400E-05	9.026E-03	1.304E-02	0.0437
54.7	30.000	1.119E-04	1.038E-04	8.042E-06	8.392E-03	1.246E-02	0.0440
60.3	35.000	9.017E-05	8.565E-05	4.523E-06	7.890E-03	1.199E-02	0.0441
65.4	40.000	7.479E-05	7.248E-05	2.315E-06	7.479E-03	1.160E-02	0.0441
74.9	50.000	5.473E-05	5.484E-05	-1.114E-07	6.841E-03	1.097E-02	0.0439
83.4	60.000	4.240E-05	4.366E-05	-1.264E-06	6.360E-03	1.048E-02	0.0436
91.3	70.000	3.417E-05	3.601E-05	-1.842E-06	5.979E-03	1.008E-02	0.0432
							1.4000
							1.2500
							0.0427
							0.0414

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7.41527E-01		3.75000E-01	3.25215E-02	3.75756E-01	1.51088E+00	3.75000E-01	1.04000E-01
REF LX-10-1 16189		1.86					
B1	B2	R1	R2	W1	C1	GAM	
8.80200E+00	1.74370E-01	4.60000E+00	1.20000E+00	3.00000E-01	8.09000E-03	2.85050E+00	
RHS	D	EO	VCJ-	PCJ	WR1	WR2	
1.86000E+00	8.82000E-01	1.04000E-01	7.40832E-01	3.75000E-01	6.52174E-02	2.50000E-01	
TEST LX-10-1 1.865	HMX	VITON					
	94.5	5.5	0.	0.			
CONSTANTS TEST LX-10-1 1.86							
B1	B2	R1	R2	W1	C1	GAM	
8.80758E+00	1.83599E-01	4.62000E+00	1.32000E+00	3.80000E-01	1.29570E-02	2.86888E+00	
RHS	D	EO	VCJ-	PCJ	WR1	WR2	
1.86500E+00	8.82000E-01	1.04000E-01	7.41527E-01	3.75000E-01	8.22511E-02	2.87879E-01	
T	R	S					
4.6200E+00	1.3200E+00	3.8000E-01					
R-RO	V	P	PREF	DP	* E	E REF	DE
-1.4	0.742	3.750E-01	3.741E-01	9.170E-04	1.525E-01	1.523E-01	0.0026
-1.1	0.800	3.001E-01	2.996E-01	5.302E-04	1.328E-01	1.327E-01	0.0029
-0.1	1.000	1.488E-01	1.491E-01	-3.035E-04	9.004E-02	8.997E-02	-0.0050
0.4	1.100	1.090E-01	1.096E-01	-5.675E-04	7.728E-02	7.717E-02	-0.0043
0.9	1.200	8.219E-02	8.296E-02	-7.697E-04	6.781E-02	6.762E-02	-0.0050
1.9	1.400	5.074E-02	5.177E-02	-1.031E-03	5.488E-02	5.451E-02	-0.0074
2.8	1.600	3.442E-02	3.555E-02	-1.140E-03	4.652E-02	4.594E-02	-0.0101
3.6	1.800	2.497E-02	2.611E-02	-1.137E-03	4.066E-02	3.985E-02	-0.0127
4.5	2.000	1.894E-02	1.999E-02	-1.058E-03	3.631E-02	3.528E-02	-0.0150
6.4	2.500	1.052E-02	1.123E-02	-7.133E-04	2.922E-02	2.774E-02	-0.0194
8.2	3.000	6.353E-03	6.713E-03	-3.595E-04	2.511E-02	2.337E-02	-0.0217
9.8	3.500	4.110E-03	4.203E-03	-9.338E-05	2.255E-02	2.070E-02	-0.0223
11.4	4.000	2.848E-03	2.769E-03	7.835E-05	2.084E-02	1.899E-02	-0.0218
12.8	4.500	2.109E-03	1.932E-03	1.766E-04	1.962E-02	1.783E-02	-0.0208
14.2	5.000	1.656E-03	1.431E-03	2.250E-04	1.869E-02	1.700E-02	-0.0194
16.8	6.000	1.160E-03	9.179E-04	2.419E-04	1.731E-02	1.586E-02	-0.0164
19.3	7.000	9.015E-04	6.839E-04	2.176E-04	1.629E-02	1.507E-02	-0.0137
21.5	8.000	7.397E-04	5.537E-04	1.860E-04	1.548E-02	1.446E-02	-0.0113
23.6	9.000	6.259E-04	4.685E-04	1.574E-04	1.480E-02	1.395E-02	-0.0094
25.7	10.000	5.405E-04	4.065E-04	1.339E-04	1.421E-02	1.352E-02	-0.0077
29.4	12.000	4.200E-04	3.200E-04	1.000E-04	1.326E-02	1.280E-02	-0.0051
34.5	15.000	3.087E-04	2.394E-04	6.932E-05	1.218E-02	1.197E-02	-0.0024
42.1	20.000	2.075E-04	1.647E-04	4.286E-05	1.092E-02	1.098E-02	0.0006
48.7	25.000	1.525E-04	1.232E-04	2.932E-05	1.003E-02	1.027E-02	0.0025
54.7	30.000	1.186E-04	9.721E-05	2.139E-05	9.363E-03	9.721E-03	0.0038
60.3	35.000	9.587E-05	7.955E-05	1.632E-05	8.830E-03	9.281E-03	0.0048
65.4	40.000	7.974E-05	6.688E-05	1.286E-05	8.393E-03	8.917E-03	0.0055
74.9	50.000	5.860E-05	5.004E-05	8.567E-06	7.711E-03	8.339E-03	0.0066
83.4	60.000	4.557E-05	3.948E-05	6.090E-06	7.195E-03	7.896E-03	0.0073
91.3	70.000	3.684E-05	3.231E-05	4.527E-06	6.786E-03	7.539E-03	0.0078

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