# MACRYNAL® SM 510/60LG

Technical Datasheet

## TYPE

Hydroxy functional acrylic resin, cross-linkable with polyisocyanates

## FORM OF DELIVERY (f.o.d.)

60 % in solvent mixture (60LG)

## SPECIAL PROPERTIES AND USE

**High gloss, very good mechanical properties, excellent outdoor stability and chemical resistance.**
**In combination with polyisocyanates for ambient cure or forced drying two-pack systems for industrial topcoats.**

**Average hydroxyl content (solid resin)**

ca. 4.5 %

## PRODUCT DATA

**Determined per batch:**

| | | |
|---|---|---|
| **Dynamic Viscosity DIN EN ISO 3219** | | |
| dynamic viscosity (400 1/s; 23 °C) | [mPa.s] | 8000 - 12000 |
| **Colour Scale (Hazen) DIN EN ISO 6271-1** | | |
| Hazen colour value | | <= 80 |
| **Hydroxyl Value DIN EN ISO 4629 (VLN 283)** | | |
| hydroxyl value (solid matter content) | [mg KOH/g] | 140 - 160 |
| **Non-Volatile Matter DIN EN ISO 3251** | | |
| non-volatile matter (1 h; 125 °C; 2 g; EAC) | [%] | 58 - 62 |

**Not continually determined:**

| | | |
|---|---|---|
| **Density (Liquids) DIN EN ISO 2811-2** | | |
| density approx. (20 °C) | [g/cm³] | 1,01 |
| **Flash Point DIN EN ISO 1523** | | |
| flash point approx. | [°C] | 26 |

## DILUTABILITY

| | | | |
|---|---|---|---|
| white spirit | ○ | methyl ethyl ketone | ● |
| toluene | ● | methyl isobutyl ketone | ● |
| xylene | ◎ | methoxypropyl acetate | ● |
| solvent naphtha 150/180 | ◎ | ethyl acetate | ● |
| acetone | ● | butyl acetate | ● |

● = unlimited dilutability
◎ = substantial dilutability
⊙ = limited dilutability
○ = very limited or no dilutability

## COMPATIBILITY

| % Macrynal SM 510 | 90 | 75 | 50 | 25 | 10 |
|---|---|---|---|---|---|
| % other binder | 10 | 25 | 50 | 75 | 90 |
| **Alkyd resins** | | | | | |
| Vialkyd AC 290 | ● | ● | ● | ● | ● |
| Vialkyd AF 342, AC 451n | ○ | ○ | ○ | ○ | ● |
| Vialkyd AN 950 | ○ | ○ | ○ | ○ | ○ |
| **Acrylic resins** | | | | | |
| Viacryl SC 121 | ○ | ○ | ○ | ○ | ○ |
| Viacryl SC 370 | ● | ● | ● | ● | ● |
| Macrynal SM 510 n, SM 513, SM 515, SM 516 | ● | ● | ● | ● | ● |
| Macrynal SM 500, SM 540, SM 548 | ○ | ○ | ○ | ○ | ○ |
| **Polyisocyanates** | | | | | |
| Desmodur L, N | ● | ● | ● | ● | ● |
| Beckocoat PU 428, PU 432 | ● | ● | ● | ● | ● |
| **Other binders** | | | | | |
| Beckopox EP 140 | ● | ● | ● | ● | ○ |
| Beckopox EP 301 | ● | ● | ○ | ○ | ● |
| Hostaflex CM 158 | ● | ● | ● | ● | ● |
| Hostaflex CM 620 | ○ | ○ | ○ | ○ | ○ |
| Ucar solution vinyl resin VAGH | ● | ● | ● | ● | ● |
| CAB-551-0.2 | ○ | ○ | ○ | ○ | ○ |
| CAB-381-0.1 | ○ | ○ | ○ | ○ | ● |
| nitrocellulose 24 E | ● | ● | ● | ● | ● |

● = definite compatibility
○ = very limited or no compatibility

## SUGGESTED USES

In combination with aliphatic polyisocyanates Macrynal SM 510/60LG is recommended for ambient cure or forced drying two-pack systems. The principal application is the industrial lacquer sector. Coatings based on Macrynal SM 510 provide very good solvent and chemical resistance as well as excellent outdoor stability.

## PROCESSING

As a two-pack system Macrynal SM 510 must be combined with polyisocyanates. Dried at room temperature, the coatings reach their optimum properties after 10 to 12 days. If forced dried, 30 min at 80 °C is sufficient for complete curing.

**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 510 (on solids):

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

42 = molecular weight of the NCO group
17 = moleculat 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 stoichiometric (equivalent) crosslinking (NCO : OH = 1 : 1) - calculated from the equivalent weights - approx. 625 parts per weight Macrynal SM 510 (f.o.d.) require approx. 255 parts per weight Desmodur N/75 %.

**Catalysis**

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

**Pigmentation**

Inert pigments and extenders are suitable for pigmentation. Care sould be taken that the material selected is free of water. Suitability should be estabilished by preliminary testing.

**Dilution**

Suitable diluents are butyl acetate, methyl isobutyl ketone, 2-methoxypropyl acetate, and mixtures 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 500 Macrynal SM 510 has a higher hydroxyl content. Owing to the higher crosslinking density coatings based on Macrynal SM 510 show higher solvent and chemical resistance and better outdoor stability.

Producers:

Desmodur (Covestro)
Ucar solution vinyl resin VAGH (Union Carbide)
CAB-551-0.2, CAB-381-0.1 (Eastman)