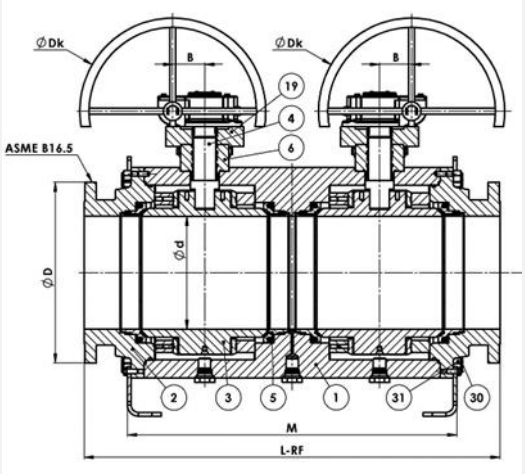
DOUBLE BLOCKING BALL VALVES

CONTENT

1. General

API 6D defines a double blocking valve as a "single valve with two seating surfaces that, in the closed position, provides a seal against pressure from both ends of the valve with a means of venting / bleeding the cavity between the seating surfaces."
A double block and bleed valve is like having three valves in one.

There are a couple different styles of double block and bleed valves. One style has two independently seating valves inside, with a bleed or drain valve in between. This configuration is referred to as a double isolation and bleed (DIB). The DIB valve can isolate either side of the valve (bi-directionally) to vent or bleed the cavity and isolate piping.



Using a single double blocking valve system versus 3 separate valves saves installation time, weight on the piping system, and space. It also cuts down the number of leak paths to the atmosphere, reducing the risk of hazards when transferring liquids dangerous to humans or the environment.

2. Applications

Which applications require a double bock blocking valve?
Double block and bleed valves are commonly used in the oil and gas industry but can also be helpful in many other industries.
It is typically used where bleeding the valve cavity is required, where piping needs isolation for maintenance, or for any of these other scenarios:

- Exits of Christmas trees or instruments connections at well heads.
- Remove equipment from service for cleaning or repair
- Meter calibration
- Chemical injection and sampling
- Isolate instrumentation such as pressure indicators and lever gauges
- Primary process steam

3. Technical description

The ball valve design meets the requirements of API 6D and EN 14141 or API 6A as well as those of the related normative documents. Each valve can be operated independently from each other.

3.1 Main design characteristics

- Soft seats of PTFE, PEEK or similar elastomers or metal/metal sealing systems with hardened surfaces TCC (Tungsten carbide) or CCC (Chrome carbide) applied in HVOF
- Leak rate according to ISO 5208 Rate A or upon request
- Three-part housings (split body) made of forged material
- Internal cladding of all surfaces in contact with the medium upon request.
- End connections flanged (RF, RTJ, Etc.) or weld ends (BW)
- Depending on the nominal width with trunnion guided or floating balls
- Blowout-safe operating stem design
- No electrostatic charge-up
- Maintenance free

The bleeding connection between the balls can be equipped with:

- Closed by a threaded plug
- Equipped with a valve (needle or ball)
- With an automatic safety valve which vents overpressure automatically

3.2 Sizes

- According to API 6D 2” up to 36”
- According to API 6A 2 1/16” up to 16”

3.3 Pressure classes

- According to API 6D 150# up to 2500#
- According to API 6A 2000 up to 15000 psi

3.4 Connections to the pipe

- Flanged ends (RF, RTJ, or other) According to ASME B16.5, ASME B16.47, EN 1092-1, etc.
- Butt welding ends (BW) according to ASME B16.25 or EN 12627.
- Combined with one flange end and one weld on end

4. Materials used

4.1 Standard materials for valves according to API 6D

Component	Carbon steel		
	For temp. range -46°C till +300°C	**For temp. range -60°C till +300°C**	**For temp. range -25°C till +300°C**
Body	A350 LF2	*A350 LF2	A350 LF2
Bonnet			
Ball (basic material)	A182 F316		
Stem	17-4PH		
Seat (basic material)	A182 F316		
Seat inserts	POM	PEEK	PEEK
Seat and ball surface at metal seated design	TCC applied in HVOF		
Bolts	A320 L7		
Nuts	A194 Gr 4		
Seals	HNBR	HNBR	VITON

*Material tested for -60°C (impact test)
The temperature range for materials subject to pressure / temperature curve and applicable technical standards
Temperature range can be limited depending on the seal material used

4.2 Other materials (upon request)

Component	Other possible materials (extract)
Body	A105, A182 F316, A182 F51, A182 F55, 17-4PH, nickel alloys, titanium
Bonnet	A105, A182 F316, A182 F51, A182 F55, 17-4PH, nickel alloys, titanium
Ball (basic material)	A105 with ENP coating, A350 LF2 with ENP coating, A182 F6a, 17-4PH, A182 F51, A182 F51, nickel alloys, titanium
Stem	A182 F6a, A182 F51, A182 F55, nickel alloys, titanium
Seat (basic material)	A182 F304, A182 F51, A182 F55, nickel alloys, titanium
Seat inserts	NYLON, DEVLON
Seat and ball surface at metal seated design	Stellite, CCC applied in HVOF, WCC alloy applied in HVOF
Bolts	A193 B7, A193 B7M, A193 B8, A320 L7M
Nuts	A194 2H, A194 2HM, A194 7, A194 7M, A194 Gr.8, A194 8M
Seals	KALREZ, LIPSEAL

4.3 Materials for valves according to API 6A

These valves can be provided in all material classes defined in the API 6A norm (AA up to HH) or in special materials upon es requested by the user.

5. Testing

The valves are subjected to the following tests according to API, ASME, EN or others standard:

- Pressure tests
- Functional tests
- Non-destructive tests and examinations
- Material traceability certifications according to EN 10204 3.1 or 3.2

The scope of testing is specified by the requirements of the customer.

5.1 Standard tests if not specified otherwise

- Hydrostatic pressure test according to API 598 at 1.5 times the nominal pressure of the valve, done with water
- Seat tightness test according to ANSI/FCI70-2 I at 1.1 times the nominal pressure of the valve, usually done with water.
- Functional test with an actuator without pressure

5.2 Additional tests on request

Material tests

- X-ray of welding seams
- Dye impregnation
- Magnetic particles distribution
- PMI (Positive Material Identification)

Valve tests

- Functional test under pressure
- Low pressure test with gas (0,34 / 1 bar) (API6D H3.2)
- Low pressure test with gas (5.5 / 6.9 bar) (API6D H3.3)
- High pressure body test with gas (API6D H4.2)
- High pressure seat test with gas (API6D H4.3)
- Antistatic test (API6D H5)
- Torque measurement (API6D H6)
- Cavity relief test (API6D H8)
- Double block & bleed test (API6D H9)
- Double isolation & bleed DIB-1 (API6D H10)
- Double isolation & bleed DIB-2 (API6D H11)

6. Operation

Each ball can be operated independently by:

- Manual (lever)
- Manual with gear operator
- Electric actuator
- Pneumatic actuator
- Hydraulic actuator
- Gas over oil actuator
- Others

When specified the valve are supplied with the corresponding actuator and the specified automation of the actuator.