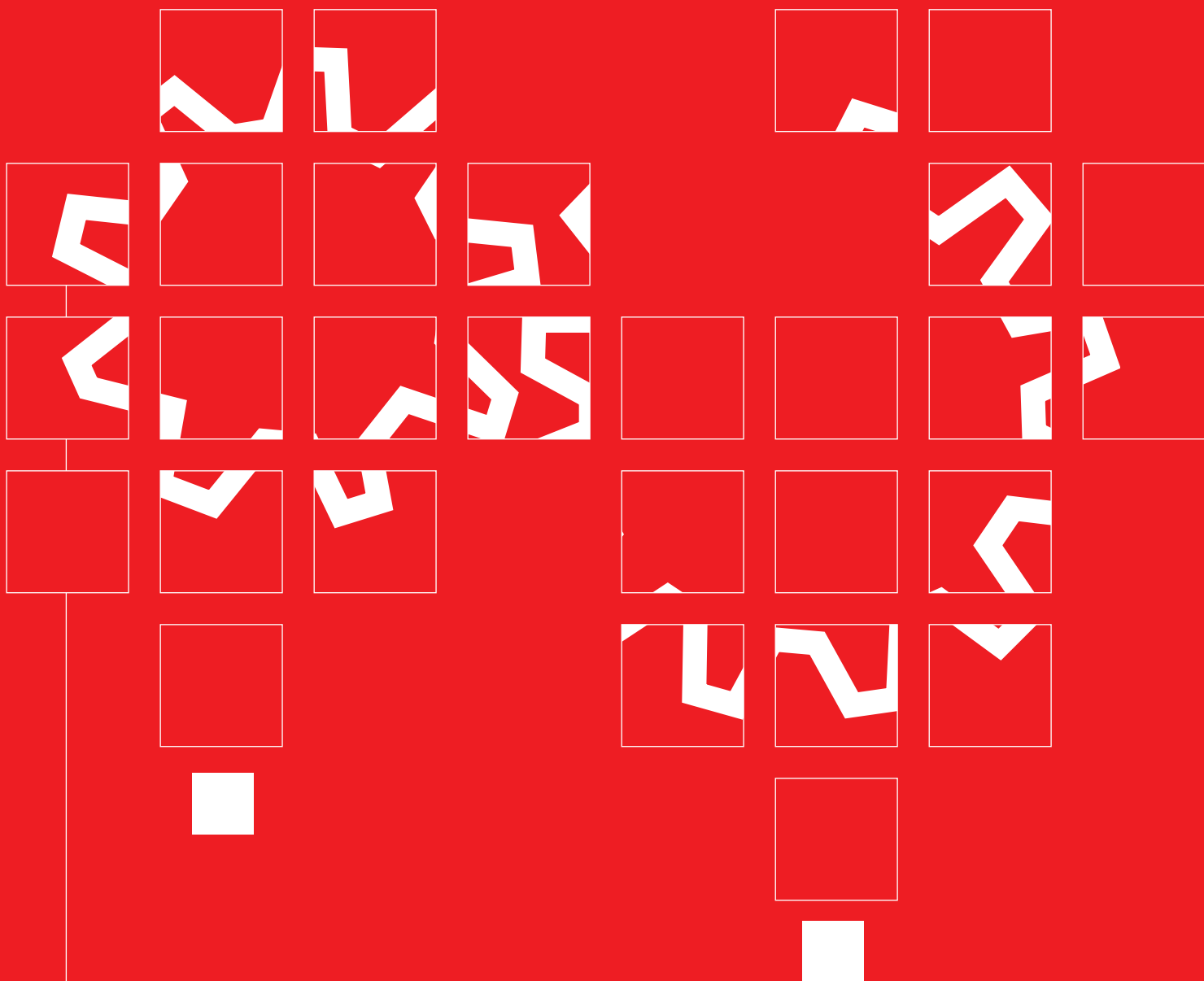


TECHNICAL DATA



A105 LF2 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	19.7	51.0	102.1	136.2	153.1	255.5	425.5	766.2
0	19.7	51.0	102.1	136.2	153.1	255.5	425.5	766.2
50	19.3	50.0	100.1	133.6	150.1	250.5	417.2	751.2
100	17.7	46.4	92.8	123.7	139.2	232.0	386.6	695.7
150	15.8	45.1	90.6	120.6	135.8	226.1	377.0	678.5
200	14.0	43.9	87.8	116.9	131.4	219.2	365.2	657.4
250	12.1	41.8	83.6	111.1	125.1	208.7	347.6	625.7
300	10.2	38.9	77.5	103.3	116.1	193.6	322.8	581.1
350	8.4	36.9	74.0	98.5	110.9	184.8	308.0	554.4
375	7.4	36.6	72.9	97.2	109.5	182.4	303.9	546.9
400	6.5	34.6	69.1	92.1	103.4	172.5	287.5	517.5
425	5.6	28.7	57.7	76.9	86.3	144.0	239.7	431.3

A105 LF2 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	285	740	1480	1975	2220	3705	6170	11110
100	285	740	1480	1975	2220	3705	6170	11110
200	260	675	1350	1800	2025	3375	5625	10120
300	230	655	1315	1750	1970	3280	5470	9845
400	200	635	1270	1690	1900	3170	5280	9505
500	170	600	1200	1595	1795	2995	4990	8980
600	140	550	1095	1460	1640	2735	4560	8210
650	125	535	1075	1430	1610	2685	4475	8055
700	110	535	1065	1420	1600	2665	4440	7990
750	95	505	1010	1345	1510	2520	4200	7560
800	80	410	825	1100	1235	2060	3430	6170

F11 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
0	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
50	19.5	51.7	103.4	137.9	155.2	258.6	431.0	775.9
100	17.7	51.5	103.1	137.4	154.5	257.5	429.5	772.4
150	15.8	49.6	100.2	133.0	149.2	248.8	418.4	746.3
200	14.0	48.1	95.9	128.0	143.9	239.8	406.6	719.6
250	12.1	46.2	92.4	123.3	138.6	231.1	386.2	692.6
300	10.2	42.9	85.8	114.5	128.6	214.4	357.2	642.8
350	8.4	40.4	80.4	107.4	120.7	201.1	335.4	603.5
375	7.4	38.9	77.6	103.6	116.5	194.1	323.3	582.0
400	6.5	36.5	73.3	97.8	109.8	183.1	305.0	548.7
425	5.6	35.3	70.2	93.7	105.5	175.7	292.6	526.3
450	4.6	33.7	67.7	90.3	101.4	169.1	281.9	507.2
475	3.7	31.7	63.4	84.6	95.1	158.2	263.9	475.0
500	2.8	25.3	50.6	67.3	75.7	126.1	231.8	378.5
525	1.9	18.2	36.3	48.4	54.5	90.8	180.6	272.5
550	1.4	12.7	25.4	33.9	38.2	63.6	128.0	190.7
575	1.4	8.8	17.7	23.5	26.4	44.0	87.7	132.1
600	1.4	6.0	12.0	16.1	18.3	30.3	57.4	90.8
625	1.3	3.9	8.1	10.8	12.1	20.2	37.1	60.3
649	1.0	2.8	5.2	6.9	7.9	13.1	23.8	39.0

F11 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	290	750	1500	2000	2250	3750	6250	11250
100	290	750	1500	2000	2250	3750	6250	11250
200	260	750	1500	2000	2250	3750	6250	11250
300	230	720	1455	1930	2165	3610	6070	10830
400	200	695	1385	1850	2080	3465	5880	10400
500	170	665	1330	1775	1995	3325	5540	9965
600	140	605	1210	1615	1815	3025	5040	9070
650	125	590	1175	1570	1765	2940	4905	8825
700	110	570	1135	1515	1705	2840	4730	8515
750	95	530	1065	1420	1595	2660	4430	7970
800	80	510	1015	1355	1525	2540	4230	7610
850	65	485	975	1300	1460	2435	4060	7305
900	50	450	900	1200	1350	2245	3745	6740
950	35	320	640	850	955	1595	3145	4785
1000	20	215	430	575	650	1080	2170	3240
1050	20	145	290	385	430	720	1455	2160
1100	20	95	190	255	290	480	915	1440
1150	20	60	125	165	185	310	570	925
1200	15	40	75	100	115	190	345	565

Notes for pressure temperature tables:

1. Class 150 flanged end ratings end at 10000F (5380C)

2. A105, LF2 can be used up to 8000F (4270F)

3. LF2 is suitable for use down to -500F (-460C)

4. F11, F22 can be used up to 11000F (5930C)

5. F5, F9, F91 can be used up to 12000F (6500F)

6. F304, F316, F321, F347 can be used down to -3200F (-1980C)

7. Over 10000F (5380C) F304, F316, F321, F347 with 0.04% min. carbon

PRESSURE TEMPERATURE RATING



F22 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
0	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
50	19.5	51.7	103.4	137.9	155.2	258.6	431.0	775.9
100	17.7	51.6	103.1	137.4	154.6	257.7	429.5	773.2
150	15.8	50.3	100.3	133.7	150.6	250.9	418.4	753.0
200	14.0	48.8	97.5	130.0	146.2	244.1	406.6	731.9
250	12.1	46.3	92.7	123.7	139.0	231.8	386.2	694.7
300	10.2	42.9	85.8	114.5	128.6	214.4	357.2	642.8
350	8.4	40.4	80.4	107.4	120.7	201.1	335.4	603.5
375	7.4	38.9	77.6	103.6	116.5	194.1	323.3	582.0
400	6.5	36.5	73.3	97.8	109.8	183.1	305.0	548.7
425	5.6	35.3	70.2	93.7	105.5	175.7	292.6	526.3
450	4.6	33.7	67.7	90.3	101.4	169.1	281.9	507.2
475	3.7	31.7	63.4	84.6	95.1	158.2	263.9	475.0
500	2.8	27.7	55.7	74.2	83.4	138.9	231.8	417.4
525	1.9	21.6	43.3	57.8	64.9	108.4	180.6	325.3
550	1.4	15.4	30.7	41.0	46.1	77.0	128.0	230.7
575	1.4	10.5	21.1	28.1	31.6	52.7	87.7	158.1
600	1.4	6.9	13.8	18.4	20.7	34.5	57.4	103.3
625	1.4	4.5	8.8	11.7	13.4	22.4	37.1	67.0
649	1.4	2.8	5.5	7.6	8.6	14.1	23.8	42.4

F22 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	290	750	1500	2000	2250	3750	6250	11250
100	290	750	1500	2000	2250	3750	6250	11250
200	260	750	1500	2000	2250	3750	6250	11250
300	230	730	1455	1940	2185	3640	6070	10925
400	200	705	1410	1880	2115	3530	5880	10585
500	170	665	1330	1775	1995	3325	5540	9965
600	140	605	1210	1615	1815	3025	5040	9070
650	125	590	1175	1570	1765	2940	4905	8825
700	110	570	1135	1515	1705	2840	4730	8515
750	95	530	1065	1420	1595	2660	4430	7970
800	80	510	1015	1355	1525	2540	4230	7610
850	65	485	975	1300	1460	2435	4060	7305
900	50	450	900	1200	1350	2245	3745	6740
950	35	375	755	1005	1130	1885	3145	5665
1000	20	260	520	695	780	1305	2170	3910
1050	20	175	350	465	525	875	1455	2625
1100	20	110	220	295	330	550	915	1645
1150	20	70	135	180	205	345	570	1030
1200	20	40	80	110	125	205	345	615

F5 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
0	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
50	19.5	51.6	103.3	137.7	154.9	258.2	430.4	774.6
100	17.7	51.1	102.3	136.3	153.4	255.7	425.9	766.8
150	15.8	49.3	98.6	131.7	148.2	246.8	411.3	740.5
200	14.0	48.7	97.4	129.8	146.1	243.7	406.0	730.9
250	12.1	46.3	92.7	123.6	139.0	231.7	386.1	694.5
300	10.2	42.9	85.8	114.5	128.6	214.4	357.2	642.8
350	8.4	40.4	80.4	107.4	120.7	201.1	335.4	603.5
375	7.4	38.9	77.5	103.5	116.4	193.9	323.0	581.5
400	6.5	36.5	72.6	97.1	109.1	181.8	303.0	545.4
425	5.6	35.3	70.2	93.7	105.4	175.6	292.4	526.1
450	4.6	33.7	67.1	89.7	100.8	167.9	280.1	504.0
475	3.7	27.6	55.1	73.4	82.6	137.7	229.7	413.5
500	2.8	21.3	42.6	56.9	64.0	106.4	177.4	319.5
525	1.9	16.2	32.3	43.1	48.3	80.5	134.1	241.7
550	1.4	12.1	24.2	32.2	36.0	60.3	100.3	180.8
575	1.4	8.9	17.9	23.7	26.6	44.4	74.1	133.3
600	1.4	6.2	12.6	16.6	18.8	31.1	52.0	93.4
625	1.4	3.9	8.1	10.7	12.0	20.0	33.3	59.8
649	1.4	2.4	4.8	6.6	7.2	11.7	19.7	35.5

F5 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	290	750	1500	2000	2250	3750	6250	11250
100	290	750	1500	2000	2250	3750	6250	11250
200	260	745	1490	1985	2235	3725	6205	11170
300	230	715	1430	1910	2150	3580	5965	10740
400	200	705	1410	1880	2115	3530	5880	10585
500	170	665	1330	1775	1995	3325	5540	9965
600	140	605	1210	1615	1815	3025	5040	9070
650	125	590	1175	1570	1765	2940	4905	8825
700	110	570	1135	1515	1705	2840	4730	8515
750	95	530	1055	1410	1585	2640	4400	7920
800	80	510	1015	1355	1525	2540	4230	7610
850	65	485	965	1290	1450	2415	4030	7250
900	50	370	740	985	1110	1850	3085	5555
950	35	275	550	735	825	1370	2285	4115
1000	20	200	400	530	595	995	1655	2985
1050	20	145	290	385	430	720	1200	2160
1100	20	100	200	265	300	495	830	1490
1150	20	60	125	165	185	310	515	925
1200	20	35	70	95	105	170	285	515

Notes for pressure temperature tables:

1. Class 150 flanged end ratings end at 10000F (5380C)

- 2. A105, LF2 can be used up to 8000F (4270F)
- 3. LF2 is suitable for use down to -500F (-460C)
- 4. F11, F22 can be used up to 11000F (5930C)

- 5. F5, F9, F91 can be used up to 12000F (6500F)
- 6. F304, F316, F321, F347 can be used down to -3200F (-1980C)
- 7. Over 10000F (5380C) F304, F316, F321, F347 with 0.04% min. carbon

F9 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
0	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
50	19.5	51.7	103.4	137.9	155.2	258.6	431.0	775.9
100	17.7	51.6	103.1	137.4	154.6	257.7	429.5	773.2
150	15.8	50.3	100.3	133.7	150.6	250.9	418.4	753.0
200	14.0	48.8	97.5	130.0	146.2	244.1	406.6	731.9
250	12.1	46.3	92.7	123.7	139.0	231.8	386.2	694.7
300	10.2	42.9	85.8	114.5	128.6	214.4	357.2	642.8
350	8.4	40.4	80.4	107.4	120.7	201.1	335.4	603.5
375	7.4	38.9	77.6	103.6	116.5	194.1	323.3	582.0
400	6.5	36.5	73.3	97.8	109.8	183.1	305.0	548.7
425	5.6	35.3	70.2	93.7	105.5	175.7	292.6	526.3
450	4.6	33.7	67.7	90.3	101.4	169.1	281.9	507.2
475	3.7	31.7	63.4	84.6	95.1	158.2	263.9	475.0
500	2.8	27.7	55.7	74.2	83.4	138.9	231.8	416.9
525	1.9	21.4	42.8	57.0	64.2	107.1	178.5	321.1
550	1.4	15.0	30.0	40.0	45.0	75.0	125.1	224.9
575	1.4	10.4	21.0	28.0	31.4	52.2	87.2	156.7
600	1.4	7.3	14.3	19.0	21.5	35.8	60.0	107.5
625	1.4	4.9	9.9	13.2	14.8	24.7	41.5	74.5
649	1.4	3.4	7.2	9.7	10.7	17.6	29.7	53.1

F9 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	90	750	1500	2000	2250	3750	6250	11250
100	290	750	1500	2000	2250	3750	6250	11250
200	260	750	1500	2000	2250	3750	6250	11250
300	230	730	1455	1940	2185	3640	6070	10925
400	200	705	1410	1880	2115	3530	5880	10585
500	170	665	1330	1775	1995	3325	5540	9965
600	140	605	1210	1615	1815	3025	5040	9070
650	125	590	1175	1570	1765	2940	4905	8825
700	110	570	1135	1515	1705	2840	4730	8515
750	95	530	1065	1420	1595	2660	4430	7970
800	80	510	1015	1355	1525	2540	4230	7610
850	65	485	975	1300	1460	2435	4060	7305
900	50	450	900	1200	1350	2245	3745	6740
950	35	375	755	1005	1130	1885	3145	5655
1000	20	255	505	675	760	1270	2115	3805
1050	20	170	345	460	515	855	1430	2570
1100	20	115	225	300	340	565	945	1695
1150	20	75	150	200	225	375	630	1130
1200	20	50	105	140	155	255	430	770

F304 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	19.0	49.7	99.3	132.4	149.0	248.3	413.8	744.8
0	19.0	49.7	99.3	132.4	149.0	248.3	413.8	744.8
50	18.3	47.8	95.7	127.6	143.5	239.2	398.6	717.5
100	15.7	40.9	81.8	109.0	122.6	204.4	340.7	613.2
150	14.1	37.2	74.4	99.2	111.5	185.9	309.8	557.7
200	13.2	34.4	69.1	92.0	103.5	172.6	287.5	517.4
250	12.0	32.5	65.0	86.6	97.4	162.7	270.9	487.7
300	10.2	30.6	61.4	81.8	92.0	153.5	255.7	460.1
350	8.4	29.6	59.1	78.8	88.7	147.9	246.2	443.2
375	7.4	29.2	58.4	78.0	87.6	146.1	243.4	438.0
400	6.5	28.6	57.2	76.1	85.8	142.9	238.3	429.2
425	5.6	28.0	55.6	74.3	83.6	139.2	232.1	418.0
450	4.6	27.4	54.6	73.0	82.3	136.9	228.2	410.9
475	3.7	27.0	54.0	71.7	80.8	134.8	224.5	404.0
500	2.8	26.5	53.1	70.7	79.5	132.6	220.8	397.4
525	1.9	24.0	48.1	64.2	72.3	120.4	200.5	360.9
550	1.4	21.8	43.4	57.9	65.3	108.9	181.3	326.5
575	1.4	20.1	40.1	53.4	60.2	100.5	167.3	301.1
600	1.4	14.4	33.6	44.7	50.2	83.8	139.8	251.5
625	1.4	3.9	26.7	35.4	39.8	66.4	110.6	199.4
650	1.4	2.7	21.1	27.5	31.7	52.5	87.7	157.9
700	1.4	1.4	12.3	1.4	18.5	31.1	51.8	93.1
725	1.4	1.4	9.4	1.4	14.0	23.5	39.1	70.2
750	1.4	1.4	7.3	1.4	11.0	18.3	30.4	54.7
775	1.2	1.2	5.6	1.2	8.5	13.9	23.3	42.0
800	0.9	0.9	4.4	0.9	6.5	10.7	18.0	32.3

F304 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	275	720	1440	1920	2160	3600	6000	10800
100	275	720	1440	1920	2160	3600	6000	10800
200	230	600	1200	1600	1800	3000	5000	9000
300	205	540	1080	1440	1620	2700	4500	8100
400	190	495	995	1325	1490	2485	4140	7450
500	170	465	930	1240	1395	2330	3880	6985
600	140	435	875	1165	1310	2185	3640	6550
650	125	430	860	1145	1290	2150	3580	6445
700	110	425	850	1135	1275	2125	3540	6370
750	95	415	830	1105	1245	2075	3460	6230
800	80	405	805	1075	1210	2015	3360	6050
850	65	395	790	1055	1190	1980	3300	5940
900	50	390	780	1035	1165	1945	3240	5830
950	35	380	765	1020	1145	1910	3180	5725
1000	20	320	640	855	965	1605	2675	4815
1050	20	310	615	820	925	1545	2570	4630
1100	20	255	515	685	770	1285	2145	3855
1150	20	60	400	530	595	995	1655	2985
1200	20	40	310	415	465	770	1285	2315
1250	20	20	225	20	340	565	945	1695
1300	20	20	170	20	255	430	715	1285
1350	20	20	125	20	185	310	515	925
1400	20	20	95	20	145	240	400	720
1450	15	15	70	15	105	170	285	515
1500	10	10	55	10	80	135	230	410

Notes for pressure temperature tables:

1. Class 150 flanged end ratings end at 10000F (5380C)

- 2. A105, LF2 can be used up to 8000F (4270F)
- 3. LF2 is suitable for use down to -500F (-460C)
- 4. F11, F22 can be used up to 11000F (5930C)

- 5. F5, F9, F91 can be used up to 12000F (6500F)
- 6. F304, F316, F321, F347 can be used down to -3200F (-1980C)
- 7. Over 10000F (5380C) F304, F316, F321, F347 with 0.04% min. carbon

PRESSURE TEMPERATURE RATING



F316 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	19.0	49.7	99.3	132.4	149.0	248.3	413.8	744.8
0	19.0	49.7	99.3	132.4	149.0	248.3	413.8	744.8
38	19.0	49.7	99.3	132.4	149.0	248.3	413.8	744.8
50	18.4	48.1	96.3	128.4	144.4	240.6	401.0	721.9
100	16.0	42.3	84.5	112.8	126.8	211.0	351.7	633.2
150	14.8	38.6	77.1	102.9	115.7	192.4	320.9	577.7
200	13.6	35.8	71.2	95.2	107.0	178.5	297.3	535.2
250	12.0	33.5	66.8	89.1	100.3	167.1	278.3	501.0
300	10.2	31.6	63.1	84.5	95.0	158.1	263.6	474.5
350	8.4	30.4	61.0	81.3	91.3	152.3	253.8	456.9
375	7.4	29.6	59.9	79.8	89.8	149.3	249.1	448.3
400	6.5	29.3	58.9	78.6	88.2	147.2	245.4	441.9
425	5.6	29.0	58.3	77.6	87.3	145.6	242.9	437.2
450	4.6	29.0	57.7	77.0	86.7	144.4	240.4	432.8
475	3.7	28.7	57.3	76.4	86.0	143.4	239.0	430.3
500	2.8	27.3	54.8	72.9	82.1	136.7	228.0	410.5
525	1.9	25.2	50.7	67.5	75.9	126.4	210.7	379.2
550	1.4	24.0	47.8	63.9	71.8	119.8	199.5	359.0
575	1.4	22.9	45.5	60.8	68.3	114.0	190.1	341.9
600	1.4	19.9	39.8	53.1	59.7	99.5	166.0	298.6
625	1.4	15.7	31.7	42.1	47.5	79.2	131.8	237.3
650	1.4	12.6	25.3	33.2	38.0	63.3	105.7	189.8
675	1.4	10.2	20.7	27.3	31.5	51.5	86.1	154.8
700	1.4	8.3	16.9	22.3	25.1	42.0	69.8	125.8
725	1.4	6.9	13.9	18.6	21.1	35.0	58.2	104.9
750	1.4	5.7	11.3	15.2	17.1	28.7	47.7	85.6
775	1.4	4.6	9.0	12.1	13.7	22.9	38.0	68.4
800	1.4	3.5	7.0	9.3	10.6	17.4	29.2	52.6
816	1.4	2.8	5.9	7.6	8.4	14.1	23.8	42.8

F316 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	75	720	1440	1920	2160	3600	6000	10800
100	275	720	1440	1920	2160	3600	6000	10800
200	235	620	1240	1655	1860	3095	5160	9290
300	215	560	1120	1495	1680	2795	4660	8390
400	195	515	1025	1370	1540	2570	4280	7705
500	170	480	955	1275	1435	2390	3980	7165
600	140	450	900	1205	1355	2255	3760	6770
650	125	445	890	1185	1330	2220	3700	6660
700	110	430	870	1160	1305	2170	3620	6515
750	95	425	855	1140	1280	2135	3560	6410
800	80	420	845	1125	1265	2110	3520	6335
850	65	420	835	1115	1255	2090	3480	6265
900	50	415	830	1105	1245	2075	3460	6230
950	35	385	775	1030	1160	1930	3220	5795
1000	20	350	700	935	1050	1750	2915	5245
1050	20	345	685	915	1030	1720	2865	5155
1100	20	305	610	815	915	1525	2545	4575
1150	20	235	475	630	710	1185	1970	3550
1200	20	185	370	495	555	925	1545	2775
1250	20	145	295	20	440	735	1230	2210
1300	20	115	235	20	350	585	970	1750
1350	20	95	190	20	290	480	800	1440
1400	20	75	150	20	225	380	630	1130
1450	20	60	115	15	175	290	485	875
1500	20	40	85	10	125	205	345	620

F321 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	19.0	49.7	99.3	132.4	149.0	248.3	413.8	744.8
0	19.0	49.7	99.3	132.4	149.0	248.3	413.8	744.8
50	18.5	48.5	97.0	129.4	145.6	242.7	404.4	727.9
100	16.8	44.1	88.1	117.5	132.2	220.6	367.6	661.7
150	15.8	41.0	82.0	109.2	122.9	204.9	341.6	615.0
200	14.0	38.2	76.7	102.0	114.9	191.5	319.2	574.6
250	12.1	36.0	72.0	96.0	107.9	179.6	299.5	539.2
300	10.2	34.0	68.3	91.1	102.3	170.5	284.3	512.0
350	8.4	32.9	65.4	87.4	98.3	163.8	272.8	491.2
375	7.4	32.0	64.0	85.3	96.0	160.3	267.0	480.7
400	6.5	31.7	63.1	84.1	94.8	157.8	263.3	473.8
425	5.6	31.1	62.1	83.2	93.5	155.7	259.6	467.3
450	4.6	30.7	61.8	82.2	92.6	154.1	257.0	462.6
475	3.7	30.4	61.2	81.6	91.6	152.8	254.5	458.2
500	2.8	27.9	56.2	74.8	84.1	140.1	233.5	420.3
525	1.9	25.4	51.2	68.1	76.6	127.7	212.8	383.1
550	1.4	23.3	46.6	62.0	69.8	116.4	193.8	348.9
575	1.4	20.7	41.2	55.0	61.9	103.1	171.7	309.0
600	1.4	18.0	36.4	48.4	54.5	90.9	151.3	272.3
625	1.4	15.7	31.7	42.1	47.5	79.2	131.8	237.3
650	1.4	12.6	25.3	32.8	37.9	63.2	105.5	189.5
700	1.4	7.9	15.8	1.4	23.8	39.6	65.9	118.6
725	1.4	6.3	12.6	1.4	18.9	31.8	52.9	95.1
750	1.4	5.0	10.0	1.4	14.9	25.0	41.8	74.9
775	1.4	3.9	8.0	1.2	12.0	19.8	33.3	59.6
800	1.4	3.1	6.3	0.9	9.5	15.6	26.2	46.9

F321 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	275	720	1440	1920	2160	3600	6000	10800
100	275	720	1440	1920	2160	3600	6000	10800
200	245	645	1290	1720	1935	3230	5380	9685
300	230	595	1190	1585	1785	2975	4960	8930
400	200	550	1105	1470	1655	2760	4600	8280
500	170	515	1030	1375	1545	2570	4285	7715
600	140	485	975	1300	1460	2435	4060	7310
650	125	480	955	1275	1435	2390	3980	7165
700	110	465	930	1240	1395	2330	3880	6985
750	95	460	915	1220	1375	2290	3820	6875
800	80	450	900	1205	1355	2255	3760	6770
850	65	445	895	1190	1340	2230	3720	6695
900	50	440	885	1180	1325	2210	3680	6625
950	35	385	775	1030	1160	1930	3220	5795
1000	20	355	715	950	1070	1785	2970	5350
1050	20	315	625	835	940	1565	2605	4690
1100	20	270	545	725	815	1360	2265	4075
1150	20	235	475	630	710	1185	1970	3550
1200	20	185	370	495	555	925	1545	2775
1250	20	140	280	20	420	705	1170	2110
1300	20	110	220	20	330	550	915	1645
1350	20	85	170	20	255	430	715	1285
1400	20	65	130	20	195	325	545	975
1450	20	50	105	15	155	255	430	770
1500	20	40	75	10	115	190	315	565

Notes for pressure temperature tables:

- Class 150 flanged end ratings end at 10000F (5380C)
- A105, LF2 can be used up to 8000F (4270C)
- LF2 is suitable for use down to -500F (-460C)
- F11, F22 can be used up to 11000F (5930C)
- F5, F9, F91 can be used up to 12000F (6500F)
- F304, F316, F321, F347 can be used down to -3200F (-1980C)
- Over 10000F (5380C) F304, F316, F321, F347 with 0.04% min. carbon

F347 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	19.0	49.7	99.3	132.4	149.0	248.3	413.8	744.8
50	18.7	48.7	97.5	130.0	146.2	243.7	406.2	731.2
100	17.4	45.1	90.3	120.4	135.4	225.7	376.2	677.1
150	15.8	42.4	84.7	113.0	127.1	211.4	352.6	634.7
200	14.0	39.9	79.4	106.1	119.3	199.0	331.5	596.8
250	12.1	37.7	75.3	100.4	113.0	188.3	313.9	565.0
300	10.2	36.0	71.8	95.8	107.8	179.8	299.4	539.0
350	8.4	34.7	69.3	92.3	103.7	173.0	288.3	519.0
375	7.4	34.1	68.2	90.9	102.3	170.2	283.9	511.0
400	6.5	33.8	67.9	90.3	101.7	169.6	282.6	508.8
425	5.6	33.5	67.3	89.7	100.8	168.0	280.2	504.4
450	4.6	33.4	67.0	89.4	100.4	167.4	278.8	501.8
475	3.7	31.7	63.3	84.5	95.0	158.1	263.6	474.3
500	2.8	28.2	56.6	75.3	84.7	140.9	235.1	423.1
525	1.9	25.8	51.6	68.8	77.4	129.0	215.0	386.8
550	1.4	25.0	49.8	66.6	74.9	124.9	208.1	374.3
575	1.4	24.0	47.9	63.9	71.8	119.7	199.5	359.2
600	1.4	21.6	42.9	57.2	64.2	107.1	178.6	321.5
625	1.4	18.0	36.0	48.0	53.9	89.5	149.3	268.9
650	1.4	11.6	23.5	30.5	35.1	58.3	97.5	175.3
700	1.4	6.9	13.4	1.4	20.3	33.7	56.0	100.9
725	1.4	5.3	10.2	1.4	15.5	25.9	42.9	77.5
750	1.4	4.2	8.2	1.4	12.4	20.7	34.2	62.0
775	1.4	3.2	6.5	1.2	9.9	16.4	27.3	49.1
800	1.2	2.6	5.2	0.9	8.0	13.1	22.0	39.4

F347 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	275	720	1440	1920	2160	3600	6000	10800
100	275	720	1440	1920	2160	3600	6000	10800
200	255	660	1320	1760	1980	3300	5500	9900
300	230	615	1230	1640	1845	3070	5120	9215
400	200	575	1145	1530	1720	2870	4780	8605
500	170	540	1080	1440	1620	2700	4500	8100
600	140	515	1025	1370	1540	2570	4280	7705
650	125	505	1010	1345	1510	2520	4200	7560
700	110	495	990	1320	1485	2470	4120	7415
750	95	490	985	1310	1475	2460	4100	7380
800	80	485	975	1300	1460	2435	4060	7310
850	65	485	970	1295	1455	2425	4040	7270
900	50	450	900	1200	1350	2245	3745	6740
950	35	385	775	1030	1160	1930	3220	5795
1000	20	365	725	970	1090	1820	3030	5450
1050	20	360	720	960	1080	1800	3000	5400
1100	20	325	645	860	965	1610	2685	4835
1150	20	275	550	735	825	1370	2285	4115
1200	20	170	345	460	515	855	1430	2570
1250	20	125	245	20	370	615	1030	1850
1300	20	95	185	20	280	465	770	1390
1350	20	70	135	20	205	345	570	1030
1400	20	55	110	20	165	275	455	825
1450	20	40	80	15	125	205	345	615
1500	15	35	70	10	105	170	285	515

F91 METRIC

T °C	PN20 (BAR)	PN50 (BAR)	PN100 (BAR)	PN140 (BAR)	PN150 (BAR)	PN250 (BAR)	PN420 (BAR)	PN760 (BAR)
-29	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
0	20.0	51.7	103.4	137.9	155.2	258.6	431.0	775.9
50	19.5	51.7	103.4	137.9	155.2	258.6	431.0	775.9
100	17.7	51.6	103.1	137.4	154.6	257.7	429.5	773.2
150	15.8	50.3	100.3	133.7	150.6	250.9	418.4	753.0
200	14.0	48.8	97.5	130.0	146.2	244.1	406.6	731.9
250	12.1	46.3	92.7	123.7	139.0	231.8	386.2	694.7
300	10.2	42.9	85.8	114.5	128.6	214.4	357.2	642.8
350	8.4	40.4	80.4	107.4	120.7	201.1	335.4	603.5
375	7.4	38.9	77.6	103.6	116.5	194.1	323.3	582.0
400	6.5	36.5	73.3	97.8	109.8	183.1	305.0	548.7
425	5.6	35.3	70.2	93.7	105.5	175.7	292.6	526.3
450	4.6	33.7	67.7	90.3	101.4	169.1	281.9	507.2
475	3.7	31.7	63.4	84.6	95.1	158.2	263.9	475.0
500	2.8	28.2	56.6	75.3	84.7	140.9	235.1	423.1
525	1.9	25.8	51.6	68.8	77.4	129.0	215.0	386.8
550	1.4	25.0	49.8	66.6	74.9	124.9	208.1	374.3
575	1.4	23.4	47.0	62.6	70.4	117.3	195.5	351.9
600	1.4	19.4	39.1	52.0	58.5	97.6	162.5	292.5
625	1.4	14.7	29.2	39.0	43.9	73.1	121.6	219.2
649	1.4	10.0	20.0	26.6	29.7	49.7	82.8	149.0

F91 PSI

°F	150# (PSI)	300# (PSI)	600# (PSI)	800# (PSI)	900# (PSI)	1500# (PSI)	2500# (PSI)	4500# (PSI)
-20	290	750	1500	2000	2250	3750	250	11250
100	290	750	1500	2000	2250	3750	6250	11250
200	260	750	1500	2000	2250	3750	6250	11250
300	230	730	1455	1940	2185	3640	6070	10925
400	200	705	1410	1880	2115	3530	5880	10585
500	170	665	1330	1775	1995	3325	5540	9965
600	140	605	1210	1615	1815	3025	5040	9070
650	125	590	1175	1570	1765	2940	4905	8825
700	110	570	1135	1515	1705	2840	4730	8515
750	95	530	1065	1420	1595	2660	4430	7970
800	80	510	1015	1355	1525	2540	4230	7610
850	65	485	975	1300	1460	2435	4060	7305
900	50	450	900	1200	1350	2245	3745	6740
950	35	385	775	1030	1160	1930	3220	5795
1000	20	365	725	970	1090	1820	3030	5450
1050	20	360	720	960	1080	1800	3000	5400
1100	20	300	605	805	905	1510	2515	4525
1150	20	225	445	595	670	1115	1855	3345
1200	20	145	290	385	430	720	1200	2160

Notes for pressure temperature tables:

1. Class 150 flanged end ratings end at 10000F (5380C)

2. A105, LF2 can be used up to 8000F (4270F)

3. LF2 is suitable for use down to -500F (-460C)

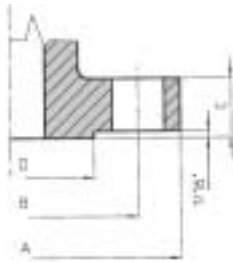
4. F11, F22 can be used up to 11000F (5930C)

5. F5, F9, F91 can be used up to 12000F (6500F)

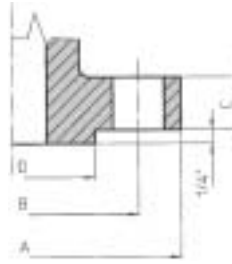
6. F304, F316, F321, F347 can be used down to -3200F (-1980C)

7. Over 10000F (5380C) F304, F316, F321, F347 with 0.04% min. carbon

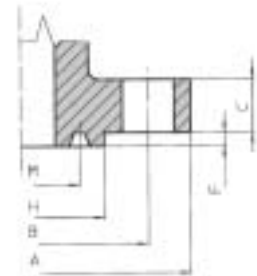
FLANGES - ASME B16.5



FLANGES ANSI - B16.5



RAISED FACE 600 & 1500 lb



RING JOINT FACE

CLASS	Size	A		C		D		B		Bolt holes		Ring Joint Facing				Ring N.			
		N	Size	H	M	F	N	Size	H	M	F								
150	1/2	3.50	89	0.44	11.5	1.38	34.9	2.38	60.3	4	0.62	16	-	-	-	-	-		
	3/4	3.88	98	0.50	13.0	1.69	42.9	2.75	69.8	4	0.62	16	-	-	-	-	-		
	1	4.25	108	0.56	14.5	2.00	50.8	3.12	79.4	4	0.62	16	2.50	63.5	1.875	47.62	0.250	6.3	R 15
	1.1/4	4.62	117	0.62	16.0	2.50	63.5	3.50	88.9	4	0.62	16	2.88	73.0	2.250	57.15	0.250	6.3	R 17
	1.1/2	5.00	127	0.69	17.5	2.88	73.0	3.88	98.4	4	0.62	16	3.25	82.5	2.562	65.07	0.250	6.3	R 19
	2	6.00	152	0.75	19.5	3.62	92.1	4.75	120.6	4	0.75	20	4.00	102.0	3.250	82.55	0.250	6.3	R 22
300	1/2	3.75	95	0.56	14.5	1.38	34.9	2.62	66.7	4	0.62	16	2.00	51.0	1.344	34.14	0.219	5.6	R 11
	3/4	4.62	117	0.62	16.0	1.69	42.9	3.25	82.5	4	0.75	20	2.50	63.5	1.688	42.88	0.250	6.3	R 13
	1	4.88	124	0.69	17.5	2.00	50.8	3.50	88.9	4	0.75	20	2.75	70.0	2.000	50.80	0.250	6.3	R 16
	1.1/4	5.25	133	0.75	19.5	2.50	63.5	3.88	98.4	4	0.75	20	3.12	79.5	2.375	60.32	0.250	6.3	R 18
	1.1/2	6.12	156	0.81	21.0	2.88	73.0	4.50	114.3	4	0.88	23	3.56	90.5	2.688	68.28	0.250	6.3	R 20
	2	6.50	165	0.88	22.5	3.62	92.1	5.00	127.0	8	0.75	20	4.25	108.0	3.250	82.55	0.312	7.9	R 23
600	1/2	3.75	95	0.56	14.5	1.38	34.9	2.62	66.7	4	0.62	16	2.00	51.0	1.344	34.14	0.219	5.6	R 11
	3/4	4.62	117	0.62	16.0	1.69	42.9	3.25	82.5	4	0.75	20	2.50	63.5	1.688	42.88	0.250	6.3	R 13
	1	4.88	124	0.69	17.5	2.00	50.8	3.50	88.9	4	0.75	20	2.75	70.0	2.000	50.80	0.250	6.3	R 16
	1.1/4	5.25	133	0.81	21.0	2.50	63.5	3.88	98.4	4	0.75	20	3.12	79.5	2.375	60.32	0.250	6.3	R 18
	1.1/2	6.12	156	0.88	22.5	2.88	73.0	4.50	114.3	4	0.88	23	3.56	90.5	2.688	68.28	0.250	6.3	R 20
	2	6.50	165	1.00	25.5	3.62	92.1	5.00	127.0	8	0.75	20	4.25	108.0	3.250	82.55	0.312	7.9	R 23
1500	1/2	4.75	121	0.88	22.5	1.38	34.9	3.25	82.5	4	0.88	23	2.38	60.5	1.562	39.67	0.250	6.3	R 12
	3/4	5.12	130	1.00	25.5	1.69	42.9	3.50	88.9	4	0.88	23	2.62	66.5	1.750	44.45	0.250	6.3	R 14
	1	5.88	149	1.12	29.0	2.00	50.8	4.00	101.6	4	1.00	26	2.81	71.5	2.000	50.80	0.250	6.3	R 16
	1.1/4	6.25	159	1.12	29.0	2.50	63.5	4.38	111.1	4	1.00	26	3.19	81.0	2.375	60.32	0.250	6.3	R 18
	1.1/2	7.00	178	1.25	32.0	2.88	73.0	4.88	123.8	4	1.12	29	3.62	92.0	2.688	68.28	0.250	6.3	R 20
	2	8.50	216	1.50	38.5	3.62	92.1	6.50	165.1	8	1.00	26	4.88	124.0	3.750	95.25	0.312	7.9	R 24
2500	1/2	5.23	133	1.20	30.5	1.38	34.9	3.50	88.9	4	0.88	23	2.55	65.0	1.688	42.88	0.250	6.3	R 13
	3/4	5.51	140	1.25	32.0	1.69	42.9	3.74	95.2	4	0.88	23	2.87	73.0	2.000	50.80	0.250	6.3	R 16
	1	6.25	159	1.37	35.0	2.00	50.8	4.24	107.9	4	1.00	26	3.24	82.5	2.374	60.32	0.250	6.3	R 18
	1.1/4	7.24	184	1.51	38.5	2.50	63.5	5.12	130.2	4	1.12	29	3.99	101.5	2.844	72.24	0.312	7.9	R 21
	1.1/2	7.99	203	1.75	44.5	2.88	73.0	5.74	146	4	1.25	32	4.50	114.5	3.250	82.55	0.312	7.9	R 23
	2	9.25	235	2.00	51.0	3.62	92.1	6.74	171.4	8	1.12	29	5.25	133.5	4.000	101.60	0.312	7.9	R 26

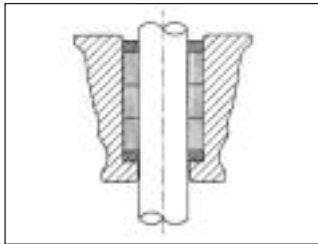
Asbestos-free packing is composed by a series of rings of pure graphite. The sets is closed with two rings, top and bottom, anti-extrusion, manufactured in braided graphite. Both internal and external rings are treated with corrosion inhibitor.

Asbestos-free gaskets used on bolted bonnet valves are of the spiral-wound type in Stainless Steel 316 and pure graphite. On class 1500 valves, ring-joint gaskets in accordance with ANSI B16.20 - API 6A can be used.

Spare Parts: CALOBRI maintains an extensive inventory of packing and gaskets spares. To individuate the require one please refer to the information shown on CALOBRI's data sheets (assembly drawings), indicating code and composition of the sets.

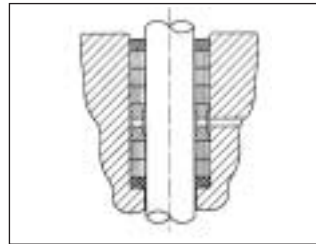
EMISSION CONTROL OPTIONS

CALOBRI offers a wide range of solutions to control fugitive emissions in **packed valves**.



GRAFITE PACKING

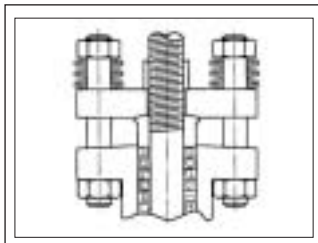
Tight control on stem and packing chamber walls finishing and material purity and density in the packing guarantee a leakproof sealing to EPA requisitions.



LANTERN PACKING

(on request)

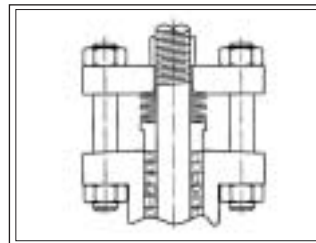
The lantern ring solution provide a way to verify the packing operation and a grease injector option to increase packing seal.



LIVE LOADING BOLTS LOADED TYPE

(on request)

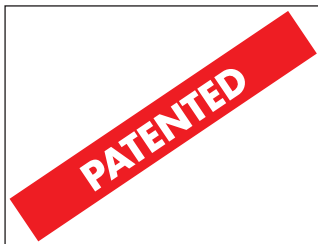
Two sets of Belleville springs keep gland flange pressure on packing for long periods of time without maintenance.



LIVE LOADING GLAND LOADED TYPE

(on request)

Sets of belleville springs keep gland pressure on packing for long periods of time without maintenance.

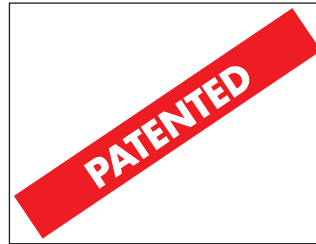


GARLOCK® EVSP 9000

(on request)

CALOBRI offers this superior designed chevron-style graphite packing.

ISA testing qualification.



ARMA-SEAL 312 (™)

(on request)

CALOBRI valves qualified to ISO15848 testing using this special designed packing.

Shell 77/312 qualification.

EMISSION CONTROL TESTING & QUALIFICATION

CALOBRI has been involved in extensive testing of various packing solutions which lead to major improvements in the standard design and qualification by the main relevant specifications.



ISO TESTING

Valve cycle tester using a mass spectrometer in sniffer mode to measure helium leakage from the valve gland.



TA-LUFT TESTING

Valve cycle tester with vacuum collection tank directly connected to the mass spectrometer



ISO 15848 TESTING

Emission test with Temperature and Pressure cycles combined. Detection by mass spectrometer in open ambient.

CALOBRI testing programme and results are available on request at www.calobri.com

FLOW COEFFICIENT C_v

The C_v 's a valve property and is defined as follows: "The Flow Coefficient C_v states the flow capacity of a valve in U.S. gallons per minute of water at a standard temperature of 60°F (15,6° C) that will flow through the valve with a pressure loss of one pound per square inch at a specific opening position". For the metric sistem the analog value is K_v where measure unit are Bar, Kg and meters. The C_v show the quality and accuracy of a valve in terms of pressure loss, the highest values of C_v indicate the highest quality of a valve.

The values shown

VALVE SIZE	GATE		GLOBE			PISTON		
	Regular Port	Full Port	Regular Port	Full Port	Y:Pattern	Regular Port	Full Port	Y:Pattern
1/4	-	2.5	-	1.1	2.9	-	0.9	2.3
3/8	-	4.3	-	1.4	3.8	-	1.1	3.5
1/2	5.5	11.6	1.5	3.6	4.5	1	2.1	4.8
3/4	12	26.6	3.8	6.6	10.1	2.8	5.8	7.8
1	27	54.6	6.8	10.9	16.0	6	7	11.2
1 1/4	55	79.8	11	14	23.1	9.5	9.2	18.0
1 1/2	80	87	14.3	24.3	47.1	11	15.4	37.8
2	105.0	108	25	39.7	80.2	18	32	69.2

FLOW-RATE

$$Q = C_v \sqrt{\frac{\Delta p}{S}}$$

PRESSURE DROP

$$\Delta p = S \left(\frac{Q}{C_v} \right)^2$$

For liquids other than water

Δp = Pressure drop (p.s.i.).

Q = Liquid flow in gallons per minute (GPM).

S = Specific gravity of liquid relative to water (60°F).

C_v = Valves flow coefficient.

CONVERSION TABLE TO METRIC STD

Flow Coefficient	C_v	K_v
C_v	1	0,865
K_v	1.156	1

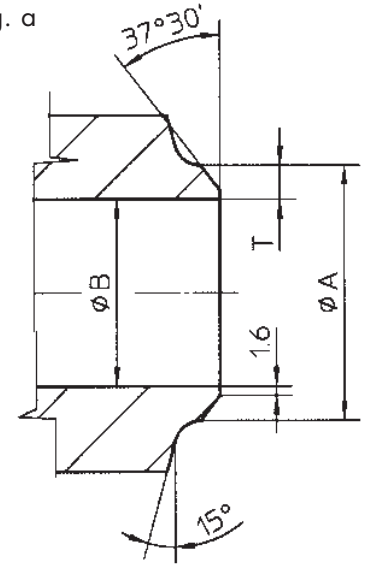


To measure the properly value of C_v there is not a standard method. CALOBRI R & D team has used two different methods: 1-Using C_v definition, through the means of a specifically built test rig, it has been obtained 1Bar of pressure loss and the flow has been verified with specific equipment. Calculation is possible to convert the measure to C_v . 2-In the same machine the flow has been changed and different measure of pressure loss has been obtained: a table has been defined and an average value per each valve has been calculated.

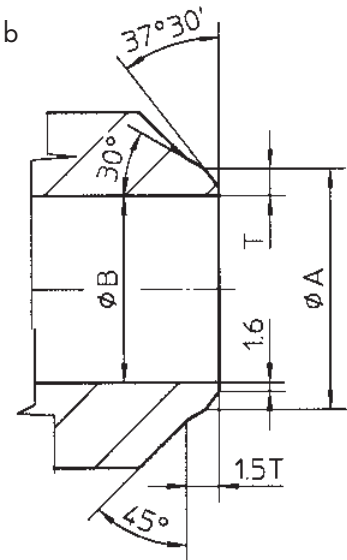
BUTT WELD - ASME B16.25

SIZE	SCHEDULE 40		SCHEDULE 80		SCHEDULE 160		SCHEDULE XXS	
	ØA	T	ØA	T	ØA	T	ØA	T
	mm	mm	mm	mm	mm	mm	mm	mm
	(In)	(In)	(In)	(In)	(In)	(In)	(In)	(In)
1/2"	21.3	2.77	21.3	3.73	21.3	4.78	21.3	7.47
	(0.840)	(0.190)	(0.840)	(0.147)	(0.840)	(0.188)	(0.840)	(0.294)
3/4"	26.7	2.87	26.7	3.91	26.7	5.56	26.7	7.82
	(1.050)	(0.113)	(1.050)	(0.154)	(1.050)	(0.219)	(1.050)	(0.308)
1"	33.4	3.38	33.4	4.55	33.4	6.35	33.4	9.09
	(1.315)	(0.133)	(1.315)	(0.179)	(1.315)	(0.250)	(1.315)	(0.358)
1.1/4"	42.2	3.55	42.2	4.85	42.2	6.35	42.2	9.70
	(1.660)	(0.140)	(1.660)	(0.191)	(1.660)	(0.250)	(1.660)	(0.382)
1.1/2"	48.3	3.68	48.3	5.08	48.3	7.14	48.3	10.15
	(1.900)	(0.145)	(1.900)	(0.200)	(1.900)	(0.281)	(1.900)	(0.400)
2"	60.3	3.91	60.3	5.54	60.3	8.74	60.3	11.07
	(2.375)	(0.154)	(2.375)	(0.218)	(2.375)	(0.344)	(2.375)	(0.436)
2.1/2"	73.0	5.15	73.0	7.01	73.0	9.53	73.0	14.02
	(2.875)	(0.203)	(2.875)	(0.276)	(2.875)	(0.375)	(2.875)	(0.552)
3"	88.9	5.48	88.9	7.62	88.9	11.13	88.9	15.24
	(3.500)	(0.216)	(3.500)	(0.300)	(3.500)	(0.438)	(3.500)	(0.600)
4"	114.3	6.02	114.3	8.56	114.3	13.49	114.3	17.12
	(4.500)	(0.237)	(4.500)	(0.337)	(4.500)	(0.531)	(4.500)	(0.674)

-Fig. a



-Fig. b



-Fig. a $\leq 2''$

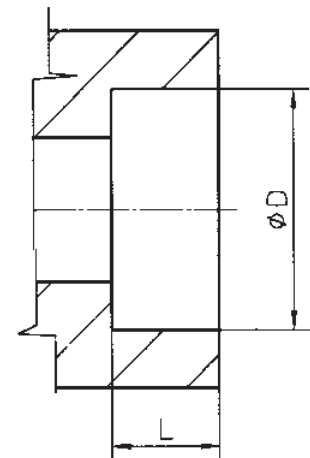
-Fig. b $> 2''$

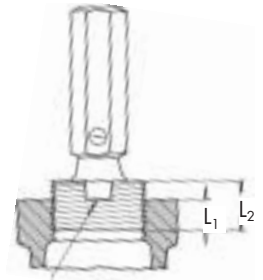
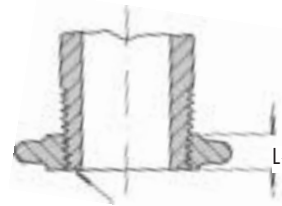
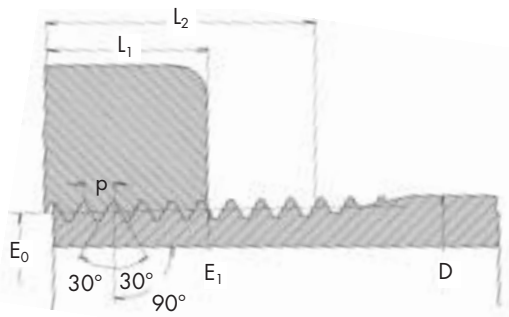
$$B = A - 2T$$

SOCKET WELD - ASME B16.11

SIZE	ØD		L (min)		L (CALOBRI)	
	Inch	mm	Inch	mm	Inch	mm
1/4"	0.555	14.10	0.38	9.53	0,44	11,1
3/8"	0.690	17.53	0.38	9.53	0,44	11,1
1/2"	0.855	21.72	0.38	9.53	0,5	12,7
3/4"	1.065	27.05	0.5	12.70	0,57	14,5
1"	1.330	33.78	0.5	12.70	0,63	16,0
1.1/4"	1.675	42.54	0.5	12.70	0,69	17,5
1.1/2"	1.915	48.64	0.5	12.70	0,75	19,0
2"	2.406	61.11	0.62	15.88	0,86	22,0

Socket wall thickness conform to ASME B16.34





Flush by Hand

Tolerance on Product

One turn large or small from notch on plug gauge or face of ring gauge.

Notch flush with face of fitting. If chamfered, notch flush with bottom of chamfer.

$$E_0 = D - (0.050D + 1.1)p$$

$$*E_1 = E_0 + 0.0625 L_1$$

$$L_2 = (0.80D = 6.8)p$$

p = Pitch
 Depth of thread = $0.80p$
 Total Taper $3/4$ -inch per Foot

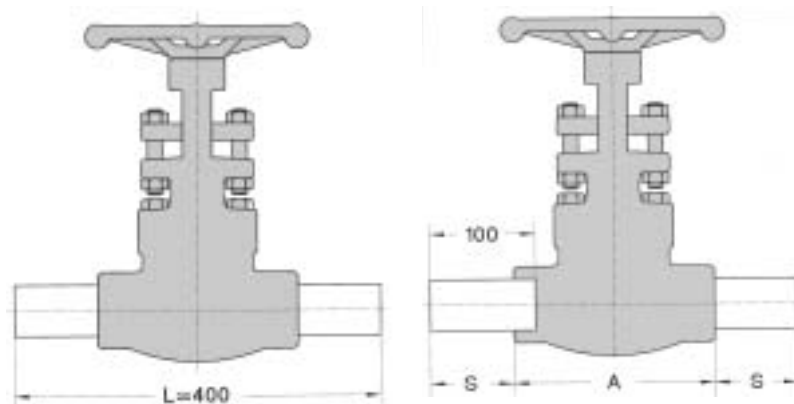
THREADS - ASME B1.20.1

Nominal pipe size	D Outside diameter of pipe	Number of threads per inch	p Pitch of thread	E ₀ Pitch diameter at end of external thread	E ₁ Pitch diameter at end of external	L ₁ Normal engagement by and between external and internal threads	L ₂ Length of effective external thread	Height of thread
1/16	0.3125	27	0.03704	0.27118	0.28118	0.160	0.2611	0.02963
1/8	0.405	27	0.03704	0.36351	0.37360	0.1615	0.2639	0.02963
1/4	0.540	18	0.05556	0.47739	0.49163	0.2278	0.4018	0.04444
3/8	0.675	18	0.05556	0.61201	0.62701	0.240	0.4078	0.04444
1/2	0.840	14	0.07143	0.75843	0.77843	0.320	0.5337	0.05714
3/4	1.050	14	0.07143	0.96768	0.98887	0.339	0.5457	0.05714
1	1.315	11.5	0.08696	1.23863	1.23863	0.400	0.6828	0.06957
1 1/4	1.660	11.5	0.08696	1.55713	1.58338	0.420	0.7068	0.06957
1 1/2	1.900	11.5	0.08696	1.79609	1.82234	0.420	0.7235	0.06957
2	2.375	11.5	0.08696	2.26902	2.29627	0.436	0.7565	0.06957

- Also pitch diameter at gauging notch.
- ◆ Also length of plug gauge.
- Also length of ring gauge, and length from gauging notch to small end of plug gauge.
- * For the 1/8-27 and 1/4-18 sizes... E₁ approx. = $D - (0.05D + 0.827)p$.

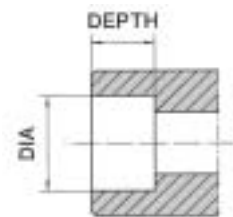
Type "L"

Type "S"



Lont Pattern Total length 400 mm.

A = See relevant Product/Size/Class table within this catalogue
 S = See table Socket Weld



VALVES WITH NIPPLES LENGTHS

NOMINAL PIPE SIZE	SOCKET BORE DIA.		SOCKET DEPTH		S		
	NPT	DN	mm	in.	mm	in.	
1/4	8	14.1	0.555	11.1	0.437	89	3.503
3/8	10	17.53	0.690	11.1	0.437	89	3.503
1/2	15	21.72	0.855	12.7	0.500	88	3.464
3/4	20	27.05	1.064	14.5	0.570	86	3.385
1	25	33.78	1.329	16	0.629	85	3.346
1 1/4	32	42.54	1.674	17.5	0.688	83	3.267
1 1/2	40	48.64	1.914	19	0.748	82	3.228
2	50	61.11	2.405	22	0.866	79	3.110

PRESSURE

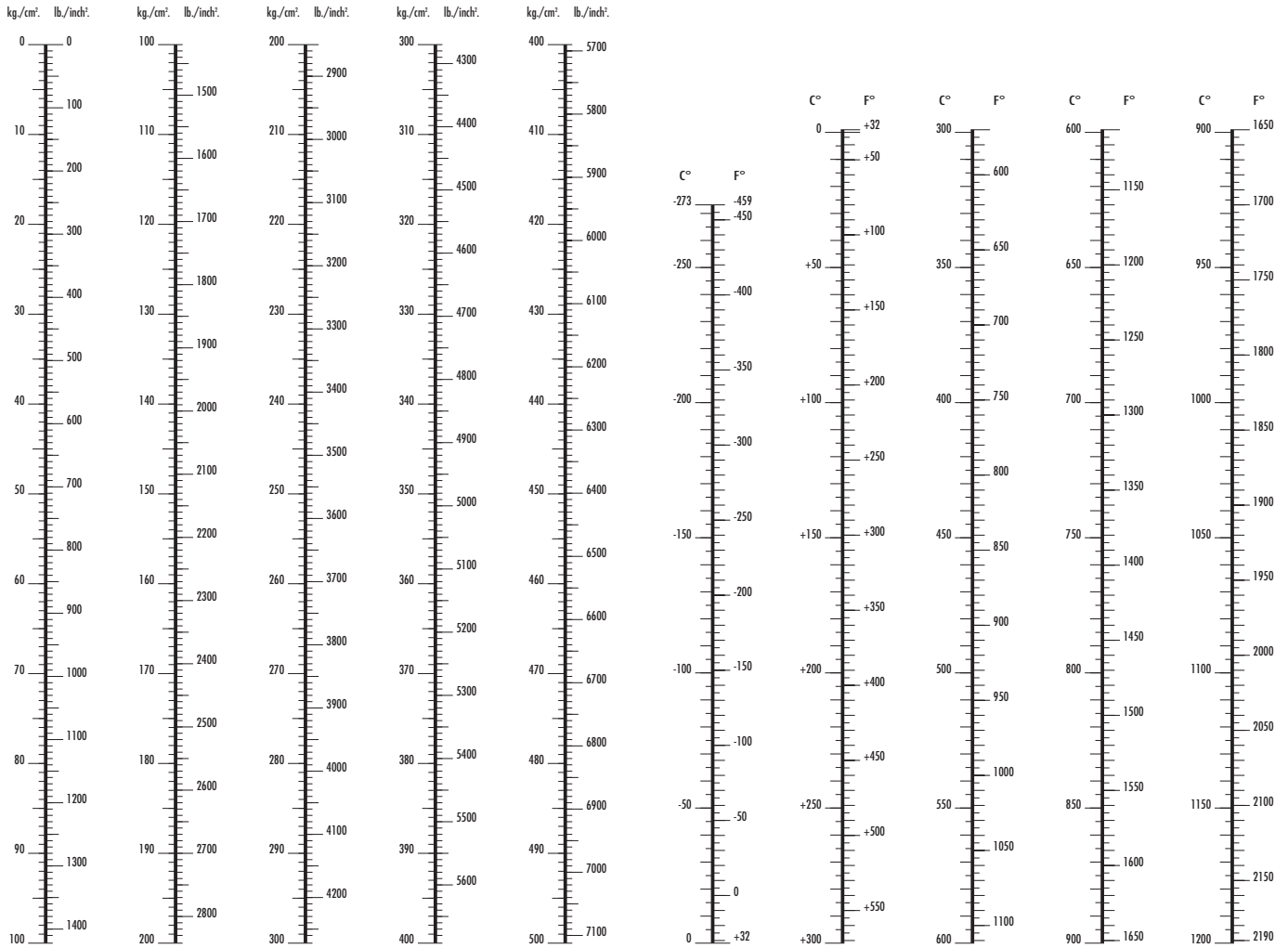
$$1 \text{ Kg/cm}^2 = 142233 \text{ lb/inch}^2$$

$$1 \text{ lb/inch}^2 = 0,07037 \text{ Kg/cm}^2$$

TEMPERATURE

$$^{\circ}\text{F} = 9/5 \text{ }^{\circ}\text{C} + 32$$

$$^{\circ}\text{C} = 5/9 (\text{ }^{\circ}\text{F} - 32)$$



FRACTION OF 1 INCH INTO DECIMALS AND MILLIMETERS

Fract.	Inch.	Millim.	Fract.	Inch.	Millim.	Fract.	Inch.	Millim.	Fract.	Inch.	Millim.
1/64	0.016	0.397	17/64	0.266	6.747	33/64	0.516	13.097	49/64	0.766	19.447
1/32	0.031	0.794	9/32	0.281	7.141	17/32	0.531	13.494	25/32	0.781	19.844
3/64	0.047	1.191	19/64	0.297	7.541	35/64	0.547	13.891	51/64	0.797	20.241
1/16	0.062	1.587	5/16	0.312	7.937	5/8	0.562	14.287	13/16	0.812	20.637
5/64	0.078	1.984	21/64	0.328	8.334	37/64	0.578	14.684	53/64	0.828	21.034
3/32	0.094	2.381	11/32	0.344	8.731	19/32	0.594	15.081	27/32	0.844	21.431
7/64	0.109	2.778	23/64	0.359	9.128	39/64	0.609	15.478	55/64	0.859	21.828
1/8	0.125	3.175	3/8	0.375	9.525	5/8	0.625	15.875	7/8	0.875	22.225
9/64	0.141	3.572	25/64	0.391	9.922	41/64	0.641	16.272	57/64	0.891	22.622
5/32	0.156	3.969	13/32	0.406	10.319	21/32	0.656	16.669	29/32	0.906	23.019
11/64	0.172	4.365	27/64	0.422	10.716	43/64	0.672	17.066	59/64	0.922	23.406
3/16	0.187	4.762	7/16	0.437	11.112	11/16	0.687	17.462	15/16	0.937	23.812
13/64	0.203	5.159	29/64	0.453	11.509	45/64	0.703	17.859	61/64	0.953	24.209
7/32	0.219	5.556	15/32	0.469	11.906	23/32	0.719	18.256	31/32	0.969	24.606
15/64	0.234	5.953	31/64	0.484	12.303	47/64	0.734	18.653	63/64	0.984	25.003
1/4	0.250	6.350	1/2	0.500	12.700	3/4	0.750	19.050	1	1.000	25.400

CONVERSIONE CHART



1 inch = 25,4 mm

Inch	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
0	0.000	25.400	50.800	76.200	101.60	127.00	152.40	177.80	203.20	228.60	254.00	279.40	304.80	330.20	355.60
1/64	0.397	25.797	51.197	76.597	102.00	127.40	152.80	178.20	203.60	229.00	254.40	279.80	305.20	330.60	356.00
1/32	0.794	26.194	51.594	76.994	102.39	127.79	153.19	178.59	203.99	229.39	254.79	280.19	305.59	330.99	356.39
3/64	1.191	26.591	51.991	77.391	102.79	128.19	153.59	178.99	204.39	229.79	255.19	280.59	305.99	331.39	356.79
5/64	1.587	26.987	52.387	77.787	103.19	128.59	153.99	179.39	204.79	230.19	255.59	280.99	306.39	331.79	357.19
3/32	1.984	27.384	52.784	78.184	103.58	128.98	154.38	179.78	205.18	230.58	255.98	281.38	306.78	332.18	357.58
7/64	2.381	27.781	53.181	78.581	103.98	129.38	154.78	180.18	205.58	230.98	256.38	281.78	307.18	332.58	357.98
	2.778	28.178	53.578	78.978	104.38	129.78	155.18	180.58	205.98	231.38	256.78	282.18	307.58	332.98	358.38
9/64	3.175	28.575	53.975	79.375	104.77	130.17	155.57	180.97	206.37	231.77	257.17	282.57	309.97	333.37	358.77
5/32	3.572	28.972	54.372	79.772	105.17	130.57	155.97	181.37	206.77	232.17	257.57	282.97	308.37	333.77	359.17
11/64	3.969	29.369	54.769	80.169	105.57	130.97	156.37	181.77	207.17	232.57	257.97	283.37	308.77	334.17	359.57
	4.366	29.766	55.166	80.566	105.97	131.37	156.77	182.17	207.57	232.97	258.37	283.77	309.17	334.57	359.97
13/64	4.762	30.162	55.562	80.962	106.38	131.76	157.16	182.56	207.96	233.36	258.76	285.16	309.56	334.96	360.38
7/32	5.159	30.559	55.959	81.359	106.76	132.16	157.56	182.96	208.36	233.76	259.16	284.56	309.96	335.36	360.76
15/64	5.556	30.956	56.356	81.756	107.16	132.56	157.96	183.36	208.76	234.16	259.56	284.96	310.36	335.76	361.16
	5.953	31.353	56.753	82.153	107.55	132.95	158.35	183.75	209.15	234.55	259.95	285.35	310.75	336.15	361.55
17/64	6.350	31.750	57.150	82.550	107.95	133.35	158.75	184.15	209.55	234.95	260.35	285.75	311.15	336.55	361.95
9/32	6.747	32.147	57.547	82.947	108.35	133.75	159.15	184.55	209.95	235.35	260.75	286.15	311.55	336.95	362.35
19/64	7.144	32.544	57.944	83.344	108.74	134.14	159.54	184.94	210.34	235.74	261.14	286.54	311.94	337.34	362.74
	7.541	32.941	58.341	83.741	109.14	134.54	159.94	185.34	210.74	236.14	261.54	286.94	312.34	337.74	363.14
21/64	7.937	33.337	58.737	84.137	109.54	134.94	160.34	185.74	211.14	236.54	261.94	287.34	312.74	338.14	363.54
11/32	8.334	33.734	59.134	84.534	109.93	135.33	160.73	186.13	211.53	236.93	262.33	287.73	313.13	338.53	363.93
23/64	8.731	34.131	59.531	84.931	110.33	135.73	161.13	186.53	211.93	237.33	262.73	288.13	313.53	338.93	364.33
	9.128	34.528	59.928	85.328	110.73	136.13	161.53	186.93	212.33	237.73	263.13	288.53	313.93	339.33	364.73
25/64	9.525	34.925	60.325	85.725	111.12	136.52	161.92	187.32	212.72	238.12	263.52	288.92	314.32	339.72	365.12
13/32	9.922	35.322	60.722	86.122	111.52	136.92	162.32	187.72	213.12	238.52	263.92	289.32	314.72	340.12	365.52
27/64	10.319	35.719	61.119	86.519	111.92	137.32	162.72	188.12	213.52	238.92	264.32	289.72	315.12	340.52	365.92
	10.716	36.116	61.516	86.916	112.32	137.72	163.12	188.52	213.92	239.32	264.72	290.12	315.52	340.92	366.32
29/64	11.112	36.512	61.912	87.312	112.71	138.11	163.51	188.91	214.31	239.71	265.11	290.51	315.91	341.31	366.71
15/32	11.509	36.909	62.309	87.709	113.11	138.51	163.91	189.31	214.71	240.11	265.51	290.91	316.31	341.71	367.11
31/64	11.906	37.306	62.706	88.106	113.51	138.91	164.31	189.71	215.11	240.51	265.91	291.31	316.71	342.11	367.51
	12.303	37.703	63.103	88.503	113.90	139.30	164.70	190.10	215.50	240.90	266.30	291.70	317.10	342.50	367.90
33/64	12.700	38.100	63.500	88.900	114.30	139.70	165.10	190.50	215.90	241.30	266.70	292.10	317.50	342.90	368.30
17/32	13.097	38.497	63.897	89.297	114.70	140.10	165.50	190.90	216.30	241.70	267.10	292.50	317.90	343.30	368.70
35/64	13.494	38.894	64.294	89.694	115.09	140.49	165.89	191.29	216.69	242.09	267.49	292.89	318.29	343.69	369.09
	13.891	39.291	64.691	90.091	115.49	140.89	166.29	191.69	217.09	242.49	267.89	293.29	318.69	344.09	369.49
37/64	14.287	39.687	65.087	90.487	115.89	141.29	166.69	192.09	217.49	242.89	268.29	293.69	319.09	344.49	369.89
19/32	14.684	40.084	65.484	90.884	116.28	141.68	167.08	192.48	217.88	243.28	268.68	294.08	319.48	344.88	370.28
39/64	15.081	40.481	65.881	91.281	116.68	142.08	167.48	192.88	218.28	243.68	269.08	294.48	319.88	345.28	370.68
	15.478	40.878	66.278	91.678	117.08	142.48	167.88	193.28	218.68	244.08	269.48	294.88	320.28	345.68	371.08
41/64	15.875	41.275	66.675	92.075	117.47	142.87	168.27	193.67	219.07	244.47	269.87	295.27	320.67	346.07	371.47
21/32	16.272	41.672	67.072	92.472	117.87	143.27	168.67	194.07	219.47	244.87	270.27	295.67	321.07	346.47	371.87
43/64	16.669	42.069	67.469	92.869	118.27	143.67	169.07	194.47	219.87	245.27	270.67	296.07	321.47	346.87	372.27
	17.066	42.466	67.866	93.266	118.67	144.07	169.47	194.87	220.27	245.67	271.07	296.47	321.87	347.27	372.67
45/64	17.462	42.862	68.262	93.662	119.06	144.46	169.86	195.26	220.66	246.06	271.46	296.86	322.26	347.66	373.06
23/32	17.859	43.259	68.659	94.059	119.46	144.86	170.26	195.66	221.06	246.46	271.86	297.26	322.66	348.06	373.46
47/64	18.256	43.656	69.056	94.456	119.86	145.26	170.66	196.06	221.46	246.86	272.26	297.66	323.06	348.46	373.86
	18.653	44.053	69.453	94.853	120.25	145.65	171.05	196.45	221.85	247.25	272.65	298.05	323.45	348.85	374.25
49/64	19.050	44.450	69.850	95.250	120.65	146.05	171.45	196.85	222.25	247.65	273.05	298.45	323.85	349.25	374.65
25/32	19.447	44.847	70.247	95.647	121.05	146.45	171.85	197.25	222.65	248.05	273.45	298.85	324.25	349.65	375.05
51/64	19.844	45.244	70.644	96.044	121.44	146.84	172.24	197.64	223.04	248.44	273.84	299.24	324.64	350.04	375.44
	20.241	45.641	71.041	96.441	121.84	147.24	172.64	198.04	223.44	248.84	274.24	299.64	325.04	350.44	375.84
53/64	20.637	46.037	71.437	96.837	122.24	147.64	173.04	198.44	223.84	249.24	274.64	300.04	325.44	350.84	376.24
27/32	21.034	46.434	71.834	97.234	122.63	148.03	173.43	198.83	224.23	249.63	275.03	300.43	325.83	351.23	376.63
55/64	21.431	46.831	72.231	97.631	123.03	148.43	173.83	199.23	224.63	250.03	275.43	300.83	326.23	351.63	377.03
	21.828	47.228	72.628	98.028	123.43	148.83	174.23	199.63	225.03	250.43	275.83	301.23	326.63	352.03	377.43
57/64	22.225	47.625	73.025	98.425	123.82	149.22	174.62	200.02	225.42	250.82	276.22	301.62	327.02	352.42	377.82
29/32	22.622	48.022	73.422	98.822	124.22	149.62	175.02	200.42	225.82	251.22	276.62	302.02	327.42	352.82	378.22
59/64	23.019	48.419	73.819	99.219	124.62	150.02	175.42	200.82	226.22	251.62	277.02	302.42	327.82	353.22	378.62
	23.416	48.816	74.216	99.616	125.02	150.42	175.82	201.22	226.62	252.02	277.42	302.82	328.22	353.62	379.02
61/64	23.812	49.212	74.612	100.01	125.41	150.81	176.21	201.61	227.01	252.41	277.81	303.21	328.61	354.01	379.41
31/32	24.209	49.609	75.009	100.41	125.81	151.21	176.61	202.01	227.41	252.81					

CORROSIVE MEDIA					
	Carbon Steel	Stainless Steel 304	Stainless Steel 316	Inconel	Monel
Acetate Solvents, Crude	D	A	A	A	B
Acetate Solvents, Pure	C	A	A	A	A
Acetic Acid, 95%	D	B	A	A	A
Acetic Anhydride, Boiling	D	B	A	A	A
Acetone	B	A	A	A	A
Alcohols	B	A	A	A	A
Amines	B	A	A	A	A
Ammonia, Anhydrous	B	A	A	A	A
Ammonium Hydroxide, Hot	B	A	A	A	D
Ammonium Nitrate	B	A	A	A	C
Aniline Hydrochloride	D	D	C	B	B
Antimony Trichloride	D	D	C	B	B
Asphalt	B	A	A	A	A
Barium Chloride, 5%	C	A	A	A	A
Barium Hydroxide	C	A	A	A	A
Barium Nitrate	C	A	A	B	C
Benzene, Hot	B	A	A	A	A
Benzoic Acid	B	A	A	A	A
Blood	D	A	A	A	A
Bromine, Dry Gas	D	A	A	B	A
Bromine, Moist Gas	D	D	D	D	C
Buttermilk	D	A	A	A	A
Calcium Bisulfite, Hot	D	C	B	D	D
Calcium Chloride, Dilute	C	B	A	A	A
Calcium Hydroxide, 20%, Boiling	D	A	A	A	A
Calcium Hydrochloride, < 2%	C	C	B	B	C
Carbolic Acid, 90%	C	A	A	A	B
Carbon Dioxide, Dry	C	A	A	A	A
Carbon Disulphide	B	A	A	A	B
Chloroacetic Acid	D	D	C	B	B
Chloric Acid	D	D	C	C	C
Chlorinated Water, Sat.	D	D	C	C	C
Chlorine, Dry Gas	B	B	B	A	A
Chlorine, Moist Gas	D	D	C	D	C
Citric Acid, Dilute	D	A	A	A	A
Citric Acid, Hot, Conc.	D	C	B	B	B
Creosote, Hot	B	A	A	A	A
Cupric Chloride, 5%	D	D	C	D	D
Ethyl Chloride	A	A	A	A	A
Ethylene Glycol	A	A	A	A	A
Ferric Chloride < 1%	D	C	B	B	C
Ferric Nitrate, 5%	D	B	A	C	D
Ferric Sulfate, 5%	D	B	A	B	C
Ferrous Sulfate, 10%	C	A	A	B	A
Flourine, Dry Gas	C	C	B	A	A
Flourine, Moist Gas	D	D	D	B	A
Freon, Wet	C	C	C	B	A
Fuel Oil, 140°F	A	A	A	A	B

CORROSIVE MEDIA					
	Carbon Steel	Stainless Steel 304	Stainless Steel 316	Inconel	Monel
Furfural	B	B	B	B	B
Gasoline Sour	B	A	A	C	C
Gasoline Refined	A	A	A	B	A
Gelatine	D	B	A	A	A
Glucose	B	A	A	A	A
Glycerine	B	A	A	A	A
Hydrofluoric Acid, Boiling	D	D	D	D	B
Hydrofluosilicic Acid	D	D	C	B	A
Hydrogen Chloride, Dry	B	D	C	A	A
Hydrogen Chloride, Moist	D	D	D	D	C
Hydrogen Fluoride, Dry	C	D	C	A	A
Hydrogen Peroxide, Boiling	D	C	B	B	B
Hydrogen Sulfide, Dry	B	A	A	A	A
Hydrogen Sulfide, Moist	C	B	A	A	B
Iodine, Dry	D	D	B	A	A
Kerosene	A	A	A	A	A
Lactic Acid, 5%	D	B	A	A	B
Lactic Acid, 10%	D	B	A	A	B
Lactic Acid, Boiling, 5%	D	C	B	B	C
Lactic Acid, Boiling, 10%	D	D	B	B	C
Lead Acetate, Hot	D	A	A	B	B
Magnesium Chloride, Hot, 5%	D	C	B	A	A
Magnesium Hydroxide	B	A	A	A	A
Magnesium Sulfate	B	A	A	B	A
Magnesium Sulfate, Boiling	C	A	A	C	A
Mercury	B	A	A	A	B
Mercuric Chloride, < 2%	D	D	D	D	D
Mercuric Cyanide	D	B	B	B	D
Methyl Chloride, Dry	D	B	B	A	A
Milk	D	A	A	A	B
Molasses	B	A	A	A	A
Naphtha	B	A	A	A	A
Nickel Chloride	D	C	B	B	B
Nickel Sulfate, Boiling	D	C	C	B	A
Nitric Acid, 20%	D	A	A	B	D
Nitric Acid, Boiling, Conc.	D	D	D	D	D
Nitrous Acid	D	B	B	B	C
Nitrobenzene	D	B	A	B	B
Oils - Miner.	B	A	A	C	B
Oxalic Acid, Boiling, 10%	C	A	A	A	A
Oxalic Acid, Boiling, 50%	D	D	C	B	B
Oxygen	B	A	A	A	A
Picric Acid	C	A	A	D	D
Potassium Bromide	D	C	B	A	A
Potassium Carbonate	B	A	A	A	A
Potassium Chlorate	B	A	A	A	B
Potassium Chloride	D	A	A	A	A
Potassium Chloride, Hot	D	C	B	B	A

CORROSIVE MEDIA					
	Carbon Steel	Stainless Steel 304	Stainless Steel 316	Inconel	Monel
Potassium Cyanide	B	B	B	B	B
Potassium Sulfate, Dil.	B	A	A	A	A
Propane, Liquid & Gas	B	A	A	A	A
Pyrogallic Acid	B	A	A	B	A
Rosin, Molten	D	A	A	A	A
Salicylic Acid	D	B	B	B	B
Silver Bromide	D	B	A	C	B
Silver Chloride	D	D	D	C	B
Silver Nitrate	D	A	A	A	C
Sodium Acetate	C	A	A	A	A
Sodium Bisulfate	D	B	B	B	A
Sodium Bromide, Dil.	D	B	B	B	A
Sodium Cyanide	B	B	B	B	A
Sodium Fluoride, 5%	D	B	A	B	A
Sodium Hydroxide, 50%	B	A	A	A	A
Sodium Hyposulfite	D	B	A	B	A
Sodium Nitrate	B	B	A	A	B
Sodium Perborate	C	A	A	A	B
Sodium Peroxide	C	A	A	A	B
Sodium Phosphate, Tribasic	C	A	A	A	A
Sodium Silicate	B	A	A	A	B
Sodium Thiosulfate	D	B	A	B	B
Stannous Chloride, Sat.	D	D	B	B	B
Steam, 212°F	A	A	A	A	A
Steam, 600°F	C	A	A	A	A
Sulfite Liquors	D	C	B	D	D
Sulfur Chloride	D	C	D	B	B
Sulfur Dioxide, Moist	D	B	A	D	D
Sulfuric Acid, Conc.	B	B	B	B	D
Sulfurous Acid, Sat.	D	B	B	D	D
Tannic Acid, 10%	D	A	A	B	A
Tar, Hot	B	A	A	A	B
Tartaric Acid, 120°F	D	B	A	A	A
Toluene	A	A	A	A	A
Trichlorethylene	B	A	A	A	A
Turpentine	B	A	A	A	A
Varnish, Hot	C	A	A	A	A
Vegetable Oils	B	A	A	A	B
Vinegar	D	A	A	A	A
Water, Acid Mine	D	A	A	A	C
Water, Boiler Feed	B	A	A	A	A
Water, Distilled	D	A	A	A	A
Water, Salt Sea	D	C	B	B	A
Whiskey, Boiling	D	A	A	A	C
Wine	D	A	A	A	C
Xylene, Boiling	D	A	A	A	A
Zinc Chloride, 5%	D	C	B	B	B
Zinc Sulfate, Boiling	D	A	A	B	A

A = Substantial resistance - Preferred material of construction.
B = Moderate resistance - Satisfactory for use under most conditions.
C = Questionable resistance - Use with caution.
D = Inadequate resistance - Not recommended.

CALOBRI doesn't assume any responsibility from the use of a.m. data which are purely theoretical. The user must verify the best conditions of use.



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