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Industries, Inc.**



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spec sheet



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 ²	6.4516	cm ²
ft ³ /min	0.02831685	m ³ /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.



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

- 1543-3:** A duplicate of the 1543 valve, but supplied with a 304 stainless base and disc.
- 1541-3:** A duplicate of the 1541 valve, but supplied with a 304 stainless steel base and disc.
- Bronze Bonnet:** When cast iron bonnets are not permitted, a bronze bonnet option is available.
- Soft Seats:** A PTFE soft seat option is available for improved tightness. This option is only available for ASME Code Section VIII application.
- Low Pressures:** For low pressures, we supply a special low pressure design to ensure maximum flow capacities against atmospheric pressure.
- Spring:** 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 ²	cm ²	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 ²	cm ²	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

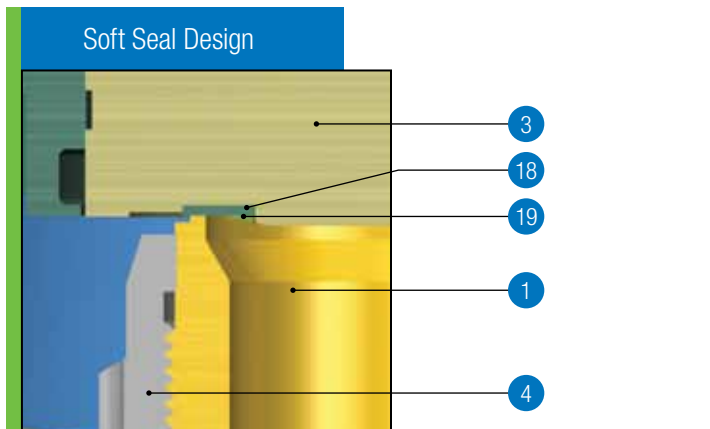
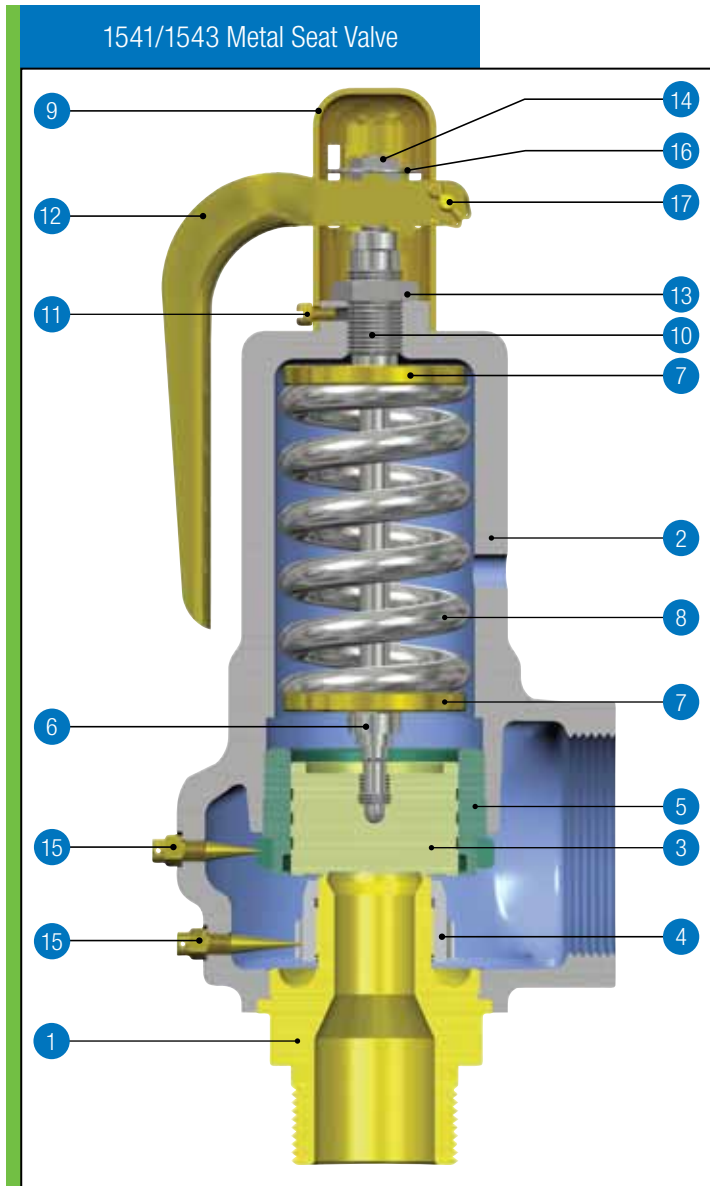
Pressure/Temperature Limits

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 ¹	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 ¹	Teflon or Neoprene
19	Soft Seat Retainer Ring ¹	Austenitic Stainless Steel (Ph15-7Mo)
20	Lift Limiter ²	ASME SA479 316/316L St. St.

Notes:

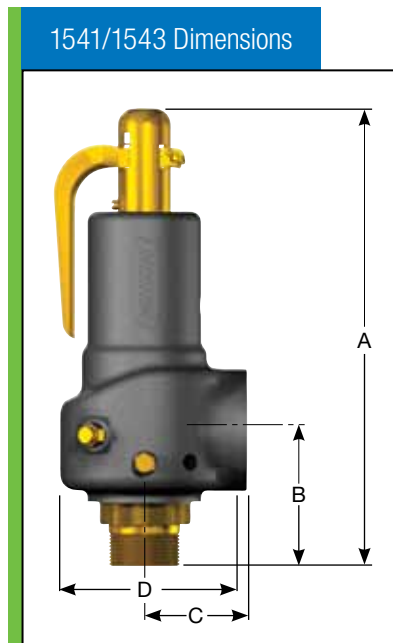
- 1. Featured on Soft Seat Only.
- 2. 5 to 15 psig (0.34 to 1.03 barg) Only.

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 ²	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²
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.)

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.

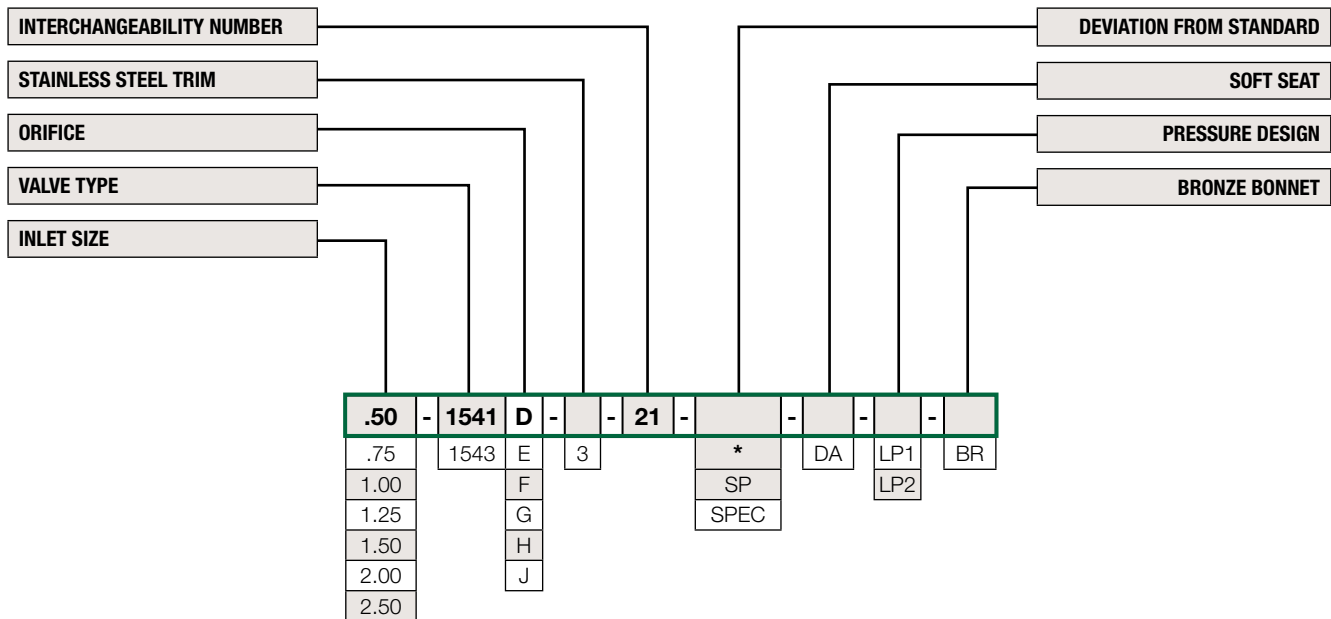
Orifice Designation		D		E		F		G		H		J	
Orifice Area		in ²	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²
Set Pressure		0.110	0.710	0.196	1.265	0.307	1.981	0.503	3.245	0.785	5.065	1.287	8.303
		Orifice Capacity											
psig	barg	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	kg/hr	lb/hr	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 ²	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²	in ²	cm ²
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 ³ /min	m ³ /min	ft ³ /min	m ³ /min	ft ³ /min	m ³ /min	ft ³ /min	m ³ /min	ft ³ /min	m ³ /min	ft ³ /min	m ³ /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 ²	cm ²
.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) ¹
	SET > 36 psig (2.48 barg) ²
LP1	5 to 15 psig (0.34 to 1.03 barg) ³
LP2	16 to 35 psig (1.10 to 2.41 barg) ²

Material Trim	
Designation	Trim
	Standard
3	Stainless Steel Trim

1543 Standard Connection				
Inlet Sizes		Orifice	Area	
in.	mm		in ²	cm ²
.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

- 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	-

