



Industrial Coatings from PPG

January 2022





Industrial Coatings from PPG

Presenter Name or Date



PPG is a **global maker** of paints, coatings and specialty materials



Founded in **1883**



Headquartered in **Pittsburgh, PA**



45,000+ Employees



Facilities in **70+** countries

We are a **recognized leader** in...



Sustainability



Innovation



Color



We are one of the few suppliers offering products and capabilities in every major coatings technology



Global Reach



Knowledge and expertise pooled from around the globe



Consistent formulation, delivered anywhere



Global sourcing that ensures a steady raw materials supply and competitive pricing



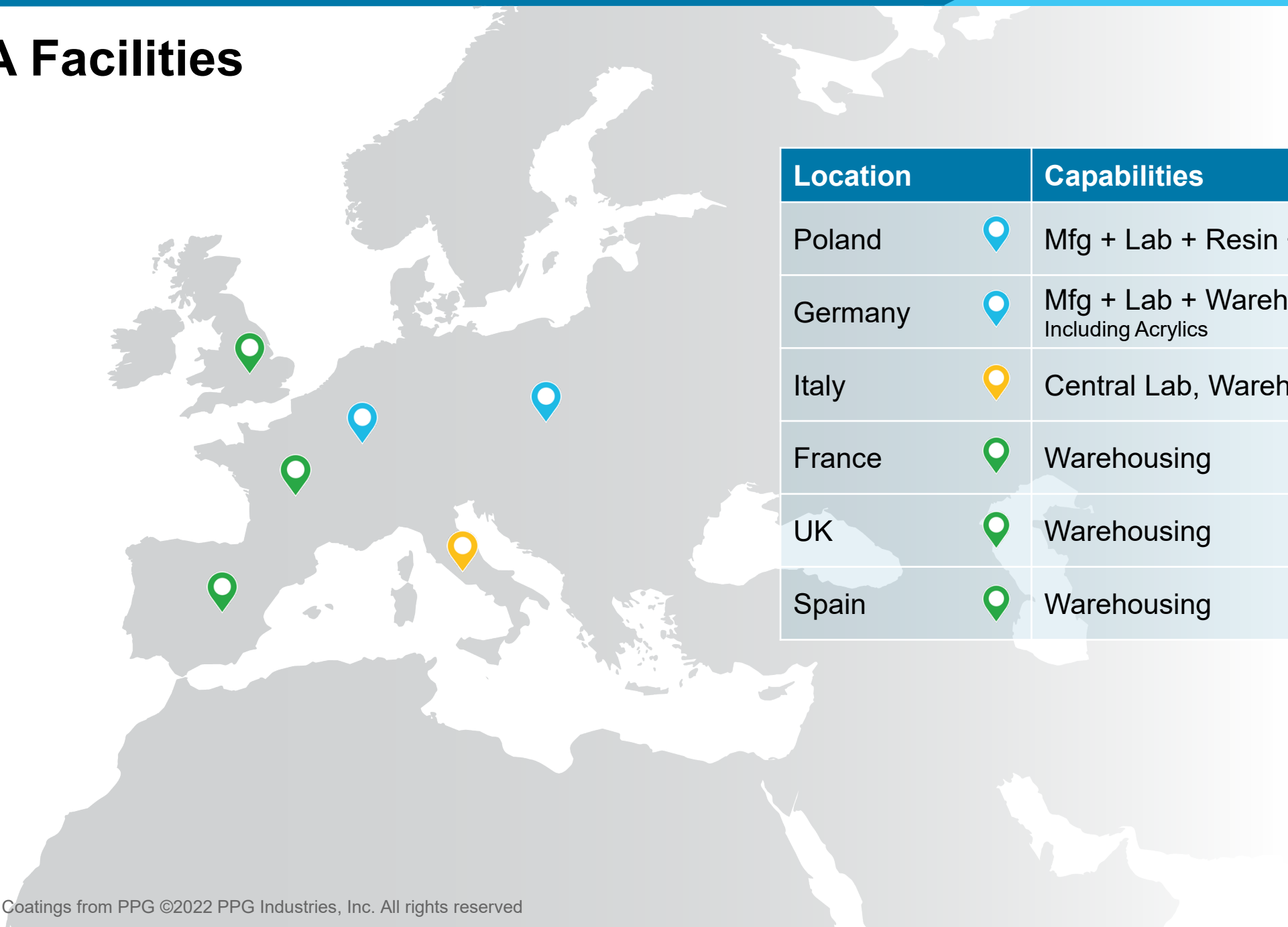
Economy of scale



Global powder manufacturing footprint



EMEA Facilities



Location		Capabilities
Poland		Mfg + Lab + Resin + Warehouse
Germany		Mfg + Lab + Warehouse (ex Woerwag) Including Acrylics
Italy		Central Lab, Warehouse
France		Warehousing
UK		Warehousing
Spain		Warehousing



EMEA Powder Production Footprint



Cieszyn, Poland

- **Capacity** 10,000 tons/year
- **Product range**
 - Epoxy
 - Epoxy-Polyester
 - Polyester
 - Polyurethane
 - Hybrid Acrylic
- **Qualicoat / GSB Standards**



Renningen, Germany

- **Capacity** 8,000 tons/year
- **Product range**
 - Epoxy
 - Epoxy-Polyester
 - Polyester
 - Polyurethane



Zuffenhausen, Germany

- **Capacity** 500 tons/year
- **Product range**
 - GMA Acrylic
 - Polyester Acrylic

EMEA Powder Lab Footprint



Milan, Italy

- Customer Support & Development
- Specialty Development
 - High transfer efficiency, scratch resistance, etc.
- Metallic Color Match
- Performance Testing
- Analytical Defect Analysis

Investment in Italy to upgrade lab in 2021



Cieszyn, Poland

- Color Match Support
- Customer Support
- Production Support



Zuffenhausen, Germany

- Customer Support & Development
- New Product and Specialty Development
- Color & Metallic Color Matching
- Performance Testing
- Analytical Defect Analysis
- Production Support

Segment Experience



Appliance



Extrusion Coatings



General Industrial



Automotive Parts and Accessories (APA)



Transportation



Heavy Duty Equipment



Interior Building Products



Consumer Electronics



Office Furniture and Equipment



Market segments with powder sales



Powder Coatings from PPG

The PPG Benefit:

- Global capability
- Increased speed and convenience with color matching
- Advanced styling and color trend consultation
- Available in a wide variety of colors, glosses and finishes
- Reduced energy costs, TGIC NIA*, BPA NIA*
- Reclaimable
- Extreme performance protection against weathering, chip and scratch, and high temperatures
- Wide variety of specialty coatings: low-cure, high-transfer efficiency, high-edge, dielectric powder and ultradurable



* Non intentionally added

Product portfolio covering key market requirements

Chemistry	PPG Series	Woerwag Series	Application Areas	Benefits	Special Features
Epoxy	ENVIROCRON PCM P5 Series	Inmotiq / Industriq W800, W803, W804	<ul style="list-style-type: none"> Protection of interior parts Tanks, pipelines, structural steelwork, trucks, trailers & car parts Primer usage against corrosion 	<ul style="list-style-type: none"> Chemical resistance Corrosion resistance 	<ul style="list-style-type: none"> Low bake
Epoxy-Polyester	ENVIROCRON PCF P8 Series	Inmotiq / Industriq W806-08, W815, W817-18, W822, W825-28	<ul style="list-style-type: none"> Domestic & industrial appliances Indoor application e.g. shelving, office furniture, partitioning, white goods Protection & decoration of interior parts 	<ul style="list-style-type: none"> Good compromise for decorative parts with optimized price 	<ul style="list-style-type: none"> Low Bake Thin Film Anti-Graffiti Abrasion Anti-Slip Induction Curable
Polyester	ENVIROCRON PCS P4 & P7 Series	Inmotiq / Industriq W889, W890, W892, W895, W898(H)	<ul style="list-style-type: none"> Urban furniture, steel or galvanized steel for cladding, Aluminum profiles and sheets Verandas, doors, window frames, facades Industrial outdoor application, e.g. HDE 	<ul style="list-style-type: none"> Outdoor use with enhanced UV resistance Qualicoat and GSB approved (P4 Series) 	<ul style="list-style-type: none"> Fast cure / low bake High edge Thin layer
Polyester Superdurable	ENVIROCRON PCS P1 & P2 Series	Inmotiq / Industriq W880, W883, W885, W888	<ul style="list-style-type: none"> Tanks, pipelines, structural steelwork, trucks, trailers & car parts Lighting equipment and construction Industrial outdoor application e.g. agricultural machinery, garden furniture, fencing, electrical 	<ul style="list-style-type: none"> Outdoor use with excellent ultradurable performance 	<ul style="list-style-type: none"> Fast cure / low bake High edge Thin layer
Acrylic	ENVIROCRON PCA P0 Series	Inmotiq / Industriq W841, W845, W847	<ul style="list-style-type: none"> Car parts Bicycle frames 	<ul style="list-style-type: none"> Outdoor use with excellent ultradurable performance & outstanding appearance 	<ul style="list-style-type: none"> Low bake
Polyurethane	ENVIROCRON PCU P3 Series	Inmotiq / Industriq W851, W852	<ul style="list-style-type: none"> Car parts Machinery Office furniture, shelving, etc. 	<ul style="list-style-type: none"> Outdoor use with excellent chemical resistance 	<ul style="list-style-type: none"> Anti-graffiti / chemical resistance

Powder innovative technologies responding to industry challenges



ENVIROCRON® HTE High Transfer Efficiency

Productivity



ENVIROCRON UltraX™ Ultradurable Low Bake

Sustainable efficiency



ENVIROCRON® XMR Extreme Mar Resistance

Product lifetime



ENVIROCRON® EPE Extreme Protection Edge

Edge protection



ENVIROCRON® EPD Extreme Protection Dielectric

Insulation



CORAFLON® Platinum Hyper Durable

Durability



ENVIROCRON® HeatSense Thermal Sensitive Substrate

Substrate

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Substrate

ENVIROCRON ULTRAX™

Ultradurable low bake powder topcoat - efficient and sustainable

- **Ultradurable** polyester with very good weathering and chemical resistance
- Low bake system with **reduced energy consumption** and carbon footprint
- Speedcure option for line speed and manufacturing **capacity increase**
- Wide processing window with **high process stability** for thin- and thick-walled components
- Good storage stability
- Blooming-resistant
- Specifically formulated without CMR NIA*



*CMR: Cancerogenic, Mutagenic and Reprotoxic
NIA: Not Intentionally Added

How UltraX can help you?



Become safer!

You are currently using accelerated PT910 systems?

Replace them by **UltraX** and use a **product formulated without CMR**. Safe for health and applicator.



Become stronger!

You are currently using standard durable systems?

Grade your performance up to **UltraX**, an **ultradurable** polyester system.



Become more efficient!

You are using already **ultradurable** polyester systems, but have issues in terms of capacity

Get rid of your bottleneck and **increase your capacity** by using the speedcure option of **UltraX**.



Become more sustainable!

Today you are using **ultradurable** standard polyester systems?

Switch to **UltraX** and use the low bake option to **save energy** and to reduce your **CO₂ footprint**.

Become safer!

Protect your people and your products.

The issues of existing PT910 systems



- Existing PT910 systems offer certain advantages for manufacturers with complex, thin- and thick-walled components, **BUT**
- PT910 systems are classified as **Repr. Cat. 1B**
- PT910 systems are a **danger to the health** of the applicator and the environment

The benefits of UltraX



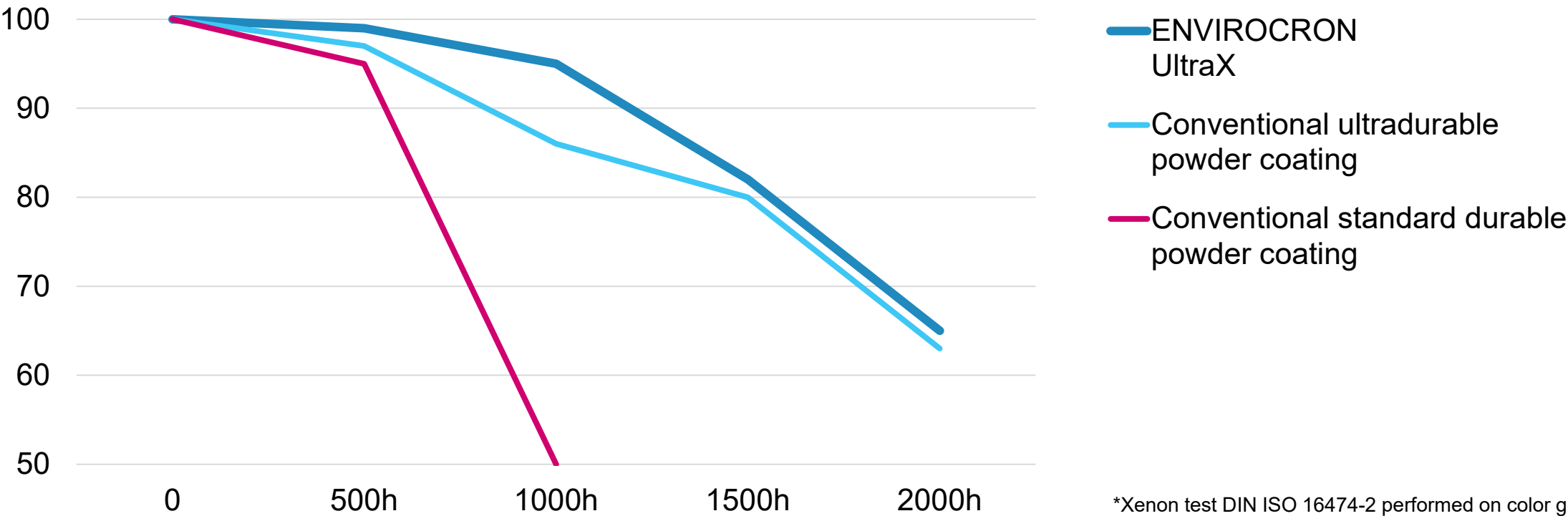
- UltraX offers a wide curing window with a high process stability, retaining important product features for thick- and thin-walled components, **AND**
- UltraX is specifically **formulated without CMR** (NIA*)
- UltraX is **no danger for the health** of the applicator and the environment and is completely **safe**

*CMR: Cancerogenic, Mutagenic and Reprotoxic
NIA: Not Intentionally Added

Become stronger!

Weathering resistance at the highest level.

Gloss [GU] 60° Angle



*Xenon test DIN ISO 16474-2 performed on color grey

Weathering performance much higher than with standard systems and at the level of standard ultradurable systems.



Become more efficient!

UltraX speedcure option – reduced curing time for increased line speed.

The Systems

Ultradurable Standard Bake

Curing Conditions

10 min180°C

10 min160°C

Curing Conditions

UltraX Ultradurable Low Bake

The Process

By reducing the target object temperature from 180°C to 160°C, the heating up time of the part, and thus the total curing time, can be significantly reduced. Depending on part thickness and oven temperature the savings can differ.

TopcoatCuringCooling

TopcoatCuringCooling

Hourglass icon

-10-25%

The Benefits

- Shorter throughput times
- Increase in line speed
- Lower heating costs per coated m² area
- Possibly saving of a complete work shift with lower capacity utilization
- Lower part temperature, thus parts can be handled after shorter time period

Line speed can be significantly increased by time savings of 10-25% for the complete curing process (depending on the part thickness).

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PPG

Become more efficient!

UltraX speedcure option – a case study

Customers Challenge



- Agricultural and construction machinery segment
- **Ultradurable standard bake** polyester powder topcoat as existing system

Situation

- **Long curing times** of the powder coatings lead to recurring problems with short-term capacity increases
- **Powder coating line** has become a **bottleneck** in the overall production of machineries
- **Extra shifts** or weekend work must be introduced to create needed extra capacity

Solution

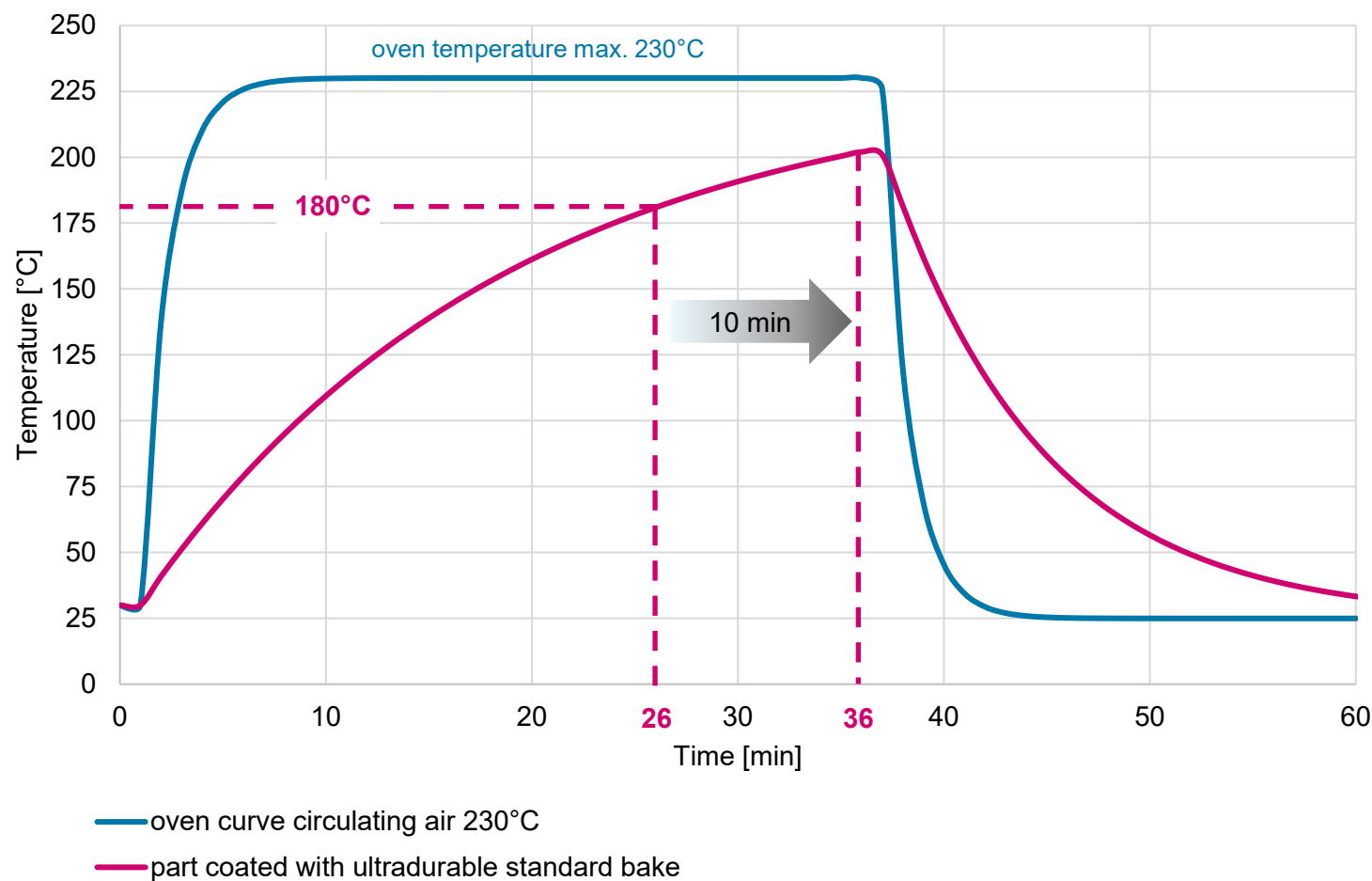


“Is there any product solution at the quality of existing ultradurable standard bake systems, but with reduced curing times?”

**ENVIROCRON UltraX
Speedcure Option**

Become more efficient!

UltraX speedcure option – a case study

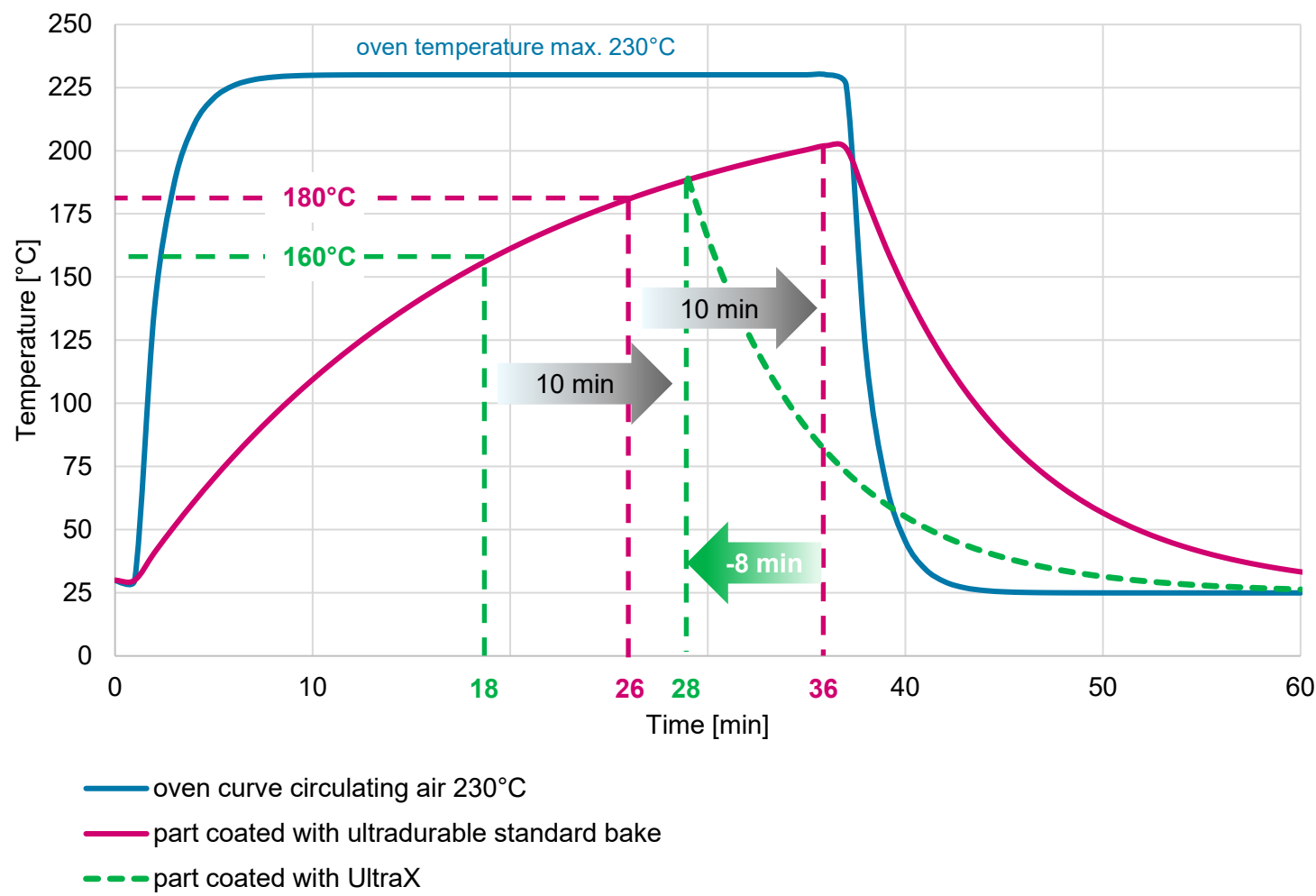


System	ultradurable standard
Part thickness	10 mm
Curing conditions	10 min 180°C
Oven temperature	230°C
Target object temperature after	26 min
Dwell time @ target object temperature	10 min
Object completely cured after	36 min



Become more efficient!

UltraX speedcure option – a case study



System	ultradurable standard	UltraX
Part thickness	10 mm	10 mm
Curing conditions	10 min 180°C	10 min 160°C
Oven temperature	230°C	230°C
Target object temperature after	26 min	18 min
Dwell time @ target object temperature	10 min	10 min
Object completely cured after	36 min	28 min



Savings - 8 min
~20% reduction
of curing time



Become more sustainable!

UltraX low cure option – reduced curing temperature for energy savings.

The Systems

Ultradurable Standard Bake

Curing Conditions

10 min

180°C

10 min

160°C

Curing Conditions

UltraX Ultradurable Low Bake

The Process

Due to the reduced curing condition, the overall oven temperature can be reduced without extension of the total curing time.

appr. -10%

standard bake

UltraX

Oven temperature

The Benefits

- Lower total oven temperature
- Lower gas consumption, thus lower energy costs
- Reduced CO₂ emissions
- Option to speedcure if capacity increase is needed

Oven temperature reduction of appr. 10% possible.

Become more sustainable!

UltraX low cure option – a case study

Customers Challenge



- Agricultural and construction machinery segment
- **Ultradurable standard bake** polyester powder topcoat as existing system

Situation

- **Increasing energy costs** making the coating line very expensive
- Existing low bake systems are not in ultradurable quality
- No capacity issues

Solution

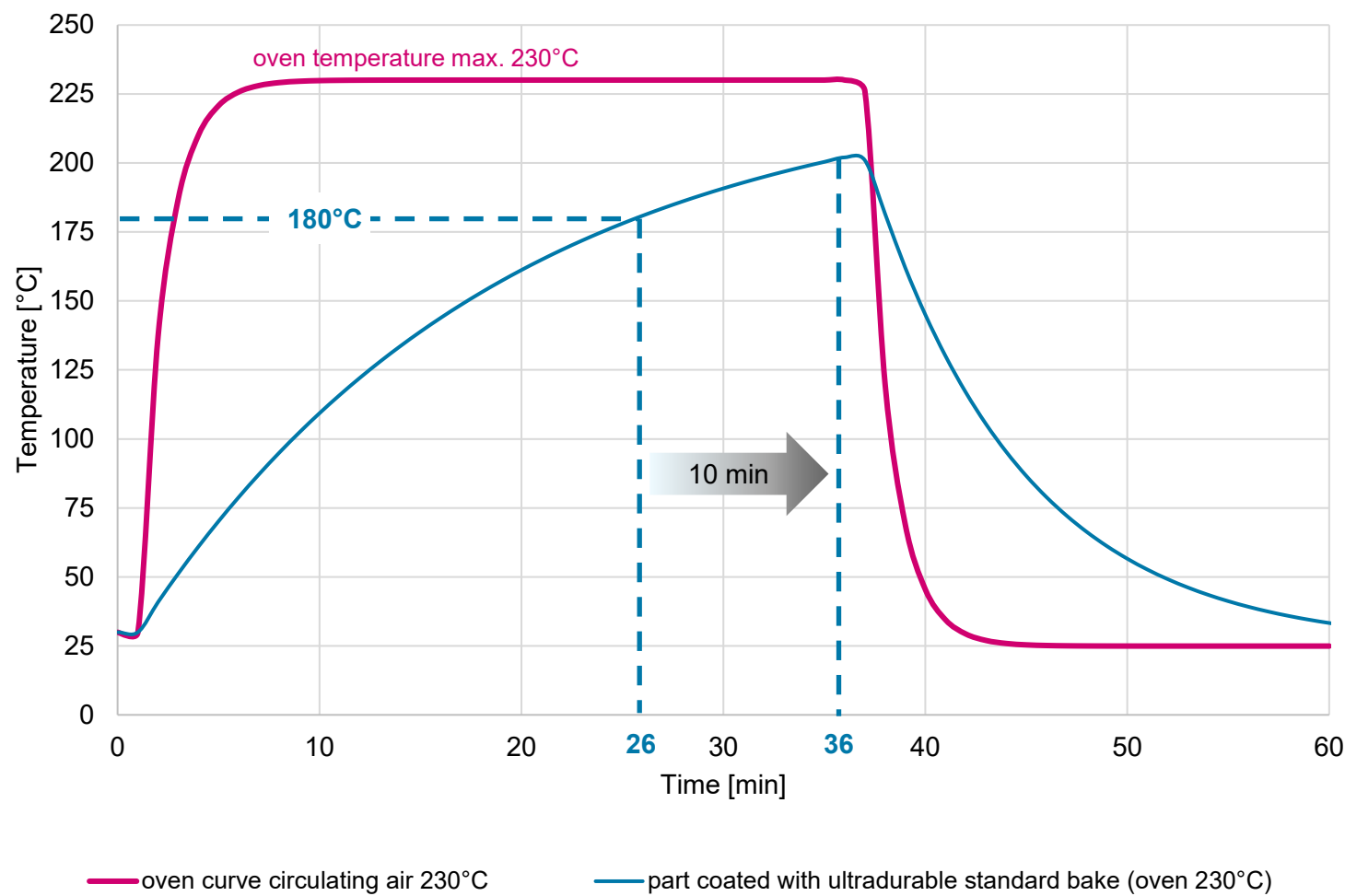


“How can I save energy costs and reduce my CO₂ footprint without compromising on the ultradurable product performance?”

**ENVIROCRON UltraX
Low Cure Option**

Become more sustainable!

UltraX low cure option – a case study

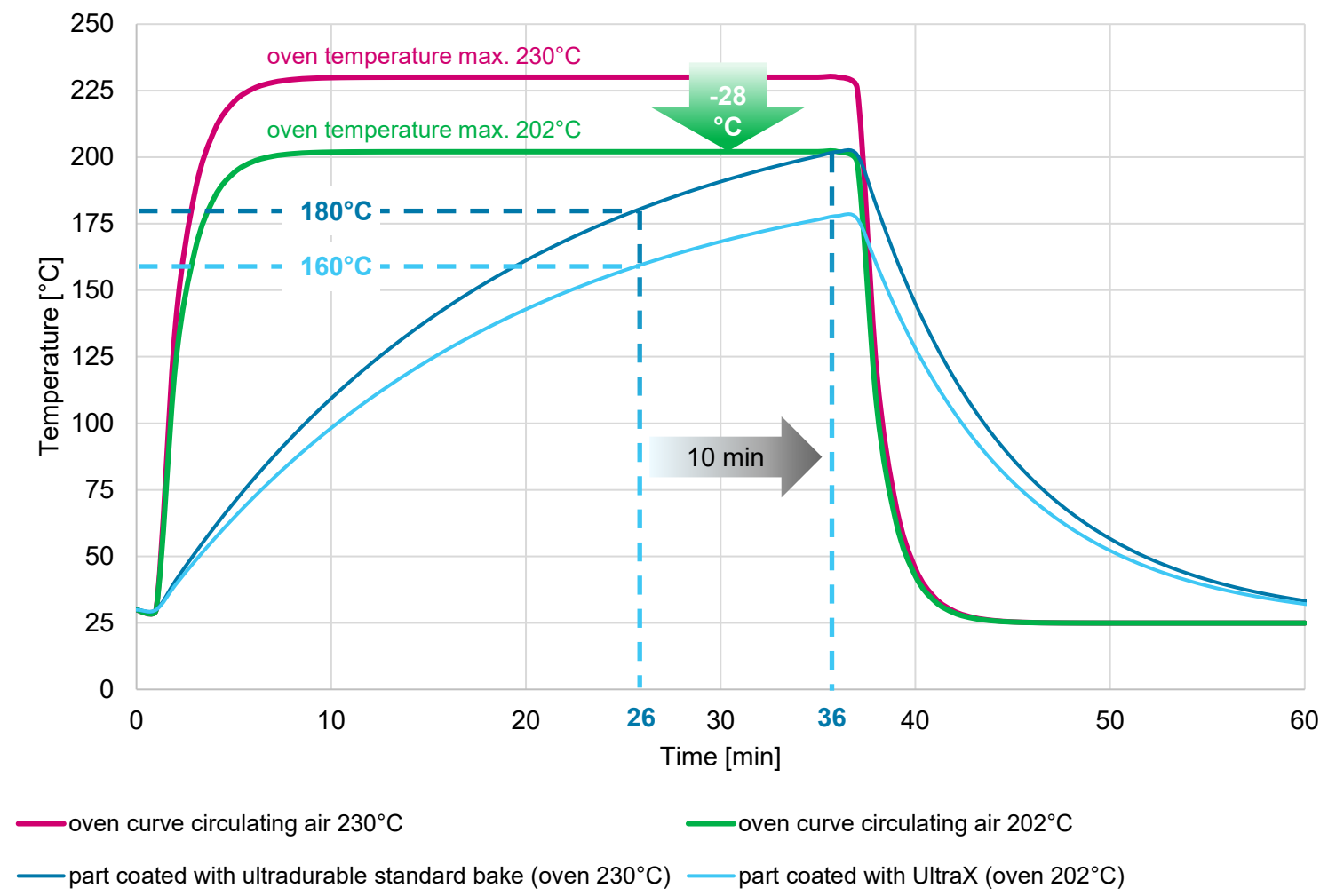


System	ultradurable standard
Part thickness	10 mm
Curing conditions	10 min 180°C
Oven temperature	230°C
Target object temperature after	26 min
Dwell time @ target object temperature	10 min
Object completely cured after	36 min



Become more sustainable!

UltraX low cure option – a case study



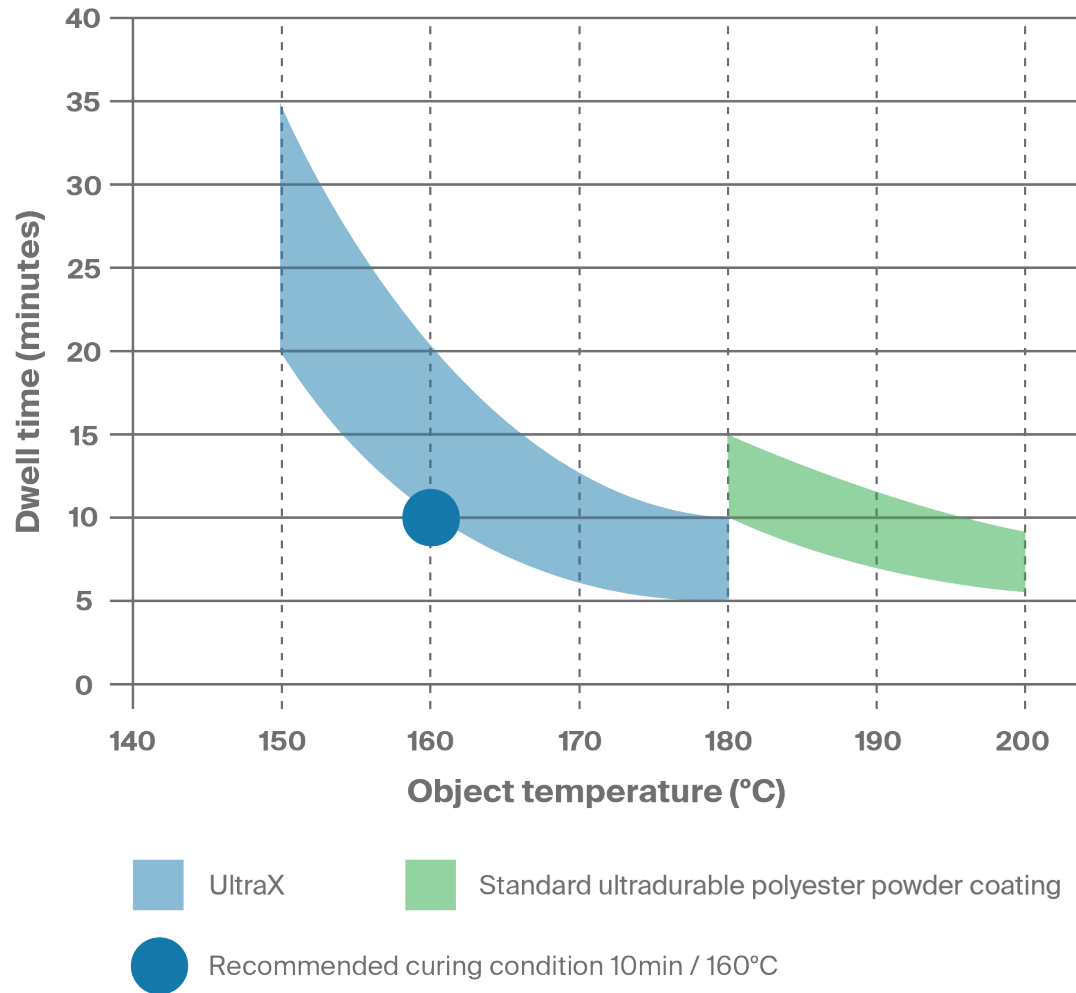
System	ultradurable standard	UltraX
Part thickness	10 mm	10 mm
Curing conditions	10 min 180°C	10 min 160°C
Oven temperature	230°C	202°C
Target object temperature after	26 min	26 min
Dwell time @ target object temperature	10 min	10 min
Object completely cured after	36 min	36 min



Savings - 28°C
~12% reduction
of oven temperature



A curing window with high process stability



The Benefits

- High process stability
- Reduced rework and reject rate
- Reduced risk of over- or underbaking
- Retention of important performance features, e.g. corrosion protection for thin- and thick-walled components
- Possibility to mix different metal gages
- No need to batch produce

Performance features at a glance

Property / Test	Test Standard	Result
Gloss level and surface variants	-	glossy semi gloss
Erichsen cupping	DIN EN ISO 1520	on 0.8 mm steel degreased > 2 mm*
Weather resistance	DIN EN ISO 16474-2 DIN EN ISO 2813	after 1500h residual gloss (60°) >80%**
Humidity test, condensation water constant climate test	DIN EN ISO 6270-2 DIN EN ISO 4628-2 DIN EN ISO 4628-3 DIN EN ISO 2409	after 240h on steel degreased - degree of blistering 0 (S0) - degree of rust Ri 0 - adhesion GT 0
Corrosion resistance, neutral salt spray test	DIN EN ISO 9227 DIN EN ISO 4628-8 DBL 7391	after 1000h on zinc-phosphated steel - corrosion creep*** ≤2 mm - edge rust KR 1

*strongly color-dependent, deviations upwards and downwards possible,

**color dependent, here tested on RAL 7035 as an example,

***test performed with Sikkens Scribe 1 mm



We protect and beautify the world[®]

What can we do to enhance your products?