

HYPOMER MT 2550K

Hydroxy acrylic matting resins for non-aqueous industrial and automotive coating systems

Key Benefits

- ❖ Excellent matting function
- ❖ Good scratch and weather resistance
- ❖ Consistent gloss level over wide range of dry film thicknesses

Introduction

HYPOMER MT 2550K is a hydroxy acrylic based, proprietary liquid matting resin that provides excellent matting effect without the addition of any additional matting agent upon drying. HYPOMER MT 2550K consists of a low odour, aromatic free composition.

Dry films of the resins are characterized by excellent transparency, smoothness and tactile or touch feeling effect. HYPOMER MT 2550K adopts a special polymerization reaction and process that combines non-soluble acrylic particles with a liquid resin through a bridging mechanism, as shown in *Figure 1*. Through a good balance of hydrophilicity and hydrophobicity, the solid particles are uniformly dispersed and suspended in the liquid resin to form an opaque white liquid.

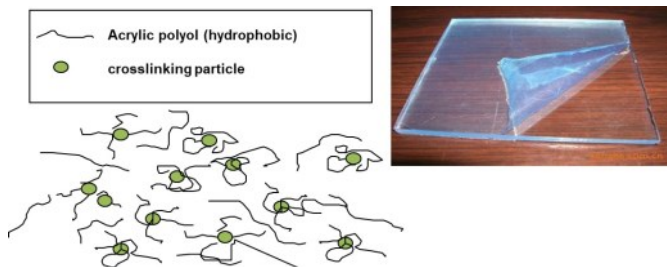


Figure 1: Application properties

HYPOMER MT 2550K has good adhesion on ABS, ABS/PC and other plastic substrates. It also has good compatibility with conventional hydroxy acrylic resins.

Physical properties

Non-volatile content [%]	47-51
Solvent	Butylacetate (nBAC) Propylene Glycol Monomethyl Ether Acetate (PMAc) Methylcyclohexane (MCH)
OH value [mg KOH/g]	app. 41.3
Viscosity [Pas]	2-12
Acid value [mg KOH/g]	15-40
T _g [°C]	app. 66

Matting theory

Upon coating, evaporation of solvents and subsequent crosslinking reaction of the matting resin with curing agent result in volume shrinkage and protrusions of solid particles out of the cured film. As shown in *Figure 2*, the protruded particles cause light scattering on the film surface, thus resulting in the matting effect. Unlike inorganic silica matting agents, the solid acrylic particles have a lower density, as such they are more evenly distributed in the coating film resulting in a more uniform matting effect over a wide range of dry film thickness. Because of the organic nature of the solid particles, the cured films have better transparency and touch feeling effect.

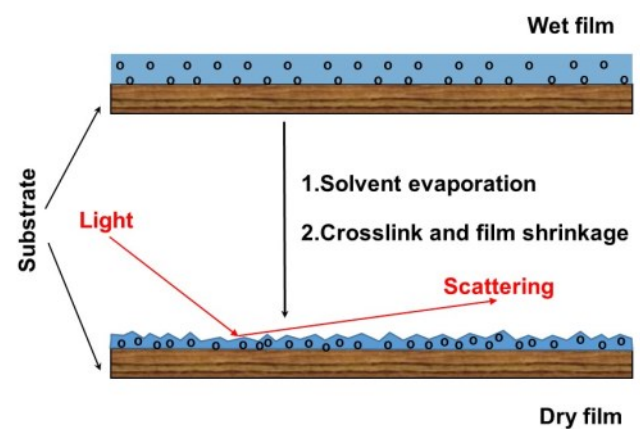


Figure 2: Matting effect

A result of the unique matting effect of HYPOMER MT 2550K is the markedly better resulting clarity.



Figure 3: Effect on film transparency

In case matt clearcoats are formulated to similar gloss levels, HYPOMER MT 2550K yield significantly better clarity/transparency than conventional systems containing silica matting agent, as shown in *Figure 3*. This is evident when the coatings were applied onto PET film, as shown.

A further key advantage of HYPOMER MT 2550K is the gloss consistency over a wide range of dry film thickness (DFT) in spray application compared to the conventional matt coatings formulated with silica-based grades. As shown in the *Figure 4*, the conventional system shows a markedly higher gloss level at higher DFT due to settling of the matting agent.

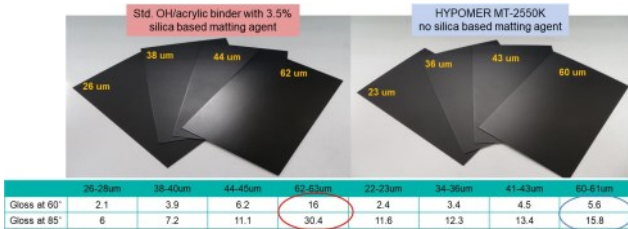


Figure 4: Gloss in dependence on the DFT

Matt coatings based on HYPOMER MT 2550K provide superb scratch resistance. *Figure 5* visualizes this effect of HYPOMER MT 2550K compared to a conventional, silica based matt clearcoat. As it can be seen, scratch marks are only minorly visible with HYPOMER MT 2550K whereas the conventional coating has obvious scratch marks. This performance advantage of HYPOMER MT 2550K translates into better polishing property than that based on conventional matt coating systems.

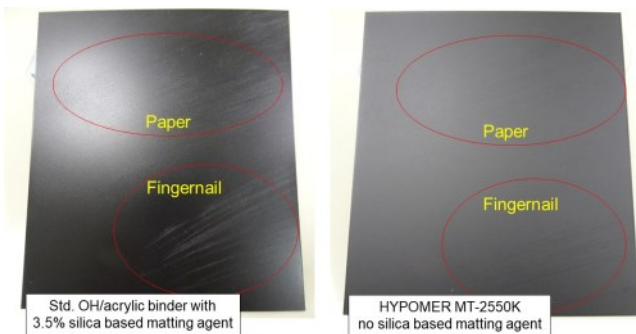


Figure 5: Scratch resistance

As shown in *Figure 6*, the chemical resistance of the coating formulated with HYPOMER MT 2550K can be classified as excellent. Especially the alkali stability is improved to coatings formulated with standard silica based matting agents. In all the other test segments, no changes could be noticed.



	Silica matting agent	HYPOMER MT-2550K
Gloss (60°)	Fully matt	Fully matt
Acid resistance	Pass	Pass
Alkali resistance	Trace Mark	Pass
Hardness	≥HB	≥HB
(ABS, no mark)		
	ABS	GT 0
Adhesion	ABS+PC	GT 0
	PC	GT 0

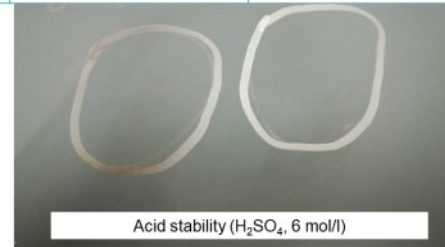


Figure 6: Chemical resistance

Conclusion

HYPOMER MT 2550K is a high-performance resin and excellent formulating tools for a unique class of non-aqueous, matt and semi-matt clear, pigmented and metallic finishes. Matt coatings formulated with HYPOMER MT 2550K combine excellent film transparency, gloss consistency, scratch resistance and tactile properties and are superior to those of the conventional matte coatings based on silica matting agents. It might be used in various industrial applications such as coatings for automotive interior parts and exterior trims, automotive refinishes, industrial and decorative coatings, plastic components, and inks.

Appendix

Experimental

Tested system: non-aqueous 2c, PU coating

Gloss measured using the Byk Gardner Haze/gloss

Chemical resistance testing

Gauze with acid, alkali, sweat, tea, coffee and water solution is put on HYPOMER® MT 2550K film

Testing time: 120 minutes

Evaluate surface immediately

Acid: Sulfuric acid w (H₂SO₄) = 0.05

Alkali: caustic potash w (KOH) = 0.05

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