



FREOL 2560

APPLICATIONS

FREOL 2560 is a versatile polymer which can be utilized to produce high quality exterior wood stains, decorative pigmented brushing enamels for exterior/interior use, and dip or spray applied timber joinery (e.g. window frame) coatings. This applies to exterior wood stains as well as high gloss decorative brushing enamels.

In the wood stain market, FREOL 2560 can be formulated to produce penetrating transparent stains, as well as semi-transparent and solid color and higher solids stains. High quality applications include wooden building panels, trim, window and door frames, doors, etc. for exterior and/or interior use.

FREOL 2560 can also be employed as a modifier for interior gloss enamels or industrial wood coatings to lower coalescing solvent content while improving block resistance.

PERFORMANCE

In exterior exposures FREOL 2560 has demonstrated excellent flexibility and dimensional stability. FREOL 2560 also exhibits excellent transparency for clear interior joinery coatings.

In the exterior/interior pigmented brushing enamel market, FREOL 2560 features a unique combination of good block resistance, very low VOC potential and high gloss capability. Excellent "hot" block resistance (despite a low Tg and MFT).

In pigmented coatings for dip or spray applied exterior timber joinery, FREOL

■ Havenstraat 19 – 21
3024 SG Rotterdam
010-4763088

■ Dorpsstraat 152
2712 AP Zoetermeer
079-3164138

■ Slaghekstraat 57 - 63
3074 LA Rotterdam
010-4190923

■ Beeklaan 39 - 45
2562 AA Den Haag
070-3469626

2560 exhibits a combination of quick development of high temperature block resistance, adhesion and flexibility.

FORMULATION GUIDELINES

Coalescing

Exterior durability, resistance properties and gloss development depend on the proper level and selection of coalescent. For optimum properties at low temperature a coalescent level of appr. 2% Texanol, butyldiglycol or butylglycol is recommended for FREOL 2560 (on delivered form). Applications above 10°C can be formulated without the use of coalescing solvents with excellent film formation properties.

Foam Control

FREOL 2560 is a low foaming polymer.

The following defoamers are recommended when necessary: - Tego Foamex 805, 810 and 825 Tego Chemie
- Byk 024 and 028 BYK Chemie
- Agitan 260 and 315 Munzing Chemie

Thickening

For optimal flow and leveling along with good brush loading, combinations of high and low shear effective polyurethane associative thickeners are recommended and/or combinations with acrylic associative thickeners like Coatex Rheo 2100 and 3000 (Coatex).

Examples of high medium shear effective PUR thickeners are:

- Bermodol PUR 2110 and 2130 Akzo Nobel
- Rheolate 278 Elementis Specialties

Examples of low shear effective PUR thickeners is:

- Tafigel PUR 60 Munzing Chemie
- Tafigel PUR 50 Munzing Chemie

For higher gel structures, titanium chelating thickeners like Tilcom AT23 (Tioxide) can be used, or silica's like Aerosil 200 (Degussa).

Pigment dispersion

FREOL 2560 is a Rheology Controlled emulsion providing the excellent shear stability needed for grinding pigment directly into the polymer.

Pigment wetting will be further improved e.g. by addition of Metolat FC 514 (Munzing Chemie).

Scratch Resistance

KROONWAX 35 is recommended to improve scratch resistance and additionally

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room temperature and high temperature block resistance. KROONWAX 120 is recommended to improve water beading effect. Addition level KROONWAX 35 is appr. 2-3%.

Open Time

In solvent free formulations the open time will be very short and in practice can only be used for spray applications. Solvents like PPG can be added for lower VOC formulations. Other possibilities for formulating 0-VOC systems and improved open time with FREOL 2560 include the addition of:

- plasticizers like Kodaflex TXIB (Eastman Kodak)
- cellulose thickeners
- waxes
- alkali soluble resins like Kroonpart Polymer's FREOL 8078 and FREOL 8082 - amines like AMP 90 and DMEA
- aromatic free white spirits like Isopar H (Exxon)

TYPICAL FORMULATIONS USING FREOL 2560

EXTERIOR, HIGH BUILD TRANSPARANT STAIN BASED ON FREOL 2560

Formulations number: 0440DL072 # Grind:

| | | |
|----------------------------------|-------|----------------------|
| FREOL 2560 acrylic RC emulsion | 79.0 | KROON POLYMER |
| Byk 028 anti-foaming agent | 0.6 | Byk Chemie |
| Butyldiglycol coalescent | 2.5 | |
| Propylene glycol co-solvent | 2.0 | |
| Traetex 250 biocide | 2.0 | Acima Tafigel PUR 50 |
| (33% in water) thickener (PU) | 5.0 | Munzing Chemie |
| PW 601 transp. iron oxide yellow | 0.4 | Johnson Matthey |
| PW 602 transp. iron oxide red | 0.8 | Johnson Matthey |
| Byk 346 wetting agent | 0.3 | Byk Chemie |
| Water to adjust viscosity | 7.4 | |
| | 100.0 | |

Solids by weight 40%

Solids by volume 36%

pH 8.0

Viscosity DIN Cup 4/ sec. 35 seconds

Application conventional spray

Spray viscosity adjust viscosity with water 25-30 seconds /DIN4

Gloss at 60° 92

EXTERIOR, HIGH GLOSS WHITE BRUSHING ENAMEL BASED ON FREOL 2560

Formulations number: 2560/104 # Grind:

| | | |
|--------------------------------|------|---------------|
| FREOL 2560 acrylic RC emulsion | 21.3 | KROON POLYMER |
|--------------------------------|------|---------------|

| | | |
|------------------------------------|-----|-------------|
| Tego Foamex 805 anti-foaming agent | 0.5 | Tego Chemie |
|------------------------------------|-----|-------------|

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Water 0.5
Kronos 2190 titanium dioxide pigment 23.3 Kronos Int.

Let-down:
FREOL 2560 acrylic RC emulsion 46.1 KROON POLYMER

Pre-mix:
- Tego Foamex 805 anti-foaming agent 0.5 Tego Chemie
- Water 0.5

Dowanol DPM coalescent 1.0 Dow Chemical
Propylene glycol co-solvent 3.4
Rheolate 278 thickener (PU) 1.0 Elementis Specialties
KROONWAX 35 wax dispersion (PE) 1.9 KROON POLYMER
100.0

PVC 16%
Solids by weight 56% Solids by volume 45% pH 8.2 Viscosity Brookfield
25°C / #4 / 60 rpm 1010 mPa.s
ICI, 23°C 1.85 P
VOC ASTM D 3960, solvent 122.7 g/L
Application brush

Gloss 20° / 3 layers on Yellow pine (2 layers) 58.9 60° / 3 layers on Yellow
pine (2 layers) 83.4
MFT <5°C

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