

**FreiLacke**



## **Ultra-High-Solid-platform technologies**

VOC-compatible coating – with significantly reduced solvent consumption.





## Ultra-High-Solid- platform technologies

The steadily growing requirements placed on surface coatings and the continuous reduction of the total VOC content in paints and coatings led FreiLacke to develop Ultra-High-Solid systems or UHS for short.

In the field of conventional coatings, completely new coating systems with a solids content of up to 80 percent by weight and a VOC value < 350 g/l were developed and brought to series-production readiness for this purpose.

The new UHS systems also include two primers and a high-gloss top coat.

## EFDEDUR-UHS UR1937H

Polyurethane primer  
with quick recoatability

Coating systems with  
solids content  
of up to 80 percent by  
weight

EFDEDUR-UHS primer  
UR1937H

As a classic 2C polyurethane primer, UR1937H can be used wherever rapid recoatability with a variety of top coat systems is required. UR1937H stands out thanks to its high stability and fast drying. Despite its high solids content of approx. 80 percent by weight, application by means of conventional air atomisation or air-assisted processes meets today's requirements.

The advantages of UR1937H in combination with the likewise recently developed UHS top coat UR1409G include excellent corrosion protection and a smooth surface. Adhesive strength is high, irrespective of whether the substrate is untreated or pretreated.

The need for only one curing agent for both the primer and top coat offers users easy handling and saves both time and money.

Technical data
2C Ultra-High-Solid polyurethane primer platform technology
Solids content 80 +-2 % in mixture
Use of standard curing agent HU0400 in MR 9:1
Rapid recoatability
High stability
Wide range of applications
Rapid drying

System	Item	Curing agents
EFDEDUR-UHS primer	UR1937H	9:1 HU0400

## FREOPOX-UHS ER1936H

Epoxy primer for high corrosion protection

FREOPOX-UHS primer  
ER1936H

The recently developed 2C epoxy UHS primer ER1936H can be used for applications with high corrosion protection requirements. Particular attention was paid to the choice of raw materials during the development of this epoxy primer. By using renewable raw materials, it was possible to formulate curing agent HE0016 in such a way that the irritation caused by amine hardeners could be significantly reduced.

What is especially noteworthy is that both ER1936H and curing agent HE0016 were brought into series production without the use of any reactive thinners. Application and performance properties are in line with the state of the art.

As well as rapid recoatability, the user can enjoy other benefits such as high stability and a sufficiently long pot life.

Technical data
2C Ultra-High-Solid epoxy primer platform technology
Curing agent made from renewable raw materials
Free from reactive thinners
Solids content 80 +-1% in mixture
High stability
Pot life of 3-4 hours depending on the temperature
Optimised for general and broad application
Good running properties
Good overspray absorption

System	Item	Curing agents
FREOPOX-UHS primer	ER1936H	12:1 HE0016

# EFDEDUR-UHS UR1409G

High-gloss polyurethane top coat system



## EFDEDUR-UHS top coat UR1409G

The new 2C polyurethane UHS top coat UR1409G is a high-gloss top coat system that boasts excellent flow properties and rapid drying.

By using the latest generation of raw materials, it was possible to achieve outstanding characteristics in terms of surface qualities and UV and chemical resistance.

As the matching top coat system for UHS primers UR1937H and ER1936H, this structure offers the solution to a wide variety of requirements in many areas: reduction of emissions, short cycle times and balanced application and surface properties.

Technical data
High-gloss 2C Ultra-High-Solid polyurethane top coat platform technology
Solids content 80 +-2 % in mixture
Use of standard curing agent HU0400 in MR 4.5:1
High gloss >20° 70-80 GE Average haze with different colours <100
Good resistance values with UR1937H and ER1936H with respect to creepage, rusting, etc.
High viscoelasticity with high surface hardness (accelerated drying)
Problem-free air-assisted application and very easy to apply on smooth substrates
Good overspray absorption
VOC content 320-340 g/l (depending on colour shade)
Pot life of 2 hours at room temperature

System	Item	Curing agents
EFDEDUR-UHS top coat	UR1409G	4.5:1 HU0400

# Technical data

comparison

A direct comparison of the properties of the products				
Product	Mixing ratio	Solids content in mixture	VOC according to ASTM D 3660-01*	Yield*
EFDEDUR-UHS Primer UR1937H	9:1 HU0400	80.0 +-2 %	348 g/l	5.1 m <sup>2</sup> /kg
FREOPOX-UHS Primer ER1936H	12:1 HE0016	80.0 +-2 %	350 g/l	4.2 m <sup>2</sup> /kg
EFDEDUR-UHS Top coat UR1409G	4.5:1 HU0400	80.0 +-2 %	320 - 340 g/l	4.7 m <sup>2</sup> /kg

# Test results for the UHS system structure

Primer UR1937H and top coat UR1409G

EFDEDUR-UHS top coat UR1409G  
MV 4.5:1 with curing agent HU0400  
Dry film thickness Ø 60 µm

EFDEDUR-UHS primer UR1937H  
MR 9:1 with curing agent HU0400  
Dry film thickness Ø 90 µm

UR1937H



## Results of the salt spray test

Substrate	Salt spray test in accordance with DIN EN ISO 9227 NSS				
	Load duration	Adhesive strength	Creepage from scribe	Bubble formation	Degree of rusting
Gardobond C steel, smooth	744 hours	Gt 1	9 mm	0 S(0)	<1.5
Gardobond WHWOC iron phosphate coating	744 hours	Gt 0	6 mm	0 S(0)	<0.5
Steel, blasted	744 hours	Gt 0	3 mm	0 S(0)	<0.5

## Results of mechanical tests

Test (standard)	after 16 h RT
Erichsen cupping test DIN EN ISO 1520	8.5 mm
Impact test DIN EN ISO 6272   1 kg weight dent	100 cm
Stone chip resistance DIN EN ISO 20567-41	K2
Bend test (cylindrical mandrel) Mandrel 5 mm   DIN EN ISO 1519   Device type 2	No cracks
Bend test (conical mandrel) DIN EN ISO 6860   Device type 2	No cracks

# Test results for the UHS system structure

Primer ER1936H and top coat UR1409G

**ER1936H**

FREOPOX-UHS primer ER1936H  
MR 12:1 with curing agent HE0016  
Dry film thickness Ø 80 µm

EFDEDUR-UHS top coat UR1409G  
MV 4.5:1 with curing agent HU0400  
Dry film thickness Ø 60 µm



## Results of the salt spray test

Substrate	Salt spray test in accordance with DIN EN ISO 9227 NSS				
	Load duration	Adhesive strength	Creepage from scribe	Bubble formation	Degree of rusting
Gardobond C steel, smooth	744 hours	Gt 0	3.5 mm	0 S(0)	2.5
Gardobond WHWOC iron phosphate coating	744 hours	Gt 0	5.0 mm	0 S(0)	<1.5
Steel, blasted	744 hours	Gt 0	1.5 mm	0 S(0)	<0.5

## Results of mechanical tests

Test (standard)	after 16 h RT
Erichsen cupping test DIN EN ISO 1520	7.5 mm
Impact test DIN EN ISO 6272   1 kg weight dent	100 cm
Stone chip resistance DIN EN ISO 20567-41	K2
Bend test (cylindrical mandrel) Mandrel 5 mm   DIN EN ISO 1519   Device type 2	No cracks
Bend test (conical mandrel) DIN EN ISO 6860   Device type 2	No cracks

- Räder  
Wheels
- Fahrzeugbau  
Vehicle construction
- Maschinen- und Apparatebau  
Mechanical engineering
- Lohnbeschichter  
Job coaters
- Funktionsmöbel und Lagertechnik  
Functional furniture and storage technology
- Bau und Sanitär  
Construction and sanitary



**FreiLacke** | Emil Frei GmbH & Co. KG  
Am Bahnhof 6  
78199 Bräunlingen/Döggingen  
Germany

Tel. +49 7707 151-0  
Fax +49 7707 151-238

info@freilacke.de  
www.freilacke.de