

# WHAT IS A DOUBLE BLOCK AND BLEED VALVE?

UNDERSTANDING SINGLE-VALVE ISOLATION

The term "Double block and bleed" (DBB) arises whenever a line has to be isolated with confidence for maintenance, instrument work or product segregation. The term covers both a valve design and a piping practice, and the two are related but not identical. This article explains what DBB means, how it differs from double isolation and bleed (DIB), and what to look for when specifying one.

**The Basic Idea**

Double block and bleed means two barriers, the "blocks," with a vented space between them, the "bleed." With both blocks closed, the cavity between them is opened to a safe vent or drain. If the upstream block leaks, the leakage comes out of the bleed instead of going downstream, and anyone checking the bleed can see that a seat is passing. An open bleed with no flow is a practical check that isolation is holding.

This can be built from separate components: two block valves in series with a small bleed valve between them. It can also be done in a single valve body with two seats and a cavity vent or drain.

**The OSHA Meaning**

In U.S. workplace safety rules, OSHA's permit-required confined spaces standard (29 CFR 1910.146) defines double block and bleed as closing a line, duct or pipe by closing and locking or tagging two in-line valves and opening and locking or tagging a drain or vent valve in the line between them. This is a lockout and isolation practice. Whether it is acceptable for a given job is decided by the site's safety program and applicable regulations.

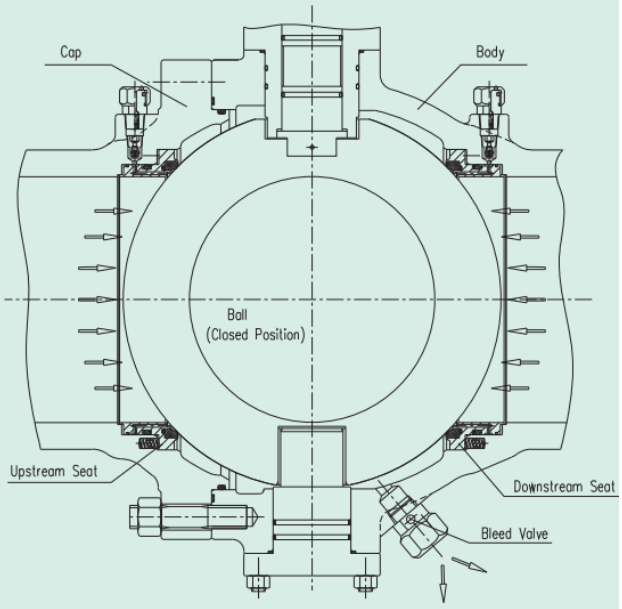
**The API 6D Definition (Single Valve)**

For pipeline and piping valves, API Specification 6D defines a double block and bleed 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 or bleeding the cavity between the seating surfaces.

API adds an important note: a DBB valve does not provide positive double isolation when only one side is under pressure. A typical DBB ball valve has two self-relieving, single piston effect (SPE) seats. If the cavity pressure rises above line pressure, the seat lets it relieve back into the line. That protects the valve from trapped cavity pressure, but with pressure on only one end, the downstream seat is not a second positive barrier.



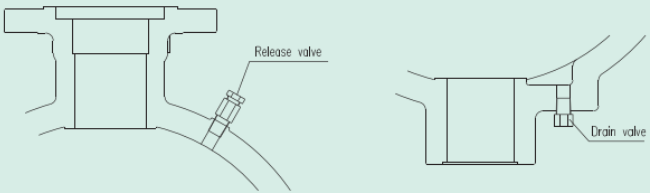
**1. Double Block and Bleed**




Seats are spring-loaded and seal individually on the upstream and downstream sides of the ball, whether the valve is in the fully open or fully closed position. The body cavity can be isolated from the pipe line pressure, and the body cavity can then be bled down or drained through a drain plug.

## 13. Valve Vent and Drain

TM Series valves are usually supplied with a vent valve located in the upper part of the body and a drain plug located in the lower part of the body. Smaller size valves may have a vent/drain valve located in the lower part of the body only.




**Double Isolation and Bleed (DIB)**

API 6D separately defines a double isolation and bleed (DIB) valve: a single valve with two seating surfaces, each of which, in the closed position, seals against pressure from a single source, with a means of venting or bleeding the cavity. The feature can be provided in one direction or both.

DIB-1: both seats are bidirectional, or double piston effect (DPE). Each seat can seal against pressure from the cavity side, giving true double isolation, but cavity pressure cannot relieve through either seat. An external cavity relief is needed.

DIB-2: one seat is unidirectional and self-relieving (SPE) and the other is bidirectional (DPE). Cavity overpressure relieves through the SPE seat, while the DPE seat holds as the second barrier. The valve is directional, and the SPE seat has to be installed on the upstream (pressurized) side.



API 6D also includes specific seat tests for DBB, DIB-1 and DIB-2 functions when a purchaser specifies them, so state the required function on the purchase order instead of just writing "DBB."



**Selection Checklist**

- Which function do you need: DBB, DIB-1 or DIB-2, or a two-valve-and-bleed piping arrangement?
- Is isolation needed from one direction or both?
- How will cavity pressure be relieved, including from thermal expansion of trapped liquid?
- Where will the bleed discharge, and is the fluid hazardous?
- What pressure class, temperature, materials and end connections are required?
- Is fire-safe certification required?
- Does the job also need to meet a lockout or confined-space procedure?

Ball valve construction also matters. Trunnion-mounted ball valves are the common platform for seat designs that use spring-loaded, piston-effect seats. Cavity fillers reduce the space where media can collect around the ball, but they change how the body cavity behaves, so discuss them with the manufacturer when cavity venting is part of the design.

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