WHAT IS A SURFACE PRETREATMENT?
A surface treatment includes the necessary steps that precede the application of a Rilsan® powder coating on the substrate to be protected. The purpose of the pretreatment stage is twofold. First, it has to eliminate all impurities from the surface prior to coating. Second, one or more protective undercoats can be applied to obtain a high-quality coating and achieve optimum performance. The lifetime of the protective coating very much depends on the quality of the preliminary surface treatment.

The nature and shape of the metal part, as well as the conditions (thermal, chemical and atmospheric) to which the parts will be subjected, are the main factors that should guide coaters in choosing the most suitable, i.e. mechanical or chemical, surface treatment.

Two types of products are available on the market for use as undercoats for Rilsan® coatings: Rilprim® and Primgreen® liquid primers.

OPERATING CONDITIONS
Degreasing
This essential step is designed to eliminate fatty substances that build up on the surface during the manufacturing of the metal part. It requires the use of alkaline, neutral or acidic products (depending on the nature of the grease to be eliminated, and the nature of the metal) that may be applied by spraying or dipping. More universal solvent-based solutions (trichloroethylene, perchloroethylene) may also be used.

In order to eliminate grease from large steel (or ferrous alloy) parts, high-temperature pyrolysis can be utilized where the metal structure allows it. In other cases, the coater may recommend manual cleaning if it is more appropriate.

A visual examination will help confirm the absence of grease or pollution on the surface of the part.

Stripping / Grit-blasting
This stage follows the degreasing step and eliminates all foreign bodies (e.g. carbon impurities or metal oxides) present on the surface of the part. Once the surface is free of oil and grease, the following process may be carried out:

- **mechanical etching** involves blasting the part surface with an abrasive medium. Type G17 angular shaped iron grit or corundum is recommended for ferrous metals, and aluminum grit for aluminum alloys. The blasting air should be dry and free of oil. Once it has been grit-blasted, the part should be coated without delay (generally within 8 hrs), or it may temporarily be kept dry to prevent the formation of oxides on the surface. Should signs of surface corrosion appear, the grit-blasting stage must be repeated before the coating can be applied.

- **chemical etching** involves immersion or spraying the part with strong acidic solutions (sulfuric, hydrochloric or phosphoric acid), followed by consecutive rinsing and drying in stable and controlled chemical baths. Other types of chemical treatment (e.g. electroplating, phosphating, chromating, etc.) may be used as long as they are compatible with the Rilsan® PA11 coating and its application process.

Quality grit-blasting should produce a thoroughly clean surface (Sa 2 1/2-3) and roughness Rz (measured per standard ISO 4287-1) generally ranging from 40 µm to 80µm when Rilsan® is applied by dip-coating, and from 20µm to 40 µm when Rilsan® is applied by electrostatic spray. The surface roughness may need to be adjusted to achieve the right properties required in certain applications, based on the nature of the metal used.

WHAT IS THE PURPOSE OF A PRIMER UNDERCOAT?
A primer undercoat creates a chemical bond producing strong adhesion between the substrate to be protected and the Rilsan® coating. It also ensures durable protection against corrosion should the coating be damaged. Arkema markets a range of solvent-based (Rilprim®) and water-based (Primgreen®) liquid primers. Primgreen® has a low volatile organic compounds (VOC) content, is particularly environmentally sound, and is very easy to use.

**Primer for Rilsan® DIP-COATING (e.g. Primgreen® LAT12035)**
This one-component product can be applied by spray-gun using a traditional spraying techniques (compressed air or electrostatic). Under normal temperature and moisture conditions, the viscosity of the product is such that the product does not need to be diluted. Dip-coating is also possible: in this case, the product should be diluted with a water/butyl glycol (3:1) blend to achieve a 60/40 product/diluting blend ratio by volume prior to application.

**Precautions required:**
It is necessary to apply, over the entire surface, a continuous and consistently thick film (8 to 12 µm dry film) on every part coated. Consult the primer data sheet to ensure that the proper drying time is observed before the primer is cured in an oven. These factors and the preheating parameters of the part, determine the quality of the primer’s curing (characterized by a brown color after curing), and conditions the quality of the Rilsan® coating’s final properties.

The curing conditions (time/temperature) necessary to achieve optimum adhesion properties depend on the nature and thickness of the part. These conditions should be determined by the coater for every type of part based on the equipment available.

The chart below, as an example, indicates the optimum range of use for Primgreen® LAT 12035 on a 6 mm thick metal part. This range is a function of the preheating and oven temperature and time parameters. Adhesion properties exceeding or equal to 3 as per standard NFT 58-112 are found in the area colored in blue.
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CHOOSING THE RIGHT PRIMER UNDERCOAT

The choice of the right undercoat depends on the nature of the substrate to be protected (steel, cast iron, stainless steel, aluminum, etc.), the level of performance sought, and the process selected to apply the Rilsan® PA11 powder.

If you require further information, please contact our technical support team and they will be pleased to assist you with choosing the right product.

Undercoats other than Rilprim® and Primgreen® may be suitable and meet the necessary specifications. Such products should be evaluated beforehand. However, only Rilprim® and Primgreen® marketed and recommended by Arkema undergo systematic performance testing, so that our customers may be assured of a top quality product.

PRIMERS: MAIN APPLICATION DEFECTS AND THEIR POSSIBLE CAUSES

<table>
<thead>
<tr>
<th>Nature</th>
<th>Range of Primers concerned</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor wetting</td>
<td>Primgreen®</td>
<td>• Part too greasy</td>
</tr>
<tr>
<td>Rust on the part (&quot;flash rust&quot;)</td>
<td>Primgreen®</td>
<td>• Drying time too long</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Temperature of metal too low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ambient temperature too low, or ambient humidity too high</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Primer coating too thick</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Insufficient air extraction from the booth</td>
</tr>
<tr>
<td>Uneven film</td>
<td>Rilprim® &amp; Primgreen®</td>
<td>• Presence of dust on the surface</td>
</tr>
<tr>
<td>Drops and runs</td>
<td>Rilprim® &amp; Primgreen®</td>
<td>• Too much primer</td>
</tr>
<tr>
<td>Bubbles</td>
<td>Rilprim® / Primgreen®</td>
<td>• Product not stirred properly</td>
</tr>
</tbody>
</table>

Rilsan® coating system

80 µm to several mm, depending on the process

Rilsan® PA 11 coating

(For optimum adhesion)

Primer

Substrate

chemical pretreatment or mechanical cleaning

Rilsan® coating

Primer

Substrate (steel, alu...)