

Ultrapack UVC



UV curing screen printing ink for pre-treated polyethylene and polypropylene, polyester PET and PETG, rigid PVC, polycarbonate PC and polystyrene PS

Very fast curing, high gloss, excellent water resistance, thixotropic adjustment, very universal use

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Field of Application

Substrates

Ultrapack UVC is an universal UV-curing screen printing ink which is well suited for printing onto the following substrates:

- pre-treated polyethylene HDPE /LDPE and polypropylene PP
- flame-treated and non-treated PET and PETG
- PC and rigid PVC
- polystyrene PS

Since all the print substrates mentioned may be different in printability even within an individual type, preliminary trials are essential to determine the suitability for the intended use as well as a sufficient adhesion.

Before printing onto PE and PP, please keep in mind that the non-polar and thus low surface tension of the substrate surface must be treated by flaming. With this process, surface tension will rise and a very good adhesion from 44 mN/m is possible. The surface treatment can be tested by appropriate test inks.

The substrate surface must be absolutely free of contaminating residues such as grease, oil, and finger sweat.

Due to the processing parameters, PET and PETG substrates can have great differences in surface tension which can be rectified by a pre-treatment with a 'soft' gas flame.

The adhesion of Ultrapack UVC to PVC is very good, but take into consideration the embrittlement of PVC due to UV-light in the UV-dryer.

Field of use

UVC has been especially developed for direct container and packaging printing. It can be used both on single and multi-colour printing machines at a printing speed of up to 7,000 bottles per hour (for more information, see chapter 'Curing'). UVC is, therefore, best suited for high-quality prints onto bottles, cans, tubes, jugs, and cartridges.

Characteristics

Colour shades

All UVC shades are brilliant and high-gloss at the best possible opacity. Further characteristics:

- press-ready
- fast curing
- good 1-c water and steam resistance
- high filler resistance
- flexible ink film, e. g. for tubes
- thixotropic structure, and no drip-through during machine stops
- Opaque White 170 for dark substrates
- can be over-embossed with hot foils

If printing onto very hot substrates, the degree of gloss of UVC will generally decrease.

Adjustment of the ink

Ultrapack UVC is press-ready. However, please stir well before printing.

To further improve the chemical resistance, we recommend to use Hardener H 3. For more details about this auxiliary, please see chapter 'Additives and Auxiliaries'. By adding Hardener H 3 to the ink, adhesion as well as water resistance will be enhanced.

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Curing

Ultrapack UVC is a very fast curing UV ink for a printing speed of up to 7,000 bottles/hour. A UV-curing unit (medium-pressure mercury lamp or fusion) of 120 to 200 W/cm is therefore necessary. The curing speed of the ink is generally depending on the kind of UV-curing unit (reflector), the number, age and power of the UV-lamps, the printed ink film thickness, the colour shade, the substrate in use, as well as the printing speed/number of passes.

Adhesion of the ink is usually controlled by a tape test after the printed bottles have cooled down to room temperature.

Ultrapack UVC is a post-curing UV ink which will achieve its best adhesion and resistances after 24 hours.

Stress resistance

After proper and thorough drying, the ink film exhibits outstanding adhesion as well as rub, scratch and block resistance and is resistant to solvents (see DIN 16 524), alcohol (96% ethanol), finger sweat, and further common alkaline and acid fillers. Especially these resistances can be improved by adding 2-4 % of Hardener H 3.

Fabrics, mileage

Selection of the fabric depends on the printing conditions, the required curing speed and productivity, as well as the requested opacity. Generally, fabrics of 140-31 to 180-31 can be used.

As a guide, a 'rule of thumb' is approx. 60-80 m². per kg of ink, which means between 6000 – 6500 containers (full print) or around 25000 prints with text (say at 25% coverage).

Stencil

All commercially available capillary films (15-20 µm) or solvent resistant photo emulsions and combined stencils can be used for UV-inks.

Range

Basic shades

(see colour chart System Ultracolor)

UVC 922	Light Yellow	UVC 952	Ultramarine Blue
UVC 924	Medium Yellow	UVC 956	Brilliant Blue
UVC 926	Orange	UVC 960	Blue Green
UVC 932	Scarlet Red	UVC 962	Grass Green
UVC 934	Carmin Red	UVC 970	White
UVC 936	Magenta	UVC 980	Black
UVC 950	Violet		

High-opaque shades

UVC 122	Light Yellow, high-opaque
UVC 132	Vermilion, high-opaque
UVC 152	Ultramarine Blue, high-opaque
UVC 162	Grass Green, high-opaque

Due to their higher pigmentation, high-opaque or mixed shades require more UV energy for ink curing resp. a reduction of the printing speed/ number of passes.

Further shades available

UVC 170	Opaque White
UVC 171	Flexible white, especially for tubes
UVC 270	High gloss white with excellent whiteness
UVC 180	Opaque Black
UVC 188	Deep black, especially for clear or natural containers

All shades are intermixable. Mixing with other ink types should be avoided in order to maintain the special characteristics of this outstanding ink range.

The basic shades according to System Ultracolor are included in our Marabu-ColorFormulator. They build the basis for the calculation of individual colour matching formulas, as well as for shades of the common colour reference systems Pantone®, and HKS®, and RAL®. All formulas are stored in the Marabu-Color Manager 2 (MCM 2) software.

The pigments used in the above mentioned standard shades, based on their chemical structure, correspond to the EEC regulations EN 71/part 3, safety of toys - migration of specific elements.

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Process Shades

UVC 425	Process Yellow
UVC 435	Process Magenta
UVC 455	Process Cyan
UVC 485	Process Black
UVC 409	Thixotropic binder

Due to a possible direct contact with the mouth, **we do not recommend** to use this ink neither for baby bottles or toys, nor for food packages in direct touch with food since the possible presence of residual monomers and decomposition products of the photoinitiators cannot be excluded even when sufficiently cured. To print onto packagings for food or consumer goods, we recommend a migration test of the finished product.

Additives

Special Binder UVC 904

- bronze binder for high-gloss bronze pastes
- dilutes the ink
- accelerates the curing process
- can be used as an overcoat

The addition of Special Binder UVC 904 (10-15% parts of weight) will accelerate the curing speed of colour shades reducing, however, the opacity at the same time.

Overprint Varnish UVC 910

Highly transparent varnish for top-coating or for spot-varnishing.

Varnish, satin-transparent UVC 914

Transparent satin-finish for special effects.

Thixotropic Binder UVC 409

For reducing the intensity of 4 colour-process shades, and as a thickening paste for addition to other shades where fine details or reverse printing requires an ink with more body.

High gloss bronze pastes

There are 8 high-gloss bronze pastes available which can be mixed with UVC 904 Special Binder. They can be chosen according to the required opacity, cost limit and curing characteristics.

Economically priced Bronzes

(Fair opacity, and 6 months pot life)

S-UV 191	High-gloss Silver (4:1- 7:1)
S-UV 192	Rich Pale Gold (4:1- 7:1)
S-UV 193	Rich Gold (4:1- 7:1)

High gloss bronzes, fine pigmentation

(24 hour pot life , with high opacity)

S-UV 296	High-gloss Silver (6:1-9:1)
S-UV 297	High-gloss Rich Pale Gold (6:1-9:1)
S-UV 298	High-gloss Pale Gold (6:1-9:1)

Can be overprinted with UVC 904 to improve rub resistance.

High Opacity 'Metallic' Bronzes

(Slightly structured, but with very good rub-resistance. Pot-life of around 12 hours)

S-UV 291	High-gloss Silver (4:1 – 10:1)
S-UV 293	High-gloss Rich Gold (4:1 – 10:1)

All figures in brackets are guidelines. The ratio figures in brackets refer to the mixture Special Binder UVC 904 to bronze paste whereas the first figure is standing for the parts by weight of Special Binder UVC 904. For further information, please refer to our Technical Data Sheet 'High-gloss bronzes'.

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Auxiliaries

Thinner: UVV 1

UVC is press-ready but, if necessary, the viscosity can be reduced by adding 1-10 % Thinner UVV 1. Due to the addition of thinner, the odour of the cured ink film will increase accordingly. We do not recommend to add a higher quantity of thinner since this will cause a reduction of the surface's hardness. UVV1 is part of the cross-linked matrix when UV-cured.

Hardener H 3

Water resistance, adhesion, as well as chemical resistances of UVC can be improved by adding Hardener H 3 as follows:

Colour shades + Black: 2-4 % parts by weight
White 970 and 170: 2 % parts by weight

H 3 is to be stirred well and homogeneously. The mixture UVC and H 3 cannot be stored for a longer time and must therefore be processed within 6-8 hours.

Accelerator UV-B1

Accelerates the curing reaction of the ink and increases the adhesion to the substrate owing to a better depth curing.

Addition: 1 – 2% parts by weight

Levelling Agent UV-VM

Helps to eliminate flow problems (e. g. bubbles, etc.) which may arise due to residuals on the substrate's surface, insufficient screen tension or incorrect adjustment of the machines.

Addition: 0.5 - 1.5 % parts by weight

A higher proportioning may reduce the ink's adhesion when overprinting. UV-VM is to be stirred well und homogeneously before printing.

Thickening Agent STM

Increases the ink's viscosity without influencing the gloss degree significantly.

Addition: 0.5 - 2 % parts by weight

STM is to be stirred well, we recommend to use a motorised stirrer.

Liquid Thickener HM 695 500 339

To be added at between 0.1 and 0.5% into the ink. This increases the viscosity of the ink to help hold fine details and when higher printing temperatures are expected.

Cleaner

Appropriate cleaners are UR 3 and UR 4. We generally recommend to clean the tools immediately after printing, especially if cross-linked adhesion modifiers have been used.

Shelf life

Shelf life is strongly depending on the formulation/reactivity of the ink system, as well as on the storage temperature. It is max. 18 months for a originally closed can stored in a dark place at 15 - 25 °C. In the case of changed storing conditions and especially at higher storing temperatures, shelf life will be reduced. In such cases, Marabu cannot be held responsible for any claims arising from that and our guarantee will no longer be valid.

Labelling

For our ink type Ultrapack UVC and its additives and auxiliaries there are current Material Safety Data Sheets according to EC-regulation 91/155 informing in detail about all relevant safety data including labelling according to the present EEC regulations as to health and safety labelling requirements. Such health and safety data may also be derived from the respective label.

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Safety rules for UV screen printing inks

We recommend to take utmost care when working with UV screen printing inks. Please pay also attention to the notes on labels and safety data sheets.

Additional information will provide the brochure 'UV curing' issued by the employer's liability insurance association for printing and paper.

Note

Our technical advice whether spoken, written, or through test trials corresponds to our current know-ledge 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 selection and testing of the ink for specific application 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.