

Product Description

Application	Film plates for subsequent inscription by laser beam		
Product	Color Laser Film silver/black (13-154 / 81-134 / 39-38)	PrBe No.	1198/2
		Valid eff	11 Oct. 2012
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1. General description

This description is meant to give examples for possible designs of this product, its range of applications and features of a general nature.

Details relating to specific customized versions or development projects were intentionally not considered. These details are subject to individual product specification for the product concerned.

Please note that the appropriateness of the product described here must be thoroughly tested and confirmed by us in writing for all kinds of applications.

2. Specific product description

This Color Laser Film consists of a high-quality polyester film compound suitable for emission-free laser beam inscription. During inscription, the silver laser-active layer underneath the transparent laminate film is activated by the laser beam, thus exposing the color reference layer.

Inscription is effectuated without burning film particles (emission-free); the film surface remains undamaged (without engraving) and therefore extremely resistant against environmental influences.

The Color Laser Film is provided with an extremely strong acrylic adhesive. Thanks to its modified recipe the adhesive shows excellent adhesive strength values on different substrates. The film can be supplied either in the form of continuous material for individual laser cutting by the user or as die-cut film plates in specified formats.

This film-adhesive compound has been conceived especially for applications in rough industrial environments or under extreme environmental conditions (such as automobile identification in the motor compartment).

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Prepared 11 October 2012 Thomas Samuel, Product development R&D / PIM	Approved 11 October 2012 Dr. Jens Vor der Brüggen, Head of R&D / PIM	Supersedes PrBe No. 1198/1
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3. Product characteristics

- Dimensionally stable and tear-resistant laser film for the production of robust film plates for applications in rough industrial environments
- Inscrutable with many Nd:YAG-, Vanadat- and fiber laser installations
- Flexible inscription
- Excellent color contrast
- Color of inscription: black
- Excellent resistance, among others against chemicals, alternating temperatures and mechanical abrasion
- Emission-free laser beam inscription
- The film is free of halogens and silicone and resistant to plasticizers; it complies with the technical requirements for label applications in the automotive industry

4. Physical data

4.1 Material compound

Laminate	Transparent PET	Thickness	Approx. 0.025 mm
Adhesive (laminate)	Modified acrylic adhesive	Thickness	Approx. 0.020 mm
Base film (color reference)	White PET	Thickness	Approx. 0.050 mm
Adhesive	Modified acrylic adhesive	Thickness	Approx. 0.040 mm
Liner material	Glassine paper	Thickness	Approx. 0.080 mm

Total thickness of compound (films + adhesives + liner material):	0.215 mm
Tolerance:	+/- 0.032 mm
Minimum application temperature:	+ 10 °C

Storage	The product can be stored at least one year under room climate conditions (please see storage recommendations).
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4.2 Adhesive properties

Modified acrylic adhesive with excellent resistance to weathering, solvents, and plasticizers. As a result of a significantly thicker adhesive layer compared to standard versions the adhesion to rough and structured substrates is also outstanding.

Thermal endurance	-40° C up to +120° C (permanent service temperature)
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4.3 Adhesive strength values

(test results according to FINAT FTM 1)

<u>Substrate</u>	<u>Adhesive strength in N/25 mm (24 h)</u>
Glass	23
Steel	17
Aluminum	19
Polypropylene	8

The indicated adhesive strength values are average values on standard substrates. The final adhesive strength is reached approximately 72 hours after application.

4.4 Climate and weathering resistance

- Climate resistance according to DIN 50 017 – KK
240 h at 100% relative humidity and 40° C: no changes
- Weathering resistance:

<u>Temperature load in °C</u>	<u>Cycle time in h</u>	<u>Change</u>
38	24	None
105	72	None
120	1	None
-30	24	None

4.5 Resistance against chemicals and solvents

<u>Test liquid</u>	<u>Cycle time in h</u>	<u>Change</u>
Super fuel	1 h	None
Cold cleaner	1 h	None
Motor oil	1 h	None
Brake fluid	1 h	None
Preserving agent	1 h	None
Diesel fuel	10 h	None

Salt spray test	According to DIN 50021 (168 h / 5 % Konz./35 °C)	No objection
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4.6 Abrasion resistance

Crockmeter test according to DIN 54021 / VDA 621-424	No objection
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5. Approvals

5.1 UL/CSA approvals

Color Laser Film silver / black is UL/CSA listed under UL-File No. PGGU2.MH25118 as Color Laser Film Silver/Black. The approval refers to unimprinted label material inscribed by laser beam.

The approval refers to the following substrates and temperature ranges:

UL

Substrate

Aluminum
Steel, galvanized
Glass
Acrylic paint
Acrylic powder paint
Alkyd resin paint
Epoxy resin paint
Epoxy powder varnish
Polyester paint
Polyester powder varnish
Epoxy resin
Melamine resin
Polypropylene
Polystyrene
Polyvinylchloride
Polyurethane powder varnish
Polyvinyl fluoride
Acrylonitrile butadiene styrene
Nylon – polyamide
Polycarbonate
Polyphenylene oxide/ether
Polypropylene
Unsaturated polyester (thermal polyester)

Temperature range

-40° C up to +125° C (inside/outside)
-40° C up to +100° C (inside/outside)
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-40° C up to +100° C (inside/outside)
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CSA (PGGU8.MH25118)

Substrate

	maximum temperature
Metals	125° C (inside/outside)
Electrostatically coated metals B	100° C (inside/outside)
Electrostatically coated metals C	100° C (inside/outside)
Electrostatically coated metals D	100° C (inside/outside)
Plastics group II	80° C (inside/outside)
Plastics group III	80° C (inside/outside)
Plastics group IV	80° C (inside/outside)
Plastics group V	80° C (inside/outside)
Plastics group VI	80° C (inside/outside)
Plastics group VII	80° C (inside/outside)
Plastics group VIII	80° C (inside/outside)
Polyvinyl fluoride	100° C (inside/outside)

6. Processing instructions

The surface to which the adhesive is applied has to be dry and free of dirt, oil residues, and release agents. Loose surface particles and oxidation layers reduce durability.

Recommended cleaning agents are: grease-free solvents such as heptane, isopropyl alcohol or spirit. In case of incompatibility of the processing surface with the chosen cleaning agent please switch to another product.

Firm application of contact pressure generally improves the adhesive's contact with the bonding substrate. If necessary please use a plastic squeegee or a rubber roller to apply controlled pressure.

The adhesive flowability depends on the application temperature. Both have an impact on the time needed to obtain the final adhesive strength.

In general, application temperature should be higher than +10°C. The biggest part of the final adhesive strength is reached after approximately 72 hours. Adhesive strength increases with ageing.

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