IVS 2019 - Industrial Valve Summit Conference
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Changing & New Codes & Standards

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BONNEY FORGE

Changing & New Codes & Standards

Codes and standards changes and new:

- **Above all for Safety**
- **Interchangeable products**
- **Common requirements**
- **Testing**
- **Adaptation to increased service/use**
- **AND A LOT MORE**

Changing & New Codes & Standards

Global Codes & Standards

Codes and standards are under continuous change about every 5 years

Common industry codes and standards

1. **API**
2. **ASME**
3. **ASTM**
4. **ISO**
5. **MSS**
6. **BS**
7. **EN**
8. **DIN**
9. **Etc.**

Newest IOGP Specifications Supplementary Requirements

Changing & New Codes & Standards

Standards changes and developing new standards activity is ever increasing

Connectivity to standards changes and new standards must be continuous and thorough

Recognizing the significance of these changes and new standards impact in the Market place and product development is mandatory

Maintaining a high competence to meet changing and new requirements is critical

Adaptation to quickly design and manufacture is the NEW norm

Increasingly the levels of complexity to control all aspects of design and manufacturing for international compliance is increasing every few years

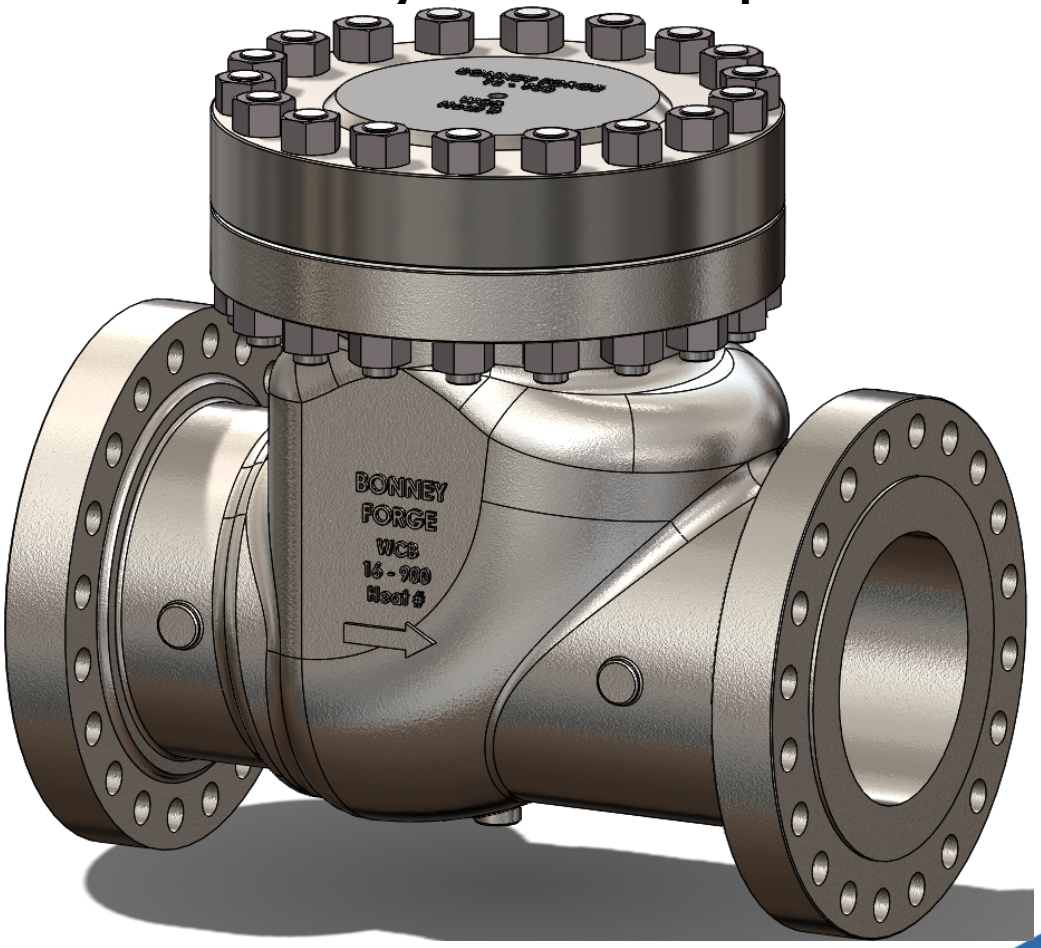
Changing & New Codes & Standards

API Most recently published

- **First time in many years new standards not currently under development**

API 594 Check Valves Flanged, Lug, Wafer and Butt-welding
8th 2017

- **Type B size increase to 36” (DN900)**
- **Type A Table 3—Face to Face Dimensions for Double Flange Valves Dimensions in mm (inches)**



Changing & New Codes & Standards

API 603 Corrosion-resistant, Bolted Bonnet Gate Valves-Flanged and Butt-welding Ends
9th 2018

- **Same requirements as API 600 & 602**

API RP 621 Reconditioning of Metallic Gate, Globe, and Check Valves
4th 2018

- **Rewrite and rearranged sections and requirements updates**

Changing & New Codes & Standards

API 622 Type Testing of Process Valve Packing for Fugitive Emissions
3rd 2018

- **100 ppmv maximum leakage with no stem packing adjustments**

- **1/8”(3.2mm) packing testing in addition to 1/4”(6.4mm)**

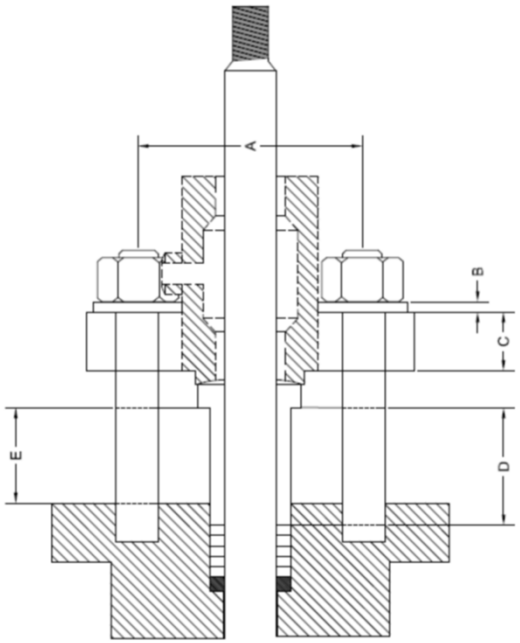


Table 2—Test Fixture Bonnet Dimensions

Item	1/8 in. Packing Fixture	1/4 in. Packing Fixture
A	48.79 mm (1.92 in.)	101.60 mm (4.00 in.)
B	3.18 mm (0.125 in.) max.	3.18 mm (0.125 in.) max.
C	25.4 mm (1.00 in.)	38.2 mm (1.50 in.)
D	50.8 mm (2.00 in.)	50.8 mm (2.00 in.)
E	Gland height shall be measured and recorded at beginning and end of test.	Gland height shall be measured and recorded at beginning and end of test.

Changing & New Codes & Standards

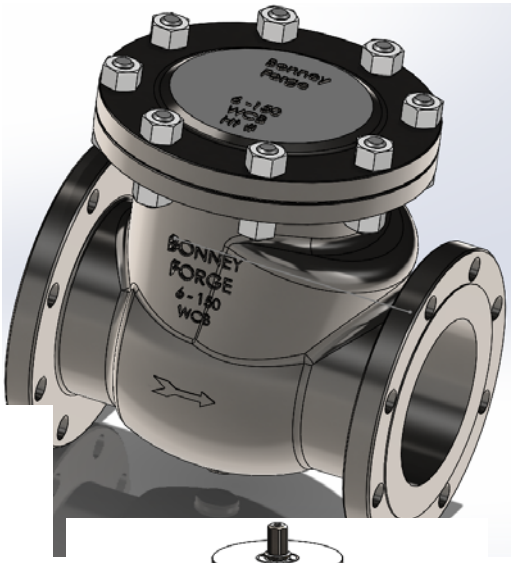
API RP 591 Process Valve Qualification Procedure
6th 2019

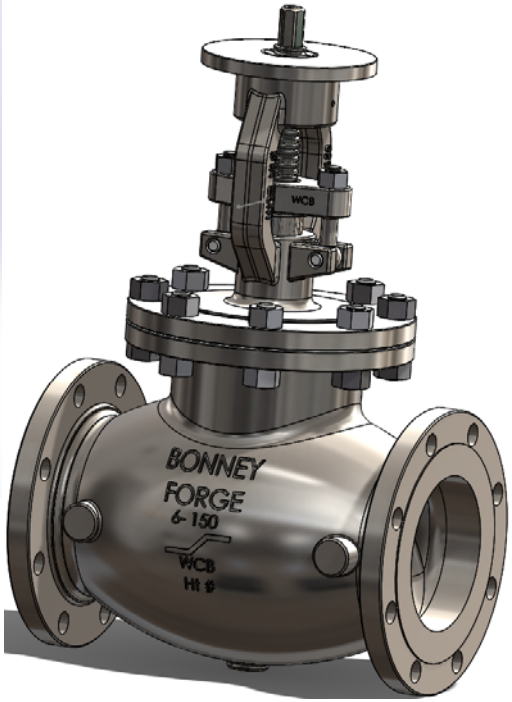
- **Test facility cannot have any commercial relationship with valve manufacturer or subcontracting with valve manufacturer**

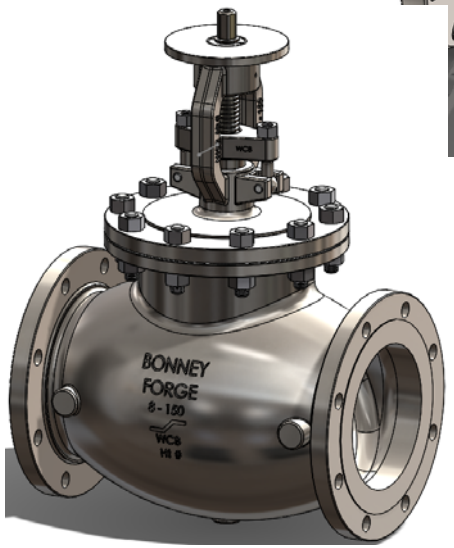
- **Carbon and alloy steels hardness and charpy impact testing**

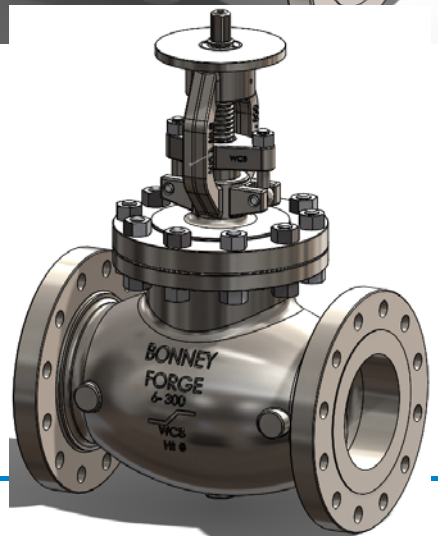
- **Additional valve sizes:**

a) **Check 6”-150**
b) **Globe 6”-150**
c) **Globe 8”-150**
d) **Globe 6”-300**









Changing & New Codes & Standards

1. **API 599 Metal Plug Valves-Flanged, Threaded and Welding Ends**

(7th 2013)

- **API 641 Type Testing of Quarter-turn Valves for Fugitive Emissions**

2. **API 600 Steel Gate Valves—Flanged and Butt-welding ends, Bolted Bonnets**

(13th 2015)

- **100 ppmv maximum leakage with no stem packing adjustments**

3. **API 602 Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries**

(10th 2015)

Changing & New Codes & Standards

4. **API 608 Metal Ball Valves—Flanged, Threaded, and Welding Ends**
(5th 2012)

- **API 641 Type Testing of Quarter-turn Valves for Fugitive Emissions**

5. **API 623 Steel Globe Valves—Flanged and Butt-welding Ends, Bolted Bonnets**
(1st 2013)

- **API 624 Type Testing of Rising Stem Valves Equipped with Graphite Packing for Fugitive Emissions**

6. **API 624 Type Testing of Rising Stem Valves Equipped with Graphite Packing for Fugitive Emissions**
(1st 2014)

- **6.2 Qualification Facility independent or 3rd party witness**

Changing & New Codes & Standards

ASME B16 published in 2017

1. **B16.5 Pipe Flanges and Flanged Fittings**
   - ❖ **No substantive changes**

2. **B16.10 Face-to-Face and End-to-End Dimensions of Valves**
   - ❖ **Valve size increased from DN 900 (36”) to DN 1800 (72”)**

3. **B16.25 Buttwelding Ends**
   - ❖ **Size increased from DN 1200 (48”) to DN 1500 (60”) & Figure 1 notes revised**

4. **B16.34 Valves – Flanged, Threaded, and Welding End**
   - ❖ **Size increased from DN 1250 (50”) to DN 1500 (60”)**

5. **B16.47 Large Diameter Steel Flanges DN650 (26”) – DN1500 (60”)**
   - ❖ **No substantive changes**

Changing & New Codes & Standards

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Changing & New Codes & Standards

New MSS Technical Committee C-410 Severe and Special Service Valves

(NO NEW STANDARDS PUBLISHED)

1. PN-16-20 Severe Service Valves

1. **SCOPE**

1.1 This Standard Practice is applicable to isolation valves as well as control valves.

2. **PURPOSE**

2.1 The purpose of this Standard Practice is to provide a method to categorize valves by the severity of the service conditions they will encounter in an application. The categories are to be used as a guide for specifying appropriate requirements for special design features, materials of construction, non-destructive testing, quality inspections, cleaning, painting/coating and testing relative to the service conditions the valve will encounter

2.2 The definition and common categorization of valves by their severity of service assists in the proper specification and selection of valves which improves process performance, increased reliability, plant safety, and environmental protection.

TABLE 1
Application Severity Checklist for Valves

Corrosivity (average penetration per year)

Value	0	5	10	Score
Mils / year	< 2	2 < 20	> 20	
Microns / year	< 51	51 < 510	> 510	

Velocity, Gas

Value	0	3	5	8	10	Score
ft. / sec.	0 – 80	80 – 165	165 – 325	325 – 400	> 400	
m / sec.	0 – 25	25 – 50	50 – 100	100 – 125	> 125	

Velocity, Liquid

Value	0	3	5	8	10	Score
ft. / sec.	0 – 6	6 – 13	13 – 20	20 – 32	> 32	
m / sec.	0 – 2	2 – 4	4 – 6	6 – 10	> 10	

Velocity, Slurry

Value	0	3	5	8	10	Score
ft. / sec.	0 – 3	3 – 6	6 – 10	10 – 16	> 16	
m / sec.	0 – 1	1 – 2	2 – 3	3 – 5	> 5	

Frequency of Operation

Value	0	3	5	8	10	Score
cycles / day	< 2	2 – 14	14 – 70	70 – 700	> 700	

Process Design Pressure

Value	0	3	5	8	10	Score
psig	< 150	150 – 750	750 – 2500	2500 – 7250	> 7250	
barg	< 10	10 – 50	50 – 170	170 – 500	> 500	

Process Design Temperature

Value	0	3	5	8	10	Score
°F	< 100	100 – 400	400 – 800	800 – 1 000	> 1000	
°C	< 38	38 – 200	200 – 430	430 – 540	> 540	

Toxicity

Value	0	5	10	Score
	Not toxic	Moderately toxic	Extremely toxic	

Reactivity

Value	0	5	10	Score
	Not reactive	Mild reaction	Highly reactive	

Scalability

Value	0	5	10	Score
	No scaling	Slight scaling	High scaling	

Flammability

Value	0	5	10	Score
	Not flammable	Moderately flammable	Highly flammable	

Speed of Operation (shortest time for stroke, close-to-open or open-to-close)

Value	0	1	3	5	8	10	Score
sec. / stroke	> 10	5 > 10	5 – 2	2 – 1	1 – 1/2	< 1/2	

Solids Content

Value	0	3	5	8	10	Score
%	0	0 < 5	5 < 20	20 < 50	> 50	

Solids Hardness

Value	0	1		5			10	Score
Mohs	None	talc	gypsum	calcite	fluorite	apatite	orthoclase	quartz to diamond	

Multiphase Flow

Value	0	8	10	Score
	single phase	two phase	three phase	

Total Score

3

Changing & New Codes & Standards

New MSS Technical Committee C-410 Severe and Special Service Valves
(NO NEW STANDARDS PUBLISHED ONLY DRAFT)

1. *PN-16-20 Severe Service Valves*

TABLE 1
Application Severity Checklist for Valves

Corrosivity (average penetration per year)

Value	0	5	10	Score
Mils / year	< 2	2 < 20	> 20	
Microns / year	< 51	51 < 510	> 510	

Velocity, Gas

Value	0	3	5	8	10	Score
ft. / sec.	0 – 80	80 – 165	165 – 325	325 – 400	> 400	
m / sec.	0 – 25	25 – 50	50 – 100	100 – 125	> 125	

Velocity, Liquid

Value	0	3	5	8	10	Score
ft. / sec.	0 – 6	6 – 13	13 – 20	20 – 32	> 32	
m / sec.	0 – 2	2 – 4	4 – 6	6 – 10	> 10	

Velocity, Slurry

Value	0	3	5	8	10	Score
ft. / sec.	0 – 3	3 – 6	6 – 10	10 – 16	> 16	
m / sec.	0 – 1	1 – 2	2 – 3	3 – 5	> 5	

Frequency of Operation

Value	0	3	5	8	10	Score
cycles / day	< 2	2 – 14	14 – 70	70 – 700	> 700	

Changing & New Codes & Standards

New MSS Technical Committee C-410 Severe and Special Service Valves
(NO NEW STANDARDS PUBLISHED ONLY DRAFT)

1. PN-16-20 Severe Service Valves

Process Design Pressure

Value	0	3	5	8	10	Score
psig	< 150	150 – 750	750 – 2500	2500 – 7250	> 7250	
barg	< 10	10 – 50	50 – 170	170 – 500	> 500	

Process Design Temperature

Value	0	3	5	8	10	Score
°F	< 100	100 – 400	400 – 800	800 – 1 000	> 1000	
°C	< 38	38 – 200	200 – 430	430 – 540	> 540	

Toxicity

Value	0	5	10	Score
	Not toxic	Moderately toxic	Extremely toxic	

Reactivity

Value	0	5	10	Score
	Not reactive	Mild reaction	Highly reactive	

Scalability

Value	0	5	10	Score
	No scaling	Slight scaling	High scaling	

Changing & New Codes & Standards

New MSS Technical Committee C-410 Severe and Special Service Valves
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1. PN-16-20 Severe Service Valves

Flammability

Value	0	5	10	Score
	Not flammable	Moderately flammable	Highly flammable	

Speed of Operation (shortest time for stroke, close-to-open or open-to-close)

Value	0	1	3	5	8	10	Score
sec. / stroke	> 10	5 > 10	5 – 2	2 – 1	1 – 1/2	< 1/2	

Solids Content

Value	0	3	5	8	10	Score
%	0	0 < 5	5 < 20	20 < 50	> 50	

Solids Hardness

Value	0	1	5				10	Score
Mohs	None	talc	gypsum	calcite	fluorite	apatite	orthoclase	quartz to diamond	

Multiphase Flow

Value	0	8	10	Score
	single phase	two phase	three phase	

Total Score

Changing & New Codes & Standards

New MSS Technical Committee C-410 Severe and Special Service Valves
(NO NEW STANDARDS PUBLISHED ONLY DRAFT)

2. PN-17-19 Special High Pressure Gas Test Procedures for Valves

SECTION

TABLE

FIGURE

ANNEX

APPENDIX

Table 1 – Test Duration

Valve Size		Test and Duration (minutes)	
NPS	DN	Shell (minimum)	Closure (minimum)
≤ 2	≤ 50	5	2
2½ – 6	65 – 150	10	2
8 – 12	200 – 300	15	5
≥ 14	≥ 350	20	5

Changing & New Codes & Standards

MSS ANSI Approved Valve Standards

1. **SP-25 *Standard Marking System for Valves, Fittings, Flanges, and Unions***
2. **SP-96 Terminology for Valves, Fittings, and Their Related Components**
3. **SP-122 Plastic Industrial Ball Valves**
4. **SP-134 Valves for Cryogenic Service, including Requirements for Body/Bonnet Extensions**
5. **SP-135 High Pressure Knife Gate Valves**
6. **SP-138 Quality Standard Practice for Oxygen Cleaning of Valves and Fittings**
7. **SP-144 Pressure Seal Bonnet Valves**

Changing & New Codes & Standards

ISO New and Revisions

ISO WG 10

Draft new standard “Type-testing of valves” 26232

New electric actuator standard draft 22153

Manual gear box standard draft 22109

1. **5209 General purpose industrial valves – Marking**
2. **5752 Metal valves for use in flanged pipe systems – Face-to-face and centre-to-face dimensions**
3. **6002 Bolted bonnet steel gate valves**

Changing & New Codes & Standards

ISO New and Revisions

4. **10434 Bolted bonnet steel gate valves for the petroleum, petrochemical and allied industries**

5. **10497 Testing of valves – Fire type-testing requirements**

6. **10631 Metallic butterfly valves for general purposes**

7. **15761 Steel gate, globe and check valves for sizes DN100 and smaller, for the petroleum and natural gas industries**

8. **15848-1 Industrial valves – Measurement, test and qualification procedures for fugitive emissions – Part 1: Classification**

Changing & New Codes & Standards

ISO New and Revisions

9. **28921 Industrial valves – Isolating valves for low-temperature applications**

AV Assembly Recommended Practice for part-turn automated on-off valves

Changing & New Codes & Standards

IOGP—International Association of Oil & Gas Producers

Supplementary requirements to standards including requirements from many standards all together into 1 standard

1. **Piping material specification (S-563)**

❖ **Chemistry, mechanical and NDE**

2. **API 6D (S-562) Specification for Pipeline and Piping Valves**

3. **API 600 & 603 (S-611) Steel Gate Valves—Flanged and Butt-welding ends, Bolted Bonnets**

These standards are many pages covering a broad range of requirements. Intent appears to be similar to some end user requirements for projects.

Changing & New Codes & Standards

IOGP—International Association of Oil & Gas Producers

JIP 33

1. **End users specifications combined into one specification standardization**
2. **2015 4 supplements**
3. **2017 11 supplements**
4. **2019 35 supplements**

Changing & New Codes & Standards

IOGP—API, ASTM, ASME, ISO, MSS

Project requirements included

Increasing requirements to existing standards must be managed concurrently

Will the replacement of customer specifications, Norsok, etc. occur?

What will be the impact in the market place?

Limited availability decreasing manufacturers meeting requirements?

Increased lead times for increased requirements?

Future stock requirements changes?

Made-to-order transition from current stock?

Changing & New Codes & Standards

API 11 published and in task group standards

ASME 5 published standards

MSS 14 standards and ANSI recognized standards

ISO 13 new and in working groups standards

IOGP 35 new standards

78 standards

MANY MORE STANDARDS NOT INCLUDED HERE

Thank you!

Do you have questions?

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