**Section 219.110 Vapor Pressure of Organic Material or Solvent**

a) If the organic material or solvent consists of only a single compound, the vapor pressure must be determined by ASTM Method D2879-86 (incorporated by reference in Section 219.112 of this Part) or the vapor pressure may be obtained from a publication such as: Boublik, T., V. Fried and E. Hala, "The Vapor Pressure of Pure Substances," Elsevier Scientific Publishing Co., New York (1973); Perry's Chemical Engineer's Handbook, McGraw-Hill Book Company (1984); CRC Handbook of Chemistry and Physics, Chemical Rubber Publishing Company (1986-87); and Lange's Handbook of Chemistry, John A. Dean, editor, McGraw-Hill Book Company (1985).

b) Except as provided in subsection (d), if the organic material or solvent is in a mixture made up of both organic material compounds and compounds which are not organic material, the vapor pressure must be determined by the following equation:



where:

|  |  |  |
| --- | --- | --- |
| Pom | = | Total vapor pressure of the portion of the mixture which is composed of organic material; |
|  |  |  |
| n | = | Number of organic material components in the mixture; |
|  |  |  |
| i | = | Subscript denoting an individual component; |
|  |  |  |
| Pi | = | Vapor pressure of an organic material component determined in accordance with subsection (a); |
|  |  |  |
| Xi | = | Mole fraction of the organic material component of the total organic mixture. |

c) If the organic material or solvent is in a mixture made up only of organic material compounds, the vapor pressure must be determined by ASTM Method D2879-86 (incorporated by reference in Section 219.112) or by the above equation.

d) For hand-wipe cleaning solvents used at aerospace facilities subject to Section 219.219(g)(2), the composite vapor pressure of a cleaning solvent consisting of multiple components must be determined by the following equation:

$$PP\_{c}=\sum\_{i=1}^{n}\frac{\frac{W\_{i}}{MW\_{1} } × VP\_{i}}{\frac{W\_{w}}{MW\_{w}} + \sum\_{j=1}^{n}\frac{W\_{j}}{MW\_{j}} + \sum\_{i=1}^{n}\frac{W\_{i}}{MW\_{i}}}$$

where:

|  |  |  |
| --- | --- | --- |
| PPc | = | Composite vapor pressure of the cleaning solvent in mmHg at 20 °C; |
|  |  |  |
| n | = | Number of components in the cleaning solvent; |
|  |  |  |
| i | = | Subscript denoting an individual VOM-containing component; |
|  |  |  |
| j | = | Subscript denoting an individual non-VOM component; |
|  |  |  |
| Wi | = | Weight of a VOM-containing component in grams; |
|  |  |  |
| Wj | = | Weight of a non-VOM component in grams; |
|  |  |  |
| Ww | = | Weight of water in grams; |
|  |  |  |
| MWi | = | Molecular weight a VOM-containing component in grams per gram-mole; |
|  |  |  |
| MWj | = | Molecular weight of a non-VOM component in grams per gram-mole |
|  |  |  |
| MWw | = | Molecular weight of water in grams per gram-mole; |
|  |  |  |
| VPi | = | Vapor pressure of a VOM-containing component in mmHg at 20 °C. |

(Source: Amended at 45 Ill. Reg. 3553, effective March 4, 2021)