

KIWOPRINT[®] D 159

Acrylate and dispersion based screenable pressure sensitive adhesive

KIWOPRINT D 159 is a high quality, screenable pressure sensitive adhesive for the production of self-adhesive materials for the automotive and electronic industry (e.g. touch panels, visual instrument panels, front panels, electrical devices) when a high peel strength is required. High viscosity allows printing of sucking surfaces (felt, PE foam). Materials bonded with KWOPRINT D 159 can be used at temperatures of between -30°C and +180°C. Good texture makes it especially suitable for the application on difficult substrates, as e.g. polyethylene, polypropylene or polyamide. Materials bonded with KIWOPRINT D 159 can be stored for a minimum of 1 year without any decrease of adhesive strength, if covered with a suitable silicone paper and kept dry and dark at room temperature.

PRECAUTIONS

For the production of self-adhesive components the following facts have to be considered:

1. Check requirements like adhesion strength, climatic load, temperature and UV-resistance.
2. Choose a suitable substrate and test for compatibility with KIWOPRINT D 159 (z. B. soft PVC 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 for the desired result. The coarser the mesh count, the thicker the adhesive layer and the higher the adhesive values.
5. When screen printing, water 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 should be used. The adhesive layer orients itself to the release liner and the smoother the release liner is, the smoother the adhesive layer will be after 24 hours. Also, the silicone layer must be compatible to assure a proper release from the adhesive.

The suitability of the adhesive together with each component i.e. substrate, ink, liner, adhesion partner etc. must be tested before production parts are made. Special attention should be made for the long-term compatibility with the component materials. Also one must check the influences of the liner material and the state or nature of the substrate's structure or roughness. Silicone release agents, plasticizer migration etc. must be checked for and ruled out before one continues.

APPLICATION

When screen printing, optimal adjustment of the printing machine can determine the print result. This largely prevents the formation of bubbles. High air humidity facilitates the application of dispersion adhesives. During short printing breaks the stencil should only be flooded with adhesive. Spray with water to facilitate further printing. If the printing breaks are longer than 10 - 15 min. the screen has to be cleaned. Water can be used to clean fresh adhesive. Dried adhesive can be removed with PREGAN 1014 E.

KIWOPRINT D 159 should not be thinned for application. Thinning with water is possible, however, it favours the formation of bubbles during printing and reduces the coating thickness and consequently the adhesive strength.

The adhesive can be dried by storage at room temperature or by tunnel dryer for industrial production. Drying time depends on the quantity of adhesive to be dried, substrate type, drying temperature and air movement. Best values have to be determined or optimized by yourself.

Only properly dried adhesive layers give highest bond values. For further processing the applied adhesive must be completely dry, only then should the silicone paper or film be applied. Avoid air traps between release liner and adhesive as trapped air will influence the adhesive surface.

To avoid die cutting problems, the adhesive layer should end 0,5 – 1,0 mm in front of the punch line. Back-lit areas will not be printed as the adhesive film has an influence on the light intensity.

ADHERING

The bond of self-adhesive components produced using KIWOPRINT D 159 can be improved by:

1. Dust and oil free parts
2. Optimum application temperature: 20 - 60°C
3. Additional pressure (approx. 3 - 4 bar on 100 cm²) with a heated silicone rubber pad (40 - 50°C)
4. Preventing air bubbles and stretching the substrate during application
5. Flat and smooth substrate (e.g. pressure molding parts without burrs or sprue marks)
6. Sufficient adhesion surface area relative to total surface area

TECHNICAL DATA

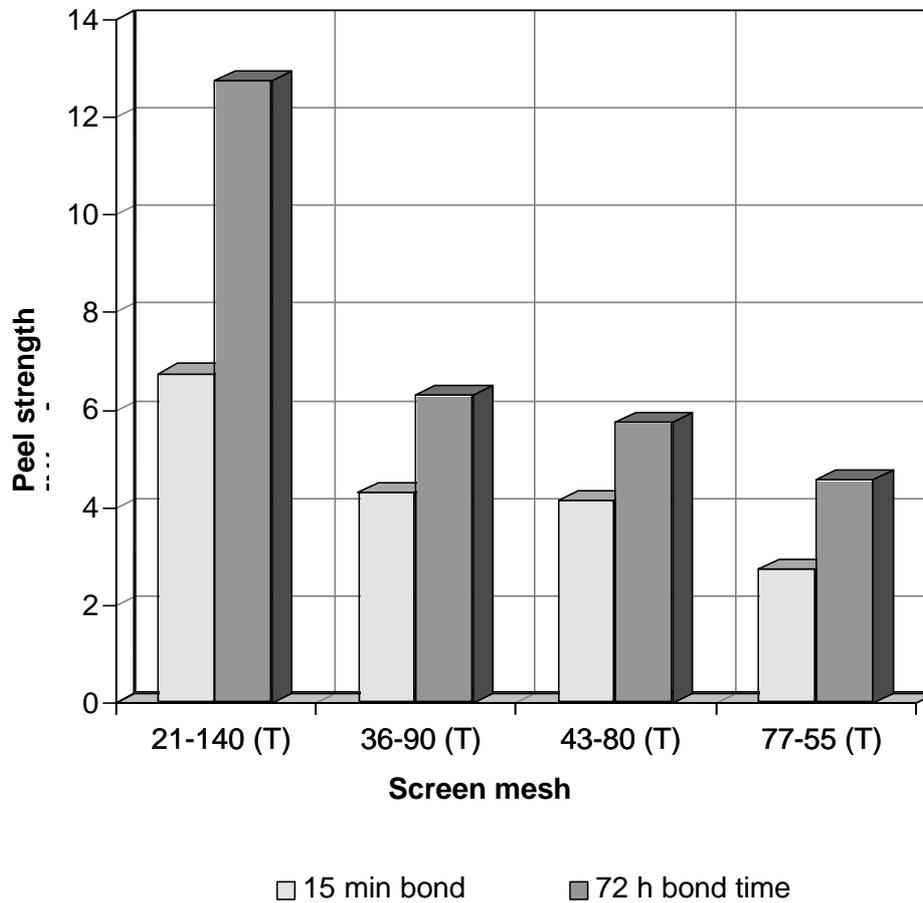
Screen printing on 50 µm polyester film

Screen mesh	21-140 (T)	36-90 (T)	43-80 (T)	77-55 (T)
Drying (at 20°C)	45 min.	25 min.	20 min.	10 min.
Drying (at 70°C)	7 min.	3,5 min.	2,5 min.	1,5 min.
Dried coating Thickness *1	approx. 45 µm	approx. 25 µm	approx. 20 µm	approx. 10 µm
Tack-value *2	approx. 1200 g	approx. 1000 g	approx. 900 g	approx. 700 g
Theoretical consumption	approx. 70 g/m ²	approx. 40 g/m ²	approx. 30 g/m ²	approx. 15 g/m ²

*1 Difference measurement per DIN 50981, measured with thickness gauge Permascope M 11 of Helmut Fischer GmbH & Co.

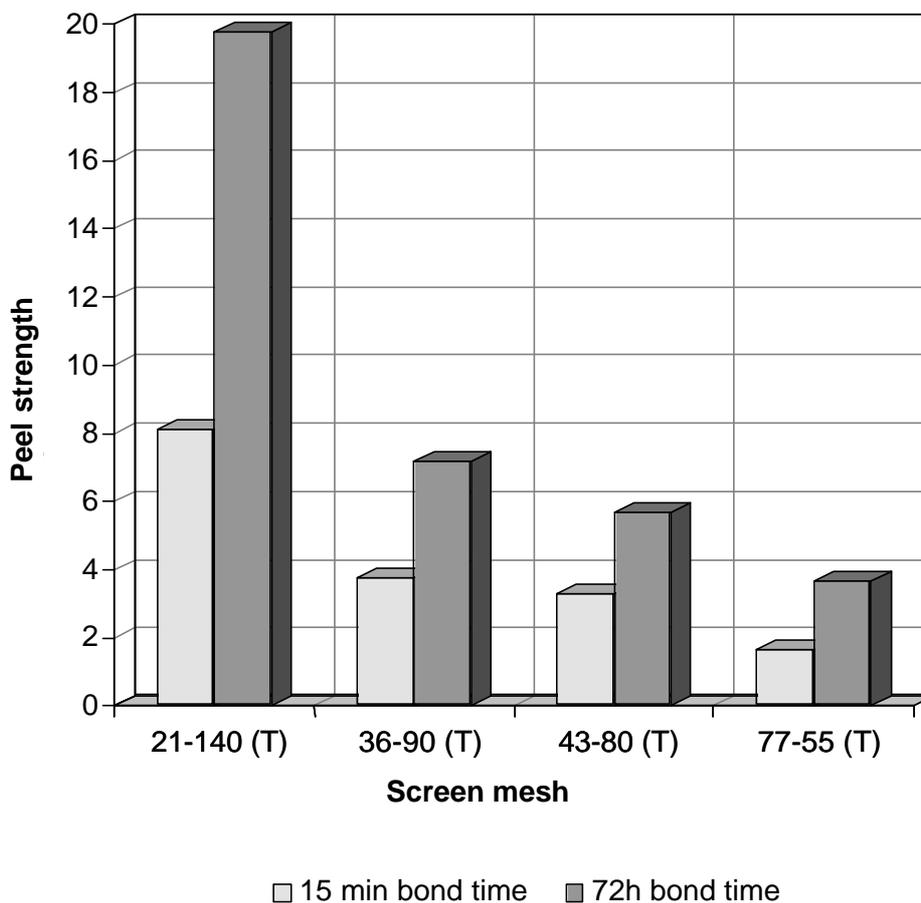
*2 Measured with Polyken Tack-Tester, 1 sec. adhering, pull off speed 1 cm/sec.

Peel strength of KIWO PRINT D 159 on 50 µm-PET-Film



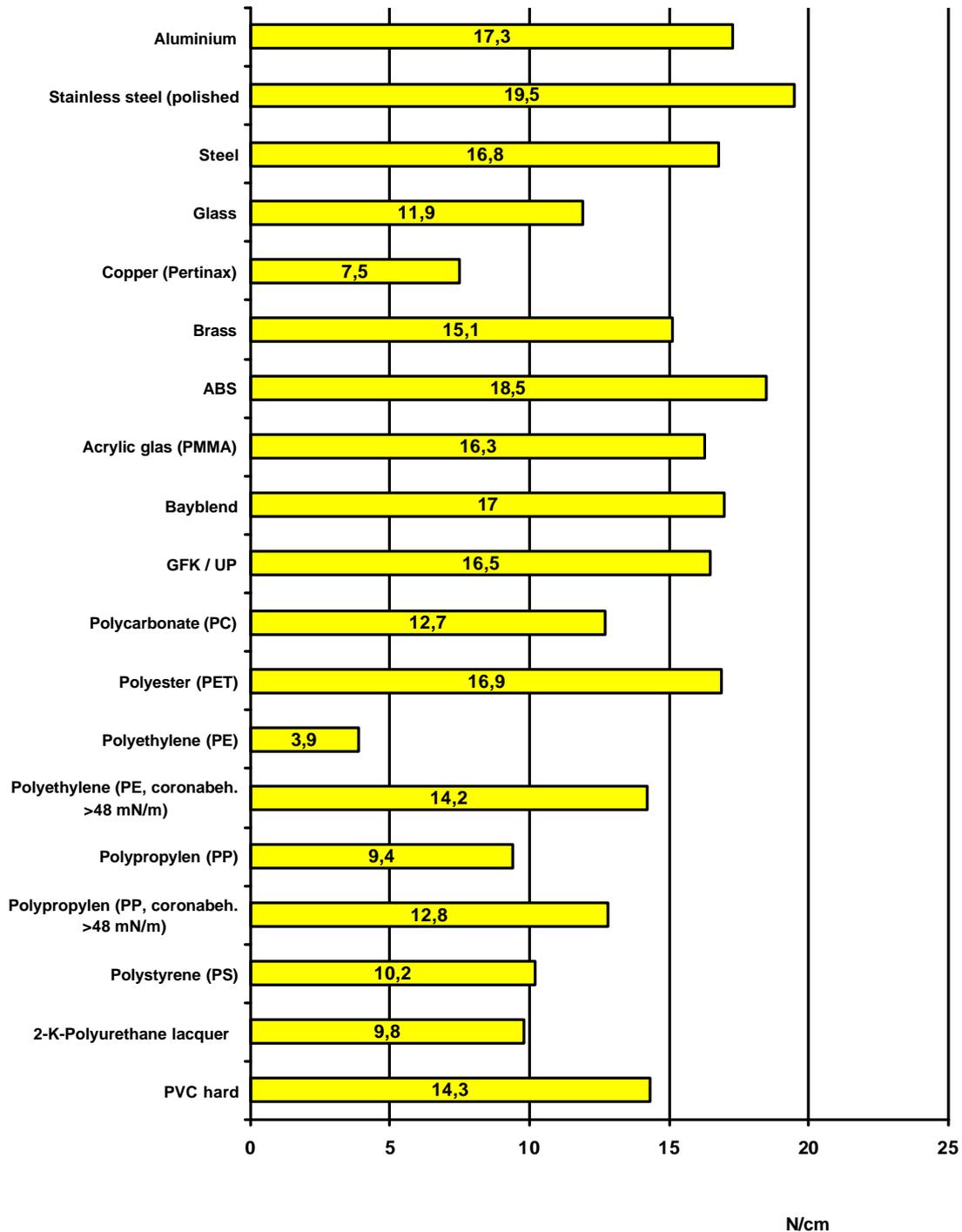
Peel strength measured as per PSTC 1 with peel tester type L 500 of Lloyd Instruments, load cell 100 N, class 1, DIN EN ISO 7500-1 for tension and pressure, 180° peel test, measured 15 min. and 72 hours after adhering, in N/cm. Peel speed 300 mm/min. Adhering at polished stainless steel (material 1.401) with hand roller (according to PSTC standard, roll weight 10 pounds, rolled 5 x in each direction). Adhering area 2,5 x 10 cm.

Peel strength of KIWO PRINT D 159 on 100 µm-PC-Film



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° peel test, measured 15 min. and 72 hours after adhering, in N/cm. Peel speed 300 mm/min. Adhering at polished stainless steel (material 1.401) with hand roller (according to PSTC standard, roll weight 10 pounds, 5 x in each direction). Adhering area 2,5 x 10 cm.

Peel strength of KIWOPRINT D 159 on various substrates:



Peel strength measured as per PSTC1 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, printed with a 21 T-mesh onto 100 µm-polycarbonate film, measured 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 (according to PSTC standard, roll weight 10 pounds, 5 x in each direction). Adhering area 2,5 x 10 cm.

BASIS	Aqueous acrylate dispersion
FARBE	Wet: yellowish Dry: transparent
VISCOSITY	Approx. 28.000 mPas (Brookfield RVT, spindle 6, 20 U/ min, 20 °C)
SOLIDS CONTENT	Approx. 64%
pH-VALUE	Approx. 4,5
DENSITY	Approx. 1,01 g/cm ³
HEAT RESISTANCE	Approx. -30°C to +180 °C (90 µm adhesive wet film thickness onto polyester film. Adhering area 2,5 x 10 cm, adhering at polished stainless steel, peel angle 90°, load 30 g)
UV-RESISTANCE	Very good
HEALTH HAZARDS/ ENVIRONMENTAL PROTECTION	Please follow further information given in the material safety data sheet.
STORAGE	1 year (at 20 - 25 °C and tightly closed original container) KIWOPRINT D 159 should not come into contact with unprotected metal for a longer period. Protect against freezing.