Flanged Steel Pressure-relief Valves

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AMERICAN PETROLEUM INSTITUTE

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Errata 1

Table of Contents: Added the following line:

Table of Contents: Changed "Effective Area" to "Effective Orifice Area" in the following lines:

Table of Contents: Changed "Limits" to "Limits[1]" in the following lines:

Table 3: The boxed sections below reflect changes made to the table:

Temperature Range Inclusive 801 °F to 1000 °F													
Chrome Molybdenum Steel	1D2	300	150					510	215	290	230	4 1/8	4 1/2
	1D2	600	150					1015	430	290	230	4 1/8	4 1/2
	1 1/2D2	900	300					1525	650	(600)	500	4 1/8	5 1/2
	1 1/2D2	1500	300					2540	1080	(600)	500	4 1/8	5 1/2
	1 1/2D3	2500	300					4230	1800	750	500	5 1/2	7
Temperature Range Inclusive –450 °F to 1000 °F													
Austenitic Stainless Steel	1D2	150	150	275	275	275	180	80	20	275	230	4 1/8	4 1/2
	1D2 [c]	300	150	(275)	(275)	(275)	(275)	(275)	(275)	275	230	4 1/8	4 1/2
	1D2	300	150	720	720	720	495	420	365	275	230	4 1/8	4 1/2
	1D2	600	150	1440	1440	1440	990	845	725	275	230	4 1/8	4 1/2
	1 1/2D2	900	300	2160	2160	2160	1485	1265	1090	(600)	500	4 1/8	5 1/2
	1 1/2D2	1500	300	3600	3600	3600	2480	2110	1820	(600)	500	4 1/8	5 1/2
	1 1/2D3	2500	300	(4000)	6000	6000	4130	3520	3030	720	500	5 1/2	7
Temperature Range Inclusive –20 °F to 300 °F [e]													
Alloy 20 [e]	1D2	150	150			230	180			230	230	4 1/8	4 1/2
	1D2 [c]	300	150			(230)	(180)			230	230	4 1/8	4 1/2
	1D2	300	150			600	465			230	230	4 1/8	4 1/2
	1D2	600	150			1200	930			230	230	4 1/8	4 1/2
	1 1/2D2	900	300			1800	1395			600	500	4 1/8	5 1/2
	1 1/2D2	1500	300			3000	2330			600	500	4 1/8	5 1/2
	1 1/2D3	2500	300			5000	3880			600	500	5 1/2	7

Table 7: The boxed section below reflects changes made to the table:

	Temperature Range Inclusive –20 °F to 900 °F [d]												
Nickel/ Copper Alloy [d]	1 1/2H3 1 1/2H3 [c] 2H3 2H3 2H3	150 300 300 600 900	150 150 150 150 150			230 (230) 600 1200 1800	175 (230) 475 945 1420	80 (230) 460 915 1375	50 (230) 275 550 825	230 230 230 230 230	230 230 230 230 230	5 1/8 5 1/8 5 1/8 6 1/16 6 1/16	4 7/8 4 7/8 4 7/8 6 3/8 6 3/8

Table 8: The title was changed to the following:

Table 8—Spring-loaded Pressure-relief Valves "J" Orifice [f]
(Effective Orifice Area = 1.287 in.^{2})

Table 9: The title was changed to the following:

Table 9—Spring-loaded Pressure-relief Valves "K" Orifice [f]
(Effective Orifice Area = 1.838 in.^{2})

Table 9: The boxed section below reflects changes made to the table:

	Temperature Range Inclusive –20 °F to 300 °F [e]												
Alloy 20 [e]	3K4 3K4 [c] 3K4 3K4 3K6 3K6	150 300 300 600 900 1500	150 150 150 150 150 300			230 (230) 600 1200 1800 (2220)	180 (180) 465 930 1395 (2220)			230 230 230 230 230 600	150 150 150 200 200 200	6 1/8 6 1/8 6 1/8 7 1/4 7 13/16 7 3/4	6 3/8 6 3/8 6 3/8 7 1/8 8 1/2 8 1/2

Table 10: The title was changed to the following:

Table 10—Spring-loaded Pressure-relief Valves "L" Orifice [f]
(Effective Orifice Area = 2.853 in.^{2})

Table 10: The boxed section below reflects changes made to the table:

	Temperature Range Inclusive –450 °F to 1000 °F												
Austenitic Stainless Steel	3L4 3L4 [c] 4L6 4L6 4L6	150 300 300 600 900	150 150 150 150 150	275 (275) (535) (535) (700)	275 (275) 720 (1000) (1500)	275 (275) 720 (1000) (1500)	180 (275) 495 990 1485	80 (275) 420 845 1265	20 (275) 365 725 1090	275 275 275 275 275	100 100 170 170 170	6 1/8 6 1/8 7 1/16 7 1/16 7 3/4	6 1/2 6 1/2 7 1/8 8 8 3/4

Table 11: The title was changed to the following:

Table 11—Spring-loaded Pressure-relief Valves "M" Orifice [f]
(Effective Orifice Area = 3.60 in.^{2})

Table 12: The title was changed to the following:

Table 12—Spring-loaded Pressure-relief Valves "N" Orifice [f]
(Effective Orifice Area = 4.34 in.^{2})

Table 12: The boxed section below reflects changes made to the table:

Temperature Range Inclusive –20 °F to 300 °F [e]													
Alloy 20 [e]	4N6 4N6[c] 4N6 4N6 4N6	150 300 300 600 900	150 150 150 150 150			230 (230) 600 (1000) (1000)	180 (180) 465 930 (1000)			230 230 230 230 230	80 80 160 160 160	7 3/4 7 3/4 7 3/4 7 3/4 7 3/4	8 1/4 8 1/4 8 1/4 8 3/4 8 3/4

Table 13: The title was changed to the following:

Table 13—Spring-loaded Pressure-relief Valves "P" Orifice [f]
(Effective Orifice Area = 6.38 in.^{2})

Table 14: The title was changed to the following:

Table 14—Spring-loaded Pressure-relief Valves "Q" Orifice [f]
(Effective Orifice Area = 11.05 in.^{2})

Table 15: The title was changed to the following:

Table 15—Spring-loaded Pressure-relief Valves "R" Orifice [f]
(Effective Orifice Area = 16.00 in.^{2})

Table 15: The boxed sections below reflects changes made to the table:

Body/ Bonnet	Inlet by Orifice by Outlet	INLET	OUTLET	Conventional and Balanced Bellows Valves						(psig)		(in.)	
				–450 °F to –76 °F	–75 °F to –21 °F	–20 °F to 100 °F	450 °F	800 °F	1000 °F	Flange Rating Limit [a] 100 °F	Bellows Rating Limit [a] 100 °F	INLET	OUTLET
Temperature Range Inclusive –20 °F to 900 °F [d]													
Nickel/ Copper Alloy [d]	6R8 6R8[c] 6R10 6R10	150 300 300 600	150 150 150 150			(100) (100) (230) (300)	(100) (100) (230) (300)	80 (100) (230) (300)	50 (100) (230) (300)	(60) (60) (100) (100)	60 60 100 100	9 7/16 9 7/16 9 7/16 9 7/16	9 1/2 9 1/2 10 1/2 10 1/2

Table 16: The title was changed to the following:

Table 16—Spring-loaded Pressure-relief Valves "T" Orifice [f]
(Effective Orifice Area = 26.00 in.^{2})

Figure B.1: The title was changed to the following:

Figure B.1—Pressure–temperature Limits[1] to be Used with Table 3 to Table 30 of This Standard

Figure B.2: The title was changed to the following:

Figure B.2—Pressure–temperature Limits[1] to be Used with Table 3 to Table 30 of This Standard

Figure B.3: The title was changed to the following:

Figure B.3—Pressure–temperature Limits[1] to be Used with Table 3 to Table 30 of This Standard

Figure B.4: The title was changed to the following:

Figure B.4—Pressure–temperature Limits[1] to be Used with Table 3 to Table 30 of This Standard

Figure B.5: The title was changed to the following:

Figure B.5—Pressure–temperature Limits[1] to be Used with Table 3 to Table 30 of This Standard

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Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

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Flanged Steel Pressure-relief Valves

1 Scope

This standard is a purchase specification for flanged steel pressure-relief valves. Basic requirements are given for direct spring-loaded pressure-relief valves and pilot-operated pressure-relief valves as follows:

— orifice designation and area;

— valve size and pressure rating, inlet and outlet;

— materials;

— pressure-temperature limits;

— center-to-face dimensions, inlet and outlet.

Nameplate nomenclature and requirements for stamping are detailed in Annex A.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Recommended Practice 520 (all parts), *Sizing, Selection, and Installation of Pressure-relieving Devices in Refineries*

API Standard 527, *Seat Tightness of Pressure Relief Valves*

ASME B16.5, *Pipe Flanges and Flanged Fittings*

ASME B16.34, *Valves-Flanged, Threaded and Welding End*

ASME Boiler and Pressure Vessel Code (BPVC), *Section VIII: Pressure Vessels, Division 1 and Division 2*

ASME BPVC, *Section II: Materials:*

ASME SA-216, *Carbon-Steel Castings Suitable for Fusion Welding for High-Temperature Service*

ASME SA-217, *Martensitic Stainless Steel and Alloy Steel Castings for Pressure-Containing Parts, Suitable for High-Temperature Service*

ASME SA-351, *Specification for Castings, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts*

ASME SA-494, *Specification for Castings, Nickel and Nickel Alloy*

3 Terms and Definitions

Pressure-relief valve terminology is defined in API 520, Part I.