



# Coffee Break Training - Fire Protection Series

## Hazardous Materials: Aboveground Flammable and Combustible Liquid Tank Emergency Venting – Part 6: Wetted Area and Vent Capacity

No. FP-2013-6 February 5, 2013

**Learning Objective:** Given a known tank wetted area, the student shall be able to select from a table the minimum ventilation required through normal and emergency vents.

Where atmospheric, aboveground flammable and combustible liquid storage tanks rely solely on pressure-relieving devices for emergency venting, the vent capacity is based on the tank's wetted area. (See Coffee Break Training FP-2013-4 for an explanation of wetted area.)

The combined air flow capacity of the normal and emergency vents is measured in cubic feet per hour (m<sup>3</sup>/hour) of free flowing air through the venting assemblies. Once the wetted area is determined, minimum air flow volumes are found in the following table from National Fire Protection Association 30, *Flammable and Combustible Liquids Code*.



The storage tanks at this drilling site are uniform in size, so they will have the same wetted area and vent capacities.

### Wetted Area vs. Cubic Feet (m<sup>3</sup>) Free Air Per Hour at 14.7 psia and 60 F (1 bar and 15.5 C)

| SQ. FT. | CFH*    | M <sup>2</sup> | M <sup>3</sup> H | SQ. FT. | CFH     | M <sup>2</sup> | M <sup>3</sup> H | SQ. FT.  | CFH     | M <sup>2</sup> | M <sup>3</sup> H |
|---------|---------|----------------|------------------|---------|---------|----------------|------------------|----------|---------|----------------|------------------|
| 20      | 21,100  | 1.85           | 597.5            | 160     | 168,000 | 14.8           | 4,757.2          | 900      | 493,000 | 83.6           | 13,960.2         |
| 30      | 31,600  | 2.78           | 894.8            | 180     | 190,000 | 16.7           | 5,380.2          | 1,000    | 524,000 | 92.9           | 14,838           |
| 40      | 42,100  | 3.71           | 1,192.1          | 200     | 211,000 | 18.6           | 5,946.5          | 1,400    | 587,000 | 130            | 16,622           |
| 50      | 52,700  | 4.64           | 1,492.3          | 250     | 239,000 | 23.2           | 6,767.7          | 1,600    | 614,000 | 148.6          | 17,386.5         |
| 60      | 63,200  | 5.57           | 1,789.6          | 300     | 265,000 | 27.9           | 7,504            | 1,800    | 639,000 | 167.2          | 18,094.1         |
| 70      | 73,700  | 6.5            | 2,087            | 350     | 288,000 | 32.5           | 8,155.3          | 2,000    | 662,000 | 185.8          | 18,745.8         |
| 80      | 84,200  | 7.43           | 2,384.2          | 400     | 312,000 | 37.1           | 8,834.9          | 2,400    | 704,000 | 223            | 19,935.1         |
| 90      | 94,800  | 8.36           | 2,684.4          | 500     | 354,000 | 46.5           | 10,024.2         | 2,800    | 742,000 | 260.1          | 21,011.1         |
| 100     | 105,000 | 9.29           | 2,973.3          | 600     | 392,000 | 55.7           | 11,100.2         | and over |         | and over       |                  |
| 120     | 126,000 | 11.14          | 3,567.9          | 700     | 428,000 | 65             | 12,119.6         |          |         |                |                  |
| 140     | 147,000 | 13             | 4,162.6          | 800     | 462,000 | 74.3           | 13,082.4         |          |         |                |                  |

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\*CFH equals feet<sup>3</sup>/hour

To apply the table, assume that your calculations have established that the wetted area of the tank under consideration is 900 feet<sup>2</sup> (83.6 m<sup>2</sup>). From the table, the minimum amount of free air flow through the normal and emergency vents would be 493,000 feet<sup>3</sup>/hour (13,960.2 m<sup>3</sup>/hour).

In the event the wetted area falls between two values from the table, the ventilation calculations should be interpolated. Next week's Coffee Break Training will explain how to compute those values.

For additional information, refer to NFPA 30.



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