

# KIWOPRINT<sup>®</sup> UV 33

## **Screen printable, pressure sensitive adhesive based on UV-cross-linking polymers, especially designed for adhesions exposed to light**

KIWOPRINT UV 33 is a high quality, screen print applied, pressure sensitive adhesive for the production of self-adhesive components made of rigid PVC, glass, metal, and films such as polycarbonate, polyester and pre-treated polyethylene and polypropylene. Depending on the properties of the substrate, adhered products are permanent, or nearly permanent. KIWOPRINT UV 33 can be used for bonds exposed to light, e.g. display behind glass, transparent film, etc. The printed and cross-linked adhesive layer is colorless and resistant to water.

### **PRECAUTIONS**

For the production of self-adhesive materials the following has to be considered:

1. Check requirements such as adhesion strength, climatic load, temperature and UV-resistance.
2. Choose a suitable substrate and test for compatibility with KIWOPRINT UV 33 (e.g. soft PVC-film may interact with the adhesive layer).
3. If direct contact between printing ink and adhesive may occur, test for compatibility, as some inks may interact with the adhesive layer.
4. When screen printing, the selection of the mesh type is essential in determining the desired result. The coarser the mesh count, the thicker the adhesive, and the higher the adhesive values. For technical applications usually a mesh of 77 threads/cm [195 threads/in] - 55 $\mu$  thread diameter (T) is used.
5. When screen printing, solvent resistant emulsions of the AZOCOL [KIWOCOL in the USA] range must be used. Ask KIWO for advice.
6. Choose a suitable release liner. Very smooth silicone paper or siliconized film of medium release should be used.

The compatibility of the adhesive to each component i.e. carrier, ink, release liner, adhesion partner etc. must be tested before use in production. Focus should be on the long-term compatibility of the adhesive with the used inks and substrates. The influences of the release liner and the quality of the substrate (roughness, silicone release agents, plasticizer migration) must be tested as well.

**PROCESSING**

When storing the liquid adhesive for a longer period of time, the additives may ascend to the surface, therefore stir thoroughly prior to use.

When screen printing, optimal press adjustment can determine the quality of the resulting print, e.g. air bubbles in the adhesive layer can be avoided. Best printing results can be achieved with a high mesh tension (25 - 30 N/cm). The snap-off should be 3 - 5 mm [0.1 – 0.2 in.], the printing speed slow to medium. The printing image produced using KIWOPRINT UV 33 is very smooth. In general, it is bubble free. Due to the light sensitivity of the liquid adhesive, process the adhesive under yellow light, or at least not in directly illuminated areas. Thinning with solvents or monomer reducers is neither recommended nor necessary.

Drying of UV-pressure sensitive adhesives is not done in the conventional way. KIWOPRINT UV 33 chemically cross-links when exposed to UV-light. Use common UV-curing units normally used for UV printing inks. The optimum curing range should be established using one's own production equipment and conditions. **Different exposure intensity causes different cross-linking results. Highly cross-linked films of KIWOPRINT UV 33 result in high shear strength. A slightly lower cross-linking produces an adhesive layer with higher bond values and reduced shear strength.** *It is absolutely necessary to control the UV-power permanently during production to guarantee uniform product quality.* Only properly cross-linked adhesive films give highest bond values. KIWOPRINT UV 33 is very reactive. An exposure dose of 500 – 700 mJ/cm<sup>2</sup> produces an adhesive film suitable for use.

**ADHERING**

The bond achieved with self-adhering articles printed with KIWOPRINT UV 33 can be improved by:

1. Ensuring parts are free of dust and mold release agents
2. Optimum application temperature: 20 - 50°C [68 – 122°F]
3. Additional pressure (approx. 20 N/cm<sup>2</sup>) with a heated silicone rubber pad (40 - 50°C / 104 – 122°F)
4. Providing a tension free bond and preventing air bubbles
5. Flat and smooth substrate (i.e. pressure molded parts free of burrs/sprue marks).
6. Sufficient adhesion surface area relative to total surface area.

**CLEANING**

KIWOSOLV L 72

**TECHNICAL DATA**

<b>BASIS</b>	UV-reactive polymers
<b>COLOUR</b>	Transparent, cloudy
<b>VISCOSITY</b>	Approx. 10.000 mPas (Brookfield RVT, spindle 5, 20 r/min., 20°C [68°F])
<b>SOLIDS CONTENT</b>	100%
<b>DENSITY</b>	Approx. 1,06 g/cm <sup>3</sup>
<b>CROSS LINKING UV LIGHT REACTION</b>	The values below were obtained using adhesive films cross-linked as follows:

Lamp type: 120 W/cm, mercury vapor lamp  
 Screen mesh: 36 threads/cm [92 threads/in] – 90µ thread diameter T [Dry thickness: avg.; 45 µ]

Exposure dose: 660 mJ/cm<sup>2</sup>

Measurements: In Metric units; converted to lbs/in<sup>2</sup> with: (N/cm x 0.227)/0.3937 = lbs/in; N/in<sup>2</sup> x 0.227 = lbs/in<sup>2</sup>

<b>PEEL VALUE</b>	Approx. 15N/ inch or 3.4 lb/in (after 1 min adhesion time) Approx. 30 N/ inch or 6.7 lb/in (after 24 h adhesion time)
	Screen printing on 125 µm polycarbonate film. Peel strength per PSTC 1. Measured with peel tester type L 500 of Lloyd Instruments, load cell 100 N, class 1, DIN EN ISO 7500-1 for tension and pressure, 180° peel test, measured 1 min. and 24 hours after adhering. Peel speed 300 mm/min. [12 in./min.] Adhering to polished stainless steel (material 1.401) with hand roller according to PSTC-standard, roll weight 10 pounds, rolled 5x in each direction. Adhesion area: 2,54 x 10 cm [1 x 4 in].

<b>DYNAMIC SHEAR STRENGTH</b>	Approx. 135 N/ in <sup>2</sup> or 30.645 lbs/in <sup>2</sup>
	Screen printing on 50 µm polyester film. Measured at 23°C or 73.4°F with peel tester type L 500 of Lloyd Instruments, load cell 2500 N, Class 1, DIN EN ISO 7500-1 for tension and pressure. Peel speed 0,1 inch/min. Bond area: 1 x 1 inch Bonded to 50 µm PET film with a hand roller according to PSTC-standard, roll weight 10 pounds, rolled 5x in each direction. Tested after 24 h adhesion time.

<b>STATIC SHEAR STRENGTH</b>	Approx. 500 s
	Bond area: 1 x 1 inch. Adhering with a hand roller, roll weight 10 pounds, rolled 5 x in each direction. Tested after 24 h adhesion

time. Measured in a drying cabinet at +105°C [221°F ] after 15 min. Shear test is made by adding a load of 1 kg [2.2 lbs].

**TACK VALUE**

Approx. 1100 g

Screen printing on 50 µm polyester film. Measured with Polyken Tack-Tester at 23°C or 73.4°F. Peel speed: 0.5 cm/s or 0.1968 in/s. Tested with probe A.

**HEAT SHEAR STRENGTH**

Approx. +90°C or +194°F

Screen printing on 50 µm polyester film. Tested according to ASTM D 4498 (SAFT = Shear Adhesion Failure Temperature). Bond area of 1 x 1 inch, adhering to polyester film with a hand roller (10 pounds, 5x in each direction). Test after 24 h. After 15 min at +40°C / 104°F in a drying chamber, shear test with an additional weight of 500 g / 17.635 oz. Start of test at 40°C / 104°F, then temperature raised in steps of 5°C every 10 min., until the test sample dropped.

**HEALTH HAZARDS/  
ENVIRONMENTAL  
PROTECTION**

Please follow information given in the material safety data sheet.

**STORAGE**

6 months (at 20–25° / 68-77°F and tightly closed original container).

Notice: Do not store or transport at a temperature over 40°C / 104°F!

Protect against direct sun exposure or other UV-light source.

Thank you for choosing KIWO.