

Blanking and Blinding Practice

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1.0 Purpose

The purpose of the Blanking and Blinding Practice is to provide instructions for the safe isolation of production processes, facilities, and equipment using blanks and blinds. The isolation is needed prior to the commencement of work to protect personnel and equipment by preventing the entry of any hazardous substances into the immediate work area. Blanking/blinding, separating, or plugging are the most positive methods of isolating systems containing pressure, toxic, or flammable materials.

2.0 Scope/Application

- a) This Blanking and Blinding Practice applies to Cenovus operations and is to be followed by all Cenovus staff and contractors.
- b) This practice is to be used as the basis for developing business unit (BU) site-specific work plans or procedures when any vessel, equipment, or piping system is being commissioned, started up, shut down or being prepared for inspection, construction, maintenance, or repair.
- c) For vessel entry or hot work, blanks/blinds should be installed at the vessel nozzles. If this is not practical, then the closest set of flanges to the vessel should have the blanks/blinds installed while ensuring that any interconnecting lines (including drain line) between the vessel nozzle and the isolating flange are also blanked/blinded or separated and plugged.
- d) If double block and bleed is not available, or if installing blanks/blinds creates a hazard for equipment isolation, a site-specific procedure must be developed. This procedure must offer an equivalent level of safety and be approved by the applicable governing authority.

3.0 Blanking and Blinding Process

3.1 Potential Hazards

- a) Explosion or explosive/flammable vapours,
- b) Toxic gas,
- c) High pressure gas or liquid,
- d) Kick from pipe due to improper alignment and pressure buildup,
- e) Environmental damage due to spillage, or
- f) Auto start drivers in an isolated system not being locked out.

Note: All equipment must be isolated, locked, and tagged from **all** hazards prior to any work commencing.

3.2 Precautions

- a) Cathodic protection systems must be shut down and flanges bonded prior to installing blinds or disconnecting piping.
- b) Heat tracing should be shut off on piping being blinded to minimize the potential of thermal expansion.
- c) The piping system should be physically checked to ensure that the depressuring, draining, and pre-blinding purge is complete.
- d) Loosening flanges and manways should be done in a safe manner as if pressure were present. Loosen the bolts opposite the worker first. If any liquid remains in the line, it will be directed away from the worker. The bolts on the side of the worker should be left until last. **Never** remove all the bolts before breaking the flange.
- e) Double-check that all nozzles into a vessel are properly isolated. Ensure that the proper pressure-rated blanks/blinds and gaskets have been used and the gaskets are installed correctly.

3.3 General Requirements

- a) A blank/blind tag board system should be used in all Cenovus facilities. For large-scale blanking/blinding jobs in large facilities or for general turnarounds, a workable system to track and account for all blanks/ blinds and plugs is mandatory.
- b) A Safe Work Permit should be obtained, and the necessary breathing apparatus, fire extinguishers, jumper cables, and other safety equipment must be on hand.
- c) A pre-job safety meeting may be required to discuss the work and all hazards and mitigating measures.
- d) For piping systems designed to operate over 100 kPa (15 psig), proper pressure-rated blanks and blinds must be used:
 - 1) They must have a CRN (Canadian Registration Number) that is valid in the applicable province along with the allowable pressure stamped on the fitting, or
 - 2) They are locally engineered and approved to withstand the maximum pressure to be encountered.
 - 3) They must be compatible to the flange rating (i.e., 150, 300, 600 ANSI, etc.) and the type of flange used (i.e., raised face, flat face, or ring joint).
 - 4) For hydrostatic testing, refer to the Hydrotest Blanks - Selection Chart in Appendix B for proper blind thickness. The selection chart was calculated in accordance to Clause 304.5.3 of ASME B31.3-2008.
 - 5) **Note:** Fully-registered blanks can be purchased from several manufacturers at a price that is very cost competitive with the "build-it-yourself" variety.
- e) Gaskets should be installed on the pressure side and, where possible, on both sides to prevent damage to flange faces.
- f) Where applicable, site-specific job procedures or guides must be followed.
- g) As part of the turnaround planning, develop specific blanking and blinding procedures for individual pieces of equipment where appropriate.

- h) A blanking/blinding checklist should typically contain the following information:
 - 1) Name of facility, equipment number, and description
 - 2) Service
 - 3) Tag number
 - 4) Blind location
 - 5) Blind size and pressure rating
 - 6) Gasket/spacer requirements, upstream or downstream, split or full gaskets
 - 7) Authorization signatures
- i) Always use the correct tools for the job, and ensure they are in good condition.
- j) Never attempt to center a gasket with your fingers.
- k) Recommended flange spreaders are of a clevis or wedge type (Titan). If clearances are too tight to allow the blind to be installed, contact engineering for further assessment as piping modification may be required.
- l) When blanking/blinding is in progress, all isolating valves must be secured in the closed position by chaining and locking, or car sealed for the duration of the blank/blind installation or removal.
- m) Always be prepared to close the flange if gas or liquid starts to come through the opening.
- n) For final bolting, non-ferrous hammers should be used. Impact wrenches should not be used.
- o) When equipment (pumps, heat exchangers, and control valves, etc.) has been removed or left open and unattended, connections must be blanked or blinded off if the equipment is:
 - 1) In C4 or lighter service.
 - 2) In hydrocarbon service where the Reid Vapour Pressure (RVP) exceeds 103 kPa (15 psi) or the temperature of the product is less than 10°C (20°F) below the hydrocarbons flashpoint.
 - 3) In toxic or noxious service.
 - 4) In other flammable service where welding or other sources of ignition may be nearby.
 - 5) In any service where leakage of fluid or pressure constitutes a hazard.
 - 6) Excluding these services or conditions, lockable block valves can be used for isolation purposes (double block and bleed).
- p) Note that each operating unit or area should maintain an up-to-date blind list of the equipment requiring blinding as the appropriate isolation method.
- q) During turnarounds or construction, blanking/blinding of individual vessels may not be necessary where an entire unit is out of service and all oil, gas, chemical, and utility lines have been blanked or disconnected at the facility perimeter and the unit is considered gas free.
- r) When the job is done, remove all blanks/blinds by the same procedure in which they were installed, and use a Safe Work Permit and a blanking/blinding checklist to log off blanks/blinds.

3.4 Exceptions

In some instances, blanking/blinding is not possible and/or practical. Exceptions to blanking/blinding are:

- a) When a hazardous work environment is not an issue and the blank/ blind installation process may cause the mechanical equipment to be misaligned.
- b) When the potential exposure to hazards is greater with the blind installation process than the work itself without blind isolation.
- c) When there is no requirement for personnel entry into the equipment and safety integrity is not compromised.
- d) When replacing a part/component on a piece of equipment that is:
 - 1) Attended 100% of the time,
 - 2) Posted with an appropriate **temporary warning sign(s)**,
 - 3) Free of any risk to personnel or the environment, and
 - 4) Being monitored for any changes in normal operation.

If it is not reasonably practicable to provide blanking, blinding or double block and bleed isolation, Cenovus must ensure that the alternate means of isolation provides adequate protection to workers and is certified as being appropriate and safe by a professional engineer.

The record of its certification, location, and conditions of service **must** be kept on file and a copy attached to the Safe Work Permit.

NOTE: This includes any newly made blanks and blinds certified by an engineer

3.5 Roles and Accountabilities

Roles and responsibilities for safety documents are described in the link below:

Cenovus CEN-EHS234, Roles and Responsibilities Standard

Roles and responsibilities specific to the Blanking and Blinding Practice described below:

3.6 Supervisor

The Supervisor ensures the work teams and the individual workers are competent in this practice and site-specific procedures prior to letting them perform blanking/blinding work independently.

3.7 Work Team

The Work Team must utilize this practice as the basis to build site and equipment-specific blanking/blinding procedures, where required, and/or identified by the risk assessment.

3.8 Workers

All workers must understand all aspects of this practice, its intent, and uses the information and knowledge in a competent manner.

4.0 References

4.1 Internal References

1. Cenovus form CEN281, *Blind Checklist*

4.2 External References

1. ANSI/ASME B16.48-2005, *Steel Line Blanks*
2. ASME B31.3-2008, *Power and Process Piping*

5.0 Change Management

Proposed changes to this practice can be directed to H&S Programs & Projects [s](#)

6.0 Definitions and Acronyms

Definitions and acronyms for safety documents are described in the link below:

Cenovus CEN-EHS243, Definitions and Acronyms

The following definitions and acronyms are specific to the Blanking and Blinding Practice.

ANSI means American National Standards Institute

ASME means American Society of Mechanical Engineers

Blanking/Blinding refers to the process of installing “blanks/blinds” or steel plates designed to fit between flanges and across pipe openings at locations between the isolated systems and the upstream and downstream isolation valves. These blanks/blinds ensure that no contaminants such as sour gas or combustibles, etc., get into the isolated components while they are being worked on.

Blind Flanges means full pressure-rated blinds that are used to blind/ blank a flange.

BU means business unit

CRN means Canadian Registration Number

Depressuring refers to the process of removing pressure from an isolated system or system components until it has equalized with atmospheric pressure.

Double Block and Bleed refers to the isolation of a system where two block valves are used together with a bleed valve located between these two valves. This can also be accomplished using a single valve with a block and bleed system built in. The bleed valve must be locked in the open position and piped to a safe place of disposal in the event of a block valve failure.

Isolating refers to the process of taking or separating a part of a process system from service. This includes vessels, equipment, piping, valves, gauge glasses, float columns, and electrical connections, etc.

Pressure-Rated Blanking/Blinding means installing isolating devices that are designed to withstand the pressure rating of the flanges and fittings of the system being isolated. These isolation devices are either ASME-approved manufactured fittings, and stamped to certify so, or locally engineered and approved pieces of metal plate that are installed between a set of flanges or bolted to the end of an open flange.

Separating and Plugging is a method of isolating screwed or union connected piping where the screwed pipe or unions are separated and the open ends are either capped or bull plugged.

Spade or Paddle Blind is a pressure retaining, circular flat metal plate with a handle.

Spectacle Blind is also known as a “figure 8 blank.” It is a pressure retaining, circular flat metal plate with one solid end and one open end connected with a web or tie bar. This is essentially a spade or paddle blind and a spacer all in one. Their location and requirements are determined during the process facility design stage.

Appendix A Applicable Legislation

The Blanking and Blinding Practice encompasses requirements of the following legislation.

1. Alberta OHS Code (2009)

- a) Part 2 – Hazard Assessment, Elimination and Control
 - Section 7 – *Hazard Assessment*
 - Section 8 – *Worker Participation*
 - Section 9 – *Hazard Elimination and Control*
 - Section 10 – *Emergency Control of Hazard*
- b) Part 10 – Fire and Explosion Hazards
 - Section 168 – *Industrial Furnaces and Fired Heaters*
- c) Part 15 – Managing the Control of Hazardous Energy
 - Section 213 – *Verifying Isolation*
 - Section 215.4 – *Isolating Piping*

2. Saskatchewan OH&S Regulations (amended to 2009)

- a) Part III – General Duties
 - Section 12 – *General Duties of Employers*
 - Section 22 – *OH&S Program*
- b) Part XVIII – Confined Space Entry
 - Section 275 – *Piping Discharging Hazardous Material*
- c) Part XXV – Fire and Explosion Hazards
 - Section 374 – *Piping*

Appendix B – Hydrotest Blanks Selection Chart

Blank Thickness		Nominal Pipe Size, inches							Nominal Pipe Size, mm						
		2	3	4	6	8	10	12	60	89	114	168	219	273	324
inches	mm	Allowable Hydrostatic Test Pressure, psig							Allowable Hydrostatic Test Pressure, kPag						
0.250	6.350	952	450	288	139	85	56	40	6,564	3,103	1,986	958	586	386	276
0.375	9.525	2,142	1,013	648	314	192	127	91	14,770	6,985	4,468	2,165	1,324	876	627
0.500	12.700	2,048	1,800	1,152	557	341	225	161	14,120	12,410	7,943	3,841	2,351	1,551	1,110
0.625	15.875	3,200	2,813	1,800	871	533	352	252	22,060	19,400	12,410	6,006	3,675	2,427	1,738
0.750	19.050	4,608	2,243	2,592	1,254	768	506	362	31,770	15,470	17,870	8,646	5,295	3,489	2,496
1.000	25.400		3,987	2,835	2,230	1,365	900	644		27,490	19,550	15,380	9,412	6,206	4,440
1.250	31.750		6,230	4,429	2,222	2,132	1,407	1,006		42,960	30,540	15,320	14,700	9,701	6,936
1.500	38.100			6,378	3,200	2,296	2,025	1,449			43,980	22,060	15,830	13,960	9,991
1.750	44.450				4,356	3,125	1,936	1,972				30,040	21,550	13,350	13,600
2.000	50.800					4,082	2,528	1,800					28,150	17,430	12,410

Notes:

1. The shaded pressure readings apply to ring joint flanges only.
2. The unshaded pressure readings apply to raised or flat face flanges only.
3. The allowable test pressure was calculated in accordance to clause 304.5.3 of ASME/ANSI B31.3-2008.
4. The plate material used for this calculation was A-285 Gr. A. Other alternative materials are A-285 Gr. B and C, A-299, A-525, A-516 and A-537
5. The allowable stress used was 90% of the SMYS. Zero corrosion allowance was used.

This selection chart is for hydrotesting blanks only. **Do Not Use For Permanent Blanks!**

Appendix C – Blind Checklist (CEN281) located here