



Coffee Break Training - Fire Protection Series

Hazardous Materials: Aboveground Flammable and Combustible Liquid Tank Emergency Venting – Part 9: Vent Sizes

No. FP-2013-9 February 26, 2013

Learning Objective: The student shall be able to identify sample nominal normal and emergency vent sizes and capacities used in flammable and combustible liquid tank storage.

The Coffee Break Training series has emphasized the importance of adequate venting for flammable and combustible liquid tanks to prevent catastrophic failures under fire conditions and tank collapse during routine filling and draining.

In many instances, emergency venting is provided through pressure relieving devices such as weighted cover style emergency vents, loose manhole covers, rupture or burst disks, remote-actuated relief devices, or other pressure relieving equipment that may be used in place of pressure relieving tank designs. Although less recognized, in legacy installations the weak roof-to-shell seam construction technique may be used as emergency venting. Remember that in double-walled tanks, equal capacity venting must be provided for both the primary tank and the secondary containment vessel.



Adequate emergency venting is an essential component in the fire control of bulk flammable or combustible liquid storage tanks. (Federal Emergency Management Agency Photo/Yuisa Rios)

The inspector should expect to see a vent with a flow rate capacity that meets or exceeds the flow rate specification defined in UL142/NFPA30 and is based on the wetted surface area of the tank. The following table is extracted from one vent vendor's product literature and is included solely to illustrate sample capacities and sizes. The table does not include the manufacturers' complete list of products nor is it intended to limit alternate venting technologies. Note that vent capacities vary based on the design of the device and manufacturer, and there is not necessarily a correlation between larger vent diameters and venting capacity.

| Minimum Free Air Flow Required | | Design Description | Vent Device Diameter | |
|--------------------------------|------------------|----------------------------|----------------------|-----|
| CFH (ft ³ /hour) | M ³ H | | Inches | Mm |
| 15,500 | 439 | Flame arrester/Vent | 2 | 51 |
| 18,600 | 527 | Pressure vacuum vent | 2 | 51 |
| 27,650 | 783 | Updraft vent | 2 | 51 |
| 43,000 | 1,217 | Pressure vacuum vent | 3 | 76 |
| 60,000 | 1,700 | Emergency vent | 3 | 76 |
| 94,906 | 2,687 | Emergency vent with screen | 4 | 102 |
| 103,799 | 2,939 | Emergency vent | 4 | 102 |
| 161,094 | 4,561 | Emergency vent with screen | 5 | 127 |
| 184,651 | 5,229 | Emergency vent | 5 | 127 |
| 278,660 | 7,891 | Emergency vent | 6 | 152 |
| 504,818 | 14,295 | Emergency vent | 8 | 203 |
| 881,670 | 24,996 | Flanged emergency vent | 10 | 254 |

For additional information, refer to the product manufacturers' literature or listings, and consider employing competent design professionals to evaluate all venting proposals or existing installations.



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