

API 600 Cast Steel Gate Valve: Bolted Bonnet, Class 150–900

The API 600 cast steel gate valve, with bolted bonnet, outside screw and yoke (OS&Y) rising stem and flexible or solid wedge, is the basic isolation valve of refineries and petrochemical plants. The standard defines minimum wall thicknesses, stem diameters and trim materials for heavy-duty service.

Technical specifications

Size	2"–42" (DN50–DN1050)
Pressure class	ASME Class 150, 300, 600, 900 (bolted bonnet)
End connections	RF / RTJ flanged (ASME B16.5 / B16.47), butt-weld (ASME B16.25)
Wedge	Flexible or solid
Trim	API Trim 1, 5, 8, 10, 12 and others
Materials	WCB, WCC, LCB, LCC, WC6, WC9, C5, CF8M
Operation	Handwheel, bevel gear operator, multi-turn electric actuator
Testing	API 598; API 624 low emission on request



Key features

- OS&Y rising stem: position visible from outside
- Flexible wedge: resists thermal binding
- Renewable seat rings and backseat
- Clear material definition by API trim number

Face-to-face dimensions (mm)

Flange-to-flange dimensions of cast steel gate valves follow ASME B16.10, so valves of the same size and class are interchangeable between manufacturers.

NPS	DN	Class 150	Class 300	Class 600
2	50	178	216	292
2½	65	190	241	330
3	80	203	283	356
4	100	229	305	432
6	150	267	403	559
8	200	292	419	660

NPS	DN	Class 150	Class 300	Class 600
10	250	330	457	787
12	300	356	502	838
14	350	381	762	889
16	400	406	838	991
18	450	432	914	1092
20	500	457	991	1194
24	600	508	1143	1397

Values are for raised-face (RF) flanged ends and conform to ASME B16.10. Ring-type joint (RTJ) ends are slightly longer; butt-weld (BW) end-to-end dimensions are listed separately in the standard. Exact dimensions are shown on the general arrangement (GA) drawing supplied with the quotation.

Typical part materials

Part	Carbon steel	Low temperature	Stainless steel	Alloy steel (high temperature)
Body, bonnet, wedge	A216 WCB	A352 LCB / LCC	A351 CF8, CF8M, CF3, CF3M	A217 WC6, WC9, C5
Seat ring	A105N (hardfaced)	A350 LF2	Same stainless grade as body	A182 F11, F22, F5
Stem	A182 F6a (13Cr)	A182 F304	A182 F304, F316, F304L, F316L	A182 F6a
Stud bolts / nuts	A193 B7 / A194 2H	A320 L7 / A194 7	A193 B8, B8M / A194 8, 8M	A193 B16 / A194 4
Gland bushing, backseat	A182 F6a	A182 F304	Same stainless grade as body	A182 F6a

In all material groups, the standard gasket is spiral-wound SS304/SS316 with graphite filler and the standard packing is flexible graphite (PTFE on request). The stem nut is austenitic ductile iron (A439 D2) or copper alloy, and the handwheel is malleable iron. For sour (H₂S) service, materials and hardness are selected to NACE MR0175 / ISO 15156.

Trim options (API 600)

Trim is the material combination of the internal parts in contact with the fluid: wedge (or disc), seat and stem. Stating the trim number in the inquiry and the order defines the internal materials in a single line:

Trim no.	Wedge / disc face	Seat face	Stem	Typical service
1	13Cr	13Cr	13Cr (F6a)	Water, air, general service
2	304 (18Cr-8Ni)	304	304	Mildly corrosive service
5	CoCr hardfacing (Stellite)	CoCr hardfacing	13Cr	High temperature, steam, erosive fluids
8	13Cr	CoCr hardfacing	13Cr	Hydrocarbons and steam; the most common trim for carbon steel valves
10	316 (18Cr-8Ni-Mo)	316	316	Corrosive service

Trim no.	Wedge / disc face	Seat face	Stem	Typical service
12	316	CoCr hardfacing	316	Corrosive and erosive service
13	Alloy 20 (19Cr-29Ni)	Alloy 20	Alloy 20	Sulfuric acid and similar aggressive media
16	CoCr hardfacing	CoCr hardfacing	316	Severe corrosive and erosive service

The table lists the most common trims. For the full API 600 trim table (1-18) or special trims, send us your specification.