

UV-curable, 1-component rotary screen printing ink for retroreflective films for vehicle license plates

Glossy, transparent, highly fade-resistant, resistant to chemicals and weathering, fast curing, press-ready

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Field of Application

Substrates

Retroreflective films of reflection classes RA 1, RA 2, and RA 3, each offering different levels of retroreflection intensity. RA 1 represents low luminance, while RA 3 provides exceptionally high luminance.

The choice of the appropriate class depends on the application location and environmental conditions - higher classes are particularly suitable for use at high driving speeds or in brightly lit environments.

If films of different manufacturers or types are used, the color specifications, reflection value, and adhesion properties may change.

Field of use

Ultra Sign UVLP was developed for the production of European vehicle license plates.

Characteristics

- High reflection for good visibility at night and in poor weather conditions
- Optimal color transparency
- Brilliant, high gloss finish
- High fade and weather resistance
- High chemical and mechanical resistance (e. g. in car washes)
- Fast curing

Ink Adjustment

The ink is press-ready and must be stirred homogeneously before and, if necessary, during production.

If necessary, auxiliaries such as thinners or other additives can be added.

Drying

UV curing with two medium-pressure mercury lamps (120 W/cm) at a belt speed of 25 m/min.

The curing process of the ink depends on

- the design of the UV dryer (e. g. reflectors)
- the number, age, and power of the UV lamps
- the processing speed of the curing unit
- the substrate and its distance from the UV lamps
- the color shade and the printed ink film thickness
- the pretreatment method

Post-curing within 24 h, improves resistance and adhesion.

Residual monomers and photoinitiators' decomposition products may still be present despite sufficient curing and must be considered depending on the application.

Waste prints must be completely cured to avoid being classified as hazardous waste.

Fade resistance

All color shades are based on a highly weather-resistant binder and contain pigments of high fade-resistant quality (blue wool scale 7–8). This enables a 2-year vertical outdoor exposure, referred to the middle European climate. Fade resistance can be further improved by overprinting with UVLP 911.

Fade and weather resistance are influenced by various factors, such as the choice of the retroreflective film, ink deposit, or mixing with Special Binder 904.

Stress resistance

Ultra Sign UVLP complies with DIN 74069, the German standard for requirements, testing, and marking of retroreflective license plates,

Ultra Pack UVLP



validation stickers, and holders for motor vehicles and trailers.

It also meets the requirements of the **RISE Method 4388**, a comprehensive testing procedure for assessing the quality and durability of license plates regarding weather resistance, retroreflection, color accuracy, mechanical stress, and resistance to water, cleaning agents, fuels, and corrosion. The tests are based on international standards such as ISO 7591, EN 12899, and the above mentioned DIN 74069, and include both visual evaluations and technical measurements.

Ultra Sign UVLP has successfully passed all relevant tests for suitability in vehicle license plate production.

Range

Transparent Shades

520	Transparent Yellow
525	Transparent Yellow
535	Transparent Red
555	Transparent Blue
565	Transparent Green

Further Products

904	Special Binder
911	Overprint Varnish, with UV-Absorber

UVLP 520 Transparent Yellow

For the stars on the Euro license plate.

UVLP 525 Transparent Yellow

For the background of Dutch vehicle license plates.

UVLP 535 Transparent Red

For construction signs or the border of Danish vehicle license plates.

UVLP 555 Transparent Blue

For the blue area of the Euro license plate.

UVLP 565 Transparent Green

For the background of Norwegian vehicle license plates.

UVLP 904 Special Binder

For mixing and adjusting the viscosity of the inks.

UVLP 911 Overprint Varnish with UV Protection

For increased resistances.

All color shades can be mixed with each other, but not with other ink systems or their auxiliaries.

Auxiliaries

UVV 1	Thinner	0-5%
UVV 2	Thinner	0-5%
UV-B 1	UV Accelerator	0-5%
UV-B 5	UV Accelerator	0-5%
UV-VM	Levelling Agent	0-2%
UR 3	Cleaner (flp. 42°C)	
UR 4	Cleaner (flp. 52°C)	
UR 5	Cleaner (flp. 72°C)	

Thinner: excessive use may lower curing speed and surface hardness. May also alter the inherent odor of the print.

UVV 1: reduces ink viscosity and increases curing speed.

UVV 2: reduces ink viscosity.

UV-B 1: accelerates curing and improves adhesion through depth curing.

UV-B 5: accelerates surface curing.

UV-VM: eliminates flow issues caused by contamination or incorrect machine settings. Overdosing may reduce overprint adhesion.

UR 3 /UR 4: for manual cleaning of work equipment.

UR 5: for manual or automatic cleaning of work equipment.

Printing Parameters

Mesh recommendation: Depending on printing conditions, speed, ink mileage, and opacity:

FV-145 / GV 200 (Screeny Mesh) or
RM 125/15 / RM 215/21 / RM 215/25
(Stork Rotamesh).

Stencils: Standard capillary films (15-20 µm) or solvent-resistant emulsions and combination stencils.

Shelf Life

Shelf life depends very much on the formula/reactivity of the ink system as well as the storage temperature. For an unopened ink contain-

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er it is:

- 1 year for all standard shades

We recommend our products to be stored in a dark, dry and well-ventilated area at 5 °C - 35 °C, protected from heat and direct sunlight. If storage conditions do not comply with this recommendation, shelf life is no longer guaranteed.

Note

Our technical advice whether spoken, written, or through test trials corresponds to our current knowledge to inform about our products and their use. This is not meant as an assurance for certain properties of the products nor their suitability for each application.

You are, therefore, obliged to conduct your own tests with our supplied products to confirm their suitability for the desired process or purpose. The foregoing information is based on our experience and should not be used for specification purposes. All characteristics described in this Technical Data Sheet refer exclusively to the standard products listed under "Range", provided that they are processed in accordance with their intended use and only when used with the recommended auxiliaries. The selection and testing of the ink for specific applications is exclusively your responsibility. Should, however, any liability claims arise, they shall be limited to the value of the goods delivered by us and utilised by you with respect to any and all damages not caused intentionally or by gross negligence.

Labeling

For Ultra *Sign* UVLP and its auxiliaries, there are current Material Safety Data Sheets available according to EC regulation 1907/2006, informing in detail about all relevant safety data including labelling according to EC regulation 1272/2008 (CLP regulation). Such health and safety data may also be derived from the respective label.

Safety rules for UV printing inks

UV inks contain some substances which may ir-

ritate the skin. Therefore, we recommend to take utmost care when working with UV-curable printing inks. Parts of the skin soiled with ink are to be cleaned immediately with water and soap. Please read the notes on labels and safety data sheets.

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