

MATERIALS / PAINTS

FNHA-2-J-001.34

VOC COMPLIANCE

1. SCOPE

This specification is used to calculate the maximum allowable volatile organic compounds minus water (VOC) content using a standard solvent density and to measure the VOC of paint coatings based on material released under specified bake conditions.

NOTE: The non-volatile weight solids (86507659) and gallon weight (density) (86507658) are required for the baking procedure. The density of the VOC of the coating being evaluated must be obtained from the coating supplier to calculate the maximum allowable VOC content.

2. REFERENCE STANDARDS

ASTM D3960 - Determining Volatile Organic Compound (VOC) Content
PA Code 129.51 and 129.52; Sources of VOC's

3. MATERIALS AND EQUIPMENT

None.

4. PROCEDURES

4.1 Procedure for Maximum Allowable VOC

To calculate the maximum allowable VOC content using the standard solvent density of 7.36 lbs. per gallon, use the following:

$$(X(1 - (Y/Z_2)) / Y(1 - (X/Z_1))) \leq 1$$

or the value of X can be computed as the maximum allowable VOC content using:

$$X = Y / (1 - Y/Z_2 + Y/Z_1)$$

X = VOC content of present coating minus water.

Y = VOC content of FNH coatings = 3.50

Z1 = Density of VOC of present coating (from supplier)

Z2 = Standard Solvent Density (7.36 lbs./gal.)

EXAMPLE:

Y = 3.5 lbs./gal.

Z1 = 7.06 lbs./gal.

Z2 = 7.36 lbs./gal. (std. density)

$$X = (3.5 / (1 - (3.5/7.36) + (3.5/7.06)))$$

$$X = 3.5 / (1 - .476 + .496)$$

$$X = 3.5 / 1.02$$

$$\text{VOC} = 3.43$$

4.2 Procedure to measure the VOC content of paint coatings based on the non-volatile content (86507659) and the gallon weight (86507658), use the following for solvent borne coatings that do not contain water:

$$\text{VOC} = (W_v)(D_c) / 100$$

W_v = Weight percent of total volatiles (100% minus weight percent non-volatiles)

D_c = Density of wet paint in lbs./gal. To convert to g/L divide the VOC result by 8.345 x 10⁻³.

					NAME	STD VOC COMPLIANCE		
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MATERIALS / PAINTS**FNHA-2-J-001.34**EXAMPLE:

Non-volatiles by weight - 59.5%
 Gallon weight - 8.60 lbs./gal.

$$\text{VOC} = \frac{(100\% - 59.5\%)(8.60)}{100}$$

$$\text{VOC} = \frac{(40.5\%)(8.60)}{100}$$

$$\text{VOC} = 3.48$$

4.3 Procedure to measure VOC content in water borne coatings use:

$$\text{VOC} = \frac{(W_v - W_w)(D_c)}{(100 - (W_w)(D_c / D_w))}$$

W_v = Weight percent of total volatiles (100% minus weight percent non-volatiles)

W_w = Weight percent of water obtained by gas chromatograph (from paint supplier or outside laboratory).

D_c = Density of wet paint in lbs./gal.

D_w = Density of water in lbs./gal. at 25°C.

EXAMPLE:

Non-volatiles by weight = 34.2%.
 Weight percent of water = 52.0%.
 Gallon weight = 8.70 lbs./gal.
 D_w = .997 lbs./gal.

$$\text{VOC} = \frac{(W_v - W_w)(D_c)}{(100 - (W_w)(D_c / D_w))}$$

$$\text{VOC} = \frac{[(100\% - 34.2\%) - 52](8.70)}{100 - (52)(8.70 / 8.32)}$$

$$\text{VOC} = \frac{(65.8 - 52)(8.70)}{100 - (52)(1.045)}$$

$$\text{VOC} = \frac{(13.8)(8.70)}{100 - 54.34}$$

$$\text{VOC} = \frac{120.06}{45.66}$$

$$\text{VOC} = 2.63$$

5. REPORT

5.1 Report the maximum allowable VOC content based on the standard solvent density.

5.2 Report the VOC content based on the weight solids and density.

5.3 The paint or coating passes if (5.2) is equal to or lower than (5.1).

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