

Calculating True Costs of Paints & Coatings

Determine Costs Per Volume of Paint Solids Versus Price Per Gallon

If you simply look at price per gallon, alternative coatings often seem more expensive. Price per gallon, however, does not tell the whole story. You can only determine true costs by calculating how much the coating costs per unit of painted product. Once this calculation is completed, you can make a more informed decision on whether to purchase a substitute coating product.

Step 1: Figure Cost of Paint Solids

Conventional solvent-based liquid paints include both volatile and solid components. When the paint is applied, the volatile components evaporate and the solids are left behind on the surface of your product. The cost of that solid fraction is what you need to figure to accurately compare the costs of coating products. The cost of the solid fraction can be calculated from information provided in the product's Material Safety Data Sheet (MSDS) or Product Data Sheet (PDS), which are available from the manufacturers. The paint's total per-gallon cost is divided by the solids percentage to obtain the cost per gallon of solids.

Example: If a paint product costs \$15 per gallon and contains 33% solids, then you would divide 15 by 0.33. So, $15 / 0.33 = \$45.45$, the cost per gallon of paint solids.

Step 2: Figure Ideal Paint Cost per Square Foot

If a desired thickness is known, this cost can be further refined into a cost per unit of painted surface area using the following formula:

(Cost of paint solids per gallon) X (film thickness in mils)
 X (0.0006233)

Example: ($\$45.45$ per gallon of paint solids) X (2 mils finished film thickness) X (0.0006233 conversion factor) = 5.7 cents per square foot, assuming an ideal 100% transfer efficiency.

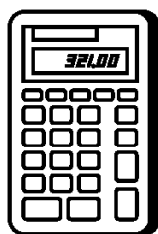
Step 3: Figure Actual Paint Cost per Square Foot

100% transfer efficiency is almost never achieved when applying liquid coatings with spray equipment. To calculate a more accurate cost of using a liquid coating, the transfer efficiency of the application equipment and paint product must be considered.

In most spray painting operations, only a portion of the product that is sprayed actually reaches the surface to be coated. The remainder, or overspray, is collected in the paint booth exhaust filter or settled to the floor of the paint area. The amount of paint reaching the product versus the total amount of paint sprayed is referred to as the transfer efficiency. To calculate the actual costs of paint per square foot of applied finish, the estimated transfer efficiency of the paint operation must be factored into the cost formula as follows:

Ideal (100% transfer efficiency) paint cost per square foot + transfer efficiency percentage = actual paint cost per square foot.

Example: A paint operation has an estimated transfer efficiency of 50%. Take the 5.7 cent calculated for 100% transfer efficiency and divide by 0.50 to determine actual coating cost. (5.7 cents per square foot) / (0.50 transfer efficiency) = 11.4 cents per square foot.



Step 4: Figure Total Cost of Painting Manufactured Product

Now that a cost estimate per square foot has been determined, you can apply this figure an estimated cost per painted part.

Example: A flat panel part has an area of 10 square feet. Multiply your cost per square foot times the square footage of the part. (11.4 cents per square foot) X (10 square feet) = \$1.14 per part. (Note: For parts that are oddly configured, estimate square footage.)

More Information

For more information about surface coating or any other air quality requirements, please contact Spokane Regional Clean Air Agency, 477-4727 or www.spokanecleanair.org.

Calculations courtesy of Pollution Prevention Resource Council: www.pprc.org/pubs/factsheet/coatcost.html

Resource: The U.S. Environmental Protection Agency, Design for the Environment, www.epa.gov/dfe/pubs/projects/auto/index.htm

Waterborne Coatings

Over the last decade, waterborne coatings have become more readily available and businesses have started using these coatings because of the economic and environmental benefits from using these less toxic coatings, or because of regulatory requirements (such as in California for auto body shops).

Pros of Waterborne Coatings (as compared to solvent-based coatings in an auto body shop)

- Increase productivity due to:
 - quicker mixing process
 - better coverage
 - faster drying times
- Better color match.
- Reduced energy usage (don't need heat to dry paint).
- Reduced hazardous waste.
- Reduced VOC emissions.
- Less regulatory burden.
- Healthier work environment.
- More environmentally friendly product.

Cons of Waterborne Coatings (as compared to solvent-based coatings in an auto body shop)

- Need to re-train painters. The painting skill set with waterborne coatings is different than with solvent-based coatings.
- Waterborne coatings show defects in parts, so parts need to be error free prior to coating.
- Paint is affected by temperatures - it cannot freeze or be overheated. You can buy paint that hasn't been pre-mixed, and it's not as susceptible to temperatures.



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