

**Texas Commission on Environmental Quality  
Air Permits Division**

**New Source Review (NSR) Emission Calculations**

This information is maintained by the Chemical NSR Section and is subject to change. Last update was made **October 2006**. These emission calculations represent current NSR guidelines and are provided for informational purposes only. The emission calculations are subject to change based on TCEQ case by case evaluation. Please contact the appropriate Chemical NSR Section management if there are questions related to the emission calculations.

**Example Calculation**

**Type of Cleaning Operation: Tank Truck Cleaning**

Compound being cleaned: Methyl Methacrylate  
Vapor Pressure at: 100 °F = 1.43 psia  
70 °F = 0.64 psia  
Molecular Weight: 100.1 lb/lb-mole  
Volume of Truck: 10,000 gallons  
Cleaning Schedule: One truck cleaned per hour, 200 trucks cleaned per year  
Control Device: Flare (98 percent destruction efficiency)

Ideal Gas Equation:

$$PV = nRT$$

Where:

P = Vapor pressure of compound being handled  
V = Volume of container being cleaned  
n = Lb-mole of material contained per container  
R = Gas Constant  
T = Temperature of compound being cleaned  
E = Emission Rate

**Short Term Emissions (lb/hour)**

$$n = \frac{PV}{RT} = \frac{(1.43 \text{ psia}) \cdot (10,000 \text{ gallons}) \cdot \left( \frac{1 \text{ ft}^3}{7.4805 \text{ gallons}} \right)}{\frac{10.73 \text{ ft}^3 \text{ psia}}{\text{lbmol} \cdot ^\circ\text{R}} \cdot 560^\circ\text{R}}$$

$$n = 0.318 \text{ lbmole/truck}$$

At one (1) truck cleaned per hour:

$$E = \left( \frac{0.318 \text{ lbmol}}{\text{truck}} \right) \cdot \left( \frac{100.1 \text{ lb}}{\text{lbmol}} \right) \cdot \left( \frac{1 \text{ truck}}{\text{hour}} \right) = 31.8 \text{ lb/hour uncontrolled}$$

$$E = \left( \frac{31.8 \text{ lb}}{\text{hour}} \right) \cdot 0.02 = 0.64 \text{ lb/hour controlled}$$

### Annual Emissions (tons/year)

$$n = \frac{PV}{RT} = \frac{(0.64 \text{ psia}) \cdot (10,000 \text{ gallons}) \cdot \left( \frac{1 \text{ ft}^3}{7.4805 \text{ gallons}} \right)}{\frac{10.73 \text{ ft}^3 \text{ psia}}{\text{lbmol} \cdot ^\circ \text{R}} \cdot 530^\circ \text{R}}$$

$$n = 0.15 \text{ lbmole/truck}$$

At 200 trucks cleaned per year:

$$E = \left( \frac{0.15 \text{ lbmol}}{\text{truck}} \right) \cdot \left( \frac{100.1 \text{ lb}}{\text{lbmol}} \right) \cdot \left( \frac{1200 \text{ trucks}}{\text{year}} \right) \cdot \left( \frac{\text{ton}}{2000 \text{ lb}} \right) = 1.50 \text{ ton/year uncontrolled}$$

$$E = \left( \frac{1.50 \text{ ton}}{\text{year}} \right) \cdot 0.02 = 0.03 \text{ ton/year controlled}$$