Additional Information:

Definitions and Abbreviations

Revision: 03
Issue date: 17/03/2020

The AkzoNobel Building
Wexham Road
Slough
SL2 5DS

T +44 (0)191 469 6111
www.akzonobel.com
www.international-pc.com

Note: Many standards are quoted throughout this document. The most recent revision of any standard should always be referred to unless otherwise stated.

Tolerances

The numerical information quoted in the product data sheets has been derived from laboratory test data obtained under controlled conditions for the products described. Whilst every effort has been made to ensure accuracy, this information will be subject to minor variations obtained in normal manufacturing tolerances, and any fluctuations in ambient conditions during the application and curing periods.

Colour

Where a small number of colours is available product data sheets generally list these; where a wider range is available this is stated. Colours specified on a worldwide product data sheet will usually be available in all regions. *Chromascan* is quoted for some products; this is International's remote tinting system that gives control over specific colour requests and allows production of a very wide range of colours from factory produced bases.

Gloss Levels

Typical gloss values have been determined in accordance with ISO 2813 using a 60º gloss head. The categories used in the product data sheets are:

Finish (Sheen)	Gloss (60º Head)
Matt	0-15
Eggshell	16-30
Semi Gloss	31-60
Gloss	61-85
High Gloss	>85

In practice, the level of sheen and surface finish will be dependent upon a number of factors, including application and the condition of the surface to be overcoated.

Dry Film Thickness (DFT)

The thickness of the final dried film applied to the substrate. The DFT is typically measured using a magnetic gauge, which will give a value measured from the surface of the coating to the *magnetic plane* within the surface profile. The magnetic plane is the theoretical point within the surface profile that the DFT gauge sees as being the average position of the substrate.

Some variations exist in methods of DFT measurement; DFT gauges can be calibrated on smooth or blasted steel panels and a correction factor for surface profile may or may not be considered. ISO 2808, ISO 19840 and SSPC-PA2 are accepted standards for measuring DFT.

Wet Film Thickness (WFT)

The initial thickness of the wet coating applied to the substrate.

Wet film thickness measurements of coatings applied on articles can be very helpful in controlling the thickness of the final dry coating and measurement of WFT permits correction and adjustment of the film by the applicator at the time of application.

Notched WFT gauges or WFT “combs” can be very useful in the shop and field for determining the approximate thickness of wet films over commercial articles and complex structures. The procedures using WFT gauges do not provide accurate or sensitive measurements of WFT; however, an operator experienced in the use of a WFT gauge can monitor the coating application well enough to ensure the minimum required film thickness will be obtained.

Volume Solids

The volume solids figure given on the product data sheet is the percentage of the wet film that remains as the dry film and is obtained from a given wet film thickness under specified method and conditions. Unless otherwise stated, these figures have been determined under laboratory conditions using the test method described in the standard ISO 3233-1 – Determination of the percentage volume of non-volatile matter – Part 1: Method using a coated test panel to determine non-volatile matter and to determine dry film density by the Archimedes principle. The volume solids of a coating is determined using the recommended dry film thickness quoted on the product data sheet and a specified drying schedule at ambient temperature, i.e. 7 days at 23ºC ± 1ºC (73°F ± 2°F).

Coverage

Theoretical coverage is calculated from a product’s volume solids and a specific DFT:

Metric: $\frac{\text{Volume solids (\%) x10}}{\text{DFT (µm)}}$ US: $\frac{\text{Volume solids (\%) x 16.04}}{\text{DFT (mils)}}$

It is possible to calculate practical coverage using theoretical values and loss factors but these calculations are complex and subject to great variability in external factors such as environment, substrate, access limitations, application methods and the complexity of the structure being coated. It is advised that such calculations are left to professional estimators with experience and knowledge of the application of protective coatings under various site conditions. For further information on coverage and loss factors, please refer to International Protective Coatings’ document “Theoretical and Practical Coverage”.

Drying Time

The drying times quoted in the product data sheets have been determined in the laboratory using a typical dry film thickness, the ambient temperature quoted in the relevant product data sheet, and the appropriate test method, i.e.

Touch Dry (ISO 9117-3)
The surface dry state of a coating when ballotini (small glass spheres) can be lightly brushed away without damage to the surface of the coating. In this state the bulk of the coating is still mobile.

Hard Dry (ISO 9117-1)
The condition of the film in which it is dry throughout its thickness.

This through drying state is determined by the use of a “mechanical thumb” device which, when applied using a specified gauge, under specified pressure, torsion and time, does not mark or damage the film.

The drying times achieved in practice may show some slight fluctuation, particularly in climatic conditions where the substrate temperature differs significantly from the ambient air temperature. Other environmental factors such as air flow and relative humidity may also affect drying times.

Overcoating Interval

The product data sheets give both **minimum** and **maximum** overcoating intervals and the figures quoted at the various temperatures are intended as guidelines, consistent with good painting practices. Certain terms require elaboration as follows:

Minimum

The minimum overcoating time quoted is an indication of the time required for the coating to attain the necessary state of dryness and hardness to allow the application of a further coat of paint. It assumes:

- The coating has been applied at the normal recommended thickness
- Environmental conditions both during and after application were as recommended for that particular coating, especially in respect of temperature, relative humidity and ventilation
- The paint used for overcoating is suitable for that purpose
- An understanding of the method of application. For example, if a coating can be applied by both brush and spray it is expected that overcoating may be carried out more rapidly if sprayed; it is the *lower* figure that is quoted.

If the above conditions are not met, the quoted minimum overcoating times are liable to variation and will invariably have to be increased.

Maximum

The maximum overcoating time indicates the allowable time period within which overcoating should take place in order to ensure acceptable intercoat adhesion is achieved.

Extended

Where an **extended** overcoating time is stated, the product can be overcoated after an unlimited time period but the anticipated level of intercoat adhesion can only be achieved if:

- The existing coating has been applied in accordance with good painting practices and at the specified film thickness
- The existing coating has the intended surface characteristics required for long term overcoatability. For example, an over-applied epoxy MIO may not have its usual textured surface and will no longer be overcoatable after ageing unless it is abraded
- The existing coating is intact, tightly adherent, clean, dry and free from all contaminants. For example, the rough textured surface of an MIO may require extensive cleaning, especially in an industrial and/or coastal environment.

Glossy surfaces can negatively affect the adhesion of subsequent coats and should be lightly abraded, sweep blasted, or treated with other suitable processes to remove the sheen. Surface treatments should not cut through or detract from the performance of the underlying coating.

Note: Adhesion is also dependent upon the chemistry of the topcoat. By their nature, primers or undercoats with a higher pigment to binder ratio will have inherently better adhesion than finish coats with relatively low pigment contents.

The measurement of ultimate adhesive strength can often be a difficult process and interpretation of results can be subjective. Excellent adhesion does not necessarily mean good performance, nor does relatively poor adhesion necessarily mean poor performance.

Although the adhesion of coatings applied to aged / cured coatings may be deemed satisfactory for the specified end use, actual numerical values obtained for adhesion may be less than for coatings applied at minimum overcoating intervals. For information on individual products or coating schemes, consult International Protective Coatings.

Flash Point

Measured as the minimum temperature to which a product confined in a Setaflash closed cup must be heated for the vapours emitted to ignite momentarily in the presence of a flame. (ISO 3679).

Product Weight

The weight of coating per unit of volume; for example, if a coating has a product weight of 1.5 kg/l this simply means that one litre of the coating will weigh 1.5 kg (10lb/gal means that one US gallon will weigh 10lb). It follows that products containing large pigment loads or dense metallic pigments will have a greater product weight.

Product weight can be calculated from the mixed formulation or measured experimentally. The most widely used experimental method is ISO 2811-4.

Volatile Organic Content (VOC)

Volatile Organic Content (VOC) is the weight of organic solvent per litre or kilogram of paint.

Legislative requirements differ from country to country and from region to region and are constantly being reviewed. **It is recommended that users check with local agencies for details of current VOC regulations to ensure compliance with any local legislative requirements when proposing the use of any coating.**

Values typically quoted for VOC on the product data sheets are as follows:

- **USA - EPA Federal Reference Method 24** (laboratory determination, given in g/l (or lb/gal))
  The Environmental Protection Agency (EPA) published procedures for demonstration of compliance with VOC limits under Federal Reference Method 24 “The Determination of Volatile Matter Content, Density, Volume Solids and Weight Solids of Surface Coatings”. This method was originally published in the Federal register in October 1980, and coded 40 CFR, Part 60, Appendix A, and amended in 1992 to incorporate instructions for dealing with multi-component systems, and a procedure for the quantitative determination of VOC-exempt solvent.

- **Solvent Emissions Directive (SED Council Directive 2010/75/EU)** (calculation, given in g/kg)
  This is European legislation aimed at limiting the level of VOCs released to the atmosphere. The figures quoted on product data sheets are calculated from products' mixed formulations rather than practically determined.

- **UK-PG6/23** (laboratory determination, given in g/l)
  This method may be given for established products but has now been superseded by the SED.

- **China National Standard GB23985**
  This is Chinese legislation aimed at limiting the level of VOCs released to the atmosphere. The figures quoted on product datasheets are practically determined from products' mixed formulations.

- **Korean Clean Air Conservation Act**
  This is South Korean legislation aimed at limiting the level of VOCs released to the atmosphere. The figures quoted on product datasheets are practically determined from products' mixed formulations.

Mix Ratio

The proportions in which multi-pack products are mixed. These can be given by volume or by weight. For example, a two-pack product with a mix ratio of 2:1 by volume would imply 2 litres of Part A should be mixed with 1 litre of Part B.

Working Pot Life

The maximum time during which a product supplied as separate components should be used after being mixed together at the specified temperature (ISO 9514).

The values quoted have been obtained from a combination of laboratory tests and application trials and refer to the time periods under which satisfactory coating performance will be achieved.

Application of any product after the working pot life has been exceeded will lead to inferior product performance and potential loss of application equipment. For these reasons it **must not** be attempted, even if the material in question appears liquid in the can.

Shipping Weight

The shipping weights quoted refer to the total weight of the product supplied (fill weight) plus the weight of the can for a pack size typical for the product. These weights are quoted for individual components, and do not take into account any additional packaging weight attributable to cartons, etc.

Shelf Life

The shelf life quoted on the data sheets is generally a conservative value, and it is probable that the coating can be applied without any deterioration in performance after this period has elapsed. However, storage conditions can affect shelf life and this must be taken into consideration. For example, prolonged storage at extreme temperatures [outside the range 4 – 40°C (39 – 104°F)] can result in deterioration of application and performance properties. Water borne products must **always** be protected from freezing and should be stored at 4 – 30°C (39 – 86°F).

It is recommended that the condition of the material is checked before any large scale application is undertaken using materials beyond the quoted shelf life. It is also advisable after long periods of storage to ensure that the containers are still intact and in good condition.