

Double Block and Bleed

The December 2011 Beacon described an incident where a missing plug on a vent line resulted in a flammable material leak that caught fire, causing a fatality. That incident reminded us of the importance of caps and plugs on process vent lines and drains. However, sometimes vents or drains should not be capped or plugged. Some (but not all) uses of a “double block and bleed” isolation system may be examples. For example, the vent on a double block and bleed used to stop material flow by a safety shutdown system most likely needs to be open when the plant is in operation. But, be careful – sometimes the bleed from a double block and bleed needs to be capped or plugged. This is often the case for a double block and bleed used only to isolate equipment for maintenance. Understand your application and how to operate it correctly.

How does a double block and bleed work?

A double block and bleed is often used for a more positive isolation of a process fluid from other equipment. It normally consists of two block valves (Valves 1

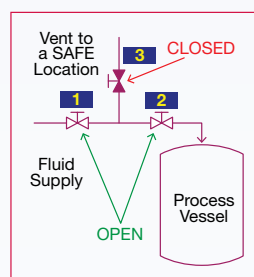
and 2 in the pictures) and a bleed valve (Valve 3) to a safe location, consistent with local environmental regulations. When the process fluid is feeding the downstream equipment, the valves are set as shown in Figure 1, with the isolation valves 1 and 2 open, and the bleed valve 3 closed. When the downstream equipment is to be isolated from the process fluid, the valves are set as shown in Figure 2, with isolation valves 1 and 2 closed, and bleed valve 3 open. If isolation valve 1 leaks, or is accidentally opened, the fluid will be prevented from flowing to the downstream equipment by the second isolation valve 2. There will be no pressure accumulation between the two isolation valves because leaking or trapped material will flow to “a safe place” through the bleed valve 3.

Some uses of double block and bleed include:

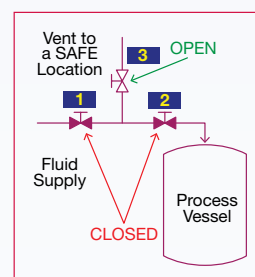
- in some automatic shutdown systems, to stop

material flow, such as in some fuel gas systems for burners

- to provide isolation of hazardous material, temperature, or pressure during equipment maintenance or temporary shutdown
- to isolate steam heat from a batch process where it is required in some steps but heating can be hazardous in other process steps
- to isolate process material feeds that are required for some operations but that can be hazardous if fed during other operations.



▲ Figure 1. Double block and bleed valves set for feeding fluid.



▲ Figure 2. Double block and bleed valves set for isolating fluid.

What Can You Do?

- Know about any double block and bleed valve sets in your plant, and make sure you know when the bleeds should be open and when they should be closed or plugged for each installation (it may be different for different services).
- Understand how to properly operate a manual double block and bleed system – close and open valves in the right order. Know whether the bleed should be closed or plugged, or left open, for each double block and bleed installation.
- For an automatic safety shutdown system, the bleed is often not plugged, but check to be sure.

- Know what may be vented through the bleed, and be sure that it vents to a safe place. It will be necessary to determine what “a safe place” is, depending on what the fluid is and its temperature and pressure. If you have a concern, ask your plant management to confirm that material released from the bleed will be safely vented.
- Recognize that valve manufacturers supply double block and bleed systems as a single assembly that incorporates all three valves, and be aware of any such installations in your plant. These prefabricated valve sets may look different from other double block and bleed installations in your plant.

Know how to properly use your double block and bleed systems!

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