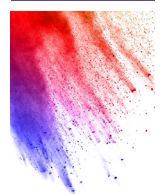


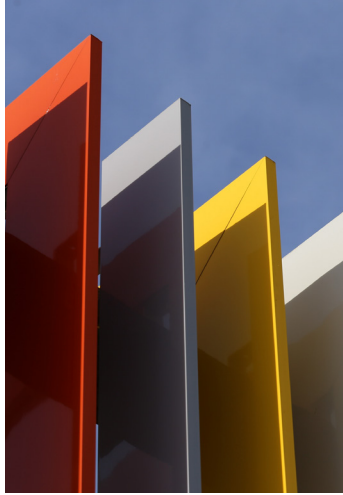
Environmentally-friendly and high-quality **protection**



TECHNICAL
INFORMATION

Powder coatings





LABELLING OF EKOLAK POWDER COATING

Powder coating is marked as follows (it is valid for PE/P and E/P):

PE/P-AB-C-XXXXX, E/P-AB-C-XXXXX, whereby PE/P means polyester cured with HAA (Primid) and E/P means polyester cured with epoxy; other marks specify the quality particulars.

A - surface

PE/P-AB-C-XXXXX and E/P-AB-C-XXXXX:

- 0 – smooth surface
- 1 – fine structured surface
- 2 – coarse structure
- 4 – intermediate structure

B - quality

(PE/P-AB-C-XXXXX):

- 0 – increased weather resistance and excellent mechanical features
- 1 – good weather resistance and excellent mechanical features
- 2 – increased weather resistance and average mechanical features
- 3 – good weather resistance and average mechanical features
- 4 – average weather resistance and mechanical features
- 5 – not occupied
- 6 – optimized for low temperature curing at 160 °C and good weather resistance and mechanical features

B1- quality

(E/P-AB-C-XXXXX):

- 1 – good mechanical features and chemical resistance
- 2 – increased chemical resistance
- 3 – improved mechanical features
- 4 – average mechanical features and chemical resistance
- 5 – improved coating of edges
- 6 – optimized for low temperature curing at 160 °C and good chemical and mechanical features
- 7 – optimized for thinner coatings
- 8 – optimized for low temperature curing up to 140 °C and good chemical and mechanical features

C- gloss

- 1 – super gloss (>90 GU @ 60 °, SIST EN ISO 2813)
- 1 – high gloss (>80 GU @ 60 °, SIST EN ISO 2813)
- 2 – gloss (60-80 GU @ 60 °, SIST EN ISO 2813)
- 3 – semi-gloss (40-60 GU @ 60 °, SIST EN ISO 2813)
- 4 – semi-matt (20-40 GU @ 60 °, SIST EN ISO 2813)
- 5 – matt (<20 GU @ 60 °, SIST EN ISO 2813)

XXXXX - color shade

- RXXXX – the shade is according to RAL (i.e. R9010)
- XXXXX – internal shade code; the first digit indicates the group of shades; the others determines the exact shade

EKOLAK EPOXY/POLYESTER– E/P

E/P (Indoor)	140°C	160°C	180°C	190°C
Super gloss SG (E/P-0X-1-xxxxx SG)	X	X	X	
High gloss (E/P-0X-1-xxxxx)	X	X	X	
Gloss (E/P-0X-2-xxxxx)	X	X	X	
Semi-gloss (E/P-0X-3-xxxxx)		X	X	
Semi-matt (E/P-0X-4-xxxxx)			X	X
Matt (E/P-0X-5-xxxxx)			X	X
Fine-structured (E/P-1X-5-xxxxx)	X	X	X	
Coarse structure (E/P-2X-4-xxxxx)	X	X	X	
Metallic coatings (dry-blend or bond)	X	X	X	X

General information - base: based on saturated polyester resins and epoxy resin, specially selected according to their good chemical resistance and the resistance to yellowing in the curing process.

Colour shade: according to available RAL cards, NCS or Pantone shade or according to sample.

Packaging: 20 or 25 kg cartons or big-bags of 400-500 kg.

Powder properties

Density (ISO 8310-3): 1,2 to 1,7 g/cm³, depending upon the shade.

Yield: 9,8 to 13,8 m²/kg at coat thickness of 60 µm, depending on the shade.

Granulation (Malvern particle sizer): above 40 µm ... 40-55 %.

Method of application: traditional CORONA procedure, negative voltage 30-100 kV, possible supply of powder adequate for TRIBO system of application (mark T i.e. E/P -XX-X-xxxxx T).

Temperature of powder coatings must be adjusted to the temperature of spraying line before the application.

Pre-treatment:

	Steel	Galvan. Steel	Aluminium
Mechanic cleaning/sandblasting	Suitable for bulk object	Less suitable	Less suitable
Cleaning/degreasing	Suitable as initial phase of pre-treatment	Suitable as initial phase of pre-treatment	Suitable as initial phase of pre-treatment
Iron phosphating	Second phase, suitable for customary requirements	Second phase, suitable for customary requirements	Not suitable
Zinc phosphating	Second phase, advisable for large-scale corrosion requirements	Second phase, advisable for large-scale corrosion requirements	Not suitable
Chrome coating	Not suitable	Partly suitable	Advisable
Zeta coat	Suitable	Suitable	Suitable
Nano ceramics	Suitable	Suitable	Suitable

Mechanical and technological features of the Epoxy/Polyester Ekolak

To determine its mechanical properties the Ekolak was applied to the 0,6 mm thick cold-rolled metal sheet degreased with acetone and cured in the oven at the temperature, required for the particular type of the Ekolak.

Coat thickness: 55-80 µm (depending upon the quality).

Gloss (ISO 2813) at the angle of 60 °.

Labelling	GU @ 60 °
1 – super gloss SG	> 90
1 – high gloss	> 80
2 – gloss	60-80
3 – semi-gloss	40-60
4 – semi-matt	20-40
5 – matt	< 20

Hardness on Buchholz scale (ISO 2815): minimum 91.

T-bend: minimum T4 - OK/OK.

Impact test (ISO 6272):direct: minimum 100 cm × kg,
indirect: minimum 100 cm × kg.

Adhesion (ISO 2409): Gt 0.

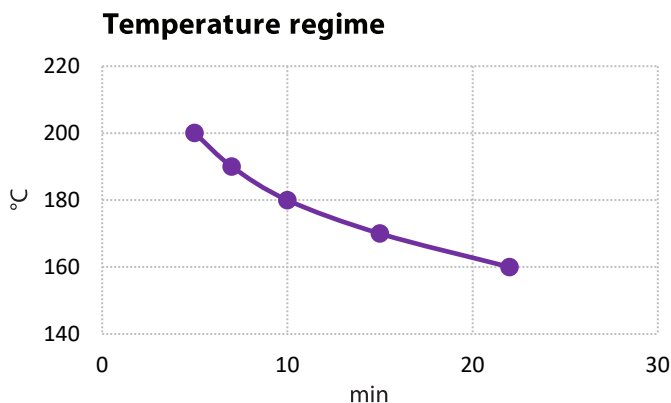
Curing conditions: from 140 °C up to 190 °C of object temperature.

In case of inadequate polymerization there is a possibility that the properties of the powder coatings changes:

- when curing on an inappropriate temperature gloss could decrease due to too high temperature,
- due to lower temperatures of curing the gloss may be higher than the prescribed and
- mechanical characteristics are potentially different due to the difference in temperature regime.

Options of curing (table of declared curing for temperature regime 180 °C/10 min):

Temperature (°C)	Time (min)
160	20-25
170	15
180	10 (declared temp. regime)
190	7
200	5



Storage time: 24 months at the temperature below 25 °C for standard coatings.

Chemical resistance and resistance to household stains:

Plates with applied Ekolak coating were exposed to the reactive agent for 48 hours, then cleaned. The surface of the coating was inspected for eventual change/damage.

REACTIVE AGENT	SURFACE CHANGE	REACTIVE AGENT	SURFACE CHANGE
HCl 10%	Coating unchanged	Gasoline	Coating unchanged
Ethanol	Coating unchanged	Aceton	Coating softened, peels off the surface
Ammonia 10%	Coating unchanged	Vegetable oil	Coating unchanged
NaOH 10%	Coating unchanged	Red wine	Coating unchanged
Wine acid 5%	Coating unchanged	Sodium, 5% solution	Coating unchanged
Lactic acid 5%	Coating unchanged	Coffee	Coating unchanged
hydrogen peroxide	Coating unchanged	Cleaning agent	Coating unchanged
KOH 10%	Coating unchanged	H3PO4 10%	Coating unchanged
Diesel	Coating unchanged	Citric acid 20%	Coating unchanged
Sodium hypochlorite 5%	Coating unchanged	Glycerin (C3H8O3)	Coating unchanged
H2SO4 40%	Coating unchanged	Coolant fluid-glycol	Coating unchanged

Hygiene and health integrity:

White powder coating has been tested on hygiene and healthiness at the National Laboratory for health, environment and food. The results shows that the powder coating on the overall migration into simulants and regardless of the specific migration of primary aromatic amines, formaldehyde and phenols in food simulant and specific migration of BADGE, BFDGE and derivatives in food simulant, consistent with the provisions of paragraph 1a and b of the 3rd article of the Regulation of the European Parliament and Council Regulation (EC) No. 1935/2004 of 27th of October 2004 on materials and articles intended to come into contact with food and repealing Directives 80/590 / EEC and 89/109 / EEC. A copy of the original report of the National Laboratory for Health, Environment and Food can be obtained at the request of customers.

Typical areas of application:

- metal furniture,
- shelves,
- lighting, lights,
- white goods,
- radiators,
- ducts, pipes,
- sanitary ware,
- int. car. parts,
- the housing of electronic appliances.

EKOLAK POLYESTER PRIMID - PE/P

PE/P (Outdoor)	160°C	180°C	190°C
Super gloss SG (PE/P-0X-1-xxxxx SG)	X	X	
High gloss (PE/P-0X-1-xxxxx)	X	X	
Gloss (PE/P-0X-2-xxxxx)	X	X	
Semi-gloss (PE/P-0X-3-xxxxx)	X	X	
Semi-matt (PE/P-0X-4-xxxxx)	X	X	
Matt (PE/P-0X-5-xxxxx)			X
Fine-structure (PE/P-1X-5-xxxxx)	X	X	
Coarse structure (PE/P-2X-4-xxxxx)	X	X	
Metallic coatings (dry-blend or bond)	X	X	X

General information - base

Base: binding on the basis of saturated polyester resins, specially selected according to their resistance to the weather conditions and UV radiation.

Colour shade: according to available RAL cards, NCS or Pantone shade or according to sample.

Packaging: 20-25 kg cartons or big-bags of 400-500 kg.

Powder properties

Density (ISO 8310-3): 1,2 to 1,7 g/cm³, depending upon the shade.

Yield: 9,8 to 13,8 m²/kg at coat thickness of 60 µm, depending on the shade.

Granulation (Malvern particle sizer): above 40 µm ... 40-55 %.

Method of application: traditional CORONA procedure, negative voltage 30-100 kV, possible supply of powder adequate for TRIBO system of application (mark T i.e. PE/P-XX-X-xxxxx T).

Temperature of powder coatings must be adjusted to the temperature of spraying line before the application

Pre-treatment:

	Steel	Galvan. Steel	Aluminium
Mechanic cleaning/sandblasting	Suitable for bulk object	Less suitable	Less suitable
Cleaning/degreasing	Suitable as initial phase of pre-treatment	Suitable as initial phase of pre-treatment	Suitable as initial phase of pre-treatment
Iron phosphating	Second phase, suitable for customary requirements	Second phase, suitable for customary requirements	Not suitable
Zinc phosphating	Second phase, advisable for large-scale corrosion requirements	Second phase, advisable for large-scale corrosion requirements	Not suitable
Chrome coating	Not suitable	Partly suitable	Advisable
Zeta coat	Suitable	Suitable	Suitable
Nano ceramics	Suitable	Suitable	Suitable

Mechanical and technological features of the Polyester/HAA Ekolak

To determine its mechanical properties the Ekolak was applied to the 0,6 mm thick cold-rolled metal sheet degreased with acetone and cured in the oven at the temperature, required for the particular type of the Ekolak.

Coat thickness: 55-80 µm (depending upon the quality).

Gloss (ISO 2813) at the angle of 60 °.

Labelling	GU @ 60 °
1 – super gloss SG	> 90
1 – high gloss	> 80
2 – gloss	60-80
3 – semi-gloss	40-60
4 – semi-matt	20-40
5 – matt	< 20

Hardness on Buchholz scale (ISO 2815): minimum 91.

T-bend: minimum T4 - OK/OK.

Impact test (ISO 6272):direct: minimum 100 cm × kg,
indirect: minimum 100 cm × kg.

Adhesion (ISO 2409): Gt 0.

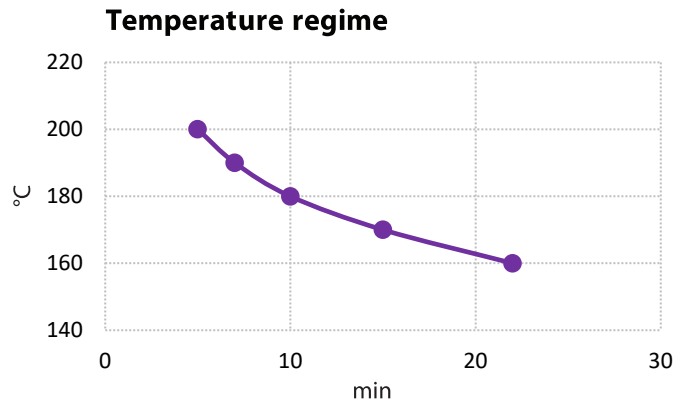
Curing conditions: from 160 °C up to 190 °C of object temperature.

In case of inadequate polymerization there is a possibility that the properties of the powder coatings changes:

- by curing on an inappropriate temperature gloss could decrease due to too high temperature,
 - due to lower temperatures of curing the gloss may be higher than the prescribed and
 - mechanical characteristics are potentially different due to the difference in temperature regime.
-

Options of curing (table of declared curing for temperature regime 180 °C/10 min):

Temperature (°C)	Time (min)
160	20-25
170	15
180	10 (declared temp. regime)
190	7
200	5



Storage time: 24 months at the temperature below 25 °C for standard coatings.

Resistance to the weather conditions - Accelerated Weathering Tester from Q-LAB.

Test conditions: UV-B testing according to a program that corresponds to the preliminary test of GSB International:

1st cycle: 4 hours of condensation at 40 °C,

2nd cycle: 4 h UV-B (313 nm), 50 °C with a light power of 0.75 W/m²/nm.

There are several levels of durability and that it is necessary to agree about the level that the buyer wants.

Typical areas of application

- outdoor metal furniture,
 - agriculture and garden tools,
 - external car parts,
 - air conditioners,
 - mailboxes,
 - advertising boards.
-

Corrosivity resistance: Specific Ekolak powder coatings has been tested and meet corrosion resistance requirements according to DIN EN ISO 12944.

The most important thing in this context is pre-treatment or lower layers (KTL, zinc) and that even the highest levels of anti-corrosion protection can be achieved with appropriate lower layers.

EKOLAK POLYESTER QUALICOAT - PEQ15

Polyester cured with HAA (Primid) certified Qualicoat Class 1.5 is identified by the code:

PEQ15 (Facade)	160°C	180°C	190°C
Super gloss (PEQ15-0X-1-XXXXX SG)	X	X	
High gloss (PEQ15-0X-1-XXXXX)	X	X	
Gloss (PEQ15-0X-2-XXXXX)	X	X	
Fine structured (PEQ15-1X-5-XXXXX)	X	X	
Coarse structure (PEQ15-2X-4-XXXXX)	X	X	
Matt (PEQ-0X-4-XXXXX)			X

We are certified for following qualities:

P-1685 is certified for glosses above 70 GU, P-1862 is certified for glosses below 30 GU, P-1897 is certified for finestructured (sand paper) surface.

General information - base

Binder based on saturated polyester resins, specially selected according to its resistance to weathering and UV radiation.

Colour shade: according to available RAL cards, NCS or Pantone shade or according to sample.

Packing: 20-25 kg cartons or big-bags of 400-500 kg.

Powder properties

Density (ISO 8310-3): 1,2 to 1,7 g/cm³, depending upon the shade.

Yield: 9,8 to 13,8 m²/kg at coat thickness of 60 µm, depending on the shade.

Granulation (Malvern particle sizer): above 40 µm ... 40-55 %.

Method of application: traditional CORONA procedure, negative voltage 30-100 kV, possible supply of powder adequate for TRIBO system of application (mark T i.e. PEQ -XX-X-xxxxx T).

Temperature of powder coatings must be adjusted to the temperature of spraying line before the application.

Pre-treatment:

	Steel	Galvan. Steel	Aluminium
Mechanic cleaning/ sandblasting	Suitable for bulk object	Less suitable	Less suitable
Cleaning/ degreasing	Suitable as initial phase of pre-treatment	Suitable as initial phase of pre-treatment	Suitable as initial phase of pre-treatment
Iron phosphating	Second phase, suitable for customary requirements	Second phase, suitable for customary requirements	Not suitable
Zinc phosphating	Second phase, advisable for large-scale corrosion requirements	Second phase, advisable for large-scale corrosion requirements	Not suitable
Chrome coating	Not suitable	Partly suitable	Advisable
Zeta coat	Suitable	Suitable	Suitable
Nano ceramics	Suitable	Suitable	Suitable

Mechanical and technological features of the Ekolak Polyester Qualicoat PEQ15

To determine its mechanical properties the Ekolak was applied to the 0,6 mm thick cold-rolled metal sheet degreased with acetone and cured in the oven at the temperature, required for the particular type of the Ekolak.

Coat thickness: 55-80 µm (depending upon the quality).

Gloss (ISO 2813) at the angle of 60 °.

Labelling	GU @ 60 °
1 – super gloss SG	> 90
1 – high gloss	> 80
2 – gloss	70-80
4 – (semi) matt (coarse structure)	< 30
5 - matt (fine structured, smooth)	-

Hardness on Buchholz scale (ISO 2815): minimum 91 for smooth surfaces.

T-bend: minimum T4 - OK/OK.

Erishsen cupping test min. 5 mm.

Adhesion (ISO 2409): Gt 0.

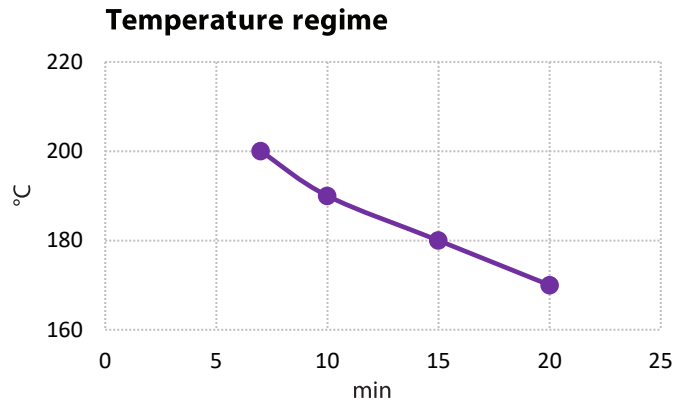
Curing conditions: from 160 °C up to 190 °C of object temperature.

In case of inadequate polymerization there is a possibility that the properties of the powder coatings changes:

- by curing on an inappropriate temperature gloss could decrease due to too high temperature,
 - due to lower temperatures of curing the gloss may be higher than the prescribed and
 - mechanical characteristics are potentially different due to the difference in temperature regime.
-

Options of curing (table of declared curing for temperature regime 180 °C/15 min):

Temperature (°C)	Time (min)
170	20
180	15
190	10
200	7



Storage time: 24 months at the temperature below 25 °C for standard coatings.

Typical areas of application:

- metal profiles,
 - facades,
 - windows,
 - aluminium profiles ...
-

Cool pigments

We have developed an Ekolak powder coating based on special pigments with a very high TSR (Total Solar Reflectance - ASTM E 891) to reduce total temperature of an object when exposed to the sun's rays. The measured temperature difference on an object can be up to 10°C or even more.

This quality is most appropriate for outdoor furniture, architectural elements, playground equipment and the like.

»Comparison of UV-B resistance and standards«

1 year Florida - arhitectural	Qualicoat Class 1	GSB standard	300 h of UV-B
2 years Florida - arhitectural	Qualicoat Class 1.5	-	450 h of UV-B
3 years Florida - super durable	Qualicoat Class 2	GSB Master	600 h of UV-B

HIGH TEMPERATURE POWDER COLORS – SX

Silicon powder coating shall be identified by:

- SX-AB-C-DEFGH (Corona application),

SX means silicone (siloxane) powder coating while other marks specify the quality particulars:

A – surface: 1 – fine structured surface

B – quality: 1 – combination of the polyester with a thermal stability up to 300 °C
2 – combination of the polyester with a thermal stability up to 450 °C

C – gloss: 5 – matt (< 20 GU @ 60 °, ISO 2813)

DEFGH colors shade: DEFGH – the shade is according to RAL (R9005),
DEFGH – internal shade code, the first digit indicates the group shade, while others determines the exact shade.

General information

Sandblasting is recommended pretreatment.

Base: binder based on a combination of polyester and silicone resins crosslinked with isocyanates. Colour shade: according to RAL-card or according to the sample.

Packaging: 25 kg cartons or big-bags of 500 kg.

Powder properties

Density (ISO 8310-3): 1,2 to 1,7 g/cm³, depending upon the shade.

Yield: 9,8 to 13,8 m²/kg at coat thickness of 60 µm, depending on the shade.

Granulation (Malvern particle sizer): above 40 µm ... 45 - 60 %.

Method of application: traditional CORONA procedure, negative voltage 30-100 kV, possible supply of powder adequate for TRIBO system of application (mark T i.e. SX-11-5-xxxxx T).

Temperature of powder coatings must be adjusted to the temperature of spraying line before the application.

Pre-treatment:

	Steel	Galvan. Steel	Aluminium
Mechanic cleaning/ sandblasting (recommended)	Suitable for bulk object	Less suitable	Less suitable
Cleaning/ degreasing	Suitable as initial phase of pre-treatment	Suitable as initial phase of pre-treatment	Suitable an initial phase of pre-treatment
Iron phosphating	Second phase, suitable for customary requirements	Second phase, suitable for customary requirements	Not suitable
Zinc phosphating	Second phase, advisable for large-scale corrosion requirements	Second phase, advisable for large-scale corrosion requirements	Not suitable
Chrome coating	Not suitable	Partly suitable	Advisable
Zeta coat	Suitable	Suitable	Suitable
Nano ceramics	Suitable	Suitable	Suitable

Curing conditions:

- 220 °C/30 min object temperature, for quality of the SX-11 (resistant to 300 °C),
- 250 °C/35 min object temperature, for quality of the SX-12 (resistant up to 450 °C).

Storage time: 24 months at the temperature below 25°C for standard coatings.

Mechanical and technological features of the silicon powder coating Ekolak SX

To determine its mechanical properties the Ekolak was applied to the 0,6 mm thick cold-rolled metal sheet degreased with acetone and cured in the oven at the temperature, required for the particular type of the Ekolak.

Coat thickness: 60-80 µm.

T-bend: minimum T4-OK/OK.

Impact test (ISO 6272): direct: minimum 50 cm × kg,
indirect: minimum 50 cm × kg.

Adhesion (ISO 2409): Gt 0.

Typical areas of application:

- car exhaust systems,
- parts of the heating elements ...

ANTIMICROBIAL POWDER COATINGS

Antimicrobial powder coating is intended to protect surfaces that we constantly touch. It reduces the possibility of microbial transmission and consequently infections associated with these microbes. The use of such varnishes is therefore particularly suitable for:

- furniture and equipment in medical institutions,
- fences, hooks and other holders,
- food preparation and storage,
- surfaces where condensation moisture is formed (molds and fungi),
- areas touched by several people,
- sanitary equipment.

The active ingredient incorporated in the powder coating prevents and inhibits the multiplication of microbes and ensures that their concentration is reduced by 99.99% within 24 hours. This is confirmed by a certificate of analysis from a microbiological laboratory in the UK. Testing was carried out according to ISO 22196:2011.

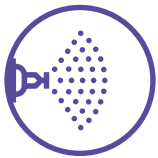
ELECTROSTATIC DISCHARGE POWDER COATINGS

Electrostatic discharge powder coating is a powder coating manufactured to dissipate static charge. The substrate to be coated must be conductive and earthed.

Electrostatic discharge powder coating EKOLAK is especially suitable for applications that require a certain discharge of static electricity and thus prevent static discharge (sparks): EX-zones, explosion safety, electronic devices, etc. We can offer a coating that has DISSIPATIVE or ANTISTATIC properties. The area of resistance is explained in the figure below.



Due to the active ingredient in the powder coating, which makes it conductive, the availability in terms of shade and structure is somewhat limited. Contact the EKOLAK sales program for more details.



SALES

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