

KIWOPRINT® D 159

1. DESCRIPTION

Water based, acrylic pressure sensitive adhesive

KIWOPRINT D 159 is a high quality pressure sensitive adhesive used for the production of self adhering materials for the automotive and electronic industry (e.g. touch panels, visual instrument panels, electrical devices) when high peel strength is required. KIWOPRINT D 159's high viscosity enables printing on absorbant surfaces such as PE foam, felt, etc. The good wetting ability makes dry KIWOPRINT D 159 especially suitable for bonding to difficult substrates such as untreated polyethylene, polypropylene, and polyamide.

Materials coated with KIWOPRINT D 159 can be stored for a minimum of 1 year without any decrease in adhesive strength, if covered with a suitable silicon release paper and kept dry and dark at room temperature.

2. PRECAUTIONS

For the production of self-adhering materials the following facts have to be considered:

A. Check the requirements such as tack values, peel strength, climate load, temperature and UV resistance.

B. Choose a suitable substrate and test for compatibility with the KIWOPRINT D 159. Example: soft PVC may interact with the adhesive layer.

C. If direct contact between printing ink and adhesive may occur, test for compatibility, as some inks may interact with the adhesive layer.

D. 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.

E. 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 proper release from the adhesive. Avoid trapping air between release liner and adhesive, as trapped air will adversely influence the adhesive surface.

NOTICE

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 paid to long term compatibility with component materials. Also one must check the influences of the line 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.

3. APPLICATION/ PROCESSING

METHOD

Screen printing, roll coating, or brush. Stir well before use!

When screen printing, optimal adjustment of the printing press can determine the print result. This largely prevents the formation of bubbles. Use a medium shore squeegee (~70-80 durometer / Shore A).

The ideal printing temperature is approx. 20°-25°C / 68-77°F. High air humidity facilitates printing with water based (dispersion) adhesives.

During short printing breaks the stencil should only be flooded with adhesive. Spray with water before printing resumes. If the printing breaks are longer than 10-15 minutes, the screen has to be cleaned before the break.

MESH SELECTION

Range: 21 - 43 threads/cm or 54 - 110 threads/in are commonly used. One may use meshes as fine as 77 threads/cm or 196 threads/in. The coarser the mesh, the higher the adhesive strength.

STENCIL SELECTION

Use water-resistant direct emulsions such as KIWOCOL POLY-PLUS HWR, SWR or HV.

REDUCING

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

Test all modifications before using in production. Reducing the adhesive can negatively influence printing characteristics and peel strength.

CLEANING

Wet adhesive: Water

Dry adhesive: Pregan 1014 E

DRYING

At room temperature or using conventional tunnel dryers for industrial production. Drying time depends on the adhesive quantity, substrate type, air humidity, drying temperature and air movement. Only completely dried adhesive films provide the best bond results. The best values have to be determined by yourself.

The adhesive must be completely dry and transparent before release liner is applied or further processing undertaken.

DIE-CUTTING

Print KIWOPRINT D 159 approximately 0.5-1.0 mm (1/64 to 1/32 in.) away from die-lines. Die cutting the adhesive may cause adhesive to accumulate on the blade of the die.

BACKLIT PARTS

Back-lit windows should not be covered with adhesive as this will change the light intensity.

4. ADHERING:

Bonding self-adhering components produces with KIWOPRINT D 159 can be improved by:

- A. Dry, dust and oil free parts.
- B. Optimum application temperature : 20-60°C.or 68-140°F
- C. Additional pressure (approx.: 3-4 bar or 45-60 psi on 100cm²) with a heated silicone rubber pad 40-50°C.or 104-122°F.
- D. Preventing air bubbles and stretching the substrate during application.
- E. Flat and smooth substrate (i.e. pressure molding parts without burrs or sprue marks.)
- F. Sufficient adhesion surface area relative to total surface area.

5. TECHNICAL DATA

Screen printed on 50µ polyester film. Peel strength & tack values resulting from smooth adhesive layers.

Screen mesh	21-140 T/cm 54-140/in	36-90 T/cm 92-90/in	43-80 T/cm 110-80 T/in	77-55 T/cm 196-55 T/in
Drying at 20°C or 68°F	45 min.	25 min.	20 min.	10 min.
Drying at 70°C or 158°F	7 min.	3.5 min.	2.5 min.	1.5 min.
Dry Coating Thickness (*1)	45 µ	25 µ	20 µ	10 µ
Tack value (*2)	~ 1200g ~ 42.3 oz	~ 1000g ~ 33.3 oz	~ 900g ~ 31.7 oz	~ 700g ~ 24.7
Theoretical consumption	~ 70 g/ sq.m 143 sq ft/ kg	~ 40 g/ sq.m 250 sq ft/ kg	~ 30 g/ sq.m 333 sq ft/ kg	~ 15 g/ sq.m 666 sq ft/ kg

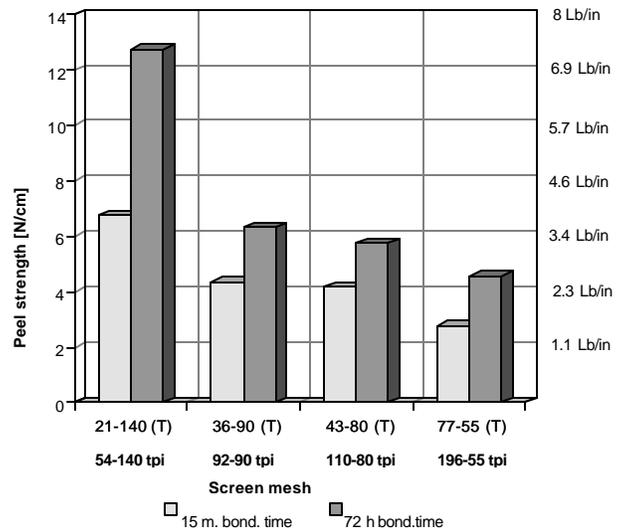
(*1) Difference measurement per DIN 50981, with PERMASCOPE M 11 thickness gauge by Helmut Fischer GmbH + Co.

(*2) Measured with Polyken Tack Tester, 1 sec. adhering, pull-off speed: 1 cm/sec or 0.3937 in. **Notice:** When screen printing, slightly lower values can be achieved due to the mesh structure of different meshes.

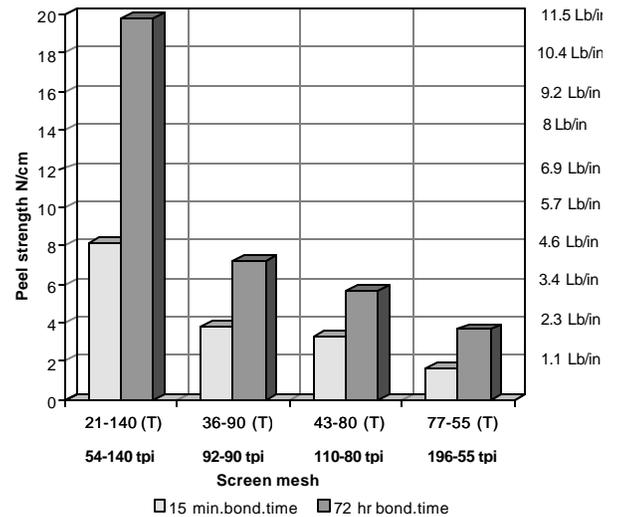
PEEL STRENGTH

Peel strength measured in N/cm per PSTC 1 with peel tester by Lloyd Instruments, type L500 with 100N load cell (22.7 Lb), Class 1, DIN 51221 for tension & compression, 180° peel angle, measured 15 min. and 72 hours after adhering. Peel speed: 300mm/min. Bonded to polished stainless steel (raw material 1.401) with hand roller as per PSTC standard: roll weight 10 lbs, 5 times each direction. Bonding area 2.5 cm x 10 cm or approx. 1 x 4 inches. **Notice:** The peel strength also depends on the surface structure of the adhesive film (which differs depending on the method of application) and the applied coating thickness.

Peel strength of KIWOPRINT D 159 on 50 µm-PET-Film



Peel strength of KIWOPRINT D 159 on 100 µm-PC-Film



Peel strength of KIWOPRINT D159 on various substrates

Peel strength measured in N/cm per PSTC 1 with instrument by Lloyd Instruments, type L500 with 100N load cell (22.7 Lb), Class 1, DIN 51221 for tension & compression, 180° peel angle, printed with a 21 T mesh onto 100µ polycarbonate, measured 72 hours after adhering (storage at ambient temperature per DIN 50014-20/65-1). Peel speed: 300mm/min. Adhering with hand roller as per PSTC standard: roll weight 10 lbs, 5 times each direction. Bond area 2.5 cm x 10 cm or approx. 1 x 4 inches.

SUBSTRATE	N/cm	Lbs/in*
Aluminum	17.3	9.97
Stainless steel, polished	19.5	11.24
Steel	16.8	9.69
Glass	11.9	6.86
Copper	7.5	4.32
Brass	15.1	8.71
ABS	18.5	10.67
Acrylic Glass	16.3	9.40
GFK Polyester	16.5	9.51
Polycarbonate (PC, 500µ)	12.7	7.32
Polyester (PETP, 50µ)	16.9	9.74
Polyethylene (PE, <35 N/cm)	3.9	2.25
Polyethylene (PE, corona treat>48 N/m)	14.2	8.19
Polypropylene (PP, <38 N/cm)	9.4	5.42
Polypropylene (PP) Corona treat>48 N/m)	12.8	7.38
Polystyrene (PS)	10.2	5.88
Polyurethane lacquer (2-K-PUR)	9.8	5.65
PVC, hard (PVC-U)	14.3	8.25
PVC, soft (PVC-P)	10.1	5.82

* converted to lbs/in from N/cm

6. PROPERTIES

BASE: Aqueous acrylic polymer dispersion

COLOR: Wet: milky white (yellowish)
 Dry: transparent

TEMPERATURE: -30°C to +180 °C

RESISTANCE: -22°F to +356 °F

Tested with 10 x 2.5 cm or 4 x 1 in adhesive area, 90 µ wet adhesive thickness on polyester, bonded to stainless steel, 90° peel angle, 30g load.

UV RESISTANCE: Very good

VISCOSITY: Approx. 20,000 mPas
 (Rheomat STV, measuring system D II, 20°C)

SOLIDS CONTENT: Approx. 64%

DENSITY: Approx. 1.01 g/ccm

pH VALUE: Approx. 4.5

PRECAUTIONS/
 ENVIRONMENTAL
 IMPACT: Please see the MSDS

STORAGE:
 1 year @ 20-25°C / 68-77°F in properly closed original container.

KIWOPRINT D 159 should not come into contact with unprotected metal for a long period.

PROTECT AGAINST FREEZING.

7. Additional information

For additional product information, please visit our web site at www.kiwo.com. All products mentioned in this technical data sheet are available through KIWO Inc. and its distributor network. For further information contact your KIWO distributor or KIWO direct.

Thank you for choosing **KIWO**.