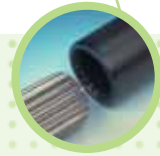


» Surface treatments and primers for Rilsan® PA11 coatings



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 80 μm when Rilsan® is applied by dip-coating, and from 20 μm 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.

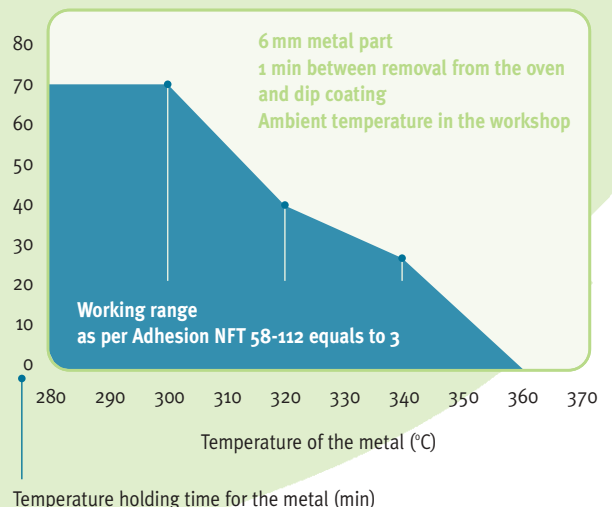
Precautions required:

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 6mm 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.

Recommended range of use for PRIMGREEN® LAT 12035



CHOOSING THE RIGHT PRIMER UNDERCOAT

Primer for Rilsan® ELECTROSTATIC SPRAY (e.g. Rilprim® LES 201/104 B)

Suitable for application by traditional spraying or electrostatic spraying, this solvent-based two-component product consists of a resin (Rilprim® LES201) and its dilutant (Rilprim® 104B) mixed in 50/50 proportions by volume. Applied in a thin coat (5 to 8µm dry film), this primer undercoat is compatible with Rilsan® powders applied by electrostatic spray. The curing of the primer occurs during the melting phase of Rilsan® ES or ESY powders. Rilprim® LES201 is a Cr⁶ free formulation. It helps produce excellent anticorrosion properties (no loss of adhesion and no corrosion creep after 2000 hrs' exposure to a salt spray or 2000 hrs in boiling water). This product is recommended for the most demanding applications on steel.

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.

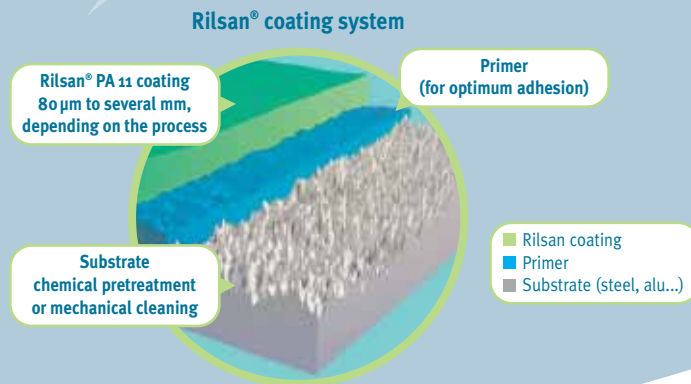
If you require further information, please contact our technical support team and they will be pleased to assist you with choosing the right product.

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

Nature	Range of Primers concerned	Cause
Poor wetting	Primgreen®	<ul style="list-style-type: none"> Part too greasy
Rust on the part ("flash rust")	Primgreen®	<ul style="list-style-type: none"> Drying time too long Temperature of metal too low Ambient temperature too low, or ambient humidity too high Primer coating too thick Insufficient air extraction from the booth
Uneven film	Rilprim® & Primgreen®	<ul style="list-style-type: none"> Presence of dust on the surface
Drops and runs	Rilprim® & Primgreen®	<ul style="list-style-type: none"> Too much primer
Bubbles	Rilprim® / Primgreen®	<ul style="list-style-type: none"> Product not stirred properly



The statements, technical information and recommendations contained herein are believed to be accurate as of the date hereof. Since the conditions and methods of use of the product and of the information referred to herein are beyond our control, ARKEMA expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information; NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE CONCERNING THE GOODS DESCRIBED OR THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be applicable when such product is used in combination with other materials or in any process. The user should thoroughly test any application before commercialization. Nothing contained herein constitutes a license to practice under any patent and it should not be construed as an inducement to infringe any patent and the user is advised to take appropriate steps to be sure that any proposed use of the product will not result in patent infringement. See MSDS for Health & Safety Considerations.

The information contained in this document is based on trials carried out by our Research Centres and data selected from the literature, but shall in no event be held to constitute or imply any warranty, undertaking, express or implied commitment from our part. Our formal specifications define the limit of our commitment. No liability whatsoever can be accepted by Arkema with regard to the handling, processing or use of the product or products concerned which must in all cases be employed in accordance with all relevant laws and/or regulations in force in the country or countries concerned.



4-8, cours Michelet
92800 Puteaux - France
Tel.: 33 (0)1 49 00 80 80
Fax: 33 (0)1 49 00 83 96
www.arkema.com

www.rilsanfinepowders.com