

MACRYNAL[®] SM 500/60X

TYPE

Hydroxy functional acrylic resin, cross-linkable with polyisocyanates

FORM OF DELIVERY (f.o.d.)

60 % in xylene (60X)

SPECIAL PROPERTIES AND USE

High gloss, good mechanical properties and good adhesion to metals and plastic substrates.

In combination with polyisocyanates for air-drying as well as forced drying primers and topcoats in industrial applications.

Average hydroxyl content (solid resin)

approx. 2.7 %

PRODUCT DATA

Determined per batch:

Dynamic Viscosity DIN EN ISO 3219

dynamic viscosity [mPa.s] 2000 - 3800
(25 1/s; 23 °C)

Colour Scale (Hazen) DIN EN ISO 6271-1

Hazen colour value <= 70

Hydroxyl Value (cat.) DIN EN ISO 4629

hydroxyl value [mg KOH/g] 80 - 100
(solids)

Non-Volatile Matter DIN EN ISO 3251

non-volatile matter [%] 58 - 62
(1 h; 125 °C; 2 g; EAC)

Not continually determined:

Density (Liquids) DIN EN ISO 2811-2

density [g/cm³] 0,97
approx.
(20 °C)

Flash Point DIN EN ISO 1523

flash point [°C] 26
approx.

DILUTABILITY

white spirit	»	methyl ethyl ketone	}
toluene	}	methyl isobutyl ketone	}
xylene	}	methoxypropyl acetate	}
solvent naphtha 150/180	}	ethyl acetate	}
acetone	}	butyl acetate	}

} = unlimited dilutability

½ = substantial dilutability

¾ = limited dilutability

» = very limited or no dilutability

COMPATIBILITY

% Macrynal SM 500	90	75	50	25	10
% other binder	10	25	50	75	90
Alkyd resins					
Vialkyd AC 290	}	}	»	»	}
Vialkyd AC 451n, AN 950	»	»	»	»	»
Vialkyd AF 342	}	»	»	»	}
Acrylic resins					
Viacryl SC 121, SC 370	}	}	}	}	}
Macrynal SM 510, SM 510 n, SM 513, SM 515	»	»	»	»	»
Macrynal SM 540, SM 548	}	}	}	}	}
Macrynal SM 516	}	»	»	»	}
Polyisocyanates					
Desmodur L	»	»	»	»	»
Desmodur N	}	}	}	}	}
Beckocoat PU 428	»	»	»	}	}
Other binders					
Beckopox EP 140	}	}	}	}	}
Beckopox EP 301	»	»	»	»	»
Vinyl VAGH	»	»	»	»	}
CAB-551-0.2	}	}	}	}	}
CAB-381-0.1	»	»	»	»	»
nitrocellulose 24 E	}	}	»	}	}

} = definite compatibility

» = very limited or no compatibility

SUGGESTED USES

In combination with polyisocyanates Macrynal SM 500 is suggested for air-drying and forced drying two pack systems. The principal application area is industrial coatings, in particular primers and topcoats. Due to the good adhesion to metals primers meeting the German Federal Railway Specification TL 18300 (sheet 34, 588.34.12, sheet 49, sheet 87, section 1.2.1.) can be formulated.

PROCESSING

As a two pack system Macrynal SM 500 must be combined with polyisocyanates. Crosslinked at room temperature the coatings reach their optimum properties after 10 to 12 days. If forced drying is employed, a time of 30 min at 80 °C is sufficient for complete curing. Addition of cellulose acetobutyrate can accelerate physical drying.

Curing with polyisocyanates

Based on 100 % conversion of reactive groups the following equation can be used to calculate the quantity of polyisocyanate needed for crosslinking 100 parts Macrynal SM 500 (on solids):

$$\frac{\text{polyisocyanate}}{\text{(f.o.d.)}} = \frac{42 \times 100 \times \text{OH\% (solid resin)}}{17 \times \text{NCO\% (f.o.d.)}}$$

42 = molecular weight of the NCO group

17 = molecular weight of the OH group

To ensure that optimal properties are obtained it is necessary to have complete crosslinking. Over- or under- crosslinking is possible within certain limits. For complete crosslinking, 100 parts by weight of Macrynal SM 500 (form of delivery) need the following amount of polyisocyanate:

Desmodur N 75 24 parts by weight

For stoichiometric (100%) crosslinking, calculated on equivalent weights (NCO : OH = 1 : 1), approx. 1050 parts by weight of Macrynal SM 500 need approx. 255 parts by weight of Desmodur N 75.

Catalysis

Drying can be accelerated by the addition of suitable catalysts, like dibutyl tin dilaurate (0.3 - 0.5 % of a 1 % solution, based on solid resin), in combination with tertiary amines, like diethyl amino ethanol (approx. 0.2 %, based on solid resin). Potlife is thereby reduced, however.

Pigmentation

Macrynal SM 500 shows good pigment wetting properties. Inert pigments and extenders are suitable for pigmentation. Pigments containing alkalies or soluble metallic compounds may catalyze the crosslinking reaction of polyol and isocyanate. Thus, potlife may be reduced. Care should be taken that the material selected is free of water. Suitability should be established by preliminary testing.

Dilution

Suitable diluents are butyl acetate, methyl isobutyl ketone, 2-methoxypropyl acetate, aromatic hydrocarbons like xylene and blends of these solvents. Anhydrous solvents as well as solvents free of hydroxy functional groups should be used in the presence of isocyanates.

STORAGE

At temperatures up to 25 °C storage stability packed in original containers amounts to at least 730 days.

DISTINGUISHING FEATURES

Compared to Macrynal SM 540 Macrynal SM 500 has a higher hydroxyl content. The resulting higher crosslinking density gives a balanced pattern of properties for application on steel, plastics and concrete.

Producers:

CAB-551-0.2, CAB-381-0.1 (Eastman)
Vinyl VAGH (Union Carbide)
Desmodur (Bayer)

4.0/17.07.2013 (replaces all previous versions)

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