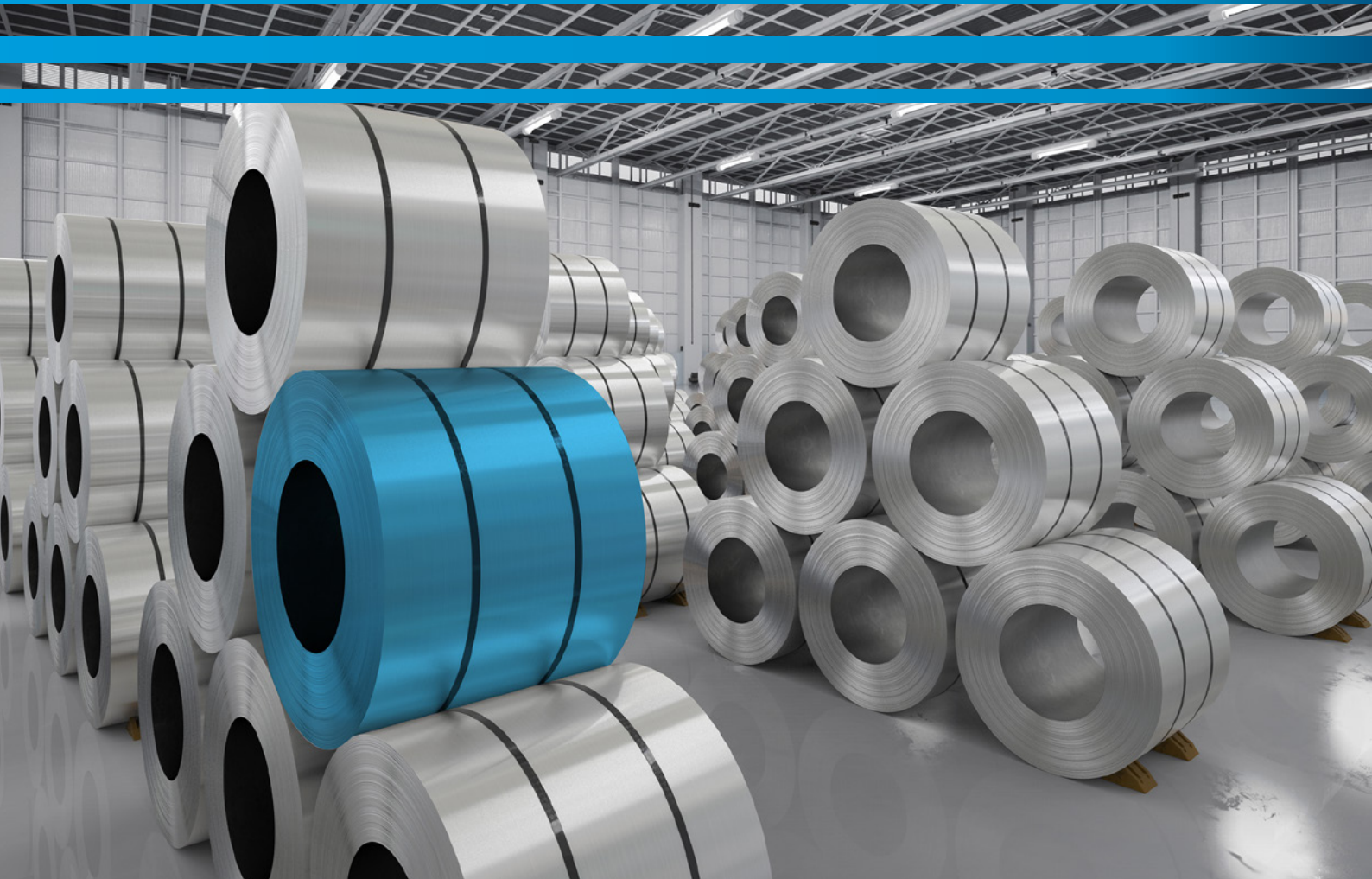


SYNOXOL™

BEPD / BEPD70L

Chemistry you can see



High performance diol
for polyester resins
in coil coatings



FLEXIBILITY



HARDNESS



UV RESISTANCE

BEST OF BOTH WORLDS

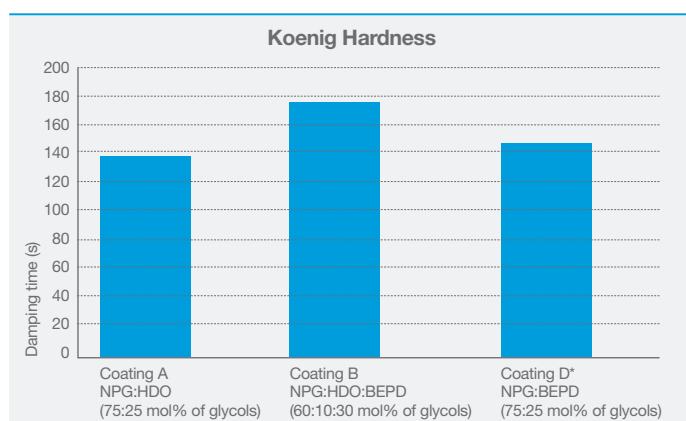


Delivering the best balance of flexibility and hardness

Mechanical properties of coil coatings strongly influence their performance. The coil coatings on metal sheet substrates are regularly subject to mechanical and physical stress during the production process and the product lifetime. Stress occurs in harsh environments or when the substrate undergoes dimensional variation, most significant when the coil coating is used for outdoor applications. These stresses can result in film damage and reduce the lifetime of the coating, which would shorten the lifetime of the asset. It is therefore important to have a balance among mechanical properties, especially flexibility and hardness. SYNOXOL™ BEPD delivers 0T-bend flexibility in polyester-based coil coatings (ASTM D4145 / ISO 17132), whilst improving film hardness by 30% against the polyester-based coil coating benchmark (Resin A) for outdoor applications (ASTM D4366 / ISO 1522).

Polyester Resin		Resin A	Resin B	Resin D
Glycol Blend (% w/w)	SYNOXOL™ BEPD	–	17.3	14.9
	HDO	11.2	4.3	–
	NPG	29.7	22.4	28.5
	TMP	0.7	0.7	0.7
Acid Blend (% w/w)	PIA	35.4	33.5	29.3
	PA	14.9	14.1	14.4
	ADA	8.1	7.7	12.2
OH Number (mgKOH/g)		33.6	32.3	31.0
T _g (°C)		14	21	13
T-Bend Value		0T	0T	0T

Note: Measured viscosities of diluted resin samples (60% w/w solids) are all comparable and within experimental error, therefore acceptable application and final cosmetic appearance can be maintained.



Koenig Hardness

Note: The higher damping time the harder the coil coating film

*T_g adjustment with acid modification

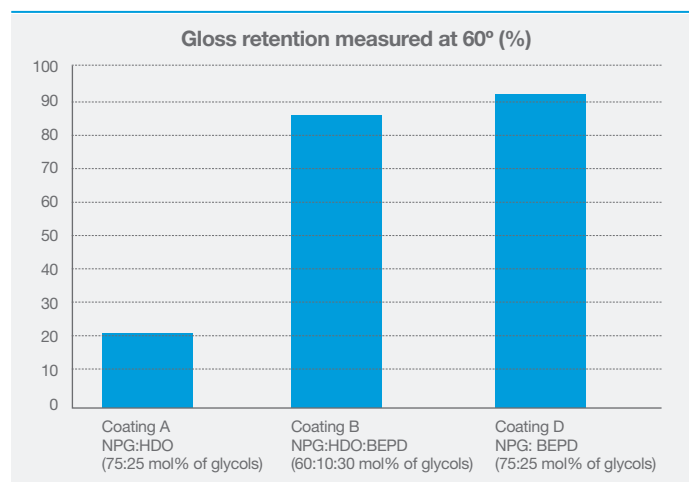


STAND OUT WHEN THE SUN IS OUT

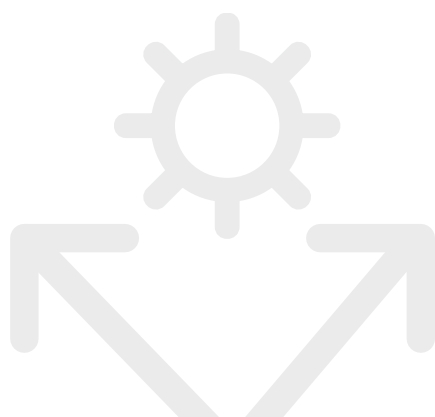
Outstanding UV resistance

SYNOXOL™ BEPD is a branched hydrophobic diol that imparts outstanding durability to polyester coil coatings used in outdoor applications. The absence of any β -hydrogens along with UV resistance / weatherability of the resultant ester leads to improved UV resistance of the coatings containing SYNOXOL™ BEPD in their polyester resin structure. The result is up to 90% gloss retention over 2 years South Florida exposure test.

This opens up opportunities to formulate highly durable polyester resins containing SYNOXOL™ BEPD, which would deliver a R_{UV4} resistance to UV in accordance with EN 13523-10 and EN 10169.



South Florida outdoor exposure weathering at 45° angle to the sun – gloss retention after 2 years

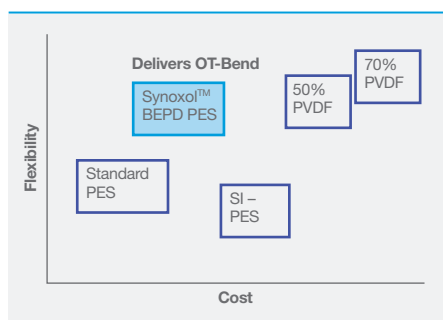


PERFORMANCE WITHOUT THE PRICE TAG

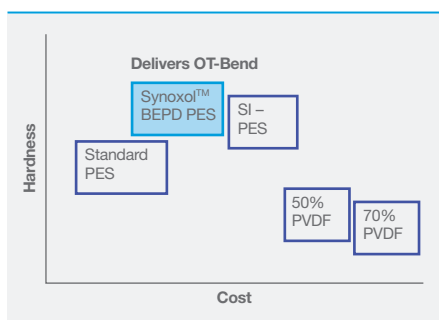
Technology positioning

SYNOXOL™ BEPD delivers a step change for polyester coil coatings, challenging costly silicone modified or superdurable polyesters and PVDF-resins in outdoor applications.

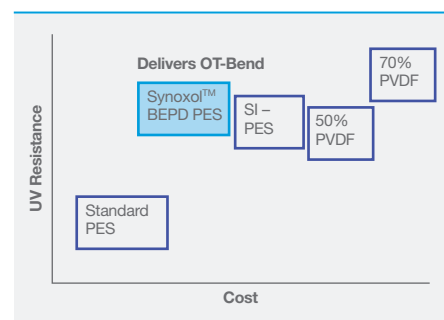
- OT-Bend flexibility without any compromise on hardness
- Improved hardness in comparison to OT-bend benchmark
- Increased UV resistance for outdoor applications
- No impact on application viscosity or cosmetic appearance
- Allows formulation of polyester coil coatings to deliver a R_{UV4} UV resistance
- Comparable UV durability at a cheaper cost than silicone modified or superdurable polyesters and 50% PVDF-resins
- Better flexibility at a cheaper cost than silicone modified or superdurable polyesters
- Harder films at a cheaper cost than PVDF-resins
- Better compatibility and workability than silicone-modified polyester and PVDF-resins



Flexibility



Hardness



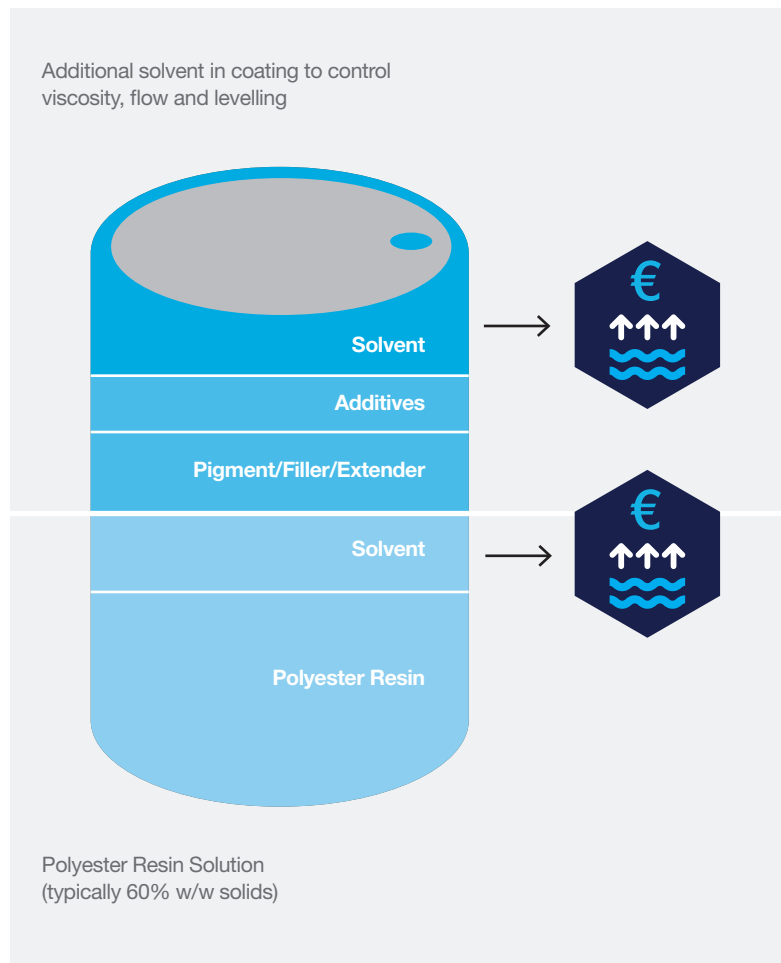
UV Resistance

Don't let your money evaporate into thin air

Replacing parts of NPG with SYNOXOL™ BEPD in resin formulations lowers the viscosity of polyesters while retaining suitable T_g . This makes it possible to produce polyester resin solutions with reduced viscosity at the same resin solids, consequently allowing coil coating formulators to replace some of the solvent with higher density fillers or extenders whilst maintaining flow and levelling properties of the final product. The result is a coil coating with less solvent (VOC), higher volume solids, higher theoretical spreading rate (TSR, m²/litre) and improved cost/m².

$$\text{TSR (m}^2\text{/L)} = \frac{\text{Paint Volume Solids (\%)} \times 10}{\text{Dry Film Thickness (\mu m)}}$$

$$\text{Coating Cost/m}^2 = \frac{\text{Coating Cost/L}}{\text{TSR}}$$



SYNOXOL™ BEPD allows polyester resin producers to formulate high value products where the resin cost/kg can be mitigated by increased volume solids. This means that a larger surface area of the metal can be coated with the same amount of coating at the same dry film thickness.



Leading in emulsions and speciality polymers

Synthomer is one of the world's leading suppliers of emulsion and speciality polymers supporting leadership positions in many market segments including coatings, construction, technical textiles, adhesives, paper and synthetic latex gloves. The company has its Head Office in London (UK) and provides customer focused services from operational centres in Cleveland (US), Harlow (UK), Marl (Germany), Kuala Lumpur (Malaysia), Shanghai (China) and Dubai (UAE).

In April 2020, we acquired OMNOVA Solutions Inc., a US-based speciality chemical company. The acquisition of this highly complementary business extends our geographic reach, particularly in North America and Asia, and expands our global platform. Synthomer is able to serve through a strong network of local technical service and sales branches, supported by regional application development and production in our key markets. We deliver the right formula, globally, individually.

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