synthomer

SYNOXOL™

BEPD / BEPD70L

Aesthetically fast

High performance diol for polyester resins in powder coatings

BLOOM RESISTANCE

FAST CURE

UV RESISTANCE

KEEP OEM PRODUCTION LINES RUNNING

Meeting the needs of the whole value chain

SYNOXOL™ BEPD → **Polyester Resin Manufacturer** → **Powder Coating Manufacturer** → **Architectural ACE General Industrial**

In today's ever changing architectural and industrial construction landscape, the requirements for the quality, durability, sustainability and aesthetics of products are becoming more demanding.

For most OEM plants and powder coating lines, this means that cost pressure and the requirement for faster product delivery cycles are increasing.

Synthomer's premium glycol brand, SYNOXOL™ BEPD, delivers on such industry requirements by offering polyester resin producers a robust glycol solution which allows for the design of UV resistant, bloom-free and fast curing powder coatings.

1 **Superdurable UV performance for architectural and industrial applications**

→ Maximization of life time for powder coated assets

2 **Bloom resistance for outdoor exposed powder coatings cured with TGIC and HAA**

→ Elimination of time-consuming and costly cleaning process after cure

3 **Reactivity increase for HAA cured polyester resins and powder coatings**

→ Productivity increase leading to total production cost reduction for powder coating lines and OEM plants

TAKE CARE IN THE SUN

Superdurable UV Performance

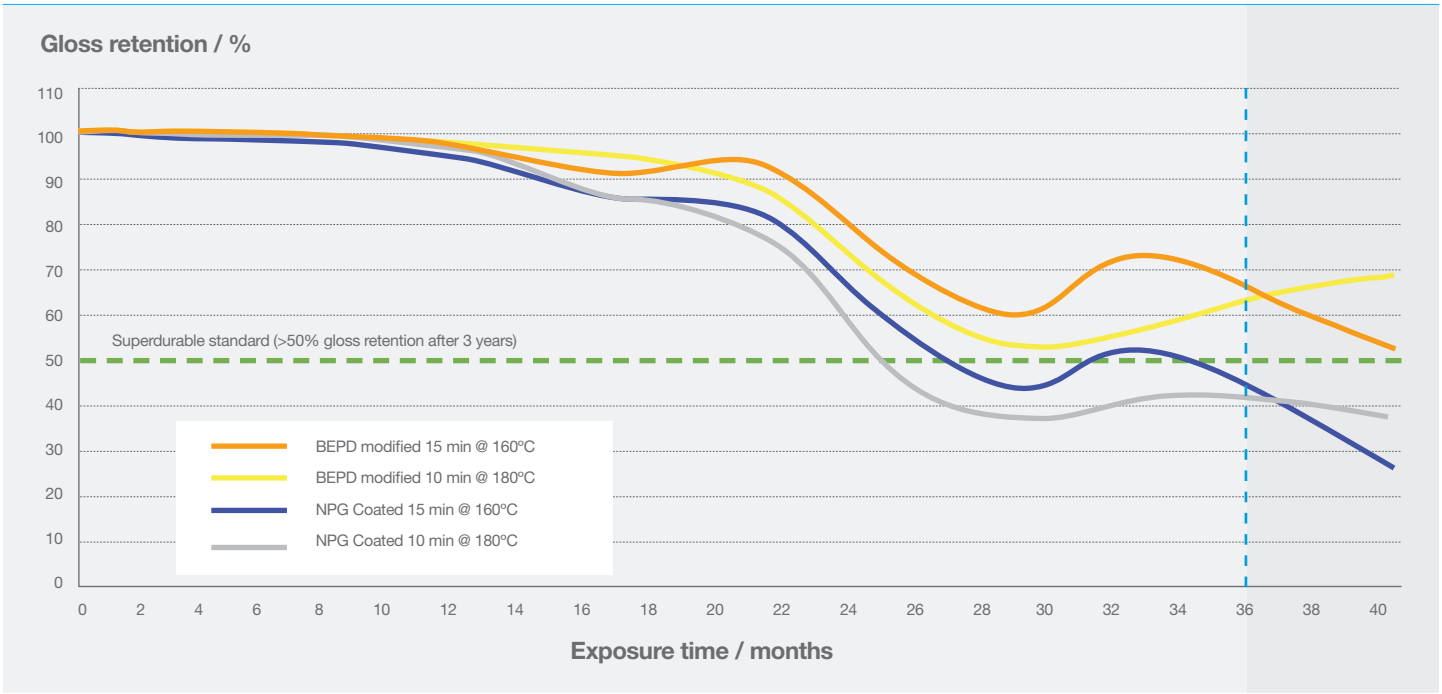
Renowned ACE equipment producers, automotive manufacturers, and industrial and architectural sectors require high UV durability as this is an important value perception on their finished products.

UV durability is assessed by utilizing natural weathering performance tests such as South Florida outdoor exposure or accelerated weathering tests which use Xenon Arc as the light source. Other accelerated weathering tests that utilize UVA and UVB light sources are unable to mimic real life sun exposure; therefore they run the risk of giving false positive or false negative results on powder coating weathering performance.

South Florida Outdoor Exposure

SYNOXOL™ BEPD meets superdurable UV performance for polyester resins in powder coatings. It has been rigorously tested in South Florida outdoor exposure over 3 years as part of a polyester resin system cured with HAA (93:7). Outstanding results as per Qualicoat Class 2 performance for architectural powder coatings were achieved.

Gloss retention over 3 years - South Florida, 5° exposure angle



South Florida Outdoor Exposure over 3 years - gloss retention % for powder coated panels at 5° angle facing the sun

The graph above shows that 50 mol% NPG replacement with SYNOXOL™ BEPD delivers superdurable UV performance. This superdurable standard can also be achieved with <50 mol% NPG replacement (93:7 PES:HAA high gloss).

Exposure time	Qualicoat Class 2	SYNOXOL™ BEPD
After 12 months	≥75%	≥98%
After 24 months	≥60%	≥79%
After 36 months	≥50%	≥61%

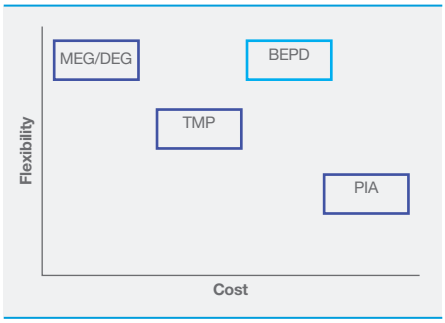
LITTLE IS BIG

Bloom Resistance Without a Compromise

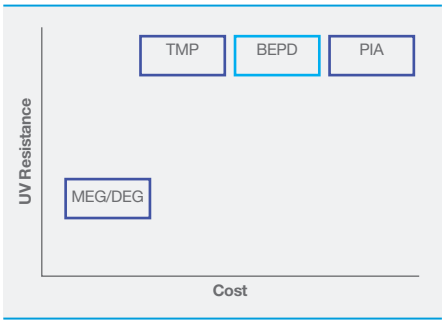
The presence of neopentyl glycol (NPG) with terephthalic acid (TPA) in polyester resins results in blooming when a powder coating is cured at low temperatures, particularly below 180ºC (356ºF). The risk of blooming is higher as the metal thickness of substrates increases; this is because minimum metal peak temperatures may never reach the oven temperature. OEM producers try to address this problem by increasing oven temperatures or cure times, which means extra energy cost and prolonged production times. Sometimes low temperature cure powder coatings are considered to solve the problem; however this, again, would represent a more expensive material cost.

Polyester resins that contain SYNOXOL™ BEPD in their glycol blend solve the blooming issue more economically by reducing the amount of crystalline NPG-TPA cyclomer formation that settle onto coated surfaces during the cure cycle; only small amounts of SYNOXOL™ BEPD make a big difference (~5% w/w NPG replacement).

Bloom resistance



Flexibility



UV Resistance

1 Allows formulation of bloom free exterior grade powder coatings

→ No compromise on flexibility, UV resistance or glass transition temperature

2 Replace as little as 5 weight % of NPG with SYNOXOL™ BEPD

→ Simple resin modification without complications

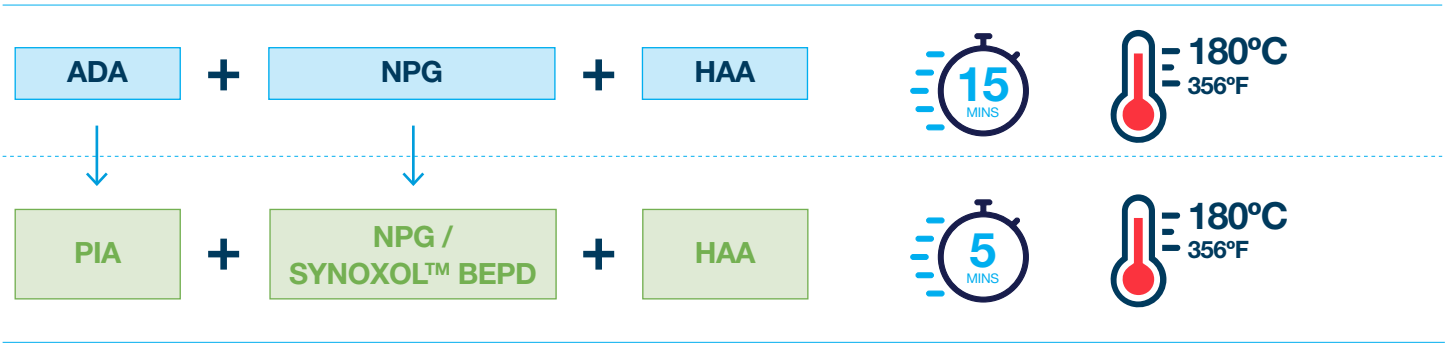
3 Implement without a new polymer registration or CAS notification

→ No more than 2 weight % of total resin formulation change

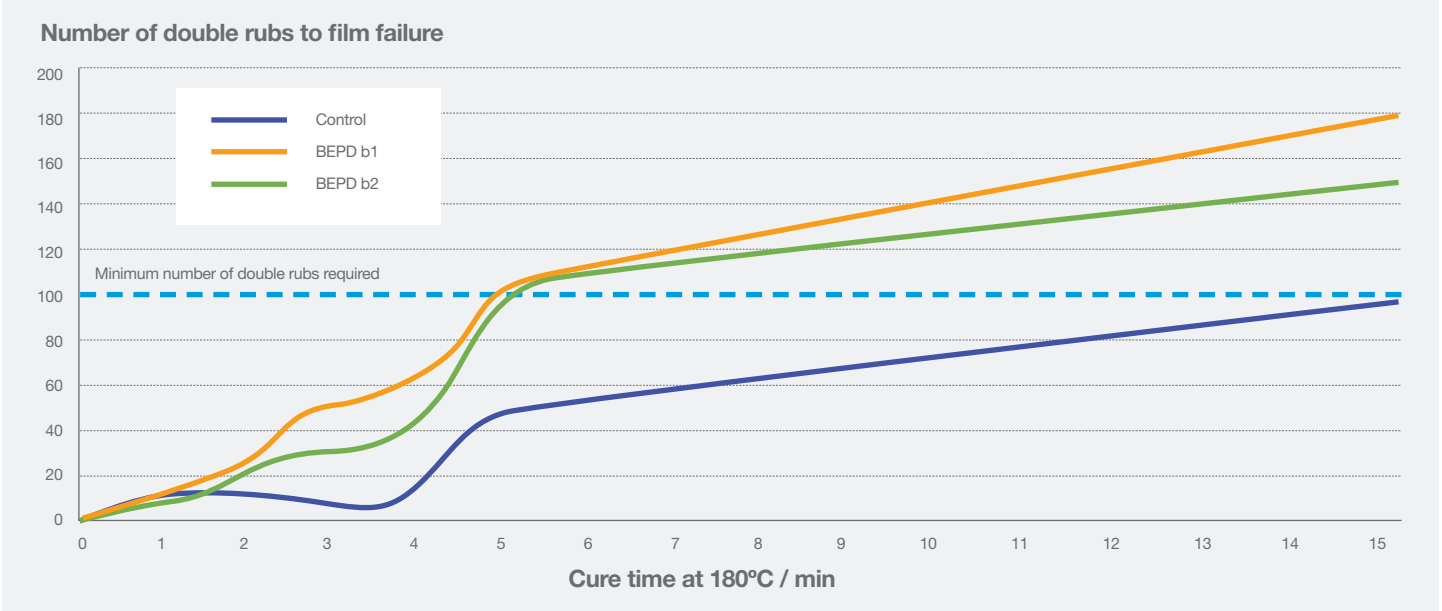
POWER YOUR PRODUCTIVITY

Adipic acid (ADA) is typically the sole monomer used to modify the viscosity of exterior grade polyester resins due to its suitability for outdoor exposure. However, this comes at the expense of increased gel times as ADA retards the reactivity of polyester / β-hydroxyalkylamide (HAA) cure chemisty, leading to powder coating cure times of 15 minutes at 180ºC (356ºF). Partially replacing neopentyl glycol (NPG) with SYNOXOL™ BEPD enables coating manufacturers to swap all ADA content of the polyester resin for isophthalic acid (PIA). The result is a polyester/HAA cure chemistry with low viscosity, high glass transition temperature and 3 times faster cure speeds (5 minutes at 180ºC / 356ºF).

Use polyester powder coatings that contain SYNOXOL™ BEPD within its resin structure and watch the product delivery cycle of OEM plants get faster. Ability to cure for 5 min, instead of 15 min, at 180ºC improves productivity by up to 3 times, resulting in a significant reduction in energy costs per manufactured item.



MEK resistance



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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