MFP

Multifunctional pigment

General

MFP is a multifunctional pigment that is used in coatings as corrosion inhibitor, ultraviolet light stabilizer, tannin stain blocking agent, flame retardant, and white rust inhibitor (zinc rich paints). Because it is multifunctional it can replace five or six products commonly warehoused by paint companies. The use of MFP results in less product storage, a faster turnover of raw materials, and a savings in raw material costs.

MFP is the commercial form of modified barium metaborate monohydrate. It is +90% active calculated as $BaB_2O_4 \cdot H_2O$. Because it has a low refractive index (1.55–1.60) it can be used in a wide variety of colors and whites. It may even be usable in some clears and varnishes.

Application

As a pigment, MFP should be added to the grind stage of the production process to break up any agglomeration that may have occurred while in the bag. MFP may be used in both water- and solvent-based coatings; however, care should be taken when formulating into water-based systems. For formulating hints on using MFP in water-based systems, contact your Buckman technical representative.

Corrosion inhibition

In industrial, solvent-thinned coatings where one has relatively good control over surface preparation and paint application, levels as low as 2% may be used to advantage. In consumer coatings and industrial coatings we recommend that 4.0–8.0% be used. Industrial maintenance coatings usually contain 8.0–16.0% of MFP but in some coatings (e.g. bridge coatings) levels in the 30–40% range may be required to give optimum performance. These comments also apply to water reducible alkyds and epoxy ester. Latex paints require a minimum of 4.5% MFP to be used. For consumer coatings we recommend that MFP be used at levels of 4.5–9.0%. For maintenance coatings, levels of 9.0–13.5% are recommended. For best performance over metallic substrates we recommend that an alkyd modifier be used at levels of 3.0–5.0%.

Where relatively low levels of MFP are used (e.g. 2.2–4.5%) the use of a flash/early rust inhibitor may be required. In such cases we recommend the use of Butrol 35 at levels of 0.1–0.5%. Butrol 35 may be added to the finished paint or to the letdown portion of the paint.

Flame retardancy

MFP performs well as a flame retardant in coatings containing halogen donors. In most formulations, MFP may be used to replace 100% of the antimony trioxide present in the formulation. However, you may also wish to evaluate MFP as a 50% replacement for the antimony trioxide, as the two compounds often perform synergistically. In new formulations we recommend that MFP be evaluated at levels of 2.0–9.0%. The level required will be dependent upon the formulation and the halogen donor(s) present.

Ultraviolet light stabilization

MFP functions as an ultraviolet light stabilizer in most coating systems. The effect may be seen at use levels as low as 2% by weight. Consequently, topcoats containing MFP as a corrosion inhibitor or tannin stain blocker show improved chalk resistance and tint retention. A ladder study is recommended to determine the appropriate use level for the system being formulated.

Tannin stain blocking

MFP is used as a tannin stain blocker in latex and alkyd primers and topcoats. For tanning stain blocking, MFP should be evaluated at levels between 3% and 10% by weight. In some resin systems, the lower use levels may provide the best performance, so a ladder study is recommended.

Storage and handling

MFP is a powder packaged in 25 kg bags. As is recommended practice with pigments, workers handling this product should wear respirators and goggles.

Refer to the Material Safety Data Sheet for suitable materials for storage and handling of the product.

When formulating with this product, the finished formula should be tested for compatibility with the intended shipping container.

Always read the label and product information before use.

Product characteristics	
Appearance	white powder
Refractive index	1.55 – 1.60
Oil absorption (g/100 g)	30
pH (sat. sol. at 25°C)	9.8 – 10.3
Solubility (%)	
Ambient temperatures	0.3 max.
Boiling water	0.4 max.
Fusion point (°C)	900 – 1050
Thermal gravimetr. test	initial weight loss at approx. 200°C
Particle size	99.5% < 20 microns 95.0% < 10 microns 75.0% < 5 microns
Shelf life	3 years

Version: 2.0
Date: 16/04/2012
Updated since last version: Heading; Characteristics
Verified by: EDC

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