

# Painting of plastics

## INSTRUCTION FOR PAINTING BODYWORK PARTS MADE OF PLASTIC

### DESCRIPTION

The instructions for painting new body parts made of plastic ensure you identify the type of plastic from which the panel is made and to properly carry out the surface preparation and painting process.

Due to the large variety of plastics and release agents used, the following instructions should be treated as a general procedure that gives good results in the vast majority of cases.

### PRODUCTS IN THE PLASTIC PAINTING SYSTEM

PLAST 705	Adhesion increasing agent
PLAST 775	Elasticity increasing agent
PLAST 815	Degreaser for plastics
PLAST 825	Plastic adhesion increasing agent
EXTRA W785	Waterborne degreaser
EXTRA 785	Universal degreaser
PLAST	Putty for plastics

### IDENTIFICATION OF PLASTICS

Despite the multitude of plastics available on the market, only about 13 of them are commonly used in the automotive industry, the leading of which is polypropylene - PP (37% of production), polyurethanes - PUR (17%), ABS (12%), composite systems (11, 5%), polycarbonate - PC (7%). In practice, it is most likely that, for example, a bumper or a spoiler that will be painted will be made of polypropylene or a modified polypropylene, e.g. with ethylene-propylene rubber - EPDM. We can come across ABS when painting mirror housings or hubcaps, and with PC / PBT mixtures by painting wings and boot lids.

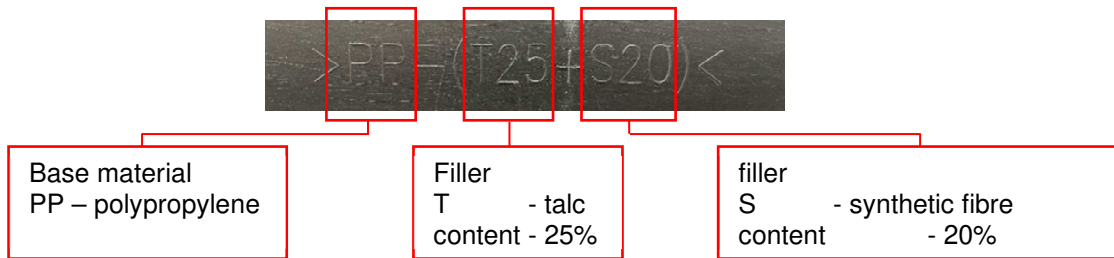
Among the plastics, we also come across a family of chemically hardening plastics, e.g. polyester laminates based on polyester resin, which ensures good adhesion of paint materials and generally in most cases, they do not cause problems when painting.

Most of the parts have letter markings, decoding which allows you to find out the full name of the material. Plastics used in the automotive industry are filled or reinforced, hence the complete marking can be as follows:

#### >PA 6 GF 10<

<b>PA 6</b>	– the base material is polyamide type 6,
<b>G</b>	– the letter in this position indicates the type of filler (G – glass, K – chalk, L – cellulose, P – mica, R- aramid (Kevlar), S – synthetic fibres, T – talc),
<b>F</b>	– the letter in this position indicates the physical state of the filler (B – beads, D – dust, F – fibre, G – grinding fibre, M – mat, W – woven),
<b>10</b>	– the number indicates the percentage content of filler (10 means 10%).

Codification example:



If there is no marking, you can cut off a piece of plastic in an invisible place and observe its behaviour with a naked flame, e.g. .:

- polypropylene (PP) - burns by itself when ignited, the material drips like a candle and smells of paraffin,
- polycarbonate (PC) - burns in the flame, self-extinguishes, the flame is luminous, smoky, the sample is charred, bubbles are formed, sweet smell,
- polyurethane (PUR) - burns itself when ignited, a glowing flame and a sharp unpleasant smell (isocyanates), foams.
- acrylonitrile-butadiene-styrene (ABS) - burns itself when ignited, thick black smoke, the smell of burning polystyrene.

In most cases, the above information is sufficient to identify the material.

The most popular plastics, i.e. polypropylene and its mixtures, cause the most problems in painting. The problem is solved by the agents increasing the adhesion (adhesion promoters) PLAST 825 Plastic adhesion increasing agent or PLAST 705 Adhesion increasing agent. The remaining most commonly used plastics: ABS, PC, PC / PBT are considered to be paintable without adhesion promoters.

In practice, it is best to adopt the rule that you always use SPECTRAL PLAST 825 Plastic adhesion increasing agent or PLAST 705 Adhesion increasing agent, because the costs of any paint correction are much higher than the cost of using the adhesion promoter. Thorough cleaning is essential.

The selection of the right promoter in combination with the right surface preparation are fundamental elements of the technology of painting plastics.

Code	Plastic
PP	polypropylene
PUR	polyurethane
ABS	acrylonitrile-butadiene-styrene
PC	polycarbonate
PP/EPDM	polypropylene modified with ethylene-propylene rubber
PC/PBT	polycarbonate - polybutylene terephthalate
TPO	thermoplastic polyolefin
PVC	polyvinyl chloride

*The plastics most commonly used in the automotive industry*

### SUBSTRATE IDENTIFICATION

Before painting a new element made of plastic, the type of plastic or coating it is covered with must be correctly identified.

This diagnosis will help in the appropriate selection of technology and proper surface preparation, which is crucial for a successful repair.

### IDENTIFICATION STEPS

**A. Presence of OEM factory primer** - the first step is to determine if the plastic part is primed with an OEM factory primer that provides adhesion of the top layers:

- visual assessment - the OEM primer is always on the top layer to be painted. It looks different than the material on the parts not intended for painting, e.g. it can have a different gloss level, it can have a slight structure, a different colour.
- sanding test - for the test use P500-grit sandpaper. If, after sanding, fine dust is noticed on the surface of the paper, it is most likely a panel covered with a primer.
- information from the manufacturer about the presence of the factory OEM primer

**B. Solvent resistance test** - the test consists of wiping a small, invisible surface of the panel with PLAST 815 Degreaser for plastics or EXTRA 785 Universal degreaser. If you notice softening or stickiness of the surface, you are dealing with a plastic or a primer not resistant to solvents.

#### CAUTION:

If there is a residue, soft layer on the surface of the material, it should be removed by using more aggressive removers, e.g. EXTRA 785 Universal degreaser - only for solvent-resistant plastics.

### SELECTION OF PAINTING TECHNOLOGY

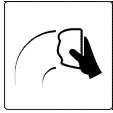



After identification, we can classify the element into one of four categories (I-IV). Then follow the instructions assigned to each category.

Category No.	Application description
I	<b>New plastic parts, pre-coated with a factory primer</b> to ensure the adhesion of the top layers, <b>the primer not sensitive to solvents.</b>
II	<b>New plastic parts, pre-coated with a factory primer</b> to ensure the adhesion of top layers, <b>the primer sensitive to solvents.</b>
III	<b>New plastic parts, not coated with factory primer.</b>
IV	<b>Existing paint coating with damage down to the plastic substrate.</b>

**SUBSTRATE PREPARATION**

**CATEGORY No. I**

**New plastic parts, pre-coated with a factory primer to ensure the adhesion of the top layers, primer not sensitive to solvents.**





	Degreasing	Degrease the surface of the parts with a degreaser tested during solvent resistance tests - PLAST 815 Degreaser for plastics or EXTRA 785 Universal degreaser.
	Sanding	Sand with fine sandpaper or grey 800 Ultra Fine scuff pad. Thoroughly blow off the surface with compressed air.
	Degreasing	Degrease the surface of the parts with a degreaser tested during solvent resistance tests - PLAST 815 Degreaser for plastics or EXTRA 785 Universal degreaser.
	Application	Application of the selected paint system in accordance with the guidelines from the technical data sheets of selected products.  In the case of a part made of flexible plastic, individual components of the paint system (except for the base coat) should be made more flexible by adding PLAST 775 Elasticity increasing agent.

**CATEGORY No. II**

**New plastic parts, pre-coated with a factory primer to ensure the adhesion of top layers, primer sensitive to solvents.**



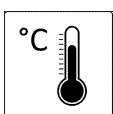




**CAUTION!**

do not use EXTRA 785 Universal degreaser and PLAST 815 Degreaser for plastics, this will remove the factory primer covering the plastic

	Degreasing	Requires EXTRA W785 Waterborne degreaser.
	Sanding	Sand with fine sandpaper or grey 800 Ultra Fine scuff pad. Thoroughly blow off the surface with compressed air.
	Degreasing	Degrease the surface of the part again with EXTRA W785 Waterborne degreaser.
	Application	Application of the selected paint system in accordance with the guidelines from the technical data sheets of selected products.  In the case of a part made of flexible plastic, individual components of the paint system (except for the base coat) should be made more flexible by adding PLAST 775 Elasticity increasing agent.

### CATEGORY No. III

New plastic parts, not coated with factory primer.

	Surface cleaning	Remove the release agent (*) by washing the substrate with hot soapy water (use a wax-free detergent).
	Degreasing	Degrease the surface of the parts with PLAST 815 Degreaser for plastics.
	Baking	Bake the parts at 60 °C for at least 30 minutes.
	Degreasing	Degrease the surface of the parts with PLAST 815 Degreaser for plastics.
	Sanding connected with degreasing	Sand with a grey 800 Ultra Fine scuff pads moistened with PLAST 815 Degreaser for plastics. Thoroughly blow off the surface with compressed air.
	Degreasing	Degrease the surface of the parts again with PLAST 815 Degreaser for plastics.
	Application	<p>We use adhesion promoters on the new material to increase adhesion.</p> <p><b>1-step process</b> (promoter as an addition):</p> <ul style="list-style-type: none"> <li>- application of acrylic / epoxy primer with the addition of PLAST 825 Plastic adhesion increasing agent.</li> </ul> <p><b>2-step process</b> (promoter as a separate layer):</p> <ul style="list-style-type: none"> <li>- application of PLAST 825 Plastic adhesion increasing agent (properly diluted) or PLAST 705 Adhesion increasing agent (also available in the PLAST 705 SPRAY aerosol version),</li> <li>- application of acrylic / epoxy primer.</li> </ul> <p>In the case of a part made of flexible plastic, individual components of the paint system (except for the base coat) should be made more flexible by adding PLAST 775 Elasticity increasing agent.</p> <p>Application of the selected paint system in accordance with the guidelines from the technical data sheets of the relevant products.</p>








(\*) Most plastic components are manufactured using injection molding. The plasticised plastic is injected into the cavity of the injection mold. The process uses release agents that prevent the material from sticking to the metal mold, which makes it easier to remove the element from it.

We divide **release agents** into two types:

- **external release agents** applied directly to the mold surfaces, thus reducing the adhesion force of the material (usually they are used in the form of pastes, dispersions or emulsions),
- **internal ones** are added to the mass of processed polymer and thanks to migration towards the polymer-metal contact surface they create an anti-adhesive layer (very often paraffins and waxes).

### CATEGORY No. IV

#### Existing paint coating with damage down to the plastic substrate.

	Degreasing	Degrease the surface of the part with EXTRA 785 Universal degreaser.
	Sanding	Sand the damaged place with P120 sandpaper until the damaged coating is removed. Thoroughly blow off the surface with compressed air.
	Degreasing	Degrease the surface of the part again with EXTRA 785 Universal degreaser.
	Application of putty	Apply PLAST Putty for plastics in accordance with recommendations in the technical data sheet.
	Sanding	Sand the putty and the existing coating in order to prepare the workpiece for application of high build primer - in accordance with the technical data sheet of the primer. Thoroughly blow off the surface with compressed air.
	Degreasing	Degrease the surface of the part again with EXTRA 785 Universal degreaser.
	Application	<p>An adhesion promoter must be additionally applied to the places where the uncoated plastic can be seen.</p> <p><b>1-step process</b> (promoter as an addition):</p> <ul style="list-style-type: none"> <li>- application of acrylic / epoxy primer with the addition of PLAST 825 Plastic adhesion increasing agent.</li> </ul> <p><b>2-step process</b> (promoter as a separate layer):</p> <ul style="list-style-type: none"> <li>- application of PLAST 825 Plastic adhesion increasing agent (properly diluted) or PLAST 705 Adhesion increasing agent (also available in the PLAST 705 SPRAY aerosol version),</li> <li>- application of acrylic / epoxy primer.</li> </ul> <p>In the case of a part made of flexible plastic, individual components of the paint system (except for the base coat) should be made more flexible by adding PLAST 775 Elasticity increasing agent.</p> <p>Application of the selected paint system in accordance with the guidelines from the technical data sheets of the relevant products.</p>

### Practical tips

PLAST 815 Degreaser for plastics is distinguished by high aggressiveness towards the substrate (to ensure effective degreasing of "raw" plastic) and antistatic properties - it does not cause static on the surface and helps to neutralise charges that form on the surface.

If it is not possible to use PLAST 815 Degreaser for plastics, directly on the degreased surface, e.g., when painting the outer surfaces of the bumper, it should be applied with an atomised spray container on the inside of the bumper to reduce the electrification of the surface.

PLAST 815 Degreaser for plastics used on a freshly painted or insufficiently hardened coating may cause its partial adhesion.

### Earthing during painting works

#### CAUTION!!!

During preparatory work and painting in the spray booth, earth all parts to minimise the risk of fire and explosion caused by static electricity discharge.

### OTHER INFORMATION

The effectiveness of our systems results from laboratory research and many years of experience. The data contained herein meets the current knowledge about our products and their application potential. We ensure high quality, provided the user follows the instructions and the work is performed in accordance with good workmanship. It is necessary to do a test application of the product due to its potentially different reaction with different materials. We may not be held liable for defects if the final result was affected by factors beyond our control.