


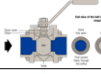
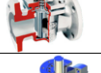
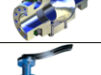
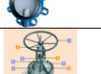



Positive lockout for fluids

Positive isolation of dangerous fluids is providing a safe environment during maintenance, repair or replacement operations, that means:

- All the hazardous energy sources must be identified
- All hazardous energies must be isolated at the source and locked (lockout)
- Residual energies must be eliminated

Valve types

TYPE	Valve type	Sealing	Security	Comment
	Twin Blok Ball valves	+++	True double isolation and bleed (DIB) per API 6D.	Single body with dual positive seals, and dual positively energized seals with cavity bleed port between them
	Ball	+++	Physical disablement	Sealing surface are not exposed to fluid flow
	Plug	+++	Physical disablement	Sealing surface are not exposed to fluid flow
	Trunnion ball valve	++	Double Block and Bleed (as defined in API 6D, but not always by industry).	It requires pressure on upstream and downstream sides simultaneously to energize the respective seals
	Butterfly	++	Physical disablement	Sealing surface are exposed to fluid flow
	Gate	++	lockout	Many turns from O-I

Isolation valves do not always provide a leak-tight seal. Identify whether valves being used for isolation are secure and are providing a tight shut-off depending on the following criteria's:

- Sealing ability
- Security (accidental or deliberate reopening)
- Reliability (partial or total loss of seal)

Bleed valves and Purge Points

Your risk assessment will identify the appropriate position for bleed valves. The bleed should be vented to a safe location. Relevant factors include:

- the inherent hazard of the fluid
- the fluid state
- the type of collection or disposal system available
- the location of any open end of the bleed or vent in relation to the worksite
- the ability to detect any leakage; and
- the level of confidence that the isolation valves are not leaking and can withstand overpressures which may develop from other parts of the system.
- If the bleed is connected to other equipment, than the possibility of a back pressure should be considered

Purge points are pipe nipples installed at strategic locations in the piping system for the purpose of introducing or removing toxic or hazardous gas.

Blank flange, Spade, Spacer and Spectacle plate

All spades and blinds should be clearly marked with material, size and rating.



Positive lockout for fluids

Gaskets

A gasket is a mechanical seal from resilient material, which fills the space between two or more mating surfaces, generally to prevent leakage from or into the joined objects while under compression. Gaskets are compressed by bolts to create seal. Commonly used types are; sheet, spiral wound or solid metal ring.


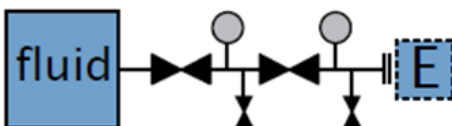
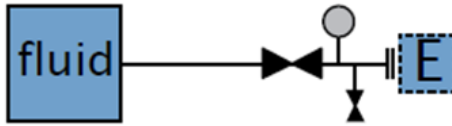
Whilst performing **isolation of fluids**, the following selection criteria's should be taken into account:

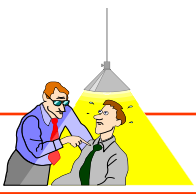
- Duration of the isolation
- Substance category
- Release factor, pressure and line size
- Location factor; place outside or in a building with workers
- Operational status of the system – shutdown and depressurized or still in service

First shutdown, depressurize and remove the hazardous substance out of the pipe system before installing a positive isolation on it included the lockout. Perform a risk assessment to support your best choice (see Guidelines for Isolation AM safety ST001 - Isolation 14.1 & Appendix 6; Example of a selection tool to establish the 'baseline standard' for a final isolation; HSE UK).









































Below a set of possible ways of working. The kind of lock out to be used may depend on a number of conditions, cf. the description in the above referenced guidelines.

! Best Practice !

Category	Method	Features
Positive isolation		
	Physical disconnection. Removable piping spool and spectacle blind or blind spade. Must withstand the system design pressure!	Complete separation of the plant/ equipment to be worked on from other parts of the system. For high pressure or toxic or high hydrocarbon or confined spaces.
	Double block, bleed and spade.	Valved isolation of an appropriate standard is required during the installation of positive isolation.
	Single block and bleed and spade. Lower rating systems	



Consider these questions during auditing

-    Is positive isolation performed when working on toxic gas equipment?
-    Are disconnections done for high risk and long term lockouts of
-    Is the need for positive isolation for toxic gases the outcome of a risk assessment?
-    Are all toxic gases identified, is there a classification of all gases on the plant?
-    Are selection criteria considered for selection of the isolation method for fluids/gases?
-   Is DBB always used as a positive lockout device?
-    Are mostly ball and plug valves used as isolation valves?
-    Are all bleeds and vent valves locked and in an open position when isolation is ongoing? Are they in a safe location?
-    Is pressure rating and construction material marked on relevant line blinks, blank flanges, etc?
-    Is there a verification process on the isolation performed before the maintenance task starts?
-    Are all isolation points uniquely identified?
-    Has safe access been provided to all isolation points?
-    Are the valves immobilized and foreseen with a lock during isolation?
-    Is there a ranking used to order the isolation devices by most secured to less secured? (Physical disconnection, DBB with spades or spectacle plates, SBB with spades or spectacle plates)

This listed points are the minimum to be checked during an audit.