



NORPOL® ULTIMATE

ULTRA LOW EMISSION GELCOAT

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Booth F19 – 7.2

REICHHOLD

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NORPOL[®] ULTIMATE

What is NORPOL[®] ULTIMATE

- Gelcoat developed on novel ground breaking technology
- Exhibits very low emissions
- Styrene free
- Uses standard equipment and peroxides, R/T cure
- For use as in-mould coating or as an external surface finish
- Compatible with multiple resin substrates
- Workplace and Environmentally friendly

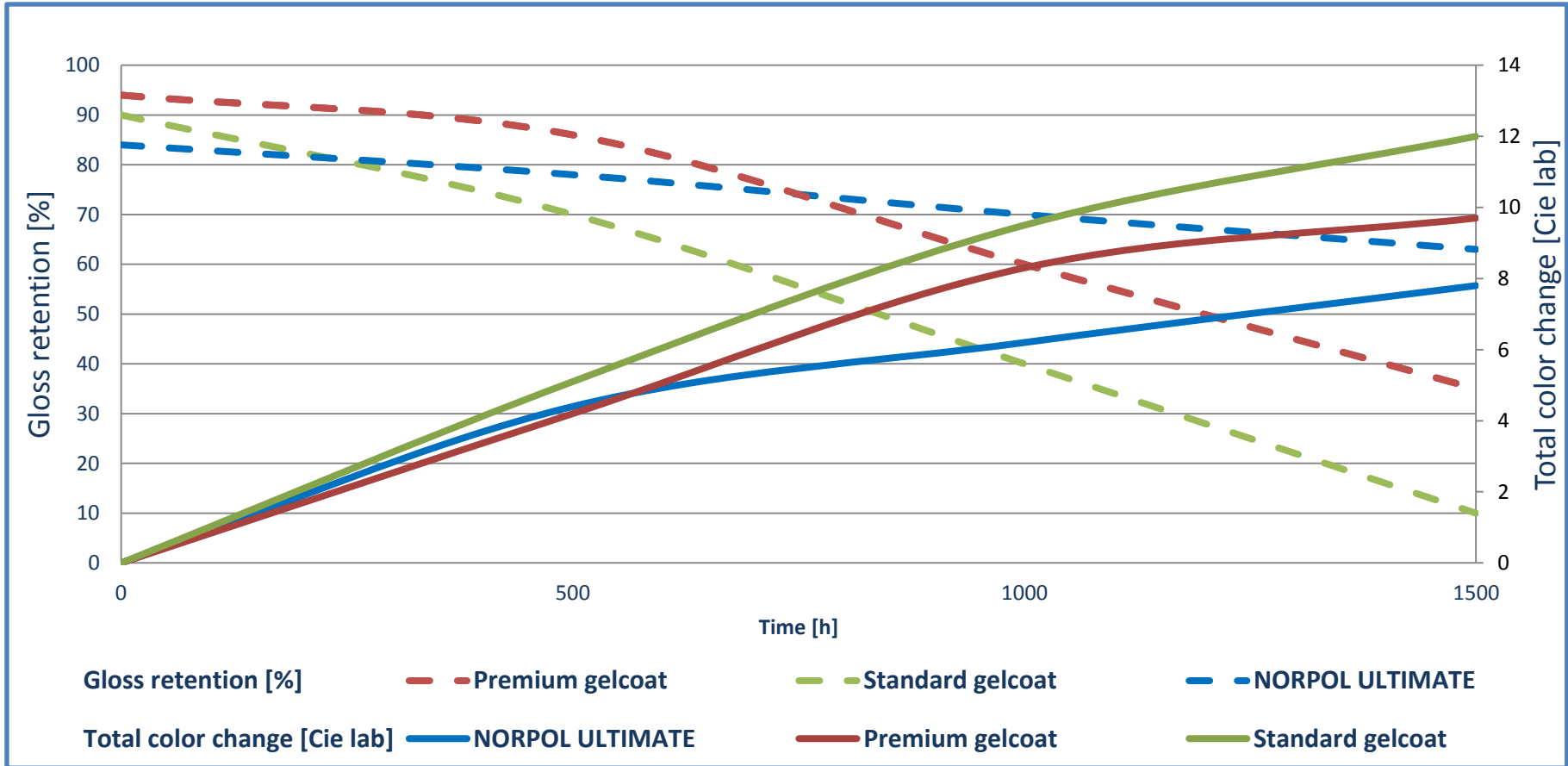
Typical Physical Properties

| Properties | Unit | Spray version | Hand version | Test method |
|------------------------------------|-------------------|---------------|--------------|----------------|
| Brookfield Visc. RVF sp.4/4 rpm | mPa·s(cP) | 12000-22000 | 20000-30000 | ASTM D 2196-86 |
| Cone & Plate Visc. | mPa·s(cP) | 300-400 | 1200-2000 | ISO 2884-1999 |
| Density | g/cm ³ | 1,1 - 1,3 | 1,1 - 1,3 | ISO 2811-2001 |
| Flash point | °C | > 93 | > 93 | ASTM D 3278-95 |
| Gel time: NOROX KP-925H | minutes | 7-25 | 10-25 | G020 |

Typical Non-Reinforced Casting Properties

| Properties | Unit | Values | Test method |
|------------------------------|------|--------|----------------|
| Tensile Strength | MPa | 70 | ISO 527-1993 |
| Tensile Modulus | MPa | 3700 | ISO 527-1993 |
| Tensile Elongation | % | 3.0 | ISO 527-1993 |
| Flexural Strength | MPa | 125 | ISO 178-2001 |
| Flexural Modulus | MPa | 3600 | ISO 178-2001 |
| Heat Distortion Temperature | °C | 70 | ISO 75-1993 |
| Hardness, Barcol 934-1, min. | - | > 40 | ASTM D 2583-99 |

Weathering resistance



Better colour retention compared to premium gelcoat
 Gloss retention is comparable

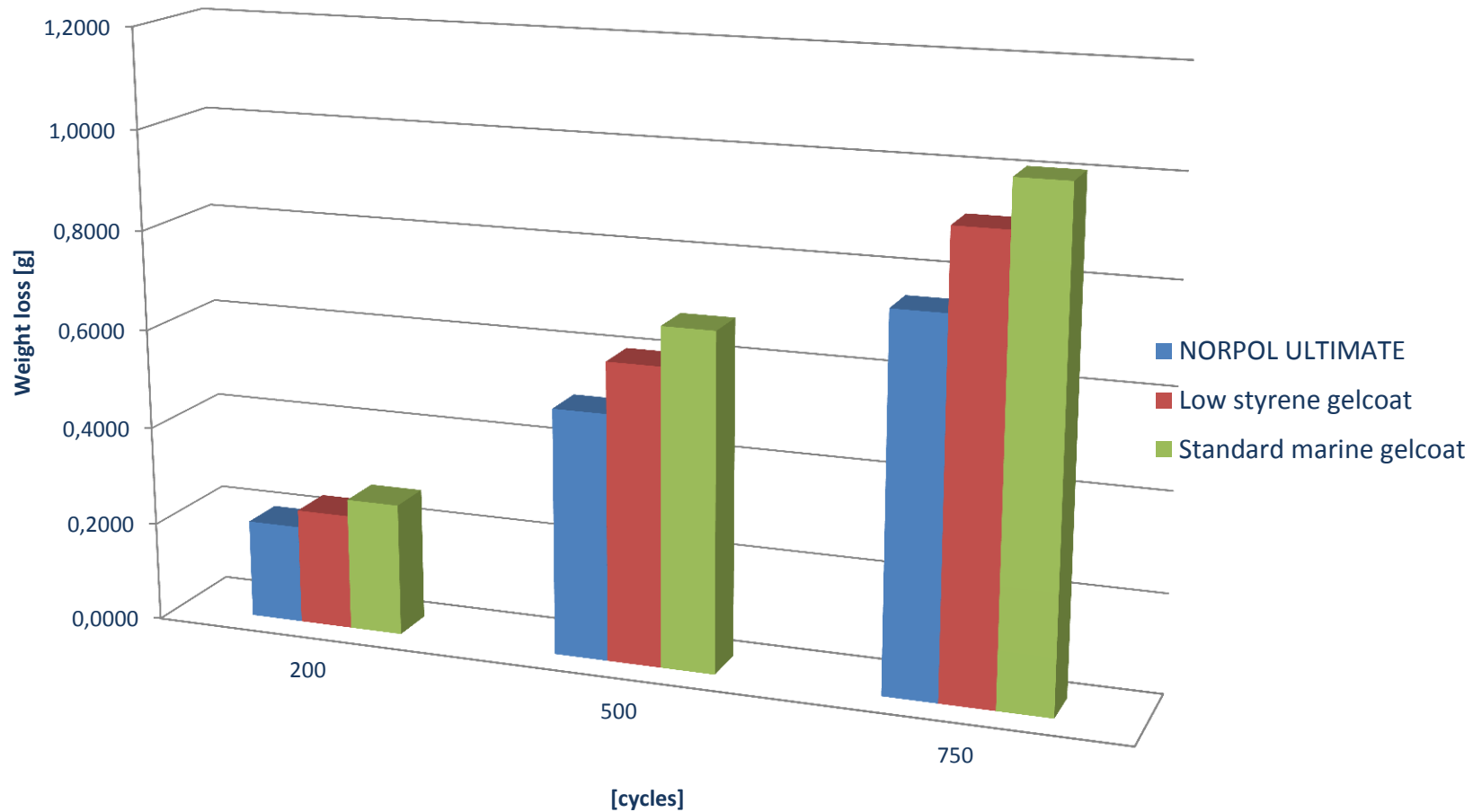
Adhesion to different laminates resin systems

| Composition | N/mm2 | Delamination |
|---|-------|-----------------|
| NORPOL® ULTIMATE + UPR laminate | 6,8 | Full Glassfibre |
| NORPOL® ULTIMATE + Epoxy laminate | 9,3 | Full Glassfibre |
| NORPOL® ULTIMATE + ADVALITE™ resin laminate | 6,5 | Full Glassfibre |
| Minimum requirements for painting | 5,0 | |



DeFelsko Positest AT-A Adhesion Tester.
Surface sanded before gluing on 20 mm. dollies.
Test speed 0,20 MPa/sec.

Abrasion resistance



Test methods: EN 14688:2006, Taber Abraser model 5150, 750g, 750 cycles, S-33

Application Overview

- Open/close mould
- Available in pigmented and clear grades
- Spray and brush/roller application
- Uses standard initiator
- Applied under standard conditions
- Very low odour environment



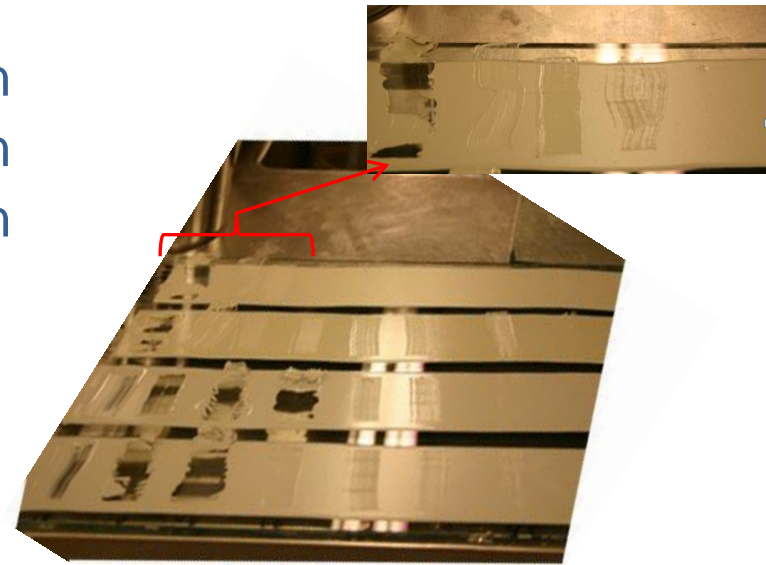
Fast Gel and Curing properties

Gel time (100g) 7 – 25 min

In Gelcoat Film

- Gel time 30 min
- Over-lamination time 40 - 60 min
- Tack free time 60 min

Same curing properties as standard gelcoat



Emissions

VOC as defined by EU "Paint Directive" 2004/42/E - an organic compound having an initial boiling point lower than or equal to 250 °C at an atmospheric pressure of 101.3.

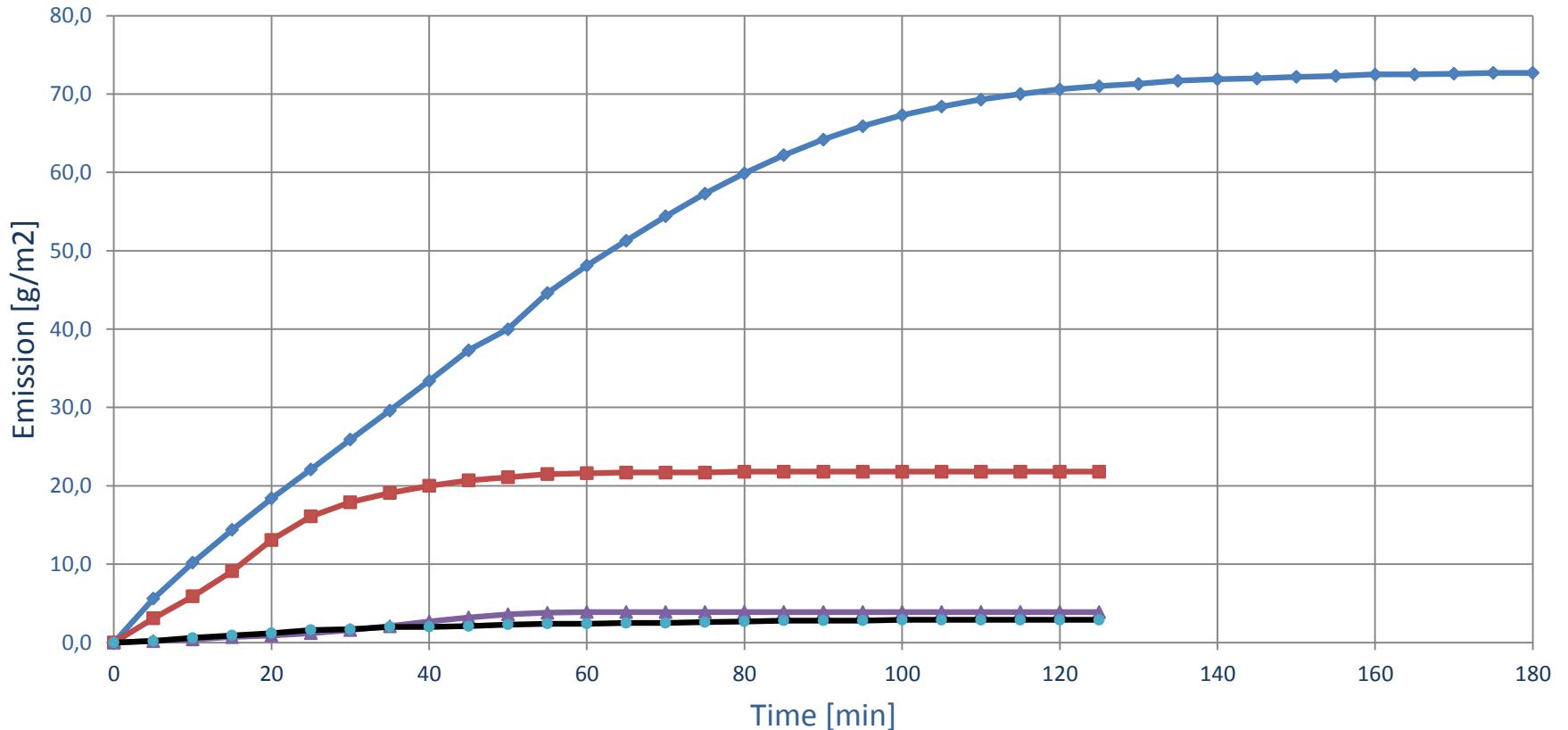
For NORPOL® ULTIMATE the VOC content is < 6.0%.

Measured < 3% emission in the exposure test for roller grades and < 4% for spray grades.

Labeling according to EU Directives 67/548/EEC or 1999/45/EC
Non hazardous / label free for roller and brush grades

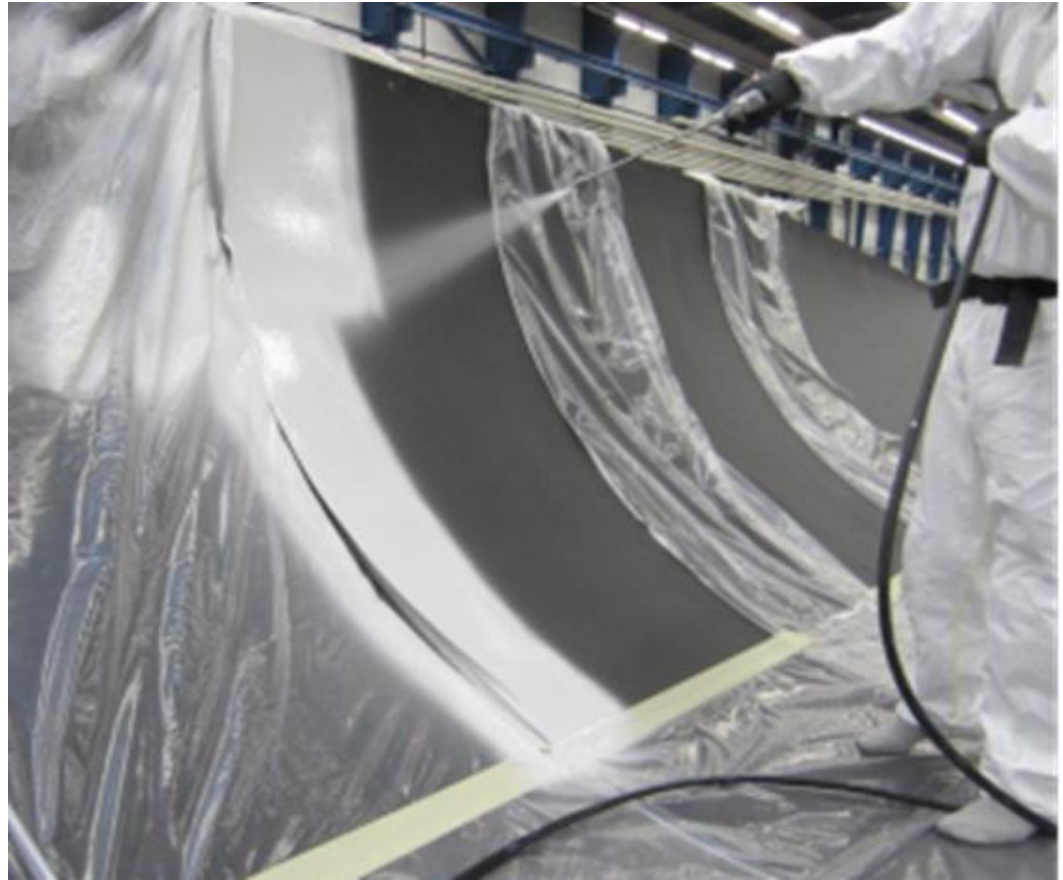
Gelcoat products supplied by Reichhold do not contain substances on the EU banned list, SVHC etc.

Static emission comparison of gelcoats



Market segments

- Automotive and Transportation
- Wind energy
- Building/Construction
- Industrial



Summary

- This gelcoat meets the tough customer requirements of performance, eco-friendliness and cost competitiveness
- **Significant reduction in emissions of volatiles.** Emissions have been measured at over 90% lower vs standard polyester gelcoats and 75% lower vs low styrene gelcoats
- Compatible with the main resin systems used in composites production and demonstrates good adhesion to polyester, vinyl ester and epoxy based laminates
- Good mechanical properties. High weathering properties
- **Can reduce costs for H&S equipment, extraction and ventilation systems**
- Compared to epoxy gel-coats allows for new users to benefit from **faster cycle times**, R/T cure and **reduced application and labour costs**

Questions?

Visit Reichhold at booth F19 – 7.2

THANK YOU FOR YOUR ATTENTION!