

## KIWOPRINT® D 158

### Acrylate and dispersion based pressure sensitive adhesive

KIWOPRINT D 158 is a high-quality pressure sensitive adhesive for the production of self-adhesive materials made of paper, cardboard, rigid PVC, rubber, technical foams, lacquered surfaces, etc. Very good adhesion to polyester and polycarbonate films, polyethylene, polypropylene, glass and metal. KIWOPRINT D 158 has very good ageing and light resistance. Relatively soft texture makes it especially suitable for the application on difficult substrates, as e.g. polyethylene, polypropylene and polyamide. Materials bonded with KIWOPRINT D 158 can be used at temperatures of approx. -30°C to +100°C and 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.

### PREPARATION

Observe the following advice when producing self-adhesive materials:

1. Check the requirements, such as e.g. requested adhering strength, climatic strain, temperatures and UV resistance.
2. Chose the correct substrate and test compatibility with KIWOPRINT D 158 (e.g. soft PVC film influences the adhesive layer):
3. In case of a direct contact of KIWOPRINT D 158 with the printing inks, check compatibility of the inks. Kind and type of ink can influence the adhesive.
4. The correct choice of the mesh count is decisive for screen printing applications. The coarser the mesh, the higher is the build-up thickness and therefore the adhesion strength. For technical applications usually a mesh of 21-140(T) is used.
5. For screen printing applications, solvent resistant emulsions of the AZOCOL range can be used. Ask KIWO for advice.
6. Chose the correct covering material. Use very smooth silicone paper or siliconized film. The adhesive layer depends on the covering material, the smoother the silicone liners, the smoother the adhesive layer (within 24 h). Furthermore, silicone liners must be adapted to the adhesive in order to avoid disturbances when removing them.

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, optimum adjustment of the printing machine determines the print result. Best results are achieved with stencils with high tension (25-30N/cm). Snap-off should be low (0-2 mm), print velocity average (from 400 mm/s). This largely prevents the formation of bubbles. By contact printing (no snap-off) optically very smooth surfaces can be achieved. High air humidity facilitates working with dispersion based adhesives. During short printing breaks the stencil should be flooded with adhesive. If the printing breaks are longer than 5 - 10 min. the screen has to be cleaned. Water can be used to clean fresh adhesive. Dried adhesive can be removed with PREGAN 1014 E.

Stir well before use. KIWOPRINT D 158 should not be thinned for application. Thinning with water is possible, however, thus printability, solids content, coating thickness and consequently the adhesive strength is reduced.

The adhesive can be dried at room temperature or in tunnel dryer for industrial production. Temperatures of up to +70°C can be applied without damaging the adhesive. Drying time depends on the applied adhesive thickness, kind of substrate, drying temperature and air flow. Test and optimize the most suitable values at your facility.

Notice: Completely dried adhesive layers are transparent.

Only completely dry adhesives achieve highest bonding values. For further processing the applied adhesive must completely be dry; only then should the silicone paper be applied. A bubble-free laminating of the liner is recommended, as enclosed air influences the adhesive layer.

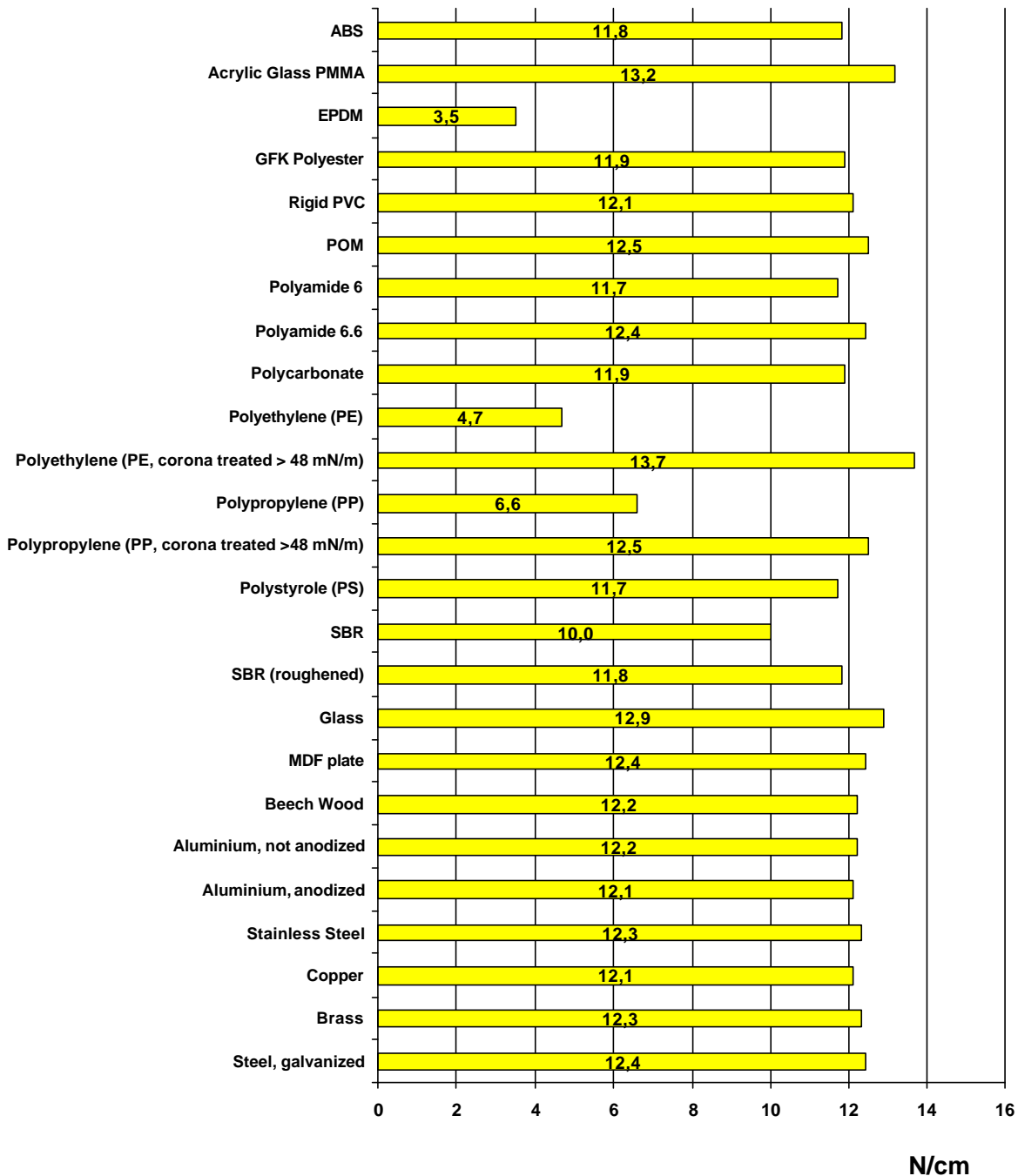
To avoid die cutting problems, the adhesive layer should end 0,5 – 1,0 mm in front of the punch line. Back-lit areas will not be printed as the adhesive film has an influence on the light intensity.

## **ADHERING**

Adherence of self-adhesive components produced using KIWOPRINT D 158 can be improved by:

1. Dust and oil free parts
2. Optimum application temperature: 20 - 50°C
3. Additional pressure (approx. 20 N/ cm<sup>2</sup>) 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

**Peel values of KIWOPRINT D 158 on different substrates:**



Tested according to PSTC 1. Measured with peel tester type L 500 from Lloyd Instruments. Load cell 100 N, class 1, DIN EN ISO 7500-1 for tension and pressure, peel angle: 180°, printed with 21-140(T) on 125 µm polycarbonate film, measured after 72 h-storage at normal climate (according to DIN 50014-23/50-1). Peel speed 300 mm/min. Applied with a hand roller (according to PSTC standard: 10 pounds, rolled 5x in each direction). Adhesion area: 2,5 x 10 cm. N/inch.

|                                |  |
|--------------------------------|--|
| <b>BASIS</b>                   | Aqueous acrylate dispersion                                      |
| <b>COLOUR</b>                  | Wet: beige<br>Dry: transparent                                   |
| <b>VISCOSITY</b>               | Approx. 26.000 mPas (Brookfield RVT, spindle 6, 20 U/ min, 20°C) |
| <b>SOLIDS CONTENT</b>          | Approx. 62%  |
| <b>pH-VALUE</b>                | Approx. 5,5  |
| <b>DENSITY</b>                 | Approx. 1,01 g/ cm <sup>3</sup>                                  |
| <b>DRYING/<br/>CONSUMPTION</b> | Applied on a 50 µm polyester film by screen printing             |

| Mesh                       | 21-140 (T)                   | 36-90 (T)                  | 77-55 (T)                   |
|----------------------------|------------------------------|----------------------------|-----------------------------|
| Drying (at 20°C)           | Approx. 30 min               | Approx. 20 min             | Approx. 10 min              |
| Drying (at 70°C)           | Approx. 5 min                | Approx. 3 min              | Approx. 1,5 min             |
| Thickness of dry adhesive* | Approx. 55 µm                | Approx. 27 µm              | Approx. 13 µm               |
| Theoretic consumption      | Approx. 100 g/m <sup>2</sup> | Approx. 5 g/m <sup>2</sup> | Approx. 27 g/m <sup>2</sup> |

\* Measuring of difference according to DIN 50981 with stencil thickness gauge Permascope M 11 of Helmut Fischer GmbH & Co.

**PEEL STRENGTH**                      Approx. 13 N/inch (after 1 min bonding time)  
Approx. 24 N/inch (after 24 h bonding time)

90 µm adhesive thickness onto 50 µm polyester film. Tested according to PSTC 1. Measured at 23°C with peel tester type L 500 from Lloyd Instruments. Load cell 100 N, class 1, DIN EN ISO 7500-1 for tension and pressure, peel speed 300 mm/min., peel angle: 180°. Applied to polished stainless steel using a hand roller (10 pounds, rolled 5x in each direction) and measured after the corresponding bonding time at 23°C. Adhesion area: 2,54 x 10 cm.

**DYNAMIC  
SHEAR STRENGTH**                      Approx. 95 N/ inch<sup>2</sup>

90 µm adhesive thickness onto 50 µm polyester film. Measured at 23°C with peel tester type L 500 from Lloyd Instruments, load cell 2500 N, class 1, DIN EN ISO 7500-1 for tension and pressure, peel speed 0,1 inch/min. Bonded onto a 50 µm polyester film using a hand roller (10 pounds, rolled 5x in each direction). Adhesion area: 1 x 1 inch. Measurement after 24 hours.

**STATIC  
SHEAR STRENGTH**

Approx. 28 s

90 µm adhesive thickness onto 50 µm polyester film.  
Bonded onto a 50 µm polyester film using a hand roller (10 pounds, rolled 5x in each direction). Adhesion area: 1 x 1 inch. Measurement after a bonding time of 24 hours. After 15 min. tempered in a drying cabinet at +105°C the shear stress was tested by hanging an extra weight of 1 kg onto the sample.

**TACK VALUE**

Approx. 700 g

90 µm adhesive thickness onto 50 µm polyester film.  
Measured with Polyken Tack-Tester at 23°C, adhesion: 1 s, peel speed; 0,5 cm/s. Measured with specimen holder „A“.

**HEAT PEEL  
RESISTANCE**

Approx. +100°C

90 µm adhesive thickness onto 50 µm polyester film. Applied to polished stainless steel using a hand roller (10 pounds, rolled 5x in each direction), adhesion area: 2,54 x 10 cm. The bond is stabilised in a drying cabinet headfirst, temperature induced stress was tested by hanging a 30 g weight onto the sample (peel angle: 90°). Measurement at 40°C, temperature is then increased every 15 min. by 10°C until the sample falls off of the polished stainless steel.

**HEAT SHEAR  
STRENGTH**

Approx. +65°C

90 µm wet adhesive thickness on 50 µm polyester film and dried at 50°C. Tested according to ASTM D 4498 (SAFT = Shear Adhesion Failure Temperature). Bonded onto a 50 µm polyester film using a hand roller (10 pounds, rolled 5x in each direction). Adhesion area: 1 x 1 inch. Test after 24 h earliest. After drying for 15 min in a drying cabinet at +40°C, shear strength is tested by hanging a 500 g weight onto the sample. Test is started at 40°C, temperature is then increased every 10 min. by 5°C until the sample falls off the substrate.

**UV-RESISTANCE**

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). Protect against freezing

KIWOPRINT D 158 should not come into contact with unprotected metal for a longer period.