

## KIWOPRINT<sup>®</sup> UV 60

### Screen printable, pressure sensitive adhesive based on UV-cross-linking polymers

KIWOPRINT UV 60 is a high quality, screen print applied, pressure sensitive adhesive for the production of self-adhesive components for the automotive and electronic industry (touch panels, visual instrument panels, front panels, electrical devices) where high peel strength is required. Storing the products printed with KIWOPRINT UV 60 appropriately (i.e. covered with suitable silicone paper, kept dry, in absolute darkness, at room temperature), they can be kept in stock at least 6 months without loss of the adhesive power. These products can be used at temperatures of approx. -30°C to +85°C. After cross-linking, KIWOPRINT UV 60 is light yellowish, partly resistant to light and has a very good water resistance.

### 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 60 (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 36-90 (T) is used.
5. When screen printing, solvent resistant emulsions of the AZOCOL 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 (e.g. roughness, silicone release agents, plasticizer migration) must be tested as well.

## **PROCESSING**

When storing the 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, the printing speed slow to medium. The printing image produced using KIWOPRINT UV 60 is very smooth. In general, it is bubble free. Due to the light sensitivity of the liquid adhesive it is recommended to 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 60 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 60 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 60 is very reactive. An exposure dose of 400 – 600 mJ/ cm<sup>2</sup> produces an adhesive film suitable for use.

## **ADHERING**

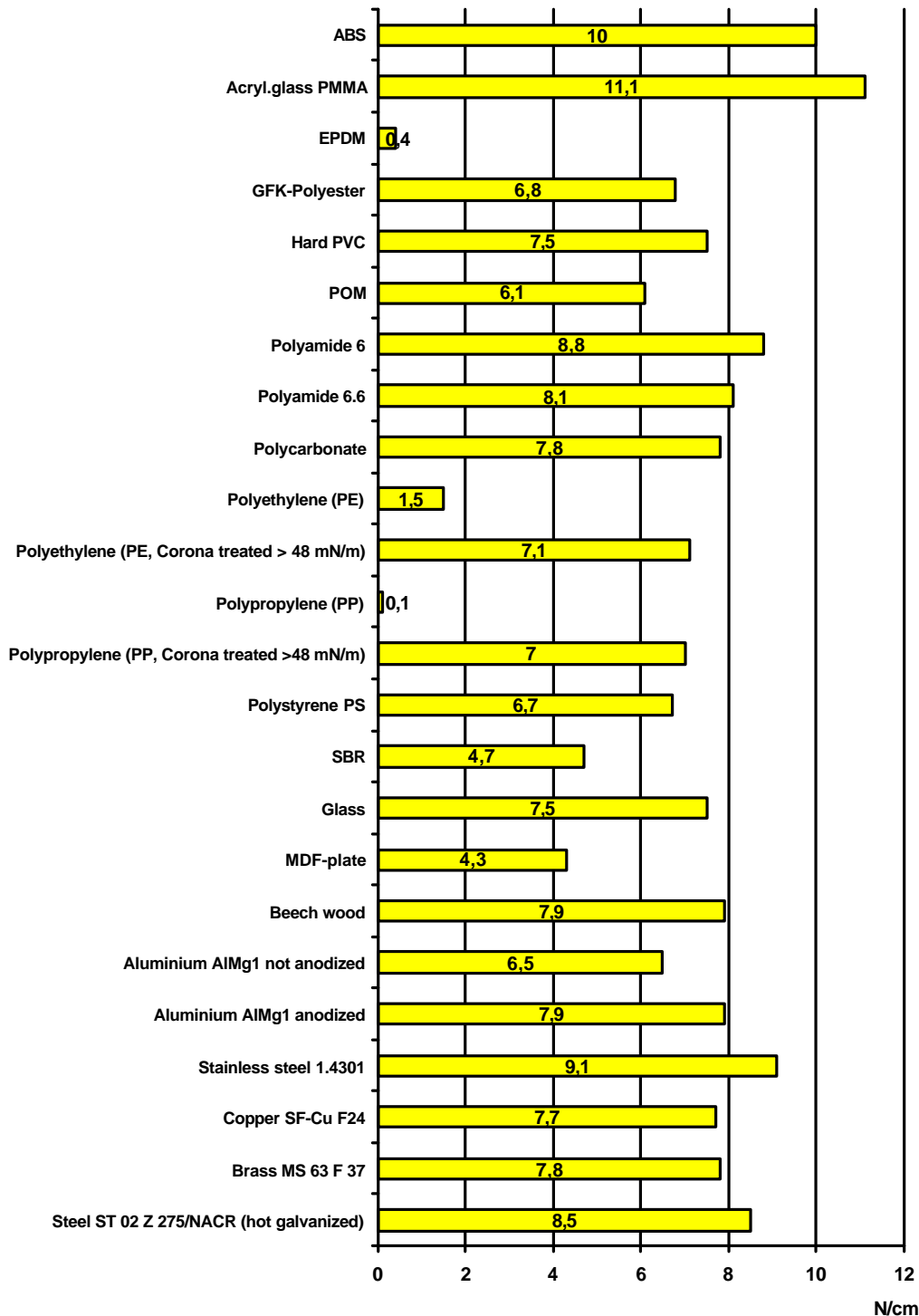
The bond achieved with self-adhering articles printed with KIWOPRINT UV 60 can be improved by:

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

## **CLEANING**

KIWOSOLV L 14

**Peel strength of KIWOPRINT UV 60 on various substrates:**



Peel strength measured as per PSTC 1 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°C peel test, printed with a 36–90(T) polyester mesh onto 50 µm PET film. Dose of exposure 660 mJ/ cm<sup>2</sup>. Measured after 72 hours storage at ambient temperature (as per DIN 50014-23/50-1), in N/cm. Peel speed 300 mm/min. Adhering with hand roller (as per PSTC standard, roll weight 10 pounds, 5 x in each direction). Adhering area: 2,5 x 10 cm.

## TECHNICAL DATA

<b>BASIS</b>	UV-reactive polymers
<b>COLOUR</b>	Yellowish
<b>VISCOSITY</b>	Approx. 13500 mPas (Brookfield RVT, spindle 5, 20 r/min., 20°C)
<b>SOLIDS CONTENT</b>	100%
<b>DENSITY</b>	Approx. 1,04 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 vapour lamp  
Screen mesh: 36-90 T

Dose of exposure (m J/cm <sup>2</sup> )	220	440	660	880
Immediate peel value (N/ cm)	7	10	10	10,2
Peel value after 24 h (N/cm)	8	12,6	12,6	13,8
Tack value (g)	1350	1150	1050	750
Heat shear strength (SAFT) (°C)	80	95	100	100
Static shear strength at 105°C (s)	250	400	600	800
Dynamic shear strength (N/inch <sup>2</sup> )	139	139	145	145

**Peel strength:** 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. Adhering at polished stainless steel (material 1.401) with hand roller according to PSTC-standard, roll weight 10 pounds, rolled 5 x in each direction. Adhering area 2,54 x 10 cm.

**Tack value:** Measured with Polyken Tack-Tester, Screen printing on 50 µm polyester film. Notice: Slightly lower values can be achieved by screen printing depending on the variation of mesh counts and the resulting surface structure.

**Heat shear strength:** Screen printing on 50 µm polyester film. Tested according to ASTM D 4498 (SAFT = Shear Adhesion Failure Temperature). Adhering area of 1 x 1 inch, adhering at polyester film with a hand roller (10 pounds, 5 x in each direction). Test after 24 h. After 15 min at +40°C in a drying chamber, shear test with an additional weight of 500 g. Start of the test at 40°C, the temperature; raised temperature in steps of 5°C every 10 min. until the test sample has removed from the substrate.

**Static Shear strength:** Measured in a drying cabinet at +105°C, 24 hours after adhering. Load: 1 kg. Bonded on 50 µm PET film. Adhering area 1 x 1 inch.

**Dynamic Shear Strength:** Measured with peel tester type L 500 of Lloyd Instruments, load cell 2500 N, class 1, DIN EN ISO 7500-1 for tension and pressure, measured 24 hours after adhering. Peel speed 0,1 inch/min., bonded on 50 µm PET film. Adhering area 1 x 1 inch.

**HEALTH HAZARDS/  
ENVIRONMENTAL  
PROTECTION**

Please follow further information given in the material safety data sheet.

**STORAGE**

6 months (at 20 – 25° and tightly closed original container).

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

Protect against direct sun exposure or other UV-light sources