

LESER-Coating Systems.
Highest Corrosion Protection.



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Objectives of Presentation.

1. [Objectives](#) | 2. [Requirements](#) | 3. [Solution](#) | 4. [Customer Benefit](#)

Expand Expert Knowledge

The objective of this presentation is to give an **overview of application based solutions of LESER coating systems.**



Requirements for Corrosion Protection for Safety Valves.

1. Objectives | 2. Requirements | 3. Solution | 4. Customer Benefit

Depending on the operating site and medium, the inner and outer surface needs to meet high requirements:

- Aggressive or abrasive mediums
- Environmental conditions such as
 - High salt exposure
 - Continuous condensation
 - High air pollution
- ➔ Effective corrosion protection and reliable valve function depends on the choice of the right material as well as an applicable coating system.



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Requirements for Corrosion Protection for Safety Valves.

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- The selection of the coating system depends on the protection durations and corrosion protection category.
- According to DIN EN ISO 12944-2 several protection durations as well as corrosiveness categories for coating systems can be set:

DIN EN ISO 12944-2 corrosiveness category	Typical environmental conditions
C1 – insignificant	Heated buildings with neutral atmosphere
C2 – low	Atmosphere with low contamination and unheated buildings, where condensation may occur
C3 – moderate	City- and industry atmosphere, moderate contamination through sulfur dioxide, coastal areas with low salt exposure, production buildings with high air humidity and some air pollution
C4 – strong	Industrial and coastal areas with moderate salt exposure, chemical plants, swimming pools
C5-J – very strong (Industry)	Industrial areas with high humidity and aggressive atmosphere, buildings or areas with nearly continuous condensation and high contamination
C5-M – very strong maritime	Coastal or off-shore areas with high salt exposure, buildings or areas with nearly continuous condensation and high contamination

Product Solution. General.

1. Objectives | 2. Requirements | 3. **Solution** | 4. Customer Benefit

For application conditions, which require special outer corrosion protection, LESER offers appropriate solutions up to the highest level:

- Standard coloration (one layer, LESER blue RAL 5005)
- Coating systems for costal or industrial areas
- Corrosion protection system according to ISO 12944 in the corrosiveness category C5-M and Norsok M-501
- Frosio-certified production process
- Customer specific coloration systems



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Product solution. Corrosion Protection According to ISO 12944 and Norsok.

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- According to the procedure of a Fersio-certified process up to 5 layers are applied on the safety valve
- Destructive as well as non-destructive tests during the production, proof the quality of the corrosion protection
- The delivery time for the standardized procedure takes additional two weeks

Coating systems	Tests	Inspections
The corrosion protection system is selected to comply with safety valve material and temperature of medium.	Non-destructive tests are performed on the coated safety valve. Destructive tests are performed on a test panel. All test results are documented in reports.	Inspections according to Frosio can be performed by LESER's own Frosio-certified inspectors or by a third party. The Frosio inspections include the applicable tests for the coating systems
Temperature -196 to -50°C, Material stainless steel	Dry film thickness (non-destructive)	Frosio, by LESER-internal Frosio-Inspector (Level II)
Temperature -50 to +120°C, Material carbon steel	Porosity: holiday test (non-destructive)	Frosio, by third-party Frosio-Inspector (Level III)
Temperature -50 to +120°C, Material stainless steel	Adhesion test: pull-off test or cross-cut test	
Temperature +120 to +540°C, Material carbon steel		
Temperature +120 to +540°C, Material stainless steel		

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Product solution. Coating Process for Corrosion Protection.

1. Objectives | 2. Requirements | 3. Solution | 4. Customer Benefit

- Example for layers of a safety valve made of carbon steel, temperature -50 to +120°C:

Layer	Coating name	Coating name	Colour	Layer thickness in µm (min/max)
Primer	Interzinc 52	2k-EP-Zn (zinc rich epoxy)	Grey	60 – 150
Intermediate	Intergard 475 HS	2k-EP-EG (micaceous iron epoxy)	Light Grey	Light Grey
Intermediate	Intergard 475 HS	2k-EP-EG (micaceous iron epoxy)	Light Grey	80 – 250
Intermediate	Intergard 475 HS	2k-EP-EG (micaceous iron epoxy)	Light Grey	80 – 250
Finale	Interthane 990	2k-PU-AY (polyurethane)	RAL 5005	60 – 150

Product solution. Corrosion Protection According to ISO 12944 and Norsok.

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Preparation		Preparation	
Cleaning		Drying	
Masking Off		Intermediate application	
Sandblasting		Measuring the wet film thickness	
Coating		Application of final layer	
Prime Coating			

Customer Benefit. Corrosion Protection According to ISO 12944 and Norsok.

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- Frosio-certified process
- Conformity to leading international standard ISO 12944 and Norsk M-501
- Internal production ensures short und reliable delivery times and continous tests during coloration
- Highest corrosiveness level C5-M ensures the reliable application of LESER safety valves even under extremest offshore-conditions

LESER-Coating Systems

Thank you for your attention.

