



## 1541/1543 Series

Consolidated® Safety Valve







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# Conversion Table

All the USCS values are converted to Metric values using the following conversion factors:

USCS Unit	Conversion Factor	Metric Unit
in.	25.4	mm
lb.	0.4535924	kg
in <sup>2</sup>	6.4516	cm <sup>2</sup>
ft <sup>3</sup> /min	0.02831685	m <sup>3</sup> /min
gal/min	3.785412	L/min
lb/hr	0.4535924	kg/hr
psig	0.06894757	barg
ft lb	1.3558181	Nm
°F	5/9 (°F-32)	°C

Consolidated® Type 1541 and 1543 safety valves are designed for steam and other compressible fluids. They are most commonly used in pharmaceutical, dying and process plants.



<b>INLET SIZES</b>	.50" (12.7 mm) through 2.50" (63.5 mm) threaded
<b>OUTLET SIZES</b>	.75" (19.1 mm) through 2.50" (63.5 mm) threaded
<b>ORIFICE SIZES</b>	Six sizes: D through J
<b>PRESSURE RANGE</b>	5 psig (0.34 barg) to 350 psig (24.13 barg)
<b>TEMPERATURE RANGE</b>	-20°F (-28.9°C) to 420°F (215.6°C)
<b>MATERIALS</b>	Cast iron bonnet with brass base and trim is standard. Available with bronze bonnet. Stainless steel base and disc are also optional.
<b>CERTIFICATION</b>	ASME B&PVC Section I and VIII
<b>BLOWDOWN</b>	4%
<b>BACK PRESSURE LIMIT</b>	10% of Set Pressure



## Features & Benefits

### The 1541/1543 Series Safety Valve:

- Equipped with two adjusting rings to allow for sharp opening action and full lift at 3% overpressure.
- Low spindle bearing point between the spindle and disc for improved tightness.
- Self-aligning spring washer for reliability and long life.
- Precision wound spring, ± 5% tolerance on rate to ensure repeatability and maximum tightness. Manufactured and capacity certified to ASME Code Sections I and VIII.
- Valves tested on steam.
- Seats checked for tightness on steam.
- The adjustable lifting mechanism can be positioned in any location with 300 degrees of rotation to facilitate ease of installation.

## Applications

### • Options

<b>1543-3:</b>	A duplicate of the 1543 valve, but supplied with a 304 stainless base and disc.
<b>1541-3:</b>	A duplicate of the 1541 valve, but supplied with a 304 stainless steel base and disc.
<b>Bronze Bonnet:</b>	When cast iron bonnets are not permitted, a bronze bonnet option is available.
<b>Soft Seats:</b>	A PTFE soft seat option is available for improved tightness. This option is only available for ASME Code Section VIII application.
<b>Low Pressures:</b>	For low pressures, we supply a special low pressure design to ensure maximum flow capacities against atmospheric pressure.
<b>Spring:</b>	When chrome alloy springs are not permitted, A 17-7PHSS is available.

### • Connections

The 1541 valve is supplied with inlet sizes of .75" (19.1 mm) to 2.50" (63.5mm). The 1543 sizes are supplied with inlet connections of .50" (12.7mm) to 2.00" (50.8 mm). All inlet connections are male NPT with standard hex head on surfaces for easy wrenching.



### CAUTION

The discharged fluid may escape to the atmosphere through the bonnet vent and drain hole, so toxic or hazardous applications must be avoided.



# Scope of Design

## 1541 Standard Inlet & Outlet Connections

Orifice	Discharge Area		Inlet Size Male NPT		Outlet Size Female NPT	
	in <sup>2</sup>	cm <sup>2</sup>	in	mm	in	mm
D	0.110	0.710	.75	19.1	.75	19.1
E	0.196	1.265	1.00	25.4	1.00	25.4
F	0.307	1.981	1.25	31.8	1.25	31.8
G	0.503	3.245	1.50	38.1	1.50	38.1
H	0.785	5.065	2.00	50.8	2.00	50.8
J	1.287	8.303	2.50	63.5	2.50	63.5

## 1543 Standard Inlet & Outlet Connections

Orifice	Discharge Area		Inlet Size Male NPT		Outlet Size Female NPT	
	in <sup>2</sup>	cm <sup>2</sup>	in	mm	in	mm
D	0.110	0.710	.50	12.7	.75	19.1
E	0.196	1.265	.75	19.1	1.00	25.4
F	0.307	1.981	1.00	25.4	1.25	31.8
G	0.503	3.245	1.25	31.8	1.50	38.1
H	0.785	5.065	1.50	38.1	2.00	50.8
J	1.287	8.303	2.00	50.8	2.50	63.5

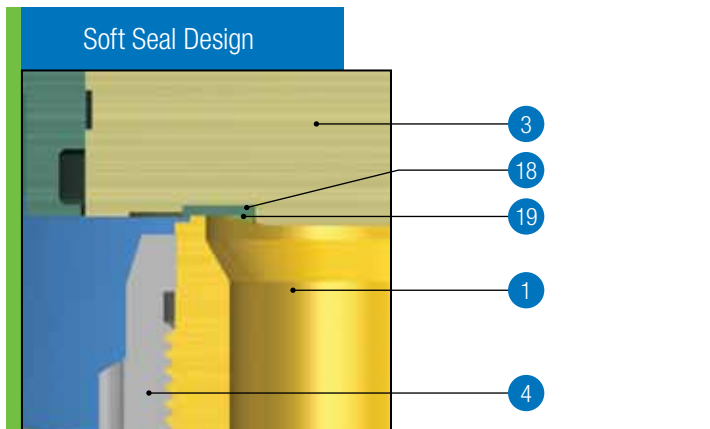
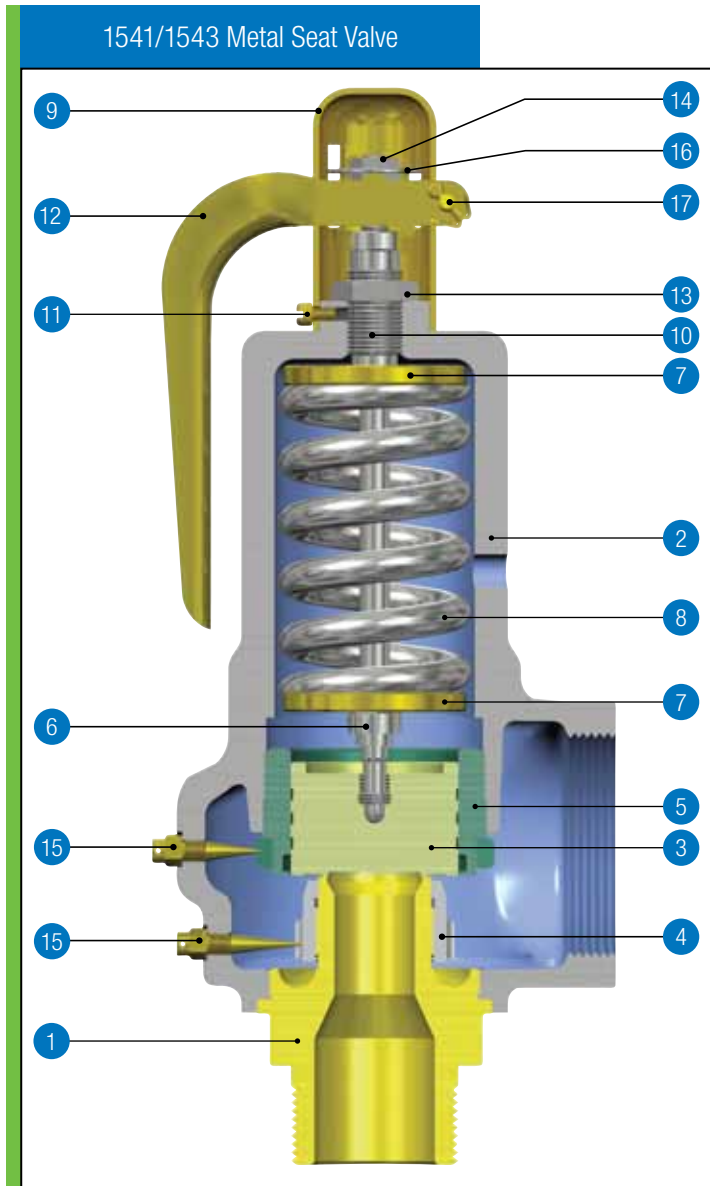
## Pressure/Temperature Limits

Valve Type	Media	Orifice	Temperature Range				Maximum Set Pressure	
			min.		max.		psig	barg
			°F	°C	°F	°C		
1541/43	Steam	All	-20	-28.9	406	207.8	250	17.24
1541/43	Air	All	-20	-28.9	406	207.8	300	20.68
1541-3/1543-3 <sup>1</sup>	Steam	D	-20	-28.9	420	215.6	350	24.13
1541-3/1543-3	Steam	E - J	-20	-28.9	420	215.6	300	20.68
1541-3/1543-3	Air	All	-20	-28.9	420	215.6	350	24.13

### Notes:

1. Dresser's current National Board Certification limits the 1541-3/1543-3 to 300 psig (20.68 barg) for code stamped applications.

# Materials



Part & Material		
Part No.	Part Name	Material
1	Base	ASTM B283 Alloy C46400 Naval Brass
2	Bonnet	
	Standard	ASTM A126 Class B Iron
	Optional	ASTM B584 Alloy Leaded Semi-Red Brass
3	Disc	ASTM B124 Alloy Half Hard Brass
4	Lower Adjusting Ring	
	D, E & J Orifices	ASME SB283 C37700 Copper Alloy
	F, G & H Orifices	ASTM B124 C37700 Copper Alloy
5	Upper Adjusting Ring	
	D, E, F & G Orifices	ASME SB283 C37700 Copper Alloy
	H & J Orifices	ASTM B124 C37700 Copper Alloy
6	Spindle (D & E Orifice)	ASTM A108 1213 Carbon Steel
6	Spindle Assembly (F & J Orifice)	
	Spindle Collar	ASTM A276 410 Cond. T St. St.
	Spindle	ASTM A108 1213 Carbon Steel
6	Spindle Assembly (G & H Orifice)	
	Spindle Collar	ASTM A582 416 Cond. T St. St.
	Spindle	ASTM A108 1213 Carbon Steel
7	Spring Washer	ASTM A108 1213 Carbon Steel
8	Spring	Alloy Steel
9	Cap	Brass/Commercial Grade Brass
10	Compression Screw	ASTM B16 Half Hard Brass
11	Cap Screw	Carbon Steel, Zinc Plated
12	Lever	
	D, E, F, H & J Orifice	ASTM B36 Alloy 220 Brass
	G Orifice	ASTM B36 Alloy 230 Brass
13	Compression Screw Nut	
	D, E, G, H & J Orifice	ASTM A108 1213 Carbon Steel
	F Orifice	Carbon Steel, Cadmium Plated
14	Lifting Washer Nut	Commercial Grade Carbon Steel
15	Adjusting Ring Pin	ASTM B16 Half Hard Brass
16	Lifting Washer	SAE 1010 Zinc Plated Carbon Steel
17	Lever Pin	Brass/Commercial Grade Brass
18	Seat Washer <sup>1</sup>	Teflon or Neoprene
19	Soft Seat Retainer Ring <sup>1</sup>	Austenitic Stainless Steel (Ph15-7Mo)
20	Lift Limiter <sup>2</sup>	ASME SA479 316/316L St. St.

**Notes:**

- 1. Featured on Soft Seat Only.
- 2. 5 to 15 psig (0.34 to 1.03 barg) Only.

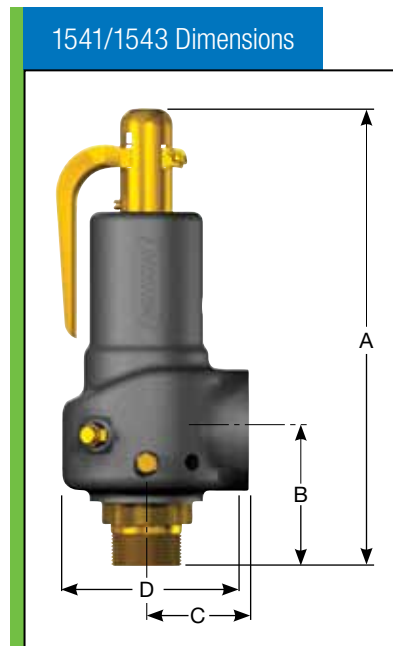
# Materials (Contd.)

## Optional Materials

Stainless Steel Trim (1541-3 & 1543-3)		
Part No.	Part Name	Material
1	Base	
	1541D & H Orifice, 1543D, E & F Orifice	ASME SA479 316/316L Stainless Steel
	1541E, F & G Orifice, 1543G Orifice	ASME SA479 304 Stainless Steel
	1543H & J Orifice	ASME SA351 CF8M Stainless Steel
	1541J Orifice	ASME SA351 CF8 Stainless Steel
2	Bonnet	
	Standard	ASTM A126 Class B Iron
	Optional	ASTM B584 Alloy Leaded Semi-Red Brass
3	Disc	
	D & G Orifices	ASME SA479 316/316L Stainless Steel
	E, F, H & J Orifices	ASME SA479 304 Stainless Steel
4	Lower Adjusting Ring	
	D, E & J Orifices	ASME SB283 Copper Alloy
	F, G & H Orifices	ASTM B124 Copper Alloy
5	Upper Adjusting Ring	
	D, E, F & G Orifices	ASME SB283 Copper Alloy
	H & J Orifices	ASTM B124 Copper Alloy
6	Spindle (D & E Orifice)	ASTM A108 1213 Carbon Steel
6	Spindle Assembly (F & J Orifice)	
	Spindle Collar	ASTM A276 410 Cond. T Stainless Steel
	Spindle	ASTM A108 1213 Carbon Steel
6	Spindle Assembly (G & H Orifice)	
	Spindle Collar	ASTM A582 416 Cond. T Stainless Steel
	Spindle	ASTM A108 1213 Carbon Steel
7	Spring Washer	ASTM A108 1213 Carbon Steel
8	Spring	Alloy Steel
9	Cap	Brass/Commercial Grade Brass
10	Compression Screw	ASTM B16 Half Hard Brass
11	Cap Screw	Carbon Steel, Zinc Plated
12	Lever	
	(D, E, F, H & J Orifice)	ASTM B36 Alloy 220 Brass
	(G Orifice)	ASTM B36 Alloy 230 Brass
13	Compression Screw Nut	
	(D, E, G, H & J Orifice)	ASTM A108 1213 Carbon Steel
	(F Orifice)	Carbon Steel, Cadmium Plated
14	Lifting Washer Nut	Commercial Grade Carbon Steel
15	Adjusting Ring Pin	ASTM B16 Half Hard Brass
16	Lifting Washer	SAE 1010 Zinc Plated Carbon Steel
17	Lever Pin	Brass/Commercial Grade Brass
18	Seat Washer (Soft Seat Only)	Teflon or Neoprene
19	Soft Seat Retainer Ring (Soft Seat Only)	Austenitic Stainless Steel (Ph15-7Mo)
20	Lift Limiter (5 to 15 psig Only)	ASME SA479 316/316L Stainless Steel



# Dimensions & Weights



**CAUTION**

Do not plug drain holes. The discharged fluid may escape to the atmosphere through the bonnet vent and drain connections, so toxic or hazardous applications must be avoided.

General Dimensions for 1541 Safety Valve

Inlet Size		Valve Type	A		B		C		D		Dismantling Height		Approximate Weight		Drain Hole Location
in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs	kg	
.75	19.1	1541D	6.69	169.9	2.31	58.7	1.44	36.6	2.25	57.2	8.25	209.6	2.0	0.91	Note 1
1.00	25.4	1541E	7.06	179.3	2.56	65.0	1.56	39.6	2.50	63.5	8.63	219.2	3.0	1.36	Note 1
1.25	31.8	1541F	8.94	227.1	2.94	74.7	1.94	49.3	3.00	76.2	10.50	266.7	4.5	2.04	Note 3
1.50	38.1	1541G	9.75	247.7	3.13	79.5	2.25	57.2	3.50	88.9	11.63	295.4	7.7	3.49	Note 4
2.00	50.8	1541H	11.31	287.3	3.69	93.7	2.63	66.8	4.38	111.3	13.13	333.5	10.5	4.76	Note 2
2.50	63.5	1541J	13.06	331.7	4.25	108.0	3.38	85.9	5.13	130.3	15.13	384.3	17.7	8.03	Note 2

General Dimensions for 1543 Safety Valve

Inlet Size		Valve Type	A		B		C		D		Dismantling Height		Approximate Weight		Drain Hole Location
in.	mm		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs	kg	
.50	12.7	1543D	6.63	168.4	2.25	57.2	1.44	36.6	2.25	57.2	8.25	209.6	2.0	0.91	Note 1
.75	19.1	1543E	6.94	176.3	2.44	62.0	1.56	39.6	2.50	63.5	8.50	215.9	2.7	1.22	Note 1
1.00	25.4	1543F	8.75	222.3	2.75	69.9	1.94	49.3	3.00	76.2	10.25	260.4	4.2	1.91	Note 3
1.25	31.8	1543G	9.69	246.1	3.06	77.7	2.25	57.2	3.50	88.9	11.50	292.1	7.5	3.40	Note 4
1.50	38.1	1543H	11.19	284.2	3.56	90.4	2.63	66.8	4.38	111.3	13.25	336.6	10.0	4.54	Note 2
2.00	50.8	1543J	12.81	325.4	4.00	101.6	3.38	85.9	5.13	130.3	14.88	378.0	16.7	7.57	Note 2

- Notes:**
- .25" (6.3 mm) diameter drain hole located 60° to the left when facing outlet.
  - .25" (6.3 mm) diameter drain hole located 90° to the left when facing outlet.
  - .25" (6.3 mm) diameter drain hole located 105° to the left when facing outlet.
  - .25" (6.3 mm) diameter drain hole located 110° to the left when facing outlet.

# Orifice Capacities

## ASME B&PV Code Section I, for Saturated Steam

Based at 3% overpressure or 2 psig(0.14 barg), whichever is greater, showing 90% actual capacity.

Orifice Designation		D		E		F		G		H		J	
Orifice Area		in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>
Set Pressure		Orifice Capacity											
psig	barg	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15	10.34	157	71	280	127	440	199	720	326	1125	510	1844	836
20	13.78	182	82	325	147	509	230	834	378	1302	590	2135	968
25	17.23	207	93	369	167	578	262	948	430	1480	671	2426	1100
30	20.68	232	105	413	187	648	293	1062	481	1657	751	2717	1232
35	24.13	257	116	458	207	717	325	1175	532	1835	832	3008	1364
40	27.57	282	127	502	227	787	356	1289	584	2012	912	3299	1496
45	31.02	306	138	546	247	856	388	1403	636	2190	993	3590	1628
50	34.47	331	150	591	268	925	419	1517	688	2367	1073	3881	1760
55	37.92	356	161	635	288	995	451	1630	739	2545	1154	4172	1892
60	41.36	381	172	679	307	1064	482	1744	791	2722	1234	4463	2024
65	44.81	406	184	724	328	1134	514	1858	842	2899	1314	4754	2156
70	48.26	431	195	769	348	1204	546	1974	895	3080	1397	5051	2291
75	51.71	457	207	814	369	1276	578	2091	948	3263	1480	5350	2426
80	55.15	482	218	860	390	1347	610	2208	1001	3446	1563	5650	2562
85	58.60	508	230	906	410	1419	643	2325	1054	3629	1646	5950	2698
90	62.05	534	242	951	431	1490	675	2442	1107	3812	1729	6250	2834
95	65.50	559	253	997	452	1562	708	2559	1160	3995	1812	6549	2970
100	68.94	585	265	1043	473	1633	740	2676	1213	4177	1894	6849	3106
105	72.39	611	277	1088	493	1705	773	2794	1267	4360	1977	7149	3242
110	75.84	636	288	1134	514	1776	805	2911	1320	4543	2060	7448	3378
115	79.28	662	300	1180	535	1848	838	3028	1373	4726	2143	7748	3514
120	82.73	687	311	1225	555	1919	870	3145	1426	4909	2226	8048	3650
125	86.18	713	323	1271	576	1991	903	3262	1479	5091	2309	8347	3786
130	89.63	739	335	1316	596	2062	935	3379	1532	5274	2392	8647	3922
135	93.07	764	346	1362	617	2134	967	3496	1585	5457	2475	8947	4058
140	96.52	790	358	1408	638	2205	1000	3614	1639	5640	2558	9247	4194
145	99.97	815	369	1453	659	2277	1032	3731	1692	5823	2641	9546	4329
150	103.42	841	381	1499	679	2348	1065	3848	1745	6005	2723	9846	4466
155	106.86	867	393	1545	700	2420	1097	3965	1798	6188	2806	10146	4602
160	110.31	892	404	1590	721	2491	1129	4082	1851	6371	2889	10445	4737
165	113.76	918	416	1636	742	2563	1162	4199	1904	6554	2972	10745	4873
170	117.21	944	428	1682	762	2634	1194	4316	1957	6737	3055	11045	5009
175	120.65	969	439	1727	783	2706	1227	4433	2010	6919	3138	11344	5145
180	124.10	995	451	1773	804	2777	1259	4551	2064	7102	3221	11644	5281
185	127.55	1020	462	1819	825	2849	1292	4668	2117	7285	3304	11944	5417
190	131.00	1046	474	1864	845	2920	1324	4785	2170	7468	3387	12244	5553
195	134.44	1072	486	1910	866	2992	1357	4902	2223	7651	3470	12543	5689
200	137.89	1097	497	1955	886	3063	1389	5019	2276	7833	3552	12843	5825
205	141.34	1123	509	2001	907	3135	1422	5136	2329	8016	3635	13143	5961
210	144.78	1148	520	2047	928	3206	1454	5253	2382	8199	3719	13442	6097
215	148.23	1174	532	2092	948	3278	1486	5371	2436	8382	3802	13742	6233
220	151.68	1200	544	2138	969	3349	1519	5488	2489	8565	3885	14042	6369
225	155.13	1225	555	2184	990	3421	1551	5605	2542	8747	3967	14341	6504
230	158.57	1251	567	2229	1011	3492	1583	5722	2595	8930	4050	14641	6641
235	162.02	1277	579	2275	1031	3564	1616	5839	2648	9113	4133	14941	6777
240	165.47	1302	590	2321	1052	3635	1648	5956	2701	9296	4216	15241	6913
245	168.92	1328	602	2366	1073	3707	1681	6073	2754	9479	4299	15540	7048
250	172.36	1353	613	2412	1094	3778	1713	6190	2807	9661	4382	15840	7184
255	175.81	1379	625	2458	1114	3850	1746	6308	2861	9844	4465	16140	7320
260	179.26	1405	637	2503	1135	3921	1778	6425	2914	10027	4548	16439	7456
265	182.71	1430	648	2549	1156	3993	1811	6542	2967	10210	4631	16739	7592
270	186.15	1456	660	2594	1176	4064	1843	6659	3020	10393	4714	17039	7728
275	189.60	1481	671	2640	1197	4136	1876	6776	3073	10575	4796	17338	7864
280	193.05	1507	683	2686	1218	4207	1908	6893	3126	10758	4879	17638	8000
285	196.50	1533	695	2731	1238	4279	1940	7010	3179	10941	4962	17938	8136
290	199.94	1558	706	2777	1259	4350	1973	7128	3233	11124	5045	18238	8272
295	203.39	1584	718	2823	1280	4421	2005	7245	3286	11307	5128	18537	8408
300	206.84	1610	730	2868	1300	4493	2037	7362	3339	11489	5211	18837	8544

# Orifice Capacities (Contd.)

ASME, B & PVC Code Section VIII, rating for Saturated Steam

Based at 10% overpressure or 3 psig (0.21 barg), whichever is greater, showing 90% of actual capacity.

Orifice Designation		D		E		F		G		H		J	
Orifice Area		in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>
		0.110	0.710	0.196	1.265	0.307	1.981	0.503	3.245	0.785	5.065	1.287	8.303
Set Pressure		Orifice Capacity											
psig	barg	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
15	10.34	162	73	289	131	453	205	743	337	1160	526	1902	862
20	13.78	187	84	334	151	523	237	857	388	1338	606	2193	994
25	17.23	212	96	378	171	592	268	971	440	1515	687	2484	1126
30	20.68	237	107	422	191	662	300	1084	491	1693	767	2775	1258
35	24.13	264	119	471	213	738	334	1209	548	1888	856	3095	1403
40	27.57	291	131	520	235	814	369	1335	605	2083	944	3416	1549
45	31.02	319	144	568	257	891	404	1460	662	2278	1033	3736	1694
50	34.47	346	156	617	279	967	438	1585	718	2474	1122	4056	1839
55	37.92	374	169	666	302	1043	473	1710	775	2669	1210	4376	1984
60	41.36	401	181	715	324	1120	508	1835	832	2864	1299	4696	2130
65	44.81	428	194	763	346	1196	542	1960	889	3059	1387	5016	2275
70	48.26	456	206	812	368	1272	576	2085	945	3254	1475	5336	2420
75	51.71	483	219	861	390	1349	611	2210	1002	3450	1564	5656	2565
80	55.15	510	231	910	412	1425	646	2335	1059	3645	1653	5976	2710
85	58.60	538	244	958	434	1501	680	2460	1115	3840	1741	6296	2855
90	62.05	565	256	1007	456	1578	715	2586	1172	4035	1830	6616	3000
95	65.50	592	268	1056	478	1654	750	2711	1229	4231	1919	6936	3146
100	68.94	620	281	1105	501	1731	785	2836	1286	4426	2007	7256	3291
105	72.39	647	293	1153	522	1807	819	2961	1343	4621	2096	7576	3436
110	75.84	674	305	1202	545	1883	854	3086	1399	4816	2184	7896	3581
115	79.28	702	318	1251	567	1960	889	3211	1456	5011	2272	8217	3727
120	82.73	729	330	1300	589	2036	923	3336	1513	5207	2361	8537	3872
125	86.18	757	343	1348	611	2112	957	3461	1569	5402	2450	8857	4017
130	89.63	784	355	1397	633	2189	992	3586	1626	5597	2538	9177	4162
135	93.07	811	367	1446	655	2265	1027	3711	1683	5792	2627	9497	4307
140	96.52	839	380	1495	678	2341	1061	3836	1739	5988	2716	9817	4452
145	99.97	866	392	1543	699	2418	1096	3962	1797	6183	2804	10137	4598
150	103.42	893	405	1592	722	2494	1131	4087	1853	6378	2893	10457	4743
155	106.86	921	417	1641	744	2570	1165	4212	1910	6573	2981	10777	4888
160	110.31	948	430	1690	766	2647	1200	4337	1967	6768	3069	11097	5033
165	113.76	975	442	1738	788	2723	1235	4462	2023	6964	3158	11417	5178
170	117.21	1003	454	1787	810	2799	1269	4587	2080	7159	3247	11737	5323
175	120.65	1030	467	1836	832	2876	1304	4712	2137	7354	3335	12057	5468
180	124.10	1057	479	1885	855	2952	1339	4837	2194	7549	3424	12377	5614
185	127.55	1085	492	1933	876	3028	1373	4962	2250	7745	3513	12697	5759
190	131.00	1112	504	1982	899	3105	1408	5087	2307	7940	3601	13018	5904
195	134.44	1140	517	2031	921	3181	1442	5212	2364	8135	3689	13338	6050
200	137.89	1167	529	2080	943	3258	1477	5338	2421	8330	3778	13658	6195
205	141.34	1194	541	2128	965	3334	1512	5463	2477	8525	3866	13978	6340
210	144.78	1222	554	2177	987	3410	1546	5588	2534	8721	3955	14298	6485
215	148.23	1249	566	2226	1009	3487	1581	5713	2591	8916	4044	14618	6630
220	151.68	1276	578	2275	1031	3563	1616	5838	2648	9111	4132	14938	6775
225	155.13	1304	591	2323	1053	3639	1650	5963	2704	9306	4221	15258	6920
230	158.57	1331	603	2372	1075	3716	1685	6088	2761	9502	4310	15578	7066
235	162.02	1358	615	2421	1098	3792	1720	6213	2818	9697	4398	15898	7211
240	165.47	1386	628	2469	1119	3868	1754	6338	2874	9892	4486	16218	7356
245	168.92	1413	640	2518	1142	3945	1789	6463	2931	10087	4575	16538	7501
250	172.36	1440	653	2567	1164	4021	1823	6588	2988	10283	4664	16858	7646
255	175.81	1468	665	2616	1186	4097	1858	6714	3045	10478	4752	17178	7791
260	179.26	1495	678	2664	1208	4174	1893	6839	3102	10673	4841	17499	7937
265	182.71	1522	690	2713	1230	4250	1927	6964	3158	10868	4929	17819	8082
270	186.15	1550	703	2762	1252	4326	1962	7089	3215	11063	5018	18139	8227
275	189.60	1577	715	2811	1275	4403	1997	7214	3272	11259	5106	18459	8372
280	193.05	1605	728	2859	1296	4479	2031	7339	3328	11454	5195	18779	8518
285	196.50	1632	740	2908	1319	4555	2066	7464	3385	11649	5283	19099	8663
290	199.94	1659	752	2957	1341	4632	2101	7589	3442	11844	5372	19419	8808
295	203.39	1687	765	3006	1363	4708	2135	7714	3499	12040	5461	19739	8953
300	206.84	1714	777	3054	1385	4784	2169	7839	3555	12235	5549	20059	9098

# Orifice Capacities (Contd.)

## ASME B&PV Code Section VIII, for Air

Based at 10% overpressure or 3 psig (0.21 barg), whichever is greater, showing 90% of actual capacity.

Orifice Designation		D		E		F		G		H		J	
Orifice Area		in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>
Set Pressure		0.110	0.710	0.196	1.265	0.307	1.981	0.503	3.245	0.785	5.065	1.287	8.303
		Orifice Capacity											
psig	barg	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min
15	10.34	57	1.61	103	2.91	161	4.55	265	7.50	413	11.69	678	19.19
20	13.78	66	1.86	119	3.36	186	5.26	305	8.63	476	13.47	781	22.11
25	17.23	75	2.12	134	3.79	211	5.97	346	9.79	540	15.29	885	25.06
30	20.68	84	2.37	150	4.24	235	6.65	386	10.93	603	17.07	989	28.00
35	24.13	94	2.66	168	4.75	263	7.44	431	12.20	673	19.05	1103	31.23
40	27.57	104	2.94	185	5.23	290	8.21	475	13.45	742	21.01	1217	34.46
45	31.02	113	3.19	202	5.72	317	8.97	520	14.72	812	22.99	1331	37.68
50	34.47	123	3.48	220	6.22	344	9.74	564	15.97	881	24.94	1445	40.91
55	37.92	133	3.76	237	6.71	372	10.53	609	17.24	951	26.92	1559	44.14
60	41.36	143	4.04	254	7.19	399	11.29	654	18.51	1020	28.88	1673	47.37
65	44.81	152	4.30	272	7.70	426	12.06	698	19.76	1090	30.86	1787	50.60
70	48.26	162	4.58	289	8.18	453	12.82	743	21.03	1160	32.84	1901	53.83
75	51.71	172	4.87	307	8.69	480	13.59	787	22.28	1229	34.80	2015	57.05
80	55.15	182	5.15	324	9.17	508	14.38	832	23.55	1299	36.78	2130	60.31
85	58.60	191	5.40	341	9.65	535	15.14	877	24.83	1368	38.73	2244	63.54
90	62.05	201	5.69	359	10.16	562	15.91	921	26.07	1438	40.71	2358	66.77
95	65.50	211	5.97	376	10.64	589	16.67	966	27.35	1507	42.67	2472	69.99
100	68.94	221	6.25	393	11.12	616	17.44	1010	28.60	1577	44.65	2586	73.22
105	72.39	230	6.51	411	11.63	644	18.23	1055	29.87	1647	46.63	2700	76.45
110	75.84	240	6.79	428	12.11	671	19.00	1099	31.12	1716	48.59	2814	79.68
115	79.28	250	7.07	445	12.60	698	19.76	1144	32.39	1786	50.57	2928	82.91
120	82.73	260	7.36	463	13.11	725	20.52	1189	33.66	1855	52.52	3042	86.13
125	86.18	269	7.61	480	13.59	752	21.29	1233	34.91	1925	54.50	3156	89.36
130	89.63	279	7.90	498	14.10	780	22.08	1278	36.18	1995	56.49	3270	92.59
135	93.07	289	8.18	515	14.58	807	22.85	1322	37.43	2064	58.44	3384	95.82
140	96.52	299	8.46	532	15.06	834	23.61	1367	38.70	2134	60.42	3498	99.05
145	99.97	308	8.72	550	15.57	861	24.38	1412	39.98	2203	62.38	3613	102.30
150	103.42	318	9.00	567	16.05	889	25.17	1456	41.22	2273	64.36	3727	105.53
155	106.86	328	9.28	584	16.53	916	25.93	1501	42.50	2342	66.31	3841	108.76
160	110.31	338	9.57	602	17.04	943	26.70	1545	43.74	2412	68.30	3955	111.99
165	113.76	347	9.82	619	17.52	970	27.46	1590	45.02	2482	70.28	4069	115.22
170	117.21	357	10.10	637	18.03	997	28.23	1634	46.26	2551	72.23	4183	118.44
175	120.65	367	10.39	654	18.51	1025	29.02	1679	47.54	2621	74.21	4297	121.67
180	124.10	377	10.67	671	19.00	1052	29.78	1724	48.81	2690	76.17	4411	124.90
185	127.55	386	10.93	689	19.51	1079	30.55	1768	50.06	2760	78.15	4525	128.13
190	131.00	396	11.21	706	19.99	1106	31.31	1813	51.33	2829	80.10	4639	131.36
195	134.44	406	11.49	723	20.47	1133	32.08	1857	52.58	2899	82.09	4753	134.58
200	137.89	416	11.77	741	20.98	1161	32.87	1902	53.85	2969	84.07	4867	137.81
205	141.34	425	12.03	758	21.46	1188	33.64	1947	55.13	3038	86.02	4981	141.04
210	144.78	435	12.31	776	21.97	1215	34.40	1991	56.37	3108	88.00	5095	144.27
215	148.23	445	12.60	793	22.45	1242	35.16	2036	57.65	3177	89.96	5210	147.53
220	151.68	455	12.88	810	22.93	1270	35.96	2080	58.89	3247	91.94	5324	150.75
225	155.13	464	13.13	828	23.44	1297	36.72	2125	60.17	3316	93.89	5438	153.98
230	158.57	474	13.42	845	23.92	1324	37.49	2169	61.41	3386	95.88	5552	157.21
235	162.02	484	13.70	862	24.40	1351	38.25	2214	62.69	3456	97.86	5666	160.44
240	165.47	494	13.98	880	24.91	1378	39.02	2259	63.96	3525	99.81	5780	163.67
245	168.92	503	14.24	897	25.40	1406	39.81	2303	65.21	3595	101.79	5894	166.89
250	172.36	513	14.52	915	25.90	1433	40.57	2348	66.48	3664	103.75	6008	170.12
255	175.81	523	14.80	932	26.39	1460	41.34	2392	67.73	3734	105.73	6122	173.35
260	179.26	533	15.09	949	26.87	1487	42.10	2437	69.00	3804	107.71	6236	176.58
265	182.71	542	15.34	967	27.38	1514	42.87	2482	70.28	3873	109.67	6350	179.81
270	186.15	552	15.63	984	27.86	1542	43.66	2526	71.52	3943	111.65	6464	183.04
275	189.60	562	15.91	1001	28.34	1569	44.42	2571	72.80	4012	113.60	6578	186.26
280	193.05	572	16.19	1019	28.85	1596	45.19	2615	74.04	4082	115.58	6692	189.49
285	196.50	581	16.45	1036	29.33	1623	45.95	2660	75.32	4151	117.54	6807	192.75
290	199.94	591	16.73	1054	29.84	1650	46.72	2704	76.56	4221	119.52	6921	195.98
295	203.39	601	17.01	1071	30.32	1678	47.51	2749	77.84	4291	121.50	7035	199.20
300	206.84	611	17.30	1088	30.80	1705	48.28	2794	79.11	4360	123.46	7149	202.43
305	210.29	620	17.55	1106	31.31	1732	49.04	2838	80.36	4430	125.44	7263	205.66
310	213.73	630	17.83	1123	31.79	1759	49.80	2883	81.63	4499	127.39	7377	208.89
315	217.18	640	18.12	1140	32.28	1787	50.60	2927	82.88	4569	129.37	7491	212.12
320	220.63	650	18.40	1158	32.79	1814	51.36	2972	84.15	4638	131.33	7605	215.34
325	224.07	659	18.66	1175	33.27	1841	52.13	3017	85.43	4708	133.31	7719	218.57
330	227.52	669	18.94	1193	33.78	1868	52.89	3061	86.67	4778	135.29	7833	221.80
335	230.97	679	19.22	1210	34.26	1895	53.66	3106	87.95	4847	137.25	7947	225.03
340	234.42	689	19.51	1227	34.74	1923	54.45	3150	89.19	4917	139.23	8061	228.26
345	237.86	698	19.76	1245	35.25	1950	55.21	3195	90.47	4986	141.18	8175	231.49
350	241.31	708	20.04	1262	35.73	1977	55.98	3239	91.71	5056	143.16	8289	234.71

# Orifice Capacities (Contd.)

## Capacities for Low pressure applications

ASME non-code applications

### Saturated Steam, Non-Code Stamped Applications

Based at 3 psig (0.21 barg), overpressure, showing 90% of actual capacity.

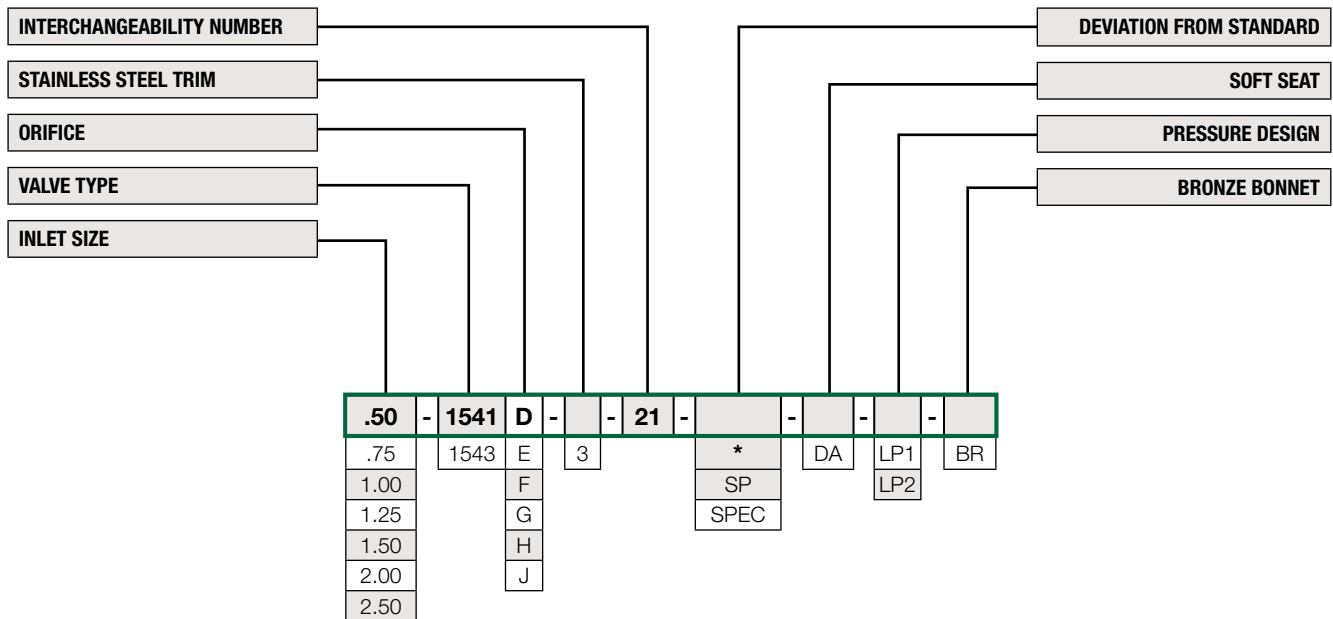
Orifice Designation		D		E		F		G		H		J	
Orifice Area		in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>
Set Pressure		0.110	0.710	0.196	1.265	0.307	1.981	0.503	3.245	0.785	5.065	1.287	8.303
		Orifice Capacity											
psig	barg	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr
5	3.44	112	3.17	201	5.69	315	8.91	516	14.61	805	22.79	1321	37.40
6	4.13	117	3.31	210	5.94	328	9.28	539	15.26	841	23.81	1379	39.04
7	4.82	122	3.45	218	6.17	342	9.68	561	15.88	876	24.80	1437	40.69
8	5.51	127	3.59	227	6.42	356	10.08	584	16.53	912	25.82	1495	42.33
9	6.20	132	3.73	236	6.68	370	10.47	607	17.18	947	26.81	1553	43.97
10	6.89	137	3.87	245	6.93	384	10.87	630	17.83	983	27.83	1611	45.61
11	7.58	142	4.02	254	7.19	398	11.27	652	18.46	1018	28.82	1670	47.28
12	8.27	147	4.16	263	7.44	412	11.66	675	19.11	1054	29.84	1728	48.93
13	8.96	152	4.30	272	7.70	426	12.06	698	19.76	1089	30.83	1786	50.57
14	9.65	157	4.44	280	7.92	440	12.45	720	20.38	1125	31.85	1844	52.21

### Low Pressure Air, Non-Code Stamped Applications

Based at 3 psig (0.21 barg), overpressure, showing 90% of actual capacity.

Orifice Designation		D		E		F		G		H		J	
Orifice Area		in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>	in <sup>2</sup>	cm <sup>2</sup>
Set Pressure		0.110	0.710	0.196	1.265	0.307	1.981	0.503	3.245	0.785	5.065	1.287	8.303
		Orifice Capacity											
psig	barg	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min	ft <sup>3</sup> /min	m <sup>3</sup> /min
5	3.44	40	1.13	71	2.01	112	3.17	184	5.21	287	8.12	470	13.30
6	4.13	42	1.18	74	2.09	117	3.31	192	5.43	299	8.46	491	13.90
7	4.82	43	1.21	78	2.20	122	3.45	200	5.66	312	8.83	512	14.49
8	5.51	45	1.27	81	2.29	127	3.59	208	5.88	325	9.20	533	15.09
9	6.20	47	1.33	84	2.37	132	3.73	216	6.11	337	9.54	553	15.65
10	6.89	49	1.38	87	2.46	137	3.87	224	6.34	350	9.91	574	16.25
11	7.58	50	1.41	90	2.54	141	3.99	232	6.56	363	10.27	595	16.84
12	8.27	52	1.47	93	2.63	146	4.13	240	6.79	375	10.61	615	17.41
13	8.96	54	1.52	96	2.71	151	4.27	248	7.02	388	10.98	636	18.00
14	9.65	56	1.58	100	2.83	156	4.41	256	7.24	401	11.35	657	18.60

# Valve Configuration Code



1541 Standard Connection				
Inlet Sizes		Orifice	Area	
in.	mm		in <sup>2</sup>	cm <sup>2</sup>
.75	19.1	D	0.110	0.710
1.00	25.4	E	0.196	1.265
1.25	31.8	F	0.307	1.981
1.50	38.1	G	0.503	3.245
2.00	50.8	H	0.785	5.065
2.50	63.5	J	1.287	8.303

Pressure Design	
Designation	Pressure Range
	SET > 15 psig (1.03 barg) <sup>1</sup>
	SET > 36 psig (2.48 barg) <sup>2</sup>
LP1	5 to 15 psig (0.34 to 1.03 barg) <sup>3</sup>
LP2	16 to 35 psig (1.10 to 2.41 barg) <sup>2</sup>

1543 Standard Connection				
Inlet Sizes		Orifice	Area	
in.	mm		in <sup>2</sup>	cm <sup>2</sup>
.50	12.7	D	0.110	0.710
.75	19.1	E	0.196	1.265
1.00	25.4	F	0.307	1.981
1.25	31.8	G	0.503	3.245
1.50	38.1	H	0.785	5.065
2.00	50.8	J	1.287	8.303

Material Trim	
Designation	Trim
	Standard
3	Stainless Steel Trim

- Notes:**
- D to G Orifice - Metal Seat and Soft Seat, H & J Orifice - Soft Seat.
  - H & J Orifice - Metal Seat.
  - D to J Orifice - Metal Seat and Soft Seat.



# How to Order a 1541 / 1543 Safety Valve

How to Order a 1541/1543 Safety Valve	
Please Specify:	Example
Number of valves	3
Inlet size (MNPT)	.500" (12.70 mm)
Type number of valve	1543-D-3
Set pressure	100 psig (6.89 barg)
Operating pressure	80 psig (5.52 barg)
Operating, relieving and design temperature	325°F/339°F/400°F (163°C/171°C/204°C)
Built-up back pressure	5 psig (0.34 barg)
Allowable overpressure	3%
Orifice size	D
Required capacity	530 PPH
Service (air, steam)	Steam
ASME Boiler & Pressure Codes	
Section I - fired pressure vessels	ASME Section I
Section VIII - unfired pressure vessels	-
Trim (bronze, stainless)	Stainless
Seat type (metal seat, soft seat)	Metal Seat
Bonnet material (cast iron, bronze)	Cast Iron
Material substitution	-
Accessories (spring coating)	-
Certification (for approval, for record)	-
Customer drawings (for approval, for record)	for approval
Note any special needs	-

