Process Isolation

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Occupational Health and Safety Act 85 of 1993

Employers (Section 8)

Provide a healthy & safe workplace.

Provide systems of work, do training, identify the risks and cause them to be removed or reduced

Employees (Section 14)

Shall obey all lawful instructions given by the employer in the interests of health & safety

Shall look after their own health & safety & that of anyone who may be affected by his/her actions

Report accident to the employer immediately

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PROCESS ISOLATION

Isolation - The process of physically interrupting, disconnecting or removing energy sources.

Energy source - Any source of electrical, mechanical, pneumatic, chemical, thermal or other energy.

I. Engen has two types of Isolation (Electrical and Physical).

II. Energy isolation shall be required before service, inspection, installation, modification and/or maintenance of live equipment and/or pipeline.

III. Where work has commenced but is, or is likely to be, suspended due to faulty parts/components e.g. awaiting spares for a repair.

IV. Mothballed equipment, which may be required in the future.

V. Where an item of equipment becomes redundant and is isolated pending removal or decommissioning.

VI. Valve that should always be on close/open (like PSV/PRD)

PHYSICAL ISOLATION

The mechanism for isolation depends on the nature of the work and type of energy, and include:

- **Positive isolation** - A standard isolation/blinding/spade list shall be applied when physical isolation of equipment or processes is required.

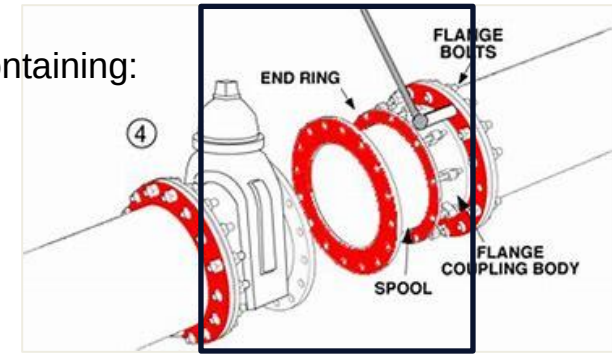
- **Double block and bleed** - The closure of a line or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves

- **Single valve isolation** - consists of the closure of a single block valve.

Positive Isolation

Positive isolation shall be applied for the following activities or situations:

1. Confined space entry.
2. Any work on a system containing or connected to other systems containing:
   - combustible/flammable or explosive material
   - hazardous materials e.g. asphyxiant, toxic, corrosive, irritant
   - energy e.g. high temperature, high pressure, potential, kinetic



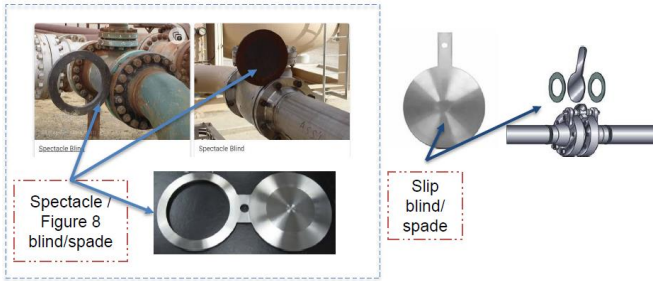
Positive isolation may be carried out as follows:

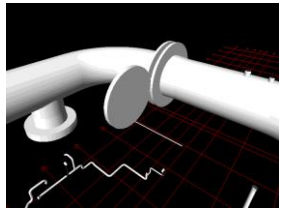
a. **Spool removal** which involves the *removal of a section of piping and bolting blank flanges on to open potential live flanges*. The blank flanges shall be rated for the full line design pressure.

b. **Blind or spade** isolation which involves the *insertion of a blind plate or spectacle blind between the bolted flanges.* The blinds or spades shall be:

O Rated for the full line design pressure.

O Installed on the side of the isolation device which has been isolated, depressurized and cleared of hazardous materials.





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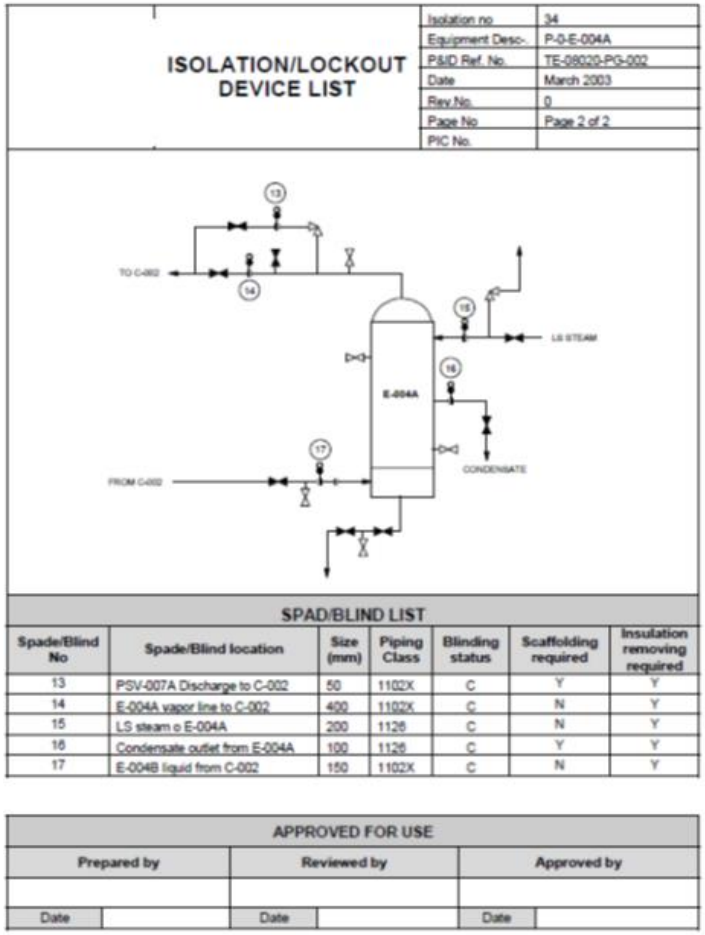
Positive Isolation

- A standard ***isolation/blinding/spade list*** is put in place when physical isolation of equipment or processes is required.

- Where positive isolation is *not feasible*, for example due to space constraint or passing valves, ***a risk assessment*** shall be carried out to consider alternative methods of isolation to allow the work to be executed safely. A detailed ***procedure*** for the work shall also be established.



ISOLATION/LOCKOUT DEVICE LIST

Isolation no	34
Equipment Desc-	P-0-E-004A
P&ID Ref. No.	TE-08020-PG-002
Date	March 2003
Rev No.	0
Page No	Page 2 of 2
PIC No.	

SPAD/BLIND LIST

Spade/Blind No	Spade/Blind location	Size (mm)	Piping Class	Blinding status	Scaffolding required	Insulation removing required
13	PSV-007A Discharge to C-002	50	1102X	C	Y	Y
14	E-004A vapor line to C-002	400	1102X	C	N	Y
15	LS steam o E-004A	200	1126	C	N	Y
16	Condensate outlet from E-004A	100	1126	C	Y	Y
17	E-004B liquid from C-002	150	1102X	C	N	Y

APPROVED FOR USE

Prepared by		Reviewed by		Approved by	
Date		Date		Date	

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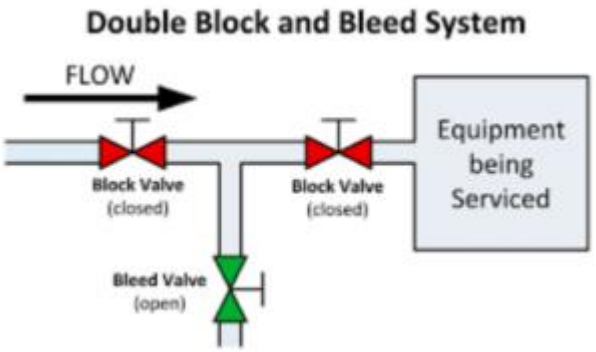
Double Block and Bleed

Double block and bleed isolation is a secure form of valve isolation, provided both the valves can maintain a reliable seal under the particular conditions of service.

a. The *bleed valve shall be locked open* and vented to a safe location, where no back pressure may accumulate.

b. The bleed must be verified to be clear of any blockage

c. The function of the bleed may also be achieved by the use of a valve with a functioning body bleed in the open position.



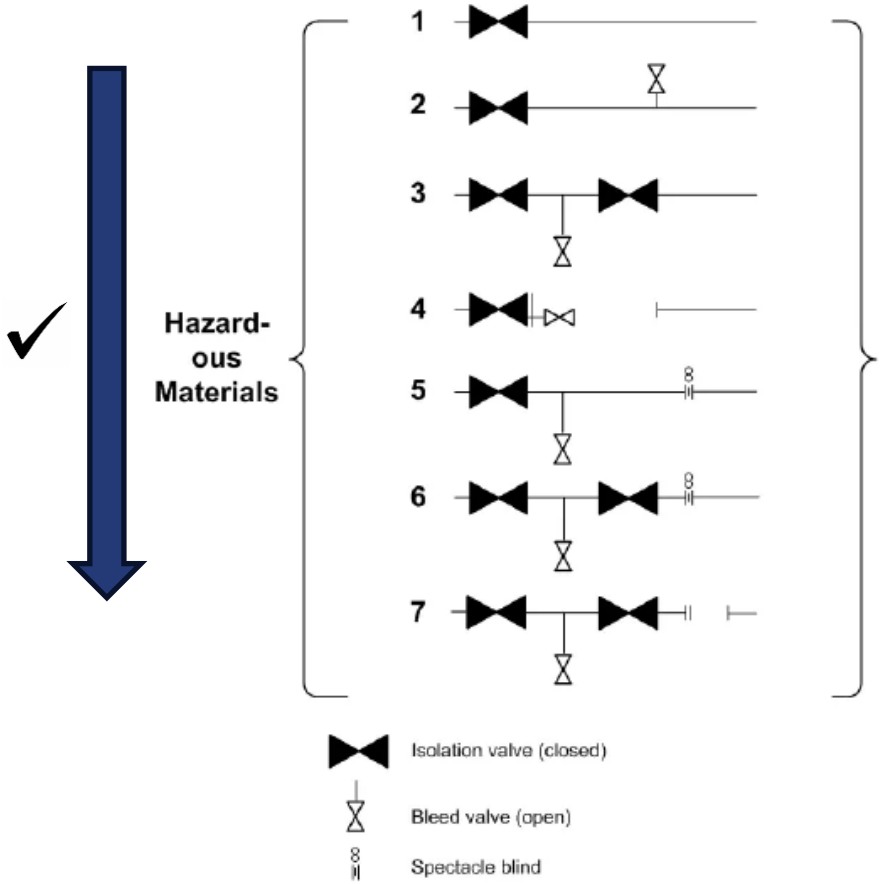
Single Valve Isolation

Also involves *valve isolation*:

1. The system is connected to other systems containing non-hazardous material, AND
2. There is no possible release of other hazards such as high pressure and high temperature.

- A valve used for SVI must provide a reliable seal which must be verified before starting the work.
- Where the security of the isolation can be compromised by operation of a single valve, positive measures to prevent operation shall be taken and clearly stated in the JMS.

Single Valve Isolation



- Level 1 — Closed Valve
- Level 2 — Closed Valve with Open Bleeder
- Level 3 — Double Block and Bleed
- Level 4 — Block and Bleed with Line Break
- Level 5 — Block, Bleed and Spectacle Blind
- Level 6 — Double Block and Bleed with Blind
- Level 7 — Double Block and Bleed with Line Break

Blinds in Process Piping - by Ian Sutton - Net Zero by 2050 (substack.com)

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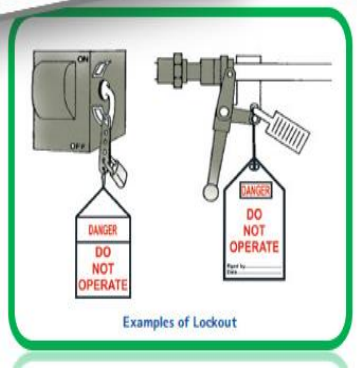
Lock Out, Tag Out (LOTO)

- Physical Isolation
- ❑ Blinding
- ✓ First Flange closest to the vessel
- ✓ Tower or Level Gauge Drain Lines, plugged or disconnected
- ✓ Double Block/Bleed NOT equivalent to blinding
- ❑ Energy Isolation (Lockout/Tagout)
- ✓ Electrical / Radiation Sources
- ✓ Rotating/Electrical parts
- ✓ Process Materials / Chemicals



Examples of Lockout

Electrical

LOTO at substation and at the field

Electrical ACP lock & tag (red)

Operation group lock & tag (blue)

Physical

Operation group lock & tag (blue) at the valve

Lock out box

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