



Coffee Break Training - Fire Protection Series

Inspection Techniques: Pressure-Vacuum Vent Maintenance

No. FP-2012-52 December 25, 2012

Learning Objective: The student shall be able to list the inspection and maintenance requirements for pressure-vacuum vents attached to aboveground flammable or combustible liquid storage tanks.

The device at the top of the pipe is a pressure-vacuum vent for routine venting of aboveground flammable or combustible liquid storage tanks. The vent opens and closes in response to internal tank pressure changes such as those that occur during filling or discharging operations. Without adequate venting, the walls of these tanks could burst or collapse. (See Coffee Break Training FP 2011-9 for a discussion of venting requirements and FP-2010-42 for information on emergency vents.)

Except during pressure changes, pressure-vacuum vents remain closed to prevent unwanted vapor emissions from the stored product. Two poppets (one pressure and one vacuum) seal vapors in the tank when the internal and external pressure are equalized. A poppet is a valve that rises perpendicular to its seat or closed position.

The model fire codes often require that safety equipment be maintained in accordance with manufacturer's standards. In this example, the manufacturer requires **monthly** routine inspections and **immediate** inspections during freezing conditions to assure the venting device functions properly before filling or unloading a tank. The inspection should be performed by a competent person because it includes maintenance on the device in and around a potentially flammable environment.

The following items are just a summary of the steps the manufacturer requires to complete the inspection and maintenance:

- The pressure-vacuum device should be removed from the vent pipe.
- Any dust, debris, snow or ice should be removed from the screens at the top and bottom of the device.
- The outer portion of the device should be removed to expose the internal poppet assemblies.
- The pressure and vacuum poppets and their seats should be checked for damage, corrosion or excessive wear. If any is found, the entire vent assembly should be replaced.
 - If any sticking or binding is found on the **vacuum** poppet, it should be replaced.
- Any dust, debris, snow or ice should be removed from the pressure poppet.
- Once cleaned, the poppet should be exercised manually to verify that it is operational.
- When the checks have been completed, the pressure-vacuum device should be reinstalled on the vent pipe.

This procedure shows that more than just a cursory check of the pressure-vacuum device is needed to protect the tank and its contents. The inspector should check with the tank owner or operator to verify that inspections are being made in accordance with the manufacturer's requirements.

In all cases, always follow the manufacturers' complete inspection and maintenance requirements.



This pressure-vacuum vent should be inspected monthly and maintained during freezing conditions.



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