

# PROCESSING GUIDELINES 211

## For the use of IGP-KORROPRIMER




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### Introduction

IGP-KORROPRIMERS have been specially developed to provide extended protection against corrosion. All IGP powder coatings, and water- and solvent-based top coats are suitable for use as top coats. An adhesion test must be done for these liquid varnish systems.

IGP-KORROPRIMER is available in the following versions:

Substrate	IGP corrosion protection systems	Stoving conditions (object temperature)	Colors	IGP Item number
STEEL	IGP-KORROPRIMER 1001	190°C / 10 - 15 min. 180°C / 20 - 25 min.	Light grey, approx. RAL 7035 Traffic grey B, approx. RAL 7043	1001A70354A00
	IGP-KORROPRIMER 1809 low temperature system 	140°C / 10 - 12 min. 130°C / 15 - 20 min.	Light grey, approx. RAL 7035	1809A70354A00
	IGP-KORROPRIMER 1001V for galvanised steel	190°C / 10 - 15 min. 180°C / 20 - 25 min.	Telegrey 4, approx. RAL 7047 Iron grey, approx. RAL 7011	1001A70474V00 1001A70114V00
ALUMINIUM	IGP-KORROPRIMER 3002	190°C / 8 - 15 min. 180°C / 10 - 20 min. 170°C / 20 - 30 min.	Traffic grey A, approx. RAL 7042	3002A70420A00
STEEL & ALUMINIUM	IGP-KORROPRIMER 6007	190°C / 8 - 12 min. 180°C / 10 - 15 min. 170°C / 15 - 20 min.	Light grey, approx. RAL 7035	6007A70354A00

### An overview of the product

1. Pay attention to the accompanying documentation such as the Technical Data Sheet and the Safety Data Sheet.
2. Work cleanly – the surfaces to be coated should only be touched while wearing gloves.
3. Only faultless powder coated surfaces provide lasting protection against corrosion.
4. The usual parameter settings apply for application of the powder.
5. The prescribed coating thicknesses are between 60 and 100 µm and depend on the corrosion category. These are described in DIN EN ISO 12944 and DIN EN ISO 55633. Alternatively, use the IGP recommendations from the IGP corrosion protection matrix – see the appendix.
6. Pay attention to the maximum oven temperatures and oven times indicated in the Technical Data Sheet (see point 4 in this processing instruction).

As an alternative to complete curing, IGP-KORROPRIMER can be gelled only. 'Gelling' is defined as reaching the possible temperatures indicated in the range of curing temperatures for short periods. If a liquid varnish is to be used as a subsequent top coat, the primer used must be completely cured.

### Detailed process description

#### Introduction

IGP-KORROPRIMERs are zinc-free priming powders that have been specially developed for heavy-duty protection against corrosion for steel and aluminium products. System elements with steel primer and suitable top coat system satisfy the most stringent corrosion protection categories C5-M long and C5-I long depending on the quality and method of preparation and pre-treatment. You can find the IGP recommendations for layering IGP coatings in the corrosion protection matrix in the appendix.

When processing IGP-KORROPRIMERs you must always comply with the Technical Data Sheet and the corresponding Safety Data Sheet. The standard 'Corrosion protection of steel structures by protective paint systems' DIN EN ISO 12944 should be used as the basis for working with IGP-KORROPRIMER. We also suggest using the recommendations in DIN 55633 'Corrosion protection of steel structures by powder coating systems' as a guide.

### Substrates, preparation and pretreatment

All substrates to be coated must be free of oxidation products, residue from scale, oil, grease and release agents. The substrates must not have any sharp edges (radius less than 2 mm). Laser-cut edges, weld points and weld seams must be sandblasted or chemically scoured prior to coating.

#### Steel pre-treatment

##### 2.2.1. Cleaning and degreasing

All conventional degreasing baths or sprayers are suitable for cleaning and degreasing. A faultless preliminary clean is essential for good corrosion protection.

##### 2.2.2. Blasting

All conventional blasting procedures can be used for the pre-treatment. After blasting, the workpieces should have a standard purity grade of at least SA 2.5 'bare metal' in accordance with DIN EN ISO 12944-4. Sharp edges and the like must be avoided. After blasting the measured surface roughness  $R_z$  must be between 40  $\mu\text{m}$  and 60  $\mu\text{m}$ . The coating thickness for the primer must be greater than the surface roughness in  $\mu\text{m}$  to ensure that all peaks are covered.

##### 2.2.4. Sweeping (sweep blasting) for galvanised surfaces

All conventional sweeping procedures can be used. The blasting material must not contain any metallic components when sweeping zinc substrates. Ideally, fused corundum is used.

##### 2.2.5. Chemical conversion

All conventional sweeping procedures can be used. The blasting material must not contain any metallic components when sweeping zinc substrates. Ideally, fused corundum is used.

#### Pre-treatment of aluminium

##### 2.3.1. Chemical conversion of aluminium

All conventional chromating and suitable chrome-free alternatives can be used for chemical conversion. The suitability of alternative procedures for providing an adhesion primer for IGP-KORROPRIMER should be checked beforehand (adhesion test □ pressure cooker test and cross-cut adhesion test in accordance with GSB, QUALICOAT).

##### 2.3.2. Pre-anodising

Experience shows that pre-anodising with optional post-purging solution as a pre-treatment method achieves the best results against filiform corrosion. We recommend regular adhesion testing of the layered coatings (pressure cooker test and cross-cut adhesion test in accordance with GSB, QUALICOAT).

### The coating

IGP-KORROPRIMER can be applied with all conventional powder coating systems (corona or tribo charging). Coat thicknesses between 60 and 100  $\mu\text{m}$  are recommended (depending on the corrosion protection category). For processing with corona pistols, a high voltage setting between 60 and 100 kV is recommended to achieve good levels of application efficiency. For finishing and complex geometries, high voltage settings between 40 and 50 kV can also be used. For complex geometries and a high penetration capacity, application with tribo charging is recommended.

For ultrasonic sieving, we recommend using sieves with grid sizes greater than 140  $\mu\text{m}$ .

Recovered powder can be fed back into the application process as fractions without any problems.

If IGP-KORROPRIMER is to be used as a finish over itself, e.g., to achieve very thick coatings, the first coating should only be gelled (see number 4).

For finishing with liquid coating systems, IGP-KORROPRIMER must be completely cured. Each coating system must also be checked for inter-coat adhesion prior to use as a top coat.

### Curing

If a top coat with powder is to be applied immediately after priming, we recommend only gelling the IGP-KORROPRIMER. 'Gelling' is defined as reaching the possible temperatures indicated in the range of curing temperatures for short periods. Ensure the maximum circulating air temperature is not exceeded (see table).

This process may be necessary for thick materials (thicknesses greater than 3 mm) in particular to ensure that the total residence time of the work piece in the oven is not exceeded, which may otherwise result in a loss of intercoat adhesion.

The primer is also cured as a result of the curing process of the top coat system. Pay attention to the adjusted curing temperatures for IGP-KORROPRIMER and the top coat system.

If a top coat is not immediately applied afterwards, the temperature / time information in the Technical Data Sheet must be complied with. To prevent losses of intercoat adhesion, the maximum residence time and the maximum circulating air temperature in the oven must not be exceeded.

System IGP- KORROPRI- MER	Curing conditions		Maximum Circulating air temperature
	Object- tempera- ture	Retenti- on time, min	
1001 & 1001V	190 °C	10 - 15	210 °C
	180 °C	20 - 25*	
	170 °C	25 - 30	
1809	150 °C	6 - 10	200 °C
	140 °C	10 - 15*	
	130 °C	15 - 20	
3002	190 °C	8 - 15	200 °C
	180 °C	10* - 20	
	170 °C	20 - 30	
6007	190 °C	15 - 20	200 °C
	180 °C	10* - 15	
	170 °C	8 - 12	

\* recommended curing conditions for 100% crosslinking.

For directly heated gas ovens (depending on gas quality and oven layout), there may be intercoat adhesion losses when reaching the maximum residence times at object temperature. Check the adhesion regularly.

### Instructions for quality assurance

#### Working cleanly

A clean working environment is required when working with IGP-KORROPRIMER. This is particularly important when working with highly active substrates such as pickled aluminium or blasted steel, for example (wear gloves!). Primed workpieces that are to be given a top coat should not be touched with bare hands.

#### Follow-up processing

Follow-up mechanical processing (for example, reshaping, milling and drilling) of the IGP-KORROPRIMER coating can destroy the coating and must not be done.

#### Storage of powder

Pay attention to the shelf life of the IGP-KORROPRIMER, particularly the reactive low-temperature coatings. IGP-KORROPRIMER should be stored in a dry place away from direct sunlight, at temperatures below 25 °C. Storing large or unwanted quantities of primer material in the coating area and especially in the immediate vicinity of the stoving oven must be strictly avoided.

#### Storing coated (primed) parts

A maximum interval of 24 hours should be allowed to elapse between the priming process and subsequent application of the top coat. Generally speaking, it is advisable to follow the priming process immediately with application of the top coat. Top coats should be applied within 6 hours on substrates whose primer coat has only been gelled.

If possible, primed components should not be stored. If, however, they must be stored, the following points must be observed:

- The components must be stored somewhere dry and clean
- Where possible, the storage temperature should be between 20 °C and 30 °C
- The components must be stored so that UV radiation / sunlight is excluded
- Pay attention to and prevent possible formation of condensation due to high temperature differences
- For primed piece goods which have been stored for more than 24 hours, appropriate cleaning is recommended



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### **Top coating with liquid coatings**

We recommend in principle sanding the IGP-KORROPRIMER coat for optimal adhesion.

### **Corrosion-protection-compliant reprocessing of components**

#### **Edges:**

Sharp edges such as those caused by cutting, drilling, punching and sawing of sheets must be rounded. This avoids excessive pulling back of the powder primer from the edge (edge retreat) during the curing process. Edges that are optimally prepared for coating should have a radius that is no less than 2 mm.

#### **Gaps:**

Gaps must be avoided during initial design of the component as dirt and moisture may accumulate here. Primer powder can only penetrate gaps with difficulty. Present protective greases and oils may escape from gaps and overlaps and can drastically impair the coating result.

## **Disclaimer**

The verbal, written and experimentally derived advice related to application we provide is based on the best of our knowledge but must be considered non-binding information and does not release you from your responsibility to conduct your own testing. The application, use and processing of our products occur outside our possibilities of control and are therefore exclusively your responsibility.

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## IGP-CORROSION TABLE FOR COATING STEEL SUBSTRATES

Pretreatment	Phosphate coating	Blasting	Electro-galvanising	Hot galvanising	Spray-galvanising	Coating system / Recommendation Coating thickness
Corrosion category according to DIN EN ISO 12944-2	Degrease Phosphate coating	Degrease Blasting SA 2 1/2	Degrease, electro-galvanising a) grease-free b) + chromic acid c) + phosphate coating	Degrease Hot galvanising Sweeping	Degrease Hot galvanising Chromating	
C1 Heated buildings, offices, schools	IGP-DURA® -mix, -pol, -than, -face, -xal IGP-HWF coating thickness > 60 µm	IGP-DURA® -mix, -pol, -than, -face, -xal IGP-HWF coating thickness > 60 µm	IGP-DURA® -mix, -pol, -than, -face, -xal IGP-HWF coating thickness > 60 µm	*	*	topcoat minimum Σ 60 µm
C2 Unheated buildings, low condensation, sport halls, warehouses, rural areas	IGP-DURA® -mix, -pol, -than, -face, -xal IGP-HWF coating thickness > 80 µm	IGP-DURA® -mix, -pol, -than, -face, -xal IGP-HWF coating thickness > 80 µm	IGP-DURA® -mix, -pol, -than, -face, -xal IGP-HWF coating thickness > 80 µm	*	*	topcoat minimum Σ 80 µm
C3 Production premises, high humidity, laundries, dairies, breweries, city and industry, atmosphere, SO <sub>2</sub> pollution, coastal areas with low salt levels	IGP-KORROPRIMER 10/18/60 coating thickness > 60 µm IGP-DURA® -pol, -cryl, -face, -xal IGP-HWF coating thickness > 80 µm	IGP-KORROPRIMER 10/18/60 coating thickness > 60 µm IGP-DURA® -pol, -cryl, -face, -xal IGP-HWF coating thickness > 80 µm	IGP-DURA® -pol, -cryl, -face, -xal IGP-HWF coating thickness > 80 µm			minimum Σ 140 µm on zinc Σ 80 µm
C4 Chemical plants, swimming pools, bathhouses, industrial areas and coastal areas with moderate salt levels	** IGP-DURA® -pol, -cryl, -face, -xal IGP-HWF coating thickness > 80 µm	IGP-KORROPRIMER 10/18 coating thickness > 80 µm IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm	IGP-KORROPRIMER 10/18 coating thickness > 80 µm IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm	IGP-DURA® -pol, -face, -cryl, -xal IGP-HWF coating thickness > 80 µm	IGP-DURA® -pol, -face, -cryl IGP-HWF coating thickness > 80 µm	IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm
C5 Areas with constant condensation, high pollution, industrial areas with high humidity and corrosive atmosphere, coastal and offshore areas with high salt levels	** IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm	IGP-KORROPRIMER 10/18 coating thickness > 100 µm IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm	** IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm	IGP-KORROPRIMER 10V coating thickness > 60 µm IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 60 µm	IGP-KORROPRIMER 10V coating thickness > 60 µm IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 60 µm	minimum Σ 160 µm on zinc Σ 120 µm
		IGP-KORROPRIMER 10/18 coating thickness > 80 µm IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm	** IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm	IGP-KORROPRIMER 10V coating thickness > 80 µm IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm	IGP-KORROPRIMER 10V coating thickness > 80 µm IGP-DURA® -pol, -cryl, -face IGP-HWF coating thickness > 80 µm	minimum Σ 180 µm on zinc Σ 160 µm
<p><b>IGP KORROPRIMER 10</b> For classic to heavy corrosion protection; the V-version is particularly outgassing-friendly, e.g. for galvanisations.</p> <p>Coating thicknesses depend on shade and its covering capacity. For heavily outgassing substrates, the coating parameters and curing conditions are adapted accordingly.</p> <p><b>IGP KORROPRIMER 18 for solid steel components</b> Low cross-linking temperatures ensure economic processing with full corrosion protection.</p>						
<p><b>IGP-DURA®mix</b> interior quality</p> <p><b>IGP-DURA®pol</b> exterior quality</p> <p><b>IGP-DURA®than</b> exterior quality</p> <p><b>IGP-DURA®face</b> facade quality</p> <p><b>IGP-DURA®face 80***</b> Qualicoat I &amp; GSB Standard</p> <p><b>IGP-DURA®cryl***</b> Qualicoat I</p> <p><b>IGP-DURA®xal***</b> Anti-Graffiti</p> <p><b>IGP-HWFe/elastic 59***</b> Qualicoat II &amp; GSB Master</p> <p><b>IGP-HWFe/superior 57****</b> Qualicoat I &amp; GSB Premium</p> <p><b>IGP-KORROPRIMER: 1001/1001 V, 1805, 6007</b> Qualisteelcoat</p>						
<p><b>powder coating systems steel substrates</b></p>						
<p>* Technically irrelevant ** Not suitable *** Especially emissions-friendly **** Recommended for a protection period of more than 5 years</p>						

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### IGP-CORROSION TABLE FOR COATING ALUMINIUM SUBSTRATES

Pretreatment	Green chromating	Yellow chromating	Alternative pretreatment	Pre-adonisation	Coating systems	Recommended coating thickness
Corrosion classification	Degrease Chromating DIN 50939	Degrease Chromating DIN 50939	Degrease Chromating Pretreatment	Degrease Pre-adonisation		
<b>Mild climate (AL1)</b> Rural areas, low pollution, dry	IGP-DURA® -mix, -pol, -face, -xal IGP-HWF coating thickness > 60 µm	IGP-DURA® -mix, -pol, -face, -xal IGP-HWF coating thickness > 60 µm	IGP-DURA® -mix, -pol, -face, -xal IGP-HWF coating thickness > 60 µm	*	topcoat	minimum 60 µm
<b>Urban climate (AL2)</b> Urban and industrial climate with moderate pollution	IGP-DURA® -pol, -face, -xal IGP-HWF coating thickness > 60 µm	IGP-DURA® -pol, -face, -xal IGP-HWF coating thickness > 60 µm	IGP-DURA® -pol, -face, -xal IGP-HWF coating thickness > 60 µm	*	topcoat	minimum 60 µm
<b>Urban and industrial climate (AL3)</b> Urban and industrial climate with high pollution	IGP-KORROPRIMER 30 / 60 coating thickness > 60 µm IGP-DURA® -pol, -face, -xal IGP-HWF coating thickness > 60 µm	IGP-KORROPRIMER 30 / 60 coating thickness > 60 µm IGP-DURA® -pol, -face, -xal IGP-HWF coating thickness > 60 µm	IGP-KORROPRIMER 30 / 60 coating thickness > 60 µm IGP-DURA® -pol, -cryl, -face, -xal IGP-HWF coating thickness > 60 µm	*	primer 60 µm topcoat 60 µm	minimum 120 µm
<b>Corrosive climate (AL4)</b> The industrial sector, high humidity and / or corrosive load, coastal region	Increased stain removal before passivation IGP-KORROPRIMER 30 / 60 coating thickness > 80 µm IGP-DURA® -pol, -face, -xal IGP-HWF coating thickness > 80 µm	Increased stain removal before passivation IGP-KORROPRIMER 30 / 60 coating thickness > 80 µm IGP-DURA® -cryl, -face, -xal IGP-HWF coating thickness > 80 µm	Increased stain removal before passivation IGP-KORROPRIMER 30 / 60 coating thickness > 80 µm IGP-DURA® -pol, -cryl, -face, -xal IGP-HWF coating thickness > 80 µm	*	primer 80 µm topcoat 80 µm	minimum 160 µm
				IGP-KORROsystem – certified two-coat system IGP Pulvertechnik AG offers a certified two-coat system for all weathering categories, consisting of an anti-corrosion primer and a proven topcoat system. Test Certificate Qualicoat P-1165.  Coating thicknesses depend on shade and its covering capacity.  <b>IGP KORROPRIMER 60 for highly weather-resistant powder coatings</b> Primer is polyester resin-based, for use with highly weather-resistant powder coatings. Also for use on steel.	* Technically irrelevant ** Recommended for a protection period of more than 5 years	