

KIWOPRINT® D 141

1. DESCRIPTION

Screen printable acrylic water based adhesive for Automotive Moisture Barriers

KIWOPRINT D 141 is a high quality, screen print applied adhesive for the production of self-adhering articles in the electronic and automotive industry (e.g. touch panels, appliques, instrument panels, electrical units) where high peel strength is required. Materials bonded with KIWOPRINT D 141 can be used at temperatures between -35°C to +120°C OR -30°F to 248°F. KIWOPRINT D 141 has very good aging and UV resistance. The dry adhesive film is colorless and does not turn yellow. KIWOPRINT D 141 has very good water resistance.

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 141. 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.

When screen printing, the print result is largely dependant on optimal adjustment of the printing press. Best printing results can be achieved with:

- Screen tension should be high (25-30 N/cm)
- Peel/snap off should be high (5-10 mm or 0.19 -0.39 in.)
- Printing speed med.- high (~400 mm/min or 15.7 in/min).

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 - 77 threads/cm or 54 - 196 threads/in. The coarser the mesh, the higher the adhesive strength.

STENCIL SELECTION

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

REDUCING

KIWOPRINT D 141 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 temperatures up to +100 °C or 212 °F do not have any influence on the adhesive. 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/optimized by you, in your production setting.

The adhesive must be completely dry and transparent before release liner is applied or further processing undertaken. Avoid trapping air between the liner and the adhesive. Trapped air can dent the adhesive surface.

DIE-CUTTING

Print KIWOPRINT D 141 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 141 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.

Process	21-140 /cm-µ 54-140/in-µ	36-90 /cm-µ 92-90/in-µ	43-80 /cm-µ 110-80 /in-µ	77-55 /cm-µ 196-55 /in-µ
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
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 guage by Helmut Fischer GmbH + Co.

PEEL STRENGTH

Approx. 29 N/inch OR 6.58 lbs/inch (bonding time 1 min)

Approx. 32 N/inch OR 7.26 lbs/inch (bonding time 24 hr)

Adhesive film thickness approx. 60 µm..Peel strength per PSTC1 in N/cm, peel tester type L 500 of Lloyds instruments, load cell 100 N/class 1.(22.7lb/class1) DIN 51221 for tension and pressure. Peel angle: 180°, measured 15 minutes and 72 hours after adhering. Peel speed 300 mm/min. [11.81 in/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 [0.99 in x 3.94 in].

KIWOPRINT D 141 Peel strength on various substrates

SUBSTRATE	N/cm	Lbs/in *
ABS	12.7	7.32
Acrylic. Glass PMMA	12.5	7.21
EPDM	6.2	3.57
GFK Polyester	13.6	7.84
Hard PVC	12.8	7.38
POM polyacetal (thermopl)	12.8	7.38
Polyamide 6	12.2	7.03
Polyamide 6.6	12.5	7.21
Polycarbonate (PC)	12.9	7.44
Polyethylene (PE)	1	0.58
Polyethylene (PE) Corona treat>48 N/m	13	7.50
Polypropylene (PP)	2.3	1.33
Polypropylene (PP) Corona treat>48 N/m	14	8.07
Polystyrene (PS)	12.5	7.21
SBR	3.6	2.08
SBR (roughened)	8.2	4.73
Glass	11.6	6.69
MDF plateMed. Den.fiber	13.5	7.78
Beech wood	12.6	7.26
Aluminum (AlMg1)	13.4	7.73
Aluminum (AlMg1) Anodized E6EV1	13.2	7.61
Stainless steel 1.4301	12.7	7.32
Copper SF-Cu F24	13	7.50
Brass MS 63 F 37	12.4	7.15
Steel:ST 02 Z 275/NACR Galvanized	13	7.50

* converted to lbs/in from N/cm

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 350 µ steel mesh onto 50 µ polyester, measured 72 hours after adhering (storage at ambient temperature per DIN 50014-20/65-1) in N/cm. (Converted to Lbs/in) Peel speed:300 mm/min. or 11.81 in/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.

DYNAMIC SHEAR STRENGTH: Approx. 115 N/inch²
 Approx. 26 lbs/inch²

Measured with peel tester Type L 500 of Lloyds Instruments, load cell 2500 N (567 lbs), class 1, DIN 51221 for tension and pressure, measured 24 h after bonding. Peel speed 0.1 inch/min. Bonded to 50 µm PET film. Adhering surface 1 x 1 inch.

STATIC SHEAR STRENGTH: Approx. 880 s

Measured in drying cabinet at +105 °C / 221°F, 24 h after bonding.
Weight: 1 kp. Bonded to 50 µm PET film. Adhering surface 1 x 1 inch.

TACK VALUE: Approx. 1,100 g

(Polyken Tack Tester), 90µm coating thickness (wet) onto polyester foil.

Note: When applied by screen printing, slightly lower tack values can be achieved due to the mesh structure of the different meshes.

6. PROPERTIES

BASE: Aqueous acrylic polymer dispersion

COLOR: Wet: milky white
Dry: transparent

TEMPERATURE RESISTANCE: -35°C to +120 °C

-31°F to +248 °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. 27,500 mPas
(Brookfield RVT, spindle 6, 20 r/min, 20°C)

SOLIDS CONTENT: Approx. 69%

DENSITY: Approx. 1.01 g/cm³

pH VALUE: Approx. 5

**PRECAUTIONS/
ENVIRONMENTAL
IMPACT:** Please see the MSDS

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

KIWOPRINT D 141 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**.

