1:4 Cost considerations

It is often difficult to select from a number of apparently equally suitable paint systems to one, which is most economic, and therefore the one, which should be chosen for the job in question. There is only one certain way of making a decision and this is dependent on the volume solids of each paint. Volume solids is expressed as a percentage and means the volume of solid material contained in the paint and that, which forms the dried film of the paint after application. The remainder of the paint evaporates, this being the solvent or thinner necessary for the process of application.

For example, the paint may contain 50% volume solids. This means that 50% of the volume is deposited during application and the remaining 50% evaporates. This also means that to apply a dry film thickness of 50 microns, a wet film thickness of 100 microns must be applied. It is possible to have paints of 100% solids, usually called solventless, and with these there is no volatile content and a dry film thickness will be the same as wet film thickness applied. It is essential that the volume solids of each paint is known together with the cost per litre. These figures permit the easy calculation of the square metreage covered by a litre of paint at the specified film thickness and the cost per square metre. The volume solids of each product dealt with in this manual are available on request from Resene.

Note: 25 microns = 1 thou (or mil).

When it is not clear at first glance which paint will prove the most economic, the foregoing simple calculation provides the answer.

Example

1. Paint A costs $16.15 per litre, volume solids = 33%

   Micron metres/litre = 10 x 33 sq metres = 330 sq metres

   Cents per micron per sq metre = $\frac{1615}{330} = 4.9$ cents

2. Paint B costs $18.45 per litre, volume solids = 53%

   Micron metres/litre = 10 x 53 sq metres = 530 sq metres

   Cents per micron per sq metre = $\frac{1845}{530} = 3.5$ cents

While the cost per litre of paint B is greater, it is in fact actually cheaper, because of its higher volume solids. It is therefore of the utmost importance that volume solids be the only basis for economic acceptance or rejection of similar paints or paint systems. Note that "solids by weight" is a figure that is meaningless and should not be used as a basis of evaluation under any circumstances. Total paint cost for a particular job is given by:

$$\text{Number of litres required} = \frac{\text{Total sq metreage to be painted x Dry Film Thickness required}}{\text{micron metres per litre}}$$

Total cost = No. of litres x cost per litre.

In actual practice, theoretical coverage is rarely obtained and an allowance for paint loss must be considered. These factors include the type of surface being painted, type of application, weather conditions, spillage and other wastage, and so on.

Theoretical coverage figures calculated from volume solids should be amended with due allowance for loss and costs calculated from an assessed practical coverage.

Practical Coverage
= Theoretical Coverage x Surface Roughness Factor x Application Condition Factor.

Surface roughness factor

	Primer coats	Body and finish coats
New smooth steel, pickled steel	0.95	0.98
Blast Cleaned Steel	0.90	0.95
Power Tool Cleaned	0.85	0.90
Blasted - lighted pitted steel	0.85	0.90
Blasted - heavily pitted steel	0.80	0.85
Rough Concrete or Masonry	0.60	0.75

Application condition factor

	All coats
Brush or Roller	0.90
Spray - interior	0.80
Spray - exterior*	0.70

*Subject to wind - if spraying in wind, this factor will be lower than 0.70.

To return to our examples, consider a priming paint of volume solids 54.5% having a theoretical coverage of 10.5 sq metres per litre, giving 50 microns film thickness being applied by spray (no wind) to a heavily pitted blast cleaned steel tank.

Practical coverage = 10.5 x 0.80 x 0.70
= 5.88 sq metres per litre

The above figures are satisfactory for use on profiles up to 75 microns; for higher profiles add 25 microns extra for each 25 microns higher than 75 microns to the dry film thickness to be applied.