

## Safeguard Universal ES

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### Product description

This is a two component polyamide cured vinyl epoxy based coating. Specially designed as a tie coat between epoxy primers and antifouling systems. Can be used as tie coat for a wide range of topcoats. To be used as tie coat in atmospheric and immersed environments. Suitable on approved primers on aluminium, carbon steel, galvanised and stainless steel substrates. It can be applied at sub zero surface temperatures.

### Scope

The Application Guide offers product details and recommended practices for the use of the product.

The data and information provided are not definite requirements. They are guidelines to assist in smooth and safe use, and optimum service of the product. Adherence to the guidelines does not relieve the applicator of responsibility for ensuring that the work meets specification requirements. Jotuns liability is in accordance with general product liability rules.

The Application Guide (AG) must be read in conjunction with the relevant specification, Technical Data Sheet (TDS) and Safety Data Sheet (SDS) for all the products used as part of the coating system.

### Referred standards

Reference is generally made to ISO Standards. When using standards from other regions it is recommended to reference only one corresponding standard for the substrate being treated.

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## Surface preparation

The required quality of surface preparation can vary depending on the area of use, expected durability and if applicable, project specification.

When preparing new surfaces, maintaining already coated surfaces or aged coatings it is necessary to remove all contamination that can interfere with coating adhesion, and prepare a sound substrate for the subsequent product. Inspect the surface for hydrocarbon and other contamination and if present, remove with an alkaline detergent. Agitate the surface to activate the cleaner and before it dries, wash the treated area using fresh water.

Paint solvents (thinners) shall not be used for general degreasing or preparation of the surface for painting due to the risk of spreading dissolved hydrocarbon contamination. Paint thinners can be used to treat small localized areas of contamination such as marks from marker pens. Use clean, white cotton cloths that are turned and replaced often. Do not bundle used solvent saturated cloths. Place used cloths into water.

### Process sequence

Surface preparation and coating should normally be commenced only after all welding, degreasing, removal of sharp edges, weld spatter and treatment of welds is complete. It is important that all hot work is completed before coating commences.

### Coated surfaces

#### Verification of existing coatings including primers

When the surface is an existing coating, verify with technical data sheet and application guide of the involved products, both over coatability and the given maximum over coating interval.

#### Organic primers/intermediates

The surface of previous coats shall be free from contamination by water, hydrocarbon based products, wax, mud, mortar droppings and loose, chalked and flaking coating.

Inspect the surface for hydrocarbon and other contamination and if present, remove with an alkaline emulsifying detergent. Agitate the surface to activate the cleaner and before it dries, wash the treated area by low-pressure waterjetting method to Wa 1 (ISO 8501-4) using fresh water. Surfaces not contaminated with hydrocarbon deposits shall be washed to Wa 1 (ISO 8501-4) using fresh water to reduce surface chlorides.

When applied on coatings past maximum over coating interval light abrading may be required to achieve proper intercoat adhesion.

## Application

### Acceptable environmental conditions - before and during application

Before application, test the atmospheric conditions in the vicinity of the substrate for the dew formation according to ISO 8502-4.

|                        |         |    |
|------------------------|---------|----|
| Air temperature        | -5 - 60 | °C |
| Substrate temperature  | -5 - 50 | °C |
| Relative Humidity (RH) | 10 - 85 | %  |

The following restrictions must be observed:

- Only apply the coating when the substrate temperature is at least 3 °C (5 °F) above the dew point
- Do not apply the coating if the substrate is wet or likely to become wet
- Do not apply the coating if the weather is clearly deteriorating or unfavourable for application or curing
- Do not apply the coating in high wind conditions

## Product mixing

### Product mixing ratio (by volume)

|                               |           |
|-------------------------------|-----------|
| Safeguard Universal ES Comp A | 5 part(s) |
| Safeguard Universal ES Comp B | 1 part(s) |

### Induction time and Pot life

|                          |              |
|--------------------------|--------------|
| <b>Paint temperature</b> | <b>23 °C</b> |
| Induction time           | 10 min       |
| Pot life                 | 2 h          |

The temperature of base and curing agent is recommended to be 18 °C or higher when the paint is mixed.

### Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 17

### Application data

#### Airless Spray Equipment

|                                |                  |
|--------------------------------|------------------|
| Pump ratio (minimum) :         | 42:1             |
| Pump output (litres/minute) :  | 1.5-2.6          |
| Pressure at nozzle (minimum) : | 150 bar/2100 psi |
| Nozzle tip (inch/1000) :       | 19-25            |
| Filters (mesh) :               | 70               |

Material hose length :

Several factors influence, and need to be observed to maintain the recommended pressure at nozzle. Among factors causing pressure drop are:

- long paint- and whip hoses
- low inner diameter hoses
- high paint viscosity
- large spray nozzle size
- inadequate air capacity from compressor
- wrong or clogged filters

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## Film thickness per coat

#### Typical recommended specification range

|                            |            |                   |
|----------------------------|------------|-------------------|
| Dry film thickness         | 50 - 200   | µm                |
| Wet film thickness         | 80 - 325   | µm                |
| Theoretical spreading rate | 12,4 - 3,1 | m <sup>2</sup> /l |

If used as a tie coat applied with dry film thickness 50-75 µm on existing antifouling systems, it is recommended to add 5-10 % Jotun Thinner No. 17.

#### Wet film thickness (WFT) measurement and calculation

To ensure correct film thickness, it is recommended to measure the wet film thickness continuously during application using a painter's wet film comb (ISO 2808 Method 1A). Use a wet-to-dry film calculation table to calculate the required wet film thickness per coat.

A wet to dry film thickness chart is available on the Jotun Web site.

#### Dry film thickness (DFT) measurement

When the coating has cured to hard dry state the dry film thickness can be checked to SSPC PA 2 or equivalent standard using statistical sampling to verify the actual dry film thickness. Measurement and control of the WFT and DFT on welds is done by measuring adjacent to and no further than 15 cm from the weld.

#### Ventilation

Sufficient ventilation is very important to ensure proper drying/curing of the film.

#### Coating loss

The consumption of paint should be controlled carefully, with thorough planning and a practical approach to reducing loss. Application of liquid coatings will result in some material loss. Understanding the ways that coating can be lost during the application process, and making appropriate changes, can help reducing material loss.

Some of the factors that can influence the loss of coating material are:

- type of spray gun/unit used
- air pressure used for airless pump or for atomization
- orifice size of the spray tip or nozzle
- fan width of the spray tip or nozzle
- the amount of thinner added
- the distance between spray gun and substrate
- the profile or surface roughness of the substrate. Higher profiles will lead to a higher "dead volume"
- the shape of the substrate target
- environmental conditions such as wind and air temperature

## Drying and Curing time

| Substrate temperature     | -5 °C | 0 °C | 5 °C | 10 °C | 23 °C | 40 °C |
|---------------------------|-------|------|------|-------|-------|-------|
| Surface (touch) dry       | 24 h  | 12 h | 8 h  | 5 h   | 2 h   | 1.5 h |
| Walk-on-dry               | 44 h  | 30 h | 24 h | 18 h  | 10 h  | 6 h   |
| Dry to over coat, minimum | 44 h  | 30 h | 24 h | 18 h  | 10 h  | 6 h   |
| Dried/cured for service   | 21 d  | 14 d | 7 d  | 5 d   | 3 d   | 2 d   |
| Dried/cured for immersion | 4 d   | 3 d  | 2 d  | 36 h  | 20 h  | 12 h  |

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The shortest time allowed before the next coat can be applied.

Dried/cured for service: Minimum time before the coating can be permanently exposed to the intended environment/medium.

Dried/cured for immersion: Minimum time before the coating can be permanently immersed in sea water.

## Maximum over coating intervals

Maximum time before thorough surface preparation is required. The surface must be clean and dry and suitable for over coating. Inspect the surface for chalking and other contamination and if present, remove with an alkaline detergent. Agitate the surface to activate the cleaner and before it dries, wash the treated area by low-pressure water jetting to Wa 1 (ISO 8501-4) using fresh water.

If maximum over coating interval is exceeded the surface should in addition be carefully roughened to ensure good inter coat adhesion.

### Areas for atmospheric exposure

| Average temperature during drying/curing | -5 °C | 0 °C  | 5 °C  | 10 °C | 23 °C | 40 °C |
|--|-------|-------|-------|-------|-------|-------|
| Itself                                   | 6 mth | 6 mth | 6 mth | 6 mth | 6 mth | 6 mth |
| acrylic                                  | 14 d  | 14 d  | 10 d  | 9 d   | 7 d   | 3 d   |
| alkyd                                    | 14 d  | 14 d  | 10 d  | 8 d   | 5 d   | 1 d   |

|              |       |       |       |       |       |       |
|--------------|-------|-------|-------|-------|-------|-------|
| epoxy        | 6 mth | 6 mth | 6 mth | 6 mth | 6 mth | 6 mth |
| polysiloxane | 6 mth | 6 mth | 6 mth | 6 mth | 6 mth | 6 mth |
| polyurethane | 6 mth | 6 mth | 6 mth | 6 mth | 6 mth | 6 mth |

For surface preparation reference is made to the recommendations for coated surfaces.

### Areas for immersed exposure

| Average temperature during drying/curing | 0 °C  | 5 °C  | 10 °C | 23 °C | 40 °C |
|--|-------|-------|-------|-------|-------|
| Itself                                   | 6 mth | 6 mth | 6 mth | 6 mth | 6 mth |
| ion exchange antifouling                 | 15 d  | 12 d  | 10 d  | 7 d   | 3 d   |
| silicone resin based FRC                 |       | 3 d   | 3 d   | 3 d   | 3 d   |
| silyl acrylate antifouling               | 10 d  | 8 d   | 8 d   | 7 d   | 7 d   |
| silyl methacrylate antifouling           | 10 d  | 8 d   | 8 d   | 7 d   | 7 d   |

For surface preparation reference is made to the recommendations for coated surfaces.

### Other conditions that can affect drying / curing / over coating

#### Repair of coating system

Damages to the coating layers:

Prepare the area through sandpapering or grinding, followed by thorough cleaning/vacuuming. When the surface is clean and dry the coating may be over coated by itself or by another product, ref. original specification.

Always observe the maximum over coating intervals. If the maximum over coating interval is exceeded the surface should be carefully roughened in order to ensure good intercoat adhesion.

Damages exposing bare substrate:

Remove all rust, loose paint, grease or other contaminants by spot blasting, mechanical grinding, water and/or solvent washing. Feather edges and roughen the overlap zone of surrounding intact coating. Apply the coating system specified for repair.

#### Repair of damaged areas

Sags and runs can be caused by too high wet film thickness, too much thinner added or the spray gun used too close to the surface.

Repair by using a paint brush to smooth the film when still wet.

Sand down to a rough, even surface and re-coat if the coating is cured.

Orange peel can be caused by poor flow/levelling properties of the paint, poor atomization of the paint, thinner evaporating too fast or the spray gun held too close to the surface.

This can be rectified by abrading the surface and applying an additional coat after having adjusted the application properties or the application technique.

Dry spray can be caused by poor atomization of the paint, spray gun held too far from the surface, high air temperature, thinner evaporating too fast or coating applied in windy conditions.

Sand down to a rough even surface and re-coat.

Pinholes can be caused by entrapped solvents in the film or by incorrect application technique. Pinholes can be repaired as per procedure for damages to the coating layer or to the substrate, ref. above.

## Quality assurance

The following information is the minimum required. The specification may have additional requirements.

- Confirm that all welding and other metal work has been completed before commencing pre-treatment and surface preparation
- Confirm that installed ventilation is balanced and has the capacity to deliver and maintain the RAQ
- Confirm that the required surface preparation standard has been achieved and is held prior to coating application
- Confirm that the climatic conditions are within recommendations in the AG, and are held during the application
- Confirm that the required number of stripe coats have been applied
- Confirm that each coat meets the DFT requirements in the specification
- Confirm that the coating has not been adversely affected by rain or other factors during curing
- Observe that adequate coverage has been achieved on corners, crevices, edges and surfaces where the spray gun cannot be positioned so that its spray impinges on the surface at 90° angle
- Observe that the coating is free from defects, discontinuities, insects, abrasive media and other contamination
- Observe that the coating is free from misses, sags, runs, wrinkles, fat edges, mud cracking, blistering, obvious pinholes, excessive dry spray, heavy brush marks and excessive film build
- Observe that the uniformity and colour are satisfactory

All noted defects shall be fully repaired to conform to the coating specification.

### Caution

This product is for professional use only. The applicators and operators shall be trained, experienced and have the capability and equipment to mix/stir and apply the coatings correctly and according to Jotun's technical documentation. Applicators and operators shall use appropriate personal protection equipment when using this product. This guideline is given based on the current knowledge of the product. Any suggested deviation to suit the site conditions shall be forwarded to the responsible Jotun representative for approval before commencing the work.

For further advice please contact your local Jotun office.

### Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not inhale spray mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

### Accuracy of information

Always refer to and use the current (last issued) version of the TDS, SDS and if available, the AG for this product. Always refer to and use the current (last issued) version of all International and Local Authority Standards referred to in the TDS, AG & SDS for this product.

### Colour variation

Some coatings used as the final coat may fade and chalk in time when exposed to sunlight and weathering effects. Coatings designed for high temperature service can undergo colour changes without affecting performance. Some slight colour variation can occur from batch to batch. When long term colour and gloss retention is required, please seek advice from your local Jotun office for assistance in selection of the most suitable top coat for the exposure conditions and durability requirements.

### Reference to related documents

The Application Guide (AG) must be read in conjunction with the relevant specification, Technical Data Sheet (TDS) and Safety Data Sheet (SDS) for all the products used as part of the coating system.

When applicable, refer to the separate application procedure for Jotun products that are approved to classification societies such as PSPC, IMO etc.

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## Symbols and abbreviations

min = minutes  
h = hours

TDS = Technical Data Sheet  
AG = Application Guide

d = days  
°C = degree Celsius  
° = unit of angle  
µm = microns = micrometres  
g/l = grams per litre  
g/kg = grams per kilogram  
m<sup>2</sup>/l = square metres per litre  
mg/m<sup>2</sup> = milligrams per square metre  
psi = unit of pressure, pounds/inch<sup>2</sup>  
Bar = unit of pressure  
RH = Relative humidity (% RH)  
UV = Ultraviolet  
DFT = dry film thickness  
WFT = wet film thickness

SDS = Safety Data Sheet  
VOC = Volatile Organic Compound  
MCI = Jotun Multi Colour Industry (tinted colour)  
RAQ = Required air quantity  
PPE = Personal Protective Equipment  
EU = European Union  
UK = United Kingdom  
EPA = Environmental Protection Agency  
ISO = International Standards Organisation  
ASTM = American Society of Testing and Materials  
AS/NZS = Australian/New Zealand Standards  
NACE = National Association of Corrosion Engineers  
SSPC = The Society for Protective Coatings  
PSPC = Performance Standard for Protective Coatings  
IMO = International Maritime Organization

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## Disclaimer

The information in this document is given to the best of Jotun's knowledge, based on laboratory testing and practical experience. Jotun's products are considered as semi-finished goods and as such, products are often used under conditions beyond Jotun's control. Jotun cannot guarantee anything but the quality of the product itself. Minor product variations may be implemented in order to comply with local requirements. Jotun reserves the right to change the given data without further notice.

Users should always consult Jotun for specific guidance on the general suitability of this product for their needs and specific application practices.

If there is any inconsistency between different language issues of this document, the English (United Kingdom) version will prevail.

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