# TECHNICAL REFERENCE

## COATING APPLICATION & TESTING


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BLAST ONE

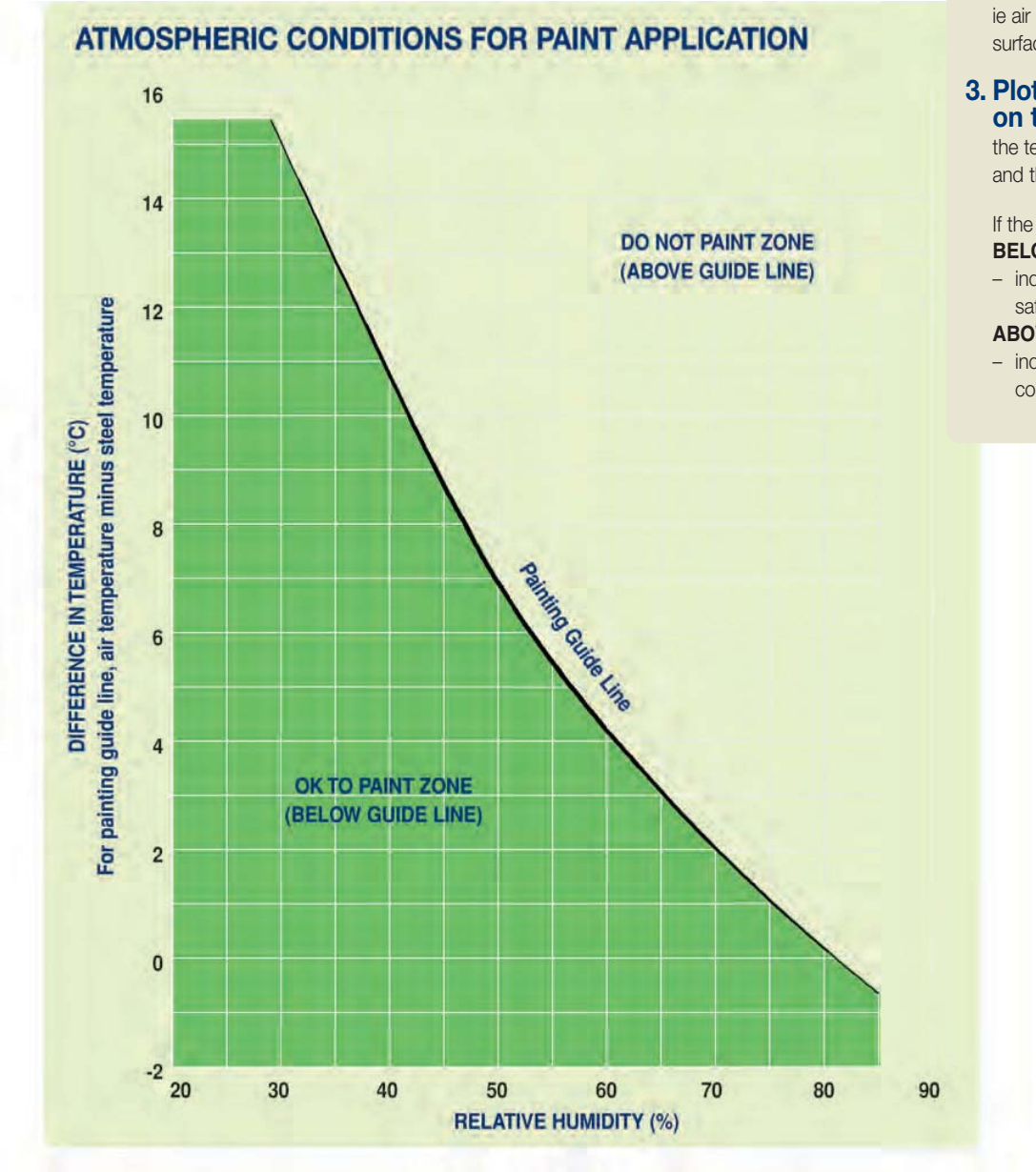
# Climatic Conditions For Safe Painting

**It is critical to the success of most coating systems, that the surface is completely free of moisture prior to and during paint application and curing.**

## DEWPOINT

Condensation of water (dew) from the atmosphere on to the surface will occur, given the right conditions. For a given set of conditions, the temperature at which condensation will occur is called the Dewpoint. As long as the surface temperature is 3°C (or more) above the Dewpoint temperature, it is generally considered safe to paint as far as risk of condensation is concerned.






## INSTRUCTIONS FOR USE

### 1. Measure

- air temperature
- surface temperature
- relative humidity

use the same instrument for reading the air and surface temperature, and with an accuracy of ±0.5°C

### 2. Calculate

the temperature difference ie air temperature minus surface temperature

### 3. Plot and intersect on the chart

the temperature difference and the relative humidity

If the intersection point is

**BELOW the guide line**

- indicates conditions are safe to paint

**ABOVE the guide line**

- indicates UNSAFE conditions for painting

# Paint Application Tables

Formula
Corrected Volume Solids (CVS)
$CVS = \frac{\text{Original Vol. Solids} \times 100}{(100 + \% \text{ thinner added})}$

## CORRECTED VOLUME SOLIDS (to the nearest 1%) after adding thinner to various initial volume solids coatings

| Initial volume solids before thinning | Amount of Thinner Added per 20 Litres | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| % | 2.5% | 3.125% | 5% | 6.25% | 7.5% | 10% | 12.5% | 18.75% | 25% | 27.5% |
| ml | 500 | 625 | 1000 | 1250 | 1500 | | | | | |
| litres | | | 1 | 1.25 | 1.5 | 2 | 2.5 | 3.75 | 5 | 7.5 |
| 100% | 98 | 97 | 96-95 | 94 | 93 | 91 | 89 | 84 | 80 | 73 |
| 95% | 93 | 93 | 91-90 | 90 | 89-88 | 87 | 85 | 81 | 77 | 70 |
| 90% | 88 | 87 | 86 | 84 | 84 | 82 | 80 | 76 | 72 | 66 |
| 85% | 83 | 82 | 81 | 80 | 79 | 78 | 76 | 72 | 68 | 62 |
| 80% | 78 | 78 | 77-76 | 75 | 74 | 73 | 71 | 68 | 64 | 58 |
| 75% | 73 | 73 | 72 | 71 | 70 | 69-68 | 67 | 63 | 60 | 55 |
| 70% | 68 | 68 | 67 | 66 | 65 | 64 | 62 | 59 | 56 | 51 |
| 65% | 64 | 63 | 62 | 61 | 60 | 60-59 | 58 | 55 | 52 | 47 |
| 60% | 59 | 58 | 57 | 57 | 56-55 | 55 | 53 | 51 | 48 | 44 |
| 55% | 54 | 53 | 53-52 | 52 | 51 | 50 | 49 | 46 | 44 | 40 |
| 50% | 49 | 48 | 48 | 47 | 46 | 46 | 45 | 42 | 40 | 36 |
| 45% | 44 | 44 | 43 | 42 | 42 | 41 | 40 | 38 | 36 | 33 |
| 40% | 39 | 39 | 38 | 38 | 37 | 37-36 | 36 | 34 | 32 | 29 |
| 35% | 34 | 34 | 34 | 33 | 33 | 32 | 31 | 30 | 28 | 26 |
| 30% | 29 | 29 | 29 | 28 | 28 | 27 | 27 | 25 | 24 | 22 |
| 25% | 24 | 24 | 24 | 24 | 23 | 23 | 22 | 21 | 20 | 18 |

Formula
Applied Wet Film Thickness (WFT)
$WFT = \frac{\text{Dry Film Thickness (DFT)} \times 100}{\text{Corrected Volume Solids (CVS)}}$

## APPLICATION WET FILM THICKNESS (in microns)* to achieve required DFT for various volume solids coatings

| Required DFT (microns) | Volume Solids % | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 |
| 25 | 71 | 63 | 56 | 50 | 46 | 42 | 39 | 36 | 33 | 31 | 29 | 28 | 26 |
| 50 | 143 | 125 | 111 | 100 | 91 | 83 | 77 | 71 | 67 | 63 | 59 | 56 | 53 |
| 75 | 214 | 188 | 167 | 150 | 136 | 125 | 115 | 107 | 100 | 94 | 88 | 83 | 79 |
| 100 | 286 | 250 | 222 | 200 | 182 | 167 | 154 | 143 | 133 | 125 | 118 | 111 | 105 |
| 125 | 357 | 313 | 278 | 250 | 227 | 208 | 192 | 179 | 167 | 156 | 147 | 139 | 132 |
| 150 | 429 | 375 | 333 | 300 | 273 | 250 | 231 | 214 | 200 | 188 | 176 | 167 | 158 |
| 175 | 500 | 438 | 389 | 350 | 318 | 292 | 269 | 250 | 233 | 219 | 206 | 194 | 184 |
| 200 | 571 | 500 | 444 | 400 | 364 | 333 | 308 | 286 | 267 | 250 | 235 | 222 | 211 |
| 250 | 714 | 625 | 556 | 500 | 455 | 417 | 385 | 357 | 333 | 313 | 294 | 278 | 263 |
| 300 | 857 | 750 | 667 | 600 | 546 | 500 | 462 | 429 | 400 | 375 | 353 | 333 | 316 |

* theoretically calculated figures and NOT applicable for zinc coatings

# Paint Application Information

**Formula**

Theoretical Spreading Rate (SR)

$$SR = \frac{\text{Corrected Volume Solids (CVS)} \times 10}{\text{Dry Film Thickness (DFT)}}$$

## SPREADING RATE (in m²/litre)* achieving required DFT for various solids coatings

| Dry Film Thickness (microns) | Volume Solids % | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
| 20 | 10.0 | 12.5 | 15.0 | 17.5 | 20.0 | 22.5 | 25.0 | 27.5 | 30.0 | 32.5 | 35.0 | 37.5 | 40.0 | 42.5 | 45.0 | 47.5 | 50.0 |
| 25 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 24.0 | 26.0 | 28.0 | 30.0 | 32.0 | 34.0 | 36.0 | 38.0 | 40.0 |
| 30 | 6.7 | 8.3 | 10.0 | 11.7 | 13.3 | 15.0 | 16.7 | 18.3 | 20.0 | 21.7 | 23.3 | 25.0 | 26.7 | 28.3 | 30.0 | 31.7 | 33.3 |
| 50 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 17.0 | 18.0 | 19.0 | 20.0 |
| 75 | 2.7 | 3.3 | 4.0 | 4.7 | 5.3 | 6.0 | 6.7 | 7.3 | 8.0 | 8.7 | 9.3 | 10.0 | 10.7 | 11.3 | 12.0 | 12.7 | 13.3 |
| 100 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 | 10.0 |
| 125 | 1.6 | 2.0 | 2.4 | 2.8 | 3.2 | 3.6 | 4.0 | 4.4 | 4.8 | 5.2 | 5.6 | 6.0 | 6.4 | 6.8 | 7.2 | 7.6 | 8.0 |
| 150 | 1.3 | 1.7 | 2.0 | 2.3 | 2.7 | 3.0 | 3.3 | 3.7 | 4.0 | 4.3 | 4.7 | 5.0 | 5.3 | 5.7 | 6.0 | 6.3 | 6.7 |
| 175 | 1.1 | 1.4 | 1.7 | 2.0 | 2.3 | 2.6 | 2.9 | 3.1 | 3.4 | 3.7 | 4.0 | 4.3 | 4.6 | 4.9 | 5.1 | 5.4 | 5.7 |
| 200 | 1.0 | 1.3 | 1.5 | 1.8 | 2.0 | 2.3 | 2.5 | 2.8 | 3.0 | 3.3 | 3.5 | 3.8 | 4.0 | 4.3 | 4.5 | 4.8 | 5.0 |
| 250 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 | 3.4 | 3.6 | 3.8 | 4.0 |
| 300 | 0.7 | 0.8 | 1.0 | 1.2 | 1.3 | 1.5 | 1.7 | 1.8 | 2.0 | 2.2 | 2.3 | 2.5 | 2.7 | 2.8 | 3.0 | 3.2 | 3.3 |
| 400 | 0.5 | 0.6 | 0.8 | 0.9 | 1.0 | 1.1 | 1.3 | 1.4 | 1.5 | 1.6 | 1.8 | 1.9 | 2.0 | 2.1 | 2.3 | 2.4 | 2.5 |
| 500 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |

* theoretically calculated figures may vary from practical spreading rates by as much as 50% or more.

## AIRLESS SPRAY - FLUID PRESSURE LOSS CALCULATION

### For pressure loss through pipe or tube

Pressure Drop P = (in psi) $\frac{0.0273 \times Q \times V \times L}{D^4}$ where

Q = flow rate (in US gallons per minute)
V = viscosity of fluid (in poise)
L = length of pipe (in feet)
D = internal pipe diameter (in inches)

## CALCULATION OF TEST VOLTAGE

### For high voltage spark test holiday detectors.

$$\text{Test Voltage (V)} = \frac{250 \times \sqrt{\text{Dry Film Thickness}}}{\text{Coating Factor (C)}}$$

Notes: Dry Film Thickness Value
- use the work specification thickness
- use the actual thickness if it is more than 25% above the work specification

| Coating Factor | | Coating Type |
|---|---|---|
| 1 | Ultra Hi-Builds | 80%+ volume solids, *e.g. Fusion bonded Epoxy, Solventless Epoxy Polyester - Vinyl Ester* |
| 2 | Hi-Builds | 60%-79% volume solids, *e.g. Highbuild epoxy, Coal Tar Epoxy* |
| 3 | Medium Builds | 40%-59% volume solids, *e.g. Medium epoxies* |
| 4 | Low-Builds | 15%-39% volume solids, *e.g. Vinyl coating, Chlorinated Rubber* |