

KIWOPRINT D 148

Screen printable acrylic water based adhesive

KIWOPRINT D148 is a high quality adhesive for production of self-adhering articles in the electronic and automotive industry (e.g. graphic overlays, touch panels, electrical instrument panels) when high shear and peel strength are required, such as required in DELCO Engineering Specification M 10163-03. The temperature resistance is as follows (High temperature shear data follows in ensuing pages):

KIWOPRINT D 148 can be used from approx. -35°C to +160°C [-31°F to 320°F]

This adhesive has excellent resistance to aging and UV light. It produces a dry adhesive film that is colorless and resists yellowing, and has good water resistance for a dispersion adhesive.

NOTE: KIWOPRINT D 148 has been tested only under laboratory conditions. These can vary greatly from factory conditions; therefore, we ask you for a thorough and meaningful evaluation of this product.

PREPARATION

The following should be considered before production of self-adhering parts:

1. Identify requirements i.e.: peel & shear strength, climate/ environmental conditions, temperature and UV resistance.
2. Select a substrate and test for compatibility with KIWOPRINT D 148 (example: soft PVC may have a negative effect on the adhesive.)
3. If direct contact between printing ink and adhesive will occur, you have to test for compatibility, as some ink may negatively interact with the adhesive.
4. When screen printing, the mesh count determines the result. The coarser the mesh count, the greater the adhesive thickness and of course the greater the adhesive strength.
5. When screen printing, water resistant emulsion, such as KIWOCOL Poly Plus HWR, should be used. Call KIWO at 800-KIWO-USA (800-549-6872) if you would like assistance with stencil selection.
6. Select a suitable release liner. A very slick and smooth silicone paper or film should be used to achieve the best results. The adhesive layer orients itself to the release liner: 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 so there is no damage to the adhesive surface when the liner is removed.* Test!

The compatibility of the adhesive to each component, i.e.: substrate or carrier, ink, release liner, 2nd substrate or mounting substrate as well as compatibility with required specifications must be tested & determined before production. Focus should be on the long term compatibility of the adhesive with the intended inks and substrates. The influences of the release liner and the quality of the substrate (e.g. the roughness, residues of mold release agents and plasticizer migration) must be tested as well.

PROCESSING

When screen printing, one can improve the print result through optimal press adjustment. The best printing results, for KIWOPRINT D 148, can be achieved with the following:

High screen tension: 25-30 N/cm			
High peel off/ snap off:	5-10 mm	OR	0.2 - 0.4 in.
Med – high Print speed:	400 mm/s	OR	~16 in/s [80 ft/min]
High humidity:	<i>at least</i> 50-60% Rh		
Reducing?	DO NOT REDUCE		

Reducing with water is possible, however, it introduces foaming during the print and will reduce the thickness of dry adhesive layer and consequently the bonding characteristics. Foaming during printing can usually be prevented or stopped through press adjustments such as these. High humidity facilitates processing of dispersion adhesives in general.

During short breaks the stencil should be flooded with adhesive to avoid drying and clogging of the mesh. Breaks longer than 5 - 10 minutes require cleaning the screen before the break. Remove wet adhesive using water; dry adhesive with PREGAN 1014 E.

Drying can be done at room temperature or in conveyor dryers with forced air. Temperatures up to 100°C or 212°F can be used for drying without damaging the adhesive. Drying time depends on thickness of adhesive, type of substrate, drying temperature and air circulation. Time required will vary depending on the dryer; therefore, dry time for each shop can only be determined by testing a given thickness in ones own drying equipment.

Only completely dried adhesive will provide maximum adhesion values. The adhesive must be completely dry before a release liner can be applied. Avoid air traps between release liner and adhesive, as trapped air will adversely influence the adhesive surface.

To avoid problems during die cutting, the die line should be at a distance of 0.5 –1.0 mm from the adhesive layer. Back lit parts should not be covered with adhesive. Printing adhesive over backlit areas may change or influence light color/intensity.

ADHERING

The bond achieved with self-adhering articles printed with KIWOPRINT D 148 can be improved by:

1. Ensuring parts are free of dust and mold release agents.
2. Optimum application temperature: 20-60°C OR 68-140°F.
3. Additional pressure (approx.: 3-4 bar on 100 cm² or 43.5-58 PSI) with a heated silicone rubber pad (40-50°C or 104-122°F).
4. Providing a tension free bond and preventing entrapment of air, i.e.: air bubbles.
5. Flat and smooth substrate (i.e. Pressure molded parts free of mold seems, burrs or sprue marks).
6. Sufficient bonding surface area relative to total surface area.

TECHNICAL DATA

CHARACTERISTIC	KIWOPRINT D 148
BASE:	acrylic dispersion
COLOR:	White
Wet:	Colorless, transparent
Dry:	
VISCOSITY:	Approx. 34,000 mPas Brookfield RVT, spindle 6, 20 rpm, 20°C
SOLIDS CONTENT:	Approx. 63 %
Ph VALUE:	Approx. 4.5
DENSITY:	Approx. 1,01 g/cm ³
UV RESISTANCE:	Very good

HEALTH HAZARDS/ ENVIRONMENTAL PROTECTION: Please follow the instructions given in the material safety data sheet.

STORAGE: 1 yr. at 20-25°C [68-77°F] in tightly closed original container. Do not store in containers with unprotected metal. PROTECT FROM FREEZING

DRYING/ COVERAGE for KIWOPRINT D 148

Screen printing on 50 µm polyester film

Mesh count/cm	21-140 T	36-90 T	43-80 T	77-55 T
Mesh count/in	54-140 T	92-90 T	110-80 T	165-55 T
Drying: 20°C/68°F	45 min.	25 min.	20 min.	10 min.
Drying: 70°C/158°F	7 min.	3.5 min.	2.5 min.	1.5 min.
Dry film:	approx. 45 µm	approx. 25 µm	approx. 20 µm	Approx. 10 µm
Theoretical usage:	approx. 70 g/m ² ~ 6.5 g/ft ²	approx. 40 g/m ² ~ 3.72 g/ft ²	approx. 30 g/m ² ~ 3.72 g/ft ²	approx. 15 g/m ² ~ 1.39 g/ft ²

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

PEEL STRENGTH

DWELL TIME	KIWOPRINT D 148
adhering time 1 min	approx. 13 N/in ~ 2.951 LB/in
adhering time 24 h	approx. 25.5 N/in ~ 5.789 LB/in

Adhesive film thickness approx. 60 µm. Peel strength per PSTC 1. Peel tester type L 500 of Lloyds instruments, load cell 100 N, Class 1, DIN 51221 for tension and pressure, Peel angle: 180°, measured at 1 minutes and 24 hours after adhering, peel speed 300 mm/min [11.81 in/min]. Adhering to 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].

STATIC SHEAR STRENGTH

CONDITIONS		KIWOPRINT D 148
105°C / 221°F		approx. 1800s [30 min]

105°C / 221°F: Tested in a heat chamber. Measured after adhered for 24h at room temperature; then raised to **105°C/ 221°F for 5 min. to equilibrate.** Weight: 1 kg [2.205 lbs.]. Adhered to 50µm PET film. 1 x 1 in overlap

DYNAMIC SHEAR STRENGTH

CONDITIONS		KIWOPRINT D 148
20°C / 68°F		approx. 132 N/in ² ~ 29.96 lb/in ²
108°C / 226.4°F		approx. 19.7 N/in ² ~ 4.47 lb/in ²

20°C / 68°F: Tested with type L 500 of Lloyds instruments. Load cell 2500 N, Class 1, DIN 51221 for tension and pressure. Measured after adhered for 24h at room temperature. Pull speed 0.1 in/min. Adhered to 50µm PET film. 1 x 1 in overlap.

108°C / 226.4°F: Tested with type Z 100 with heat chamber, from Zwick GmbH. Load cell 500 N, Class 1, DIN 51221 for tension and pressure. Measured after adhered for 24h at room temperature; then raised to **108°C/ 226.4°F for 6 min. to equilibrate.** Pull speed 0.1 in/min. Adhered to 50µm PET film. 1 x 1 in overlap

TACK VALUE

CONDITIONS		KIWOPRINT D 148
105°C / 221°F		approx. 300 g ~10.59 oz

Tested with Polyken Tack Tester), 60 µm dry film thickness.

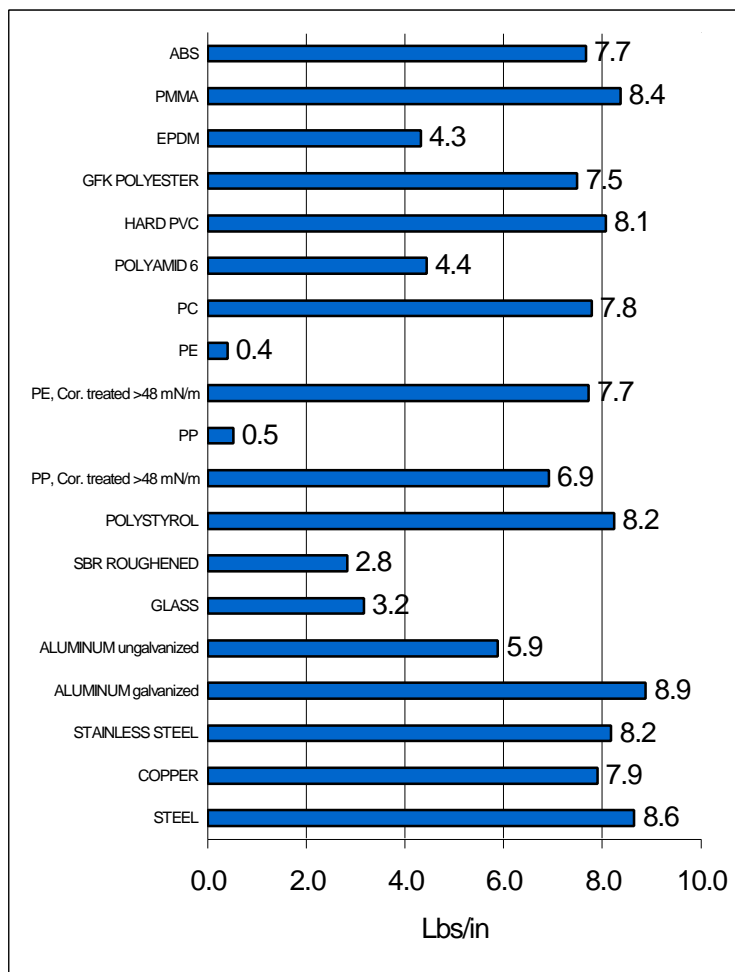
NOTE: In screenprinting, the mesh structure and fabric thickness may produce slightly lower thickness' and therefore slightly lower values than produced with this draw-down coating.

TEMPERATURE RESISTANCE

		KIWOPRINT D 148
TEMPERATURE RESISTANCE:		-35°C to +160°C [-31°F to 320°F]

90 µm wet coating thickness on polyester film. Adhering area 2.54 x 10 cm [0.99 in x 3.94 in]. Adhered to polished stainless steel. Peel angle 90°, 30g [1.059 oz.] weight.

**PEEL STRENGTH ON VARIOUS SUBSTRATES
USING KIWOPRINT D 148**



Peel strength per PSTC 1. Peel tester type L 500 of Lloyds instruments, load cell 100 N, class 1, DIN 51221 for tension and pressure, peel angle: 180°, printed with 350 µm stainless steel mesh on 50 µm PET film, measured 72 hours after storing at ambient temperature (DIN 50014-20/65-1), value in N/cm. Peel speed 300 mm/min. [11.8 in/min]. Adhering to polished stainless steel 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].