



## APPLICATION MANUAL

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### Surface preparation

Proper surface preparation is essential for the decent working of any coating application. This means that the performance of the Neosil UHN-S coating is directly related to the correct and thorough preparation of the surface prior to the coating application.

Removal of contaminants

The performance of the Neosil UHN-S coating is significantly affected by the condition of the steel, aluminium or polyester.

Main causes are:



Surface contaminants like salts, oil, grease,... - Rust and mill scale



Surface roughness

Please ensure that all contamination is removed to prevent any possibility of early stage corrosion.

### Possible treatments

#### High pressure fresh water washing

The effect will depend on the structure and condition of the surface in combination with the water pressure used. Usually for the removal of surface contamination and e.g. marine fouling, pressures between 140 - 350 Bar (2000 - 5000 psi or 14 - 35 MPa ) are used before applying the Neosil UHN-S coating.

#### Hand and power tools

Rust and loose old paint layers can be removed from the surface by hand, wire brushing, sanding, scraping and/or chipping. But be beware that these methods always leave a layer of strong adhesive rust on the steel surface, that has to be removed as well.

#### Blast cleaning

In general, when products are specified for immersion or aggressive atmospheric conditions, the blasting standard required is Sa21/2 (ISO 8501-1:1988 / SSPC SP10). Prior to the blasting, all kind of contamination must be removed by degreasing or by a high pressure fresh water wash.



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### Grit Blasting

The effectiveness of grit blasting on large areas like a vessels hull, will greatly depend on the condition of the surface. For example, superficially corroded steel, in comparison with deep corroded or pitted steel, will easily be treated to Sa21/2. After a grit blasting all dust must be removed from the to be coated surface by blowing it with dry compressed air.

### Spot blasting

This kind of surface preparation is to be carried out where local corrosion occurs. These areas require a blasting as described in ISO 8501-1:1988 / SSPC SP10.

In practice some precautions need to be taken in account. The surrounding paint film could be undercut by the abrasive particles which could lead to a loosening of the remaining paint from the steel surface. If this occurs, the loose edges must be removed by thorough scraping with a rotating disc. Also an area of 30cm/12inch must be degreased to ensure a thorough adhesion of the repaired paint layers.

Damage can be caused when the jet is moved from one patch to the other. Please make sure to only blast the parts that have to be treated. For that reason blasting must be discontinued when moving from one patch to another.

### Sweep blasting

The effectiveness of sweep blasting depends on the condition of the surface, the type and particle size of the abrasive and the skills of the operator. Sweep blasting can be used to roughen up the old Neosil UHN-S coating to improve adhesion of the following layer of coating. A properly executed sweep blast will also remove superficial corrosion or flash - rust.

The choice of the particle size (grit or sand - 0.2mm-0.5mm/8-20mils) must be made in order with the specific treatment.

### Full blasting

A full blast or heavy sweeping will be necessary to remove the entire Neosil UHN-S coating. After carefully

Types of Abrasives	Mesh size	Max height of profile
Very fine sand	80	37µm / 1.5mils
Coarse sand	12	70µm / 2.8mils
Iron shot	14	90µm / 3.6mils
Non-metallic (1.5-2.0mm)		75-100µm / 3-4mils
Iron grit	12	200µm / 8mils

choosing the type of abrasion, it is only possible to blast without removing the NEOSIL primer.

### Wet abrasive blasting

This kind of blasting uses water combined with 4% of abrasives. The main advantage is that the hazards of dust, that may lead to health problems, are largely overcome. However after applying this technique on steel surfaces, flash rust will appear. It is important to keep the time between blasting and painting as short as possible.

## **General preparation guidelines**

The surface must be free of any kind of oil, grease and / or wax.

After a high pressure fresh water wash the surface must be clean and dry prior to painting. All structural works and welding must be completed before Neosil UHN-S coating is applied. Best is to de-ballast the vessel to avoid excessive condensation of moisture on the surface to be treated.

All overboard scuppers must be plugged and trailing lines fitted to ensure that there are no water leaks running down the side of the vessel.

After sanding, grinding or any kind of blasting the surface should be inspected and all inappropriate treated areas should be brought up to the required standard.

Painting of the topsides must be completed before the Neosil UHN-S coating is applied. Avoid excessive overlapping of the primer with the Neosil UHN-S coating.

When applying the Neosil UHN-S coating, the parts of the vessel that are not being coated have to covered adequately.

All areas near the areas to be treated must be cleared from any residues due to prior surface preparation. Wetting down the area is also possible but take into account that humidity surveillance is essential to prevent condensation on the surface.

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## **Application Procedures**

### **Storage**

The paint should be stored out of direct sunlight to insure that the temperature of the material does not exceed 35°C. In hot climates it is advisable to store the paint in a cooled environment 48 hours prior to use. When storage temperatures drop below 10°C is advisable to store the paint in a heated environment (20°C) 48 hours prior to use.

### **Mixing**

The Neosil UHN-S coating is moisture sensitive and should not be opened just before before is is being applied.

NEOSIL products should be stirred properly before use. The NEOSIL primers are single components, so there is no hardener to be added.

Neosil UHN-S coating is a two components paint. Part B (hardener) should be added to part A in the can (paint). These components should be thoroughly mixed, preferably with a power mixer.

After mixing component A with B, please wait for 45 minutes to allow the components to mix properly, before applying the coating.

### **Application equipment**

When using spraying equipment (airless/airmix) each emptied can should be replaced by a freshly mixed one to prevent blocking of the lines/tips during application.



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A clean mesh filter is advised at the end of each suction pipe to prevent any skins or pieces entering the spraying equipment.

It is advisable to conduct a trial spray before starting the actual application in order to determine the optimum tip size and handling to achieve the correct Wft/Dft.

When irregularities occur in the spray pattern, the pot life limit will probably be reached (°C/RAH). First check all filters for blockage. If they are clean and the problem still occurs, the paint must be removed from the lines and machine, followed by cleaning with a solvent (thinner).

Application equipment must be thoroughly cleaned after use with the Neosil UHN-S coating to prevent any kind of contamination (e.g. silicone) for future use.

If possible new spray lines should be used for the Neosil UHN-S coating application, and these lines should be kept solely for use with silicone containing paints.

### **Primer application**

NEOSIL has a set of primers available for all kinds of applications on steel, aluminium and polyester. Please ask which primer would be best to use in your case.

Surface must be Sa21/2 blast cleaned according to ISO 8501-1:1988 / SSPC SP10 or grind to a surface profile of 50µm - 75µm.

NEOSIL primers should be applied maximum 3 hours after grind or blast.

Depending on RAH and outside temperatures NEOSIL MCU primers can be recoated by another layer after 5 hours. Depending on the use of an accelerator recoating can take place within 30 minutes.

When NEOSIL primers are recoated, the surface must be clean from oil, dirt and dust to ensure proper adhesion of the next layer.

NEOSIL primers can be applied in extreme conditions (high air humidity/low temperatures). Consult a NEOSIL Representative for more information.

After use always put a thin layer of thinner on top of the primer paint and close the can to prevent further curing in the can. Only do so for the primers, not for Neosil.

Please read the instructions carefully.

### **NEOSIL Ultra Hard Non-Stick application**

NEOSIL UHN-S is a high solid two component epoxy-hybrid finish with excellent mechanical properties and outstanding easy-to-clean capacities.

After mixing component A (paint) with B (hardener), please wait for 40 to 45 minutes to allow the components to mix properly, before applying the coating.

NEOSIL UHN-S is to be diluted with a high-quality Neosil Reducer, which can be provided by DDC, ( 5%-10 % by weight ) to obtain the required viscosity for the used spraying equipment.



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If a second layer of NEOSIL UHN-S coating is needed to obtain the required dry film thickness, it must be applied in a time window from 1 to 2 hours (at 20°C). At different RAH and ambient temperatures this time window can change.

If the time window is exceeded there will be no adhesion with the next layer due to the composition of the paint (e.g. silicone). In practice this means that the paint still has to be "sticky" when overpainted. Sanding before a new layer is applied will be needed.

NEOSIL UHN-S coating does not contain any toxic or organism killing components acting as biocides and is, as such, fully in compliance with the International Convention on the Control of Harmful Anti-Fouling Systems as adopted by IMO in October 2001. Neosil UHN-S coating is free from all biocides and heavy metals.

In case NEOSIL UHN-S coating is combined with other Antifouling paints (non-silicone type) it is advised to completely remove these paints prior to the application of the NEOSIL UHN-S coating.

**NEOSIL UHN-S coating must cure more than 72h (at approximately 18c) before the vessel is launched into the water, to obtain his optimal characteristics.**

### **Inspection and application control**

Measurement of the dry Film thickness is described in ISO std 2808:1991 method 6a and ASTM D7091-05. Apply the recommended WFT as described in the Neosil Technical Data Sheet.

Inspection equipment for measurement of blast profile depth, RAH, WFT and DFT, adhesion, etc must be approved types or approved techniques by the paint manufacturer.

### **In Water Cleaning**

Because of the smoothness of the NEOSIL UHN-S coating just frequent movement of the vessel at certain speeds is needed to keep the hull free from marine fouling.

When marine fouling occurs it can be removed by increasing the speed of the vessel (>15knots) or cleaning it with non-abrasive tools (for example a wooden or plastic scraper). If the vessel is in the dry dock the fouling can be removed using a high pressure cleaner.

### **Health and Safety**

Please read the MSDS.

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General remarks related to the application

### **Temperature**

At start, during and after applying each layer of Neosil UHN-S coating the temperature and relative humidity needs to be measured. Register the temperature and the relative humidity at start, during and at the end of the application on the Neosil UHN-S coating Application Registration form.

	Total wet layer thickness	Total dry layer thickness
Neosil UHN-S coating	140 µm	133 µm

Minimum of layer thickness to apply:

Of every separate layer of Neosil UHN-S coating the wet layer thickness has to be measured with a layer thickness cam. Register the wet layer thickness on the het Neosil UHN-S coating Application Registration form.

**Drying times**

The mentioned dry times are based upon a temperature of 18°C and 65% relative humidity. The drying times will increase in case of: bad ventilation, lower temperatures and/or a higher degree of relative humidity. Always check the drying times of each layer applied Neosil UHN-S coating. Please register the drying times on the Application Register Form.

**Mixing**

Neosil UHN-S coating is a two component product. Mix the paint with the hardener first and after mixing the 2 components stir the coating for at least 3 minutes, until a homogeneous mass is reached. If needed a dilution substance (Neosil reducer) can be added after the mixture.

	Temperature	Relative humidity
Neosil MCU primer	5-50°C.	40-85%

**Primer choice**

The choice of a Neosil primer is depending on prevailing conditions.

**Putty**

In case repairs are needed, only use fillers with epoxy and first use a Neosil Primer (contains solvents). NO putty should be applied on bare surfaces without primer.

Product	Layers	Min. Total layer thickness	Drying times per layer 18°C	Application temperature	Relative humidity
Neosil UHN-S coating	1	133 µm dry (= 140 µm wet)	6 hours	Min. 5°C Max. 50°C	> 40% < 75%

**Application of Neosil UHN-S coating with roller (all surfaces)**

It is important to apply the right layer thickness in a single layer. If the desired layer thickness of the Neosil UHN-S coating cannot be applied in just one layer, a second layer can be applied when the first layer is still wet (sticky) but no longer rubs off, a second layer can be applied with a brush or roller. Please make sure the roller or brush contains sufficient paint.



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The final Neosil UHN-S coating layer must dry at least for 72 hours (18°C.) Because the coating is still vulnerable for mechanical damages, it is advised to have the full system cure for 7 days before allowing the ship to water.

During the raising of the ship, the webbing must be done slowly and evenly. Avoid sudden tension and movement.

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## Application of Neosil UHN-S coating with airless spray (all surfaces)

Product	Layers	Min. Total layer thickness	Drying times per layer 18°C	Application temperature	Relative humidity
Neosil UHN-S coating	1	140 µm wet	4 hours	Min. 15°C Max. 25°C	> 40% < 75%

When airless spraying is used to apply the Neosil UHN-S coating please take at least 10% overspray into account.

The final layer of Neosil UHN-S coating should dry at least 72 hours (18 °c.) Because the coating is still vulnerable for mechanical damages, it is advised to have the full system cure for 7 days before allowing the ship to water.

During the raising of the ship, the webbing must be done slowly and evenly. Avoid sudden tension and movement.

### Disclaimer

The information in this data sheet is given in good faith and to the best of our knowledge, but is subject to revision without notice. Because the application is done beyond our scope and control, no liabilities can be accepted on the



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