

HOW TO CALCULATE THE VOC EMISSIONS FROM A COATING

WHAT INFORMATION DO I NEED TO BEGIN WITH?

To calculate the VOC emissions that come from using a coating, you must first collect the following information for each component in the coating:

VOC of Material – sometimes labeled ‘Actual VOC’, ‘Total VOC’, or ‘Emitted VOC’

Amount Used or Mix Ratio

For help with finding this information, review [How to Find VOC Information for Coating Operations](#), a guidance document posted on the San Diego APCD website.

There are two methods to finding VOC emissions from a coating:

Method 1: Find The Individual VOC Emissions From Each Component

Method 2: Find The Overall VOC Emissions From The Coating

The remainder of this guidance document will use examples to explain the methods.

METHOD 1: FIND THE INDIVIDUAL VOC EMISSIONS FROM EACH COMPONENT

To find the VOC emissions from a component of a coating, simply multiply its *VOC of Material* by the *Amount Used*.

In this case, we will assume that the *Mix Ratio* is equal to the *Amount Used*. In reality, you may not use as much as in this example.

After each component's VOC emissions are determined, you can sum them together to find the overall coating's VOC emissions.

NAME	VARIABLE	BASECOAT	THINNER	CATALYST
VOC of Material	VOC_M	3 lbs/gal	2 lbs/gal	4 lbs/gal
Mix Ratio	MR	4	2	1

METHOD 1: FIND THE INDIVIDUAL VOC EMISSIONS FROM EACH COMPONENT

Basecoat - VOC Emissions of Component = $VOC_M \times MR = 3 \times 4 =$ **12 lbs of VOC**

+

Thinner -VOC Emissions of Component = $VOC_M \times MR = 2 \times 2 =$ **4 lbs of VOC**

+

Catalyst -VOC Emissions of Component = $VOC_M \times MR = 4 \times 1 =$ **4 lbs of VOC**

Overall Coating VOC Emissions = **20 lbs of VOC**

This method is useful for single component coatings or if you know exactly how much of each component you will use each time use the coating.

NAME	VARIABLE	BASECOAT	THINNER	CATALYST
VOC of Material	VOC_M	3 lbs/gal	2 lbs/gal	4 lbs/gal
Mix Ratio (Amount Used)	MR	4 gal	2 gal	1 gal

METHOD 2: FIND THE OVERALL VOC EMISSIONS FROM THE COATING

To find the VOC emissions from an overall coating, first find the **Overall VOC Content*** of the coating. The **Overall VOC Content** is the *Overall Weight of VOC* in the Coating divided by the *Total Parts* in the Coating.

Overall Weight of VOC – For each component, multiply its *VOC of Material* by the *Mix Ratio*. After, sum all of these together.

Total Parts – The sum of the *Mix Ratio* values, or the total amount of parts added to mix the coating

NAME	VARIABLE	BASECOAT	THINNER	CATALYST
VOC of Material	VOC_M	3 lbs/gal	2 lbs/gal	4 lbs/gal
Mix Ratio	MR	4	2	1

*Note that this number is different from 'VOC of Mixture', found in other guidance documents

METHOD 2: FIND THE OVERALL VOC EMISSIONS FROM THE COATING

Overall Weight of VOC

Basecoat - Weight of VOC in Component = $VOC_M \times MR = 3 \times 4 =$ **12 lbs of VOC**

+

Thinner - Weight of VOC in Component = $VOC_M \times MR = 2 \times 2 =$ **4 lbs of VOC**

+

Catalyst - Weight of VOC in Component = $VOC_M \times MR = 4 \times 1 =$ **4 lbs of VOC**

Overall Weight of VOC = **20 lbs of VOC**

NAME	VARIABLE	BASECOAT	THINNER	CATALYST
VOC of Material	VOC_M	3 lbs/gal	2 lbs/gal	4 lbs/gal
Mix Ratio	MR	4	2	1

METHOD 2: FIND THE OVERALL VOC EMISSIONS FROM THE COATING

Total Parts

$$\begin{aligned} \text{Total Parts} &= \text{Parts Basecoat} + \text{Parts Thinner} + \text{Parts Catalyst} \\ &= 4 + 2 + 1 = 7 \end{aligned}$$

NAME	VARIABLE	BASECOAT	THINNER	CATALYST
VOC of Material	VOC_M	3 lbs/gal	2 lbs/gal	4 lbs/gal
Mix Ratio	MR	4	2	1

To calculate the **Overall VOC Content** of the coating, take the *Overall Weight of VOC* and divide by the *Total Parts*:

$$\text{Overall VOC Content} = \frac{\text{Overall Weight of VOC}}{\text{Total Parts}} = \frac{20}{7} = \mathbf{2.86 \text{ lb/gal}}$$

This number is useful when you always mix the coating the same, but perhaps use different amounts of the coating from day to day.

METHOD 2: FIND THE OVERALL VOC EMISSIONS FROM THE COATING

Finally, multiply the *Overall VOC Content* by the *Amount of Overall Coating* used to find the **Overall Coating VOC Emissions**

Overall Coating VOC Emissions = Overall VOC Content × Amount of Overall Coating

For example, if you use 7 gallons of this example coating:

$$\text{Overall Coating VOC Emissions} = 2.86 \frac{\text{lbs}}{\text{gal}} \times 7 \text{ gal} = \mathbf{20 \text{ lbs VOC}}$$

If you only use ½ of a gallon of this example coating:

$$\text{Overall Coating VOC Emissions} = 2.86 \frac{\text{lbs}}{\text{gal}} \times \frac{1}{2} \text{ gal} = \mathbf{1.43 \text{ lbs VOC}}$$

Again, keeping the *Overall VOC Content* of each coating in your facility on record will make calculating VOC emissions from your coatings each day simpler