

Changes shown by ↗

SCOPE

- I 1.1 This practice covers the arrangement and installation of vents, drains, and flushing and cleaning connections in piping, equipment, and instruments.
- I 1.2 Design and installation requirements for venting, draining, and flushing, not specifically covered by other International Practices shall comply with the requirements given herein.
- I 1.3 **An asterisk (*)** indicates that additional information is required. If a job is contracted, this additional information is furnished in the Job Specification.

DEFINITIONS

- I 2.1 **Dangerous materials**, as used herein, include the following materials:
 - a. Toxic materials such as phenol, hydrogen sulfide, chlorine.
 - b. Highly corrosive materials such as acids, caustic.
 - c. Flammable materials and combustible liquids as defined below.
 - d. Boiler feedwater and steam in systems requiring Class 300 or greater flange ratings.
 - e. Oxygen in concentrations greater than 35 percent.
- I 2.2 **Combustible liquids**. High flash liquids [flash point 100°F (38°C) or higher] when handled at temperatures **more than** 15°F (8°C) below their flash point.
- I 2.3 **Flammable liquids**. Low flash liquids [flash point below 100°F (38°C)]; and high flash liquids [flash point 100°F (38°C) or higher] when handled at temperatures **above or within** 15°F (8°C) of their flash points.
- I 2.4 **Flammable materials**. Flammable liquids; hydrocarbon vapors; and other vapors, such as hydrogen and carbon disulfide, that are readily ignitable when released to atmosphere.
- I 2.5 **Frequent operation of vents and drains**, as used herein, infers a frequency of use of once or more per two-week period.

VENTS AND DRAINS

- O *3.1 Low point drains and high point vents shall be provided as required for pressure testing, start-up, chemical cleaning and for decommissioning.
- O,S 3.2 The need for valving vents or drains, and drain piping, shall be based on service and operation as follows:

TYPE OF SERVICE	*OPERATIONAL REQUIREMENTS		
	Normally or frequently in an open position	Startup and shutdown, or taking equipment out of service	Used only for pressure testing
*Dangerous Materials	Vents and Drains installed on piping, equipment and instruments, shall be valved. Vent and Drain discharge piping is required per Par. 3.3 .	Vents and Drains shall be valved; and either plugged, capped or blinded.	Vents shall be plugged, capped or blinded Drains shall be valved; and either plugged, capped or blinded.
Steam under Class 300 rating	Vents and Drains shall be valved.		
All other non-dangerous materials	Drains shall be valved. Vents shall be plugged, capped or blinded.		

Threaded plugs or caps shall be used for connections NPS 1 1/2 (40 mm) and smaller, and blinds for connections NPS 2 (50 mm) and larger.

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- S,E **3.3** **Discharge piping** required from **valved vents and drains normally or frequently in an open position** shall be as follows:
- * a. **Toxic and highly corrosive materials** shall be piped into a **closed drain system** appropriate for the fluid properties. For example: phenol shall be tied into a separate collection system, acidic or caustic wastes may require neutralization or other treatment before discharge to the sewer system.
 - * b. **Flammable materials and combustible liquids** shall discharge as specified to: a sewer, a closed system, or a safely located drain outlet or vent. Discharge arrangements shall be reviewed with the Owner's Engineer.
 - ♦ c. If a condensate return system is not provided, **steam** may terminate **at a steam trap**, provided discharge will not be into walkways or other areas frequented by operating personnel. Discharges from locations where hot condensate can accumulate (e.g., below exhaust heads) shall be directed away from operating areas.
 - d. **Other non-dangerous material** discharge may terminate **at the drain valve**.
- O 3.4 The discharge point of drains to open receptacles or sewer drains shall be visible from the location of the drain valve.
- O * 3.5 In plugging services such as catalyst slurry, high viscosity fluids, etc., connections shall be NPS 1 (25 mm) minimum. Non-plugging valves shall be considered for these services.

VENTING PUMP CASINGS

- M * 3.6 **If vents are not specified to be piped back to suction**, pumps handling non-dangerous materials shall be vented, via a valved vent line, to discharge at the base plate or to an open drain.

ADDITIONAL REQUIREMENTS FOR RECIPROCATING PROCESS COMPRESSORS

- S * **3.7** **Packing vent, distance piece vent, and distance piece drain** piping in toxic and flammable material services shall be installed as follows:
- a. Vents and drains shall be separately piped to prevent mixing of gases or backflow from vent or drain system.
 - b. Air and flammable material vent and drain lines shall not be piped together.
 - c. Headers for draining distance piece and packing vents shall not be used for interstage condensate trap discharge.
 - d. An oil knock-out pot shall be included in the vent line from the packing. Each distance piece line shall include a liquid seal - the depth of seal to be at least 6 in. (150 mm).
 - e. Packing vent lines shall be equipped with 3-way valves to permit leakage monitoring.

ENVIRONMENTAL CONSIDERATIONS

- S,E * **3.8** Discharge of petroleum products (including crude, intermediate, vapors and finished products), toxics, and corrosive materials to drain systems, sewers (open or closed), the atmosphere or the ground shall be minimized and must be in conformance with applicable environmental regulations. Such systems are subject to approval by the Owner's Engineer.
- O,E * **3.9** When discharging to the sewer consideration shall be given to the impact the discharged material(s) could have on wastewater treatment operations and discharge limitations. Discharges to sewer are subject to approval by the Owner's Engineer.

FLUSHING CONNECTIONS

- M 4.1 **Temporary connections for flushing purging, and steamout.** **Connections** using steam, water, air, or inert gas from the utility stations shall terminate in a connection mating to that provided on the utility hose.
- * For new work in existing plants, "quick-type" couplings shall be per Owner's standard (i.e., type or catalog number). Details will be furnished by the Owner's Engineer.
- M * 4.2 **Fluidized solids or slurry services.** If flushing of piping is specified, flushing and drain connections shall be located to minimize unflushed "dead-leg" sections. Flushing connections shall be located as closely as practicable to block valves and equipment flanges.
- Discharge piping from valved vents and drains** shall be provided with **flushing connections** located next to the valves.
- O 4.3 Flushing connections shall be NPS 3/4 (20 mm) minimum.