

ORDYL DRY FILM FLR 4000

PRODUCT DATA SHEET
Edition 03 – 28 August 2019

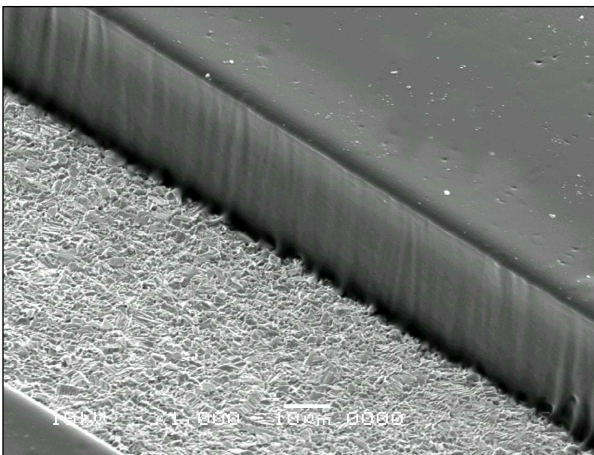
PRODUCT DESCRIPTION

Ordyl FLR 4000 is a negative, aqueous processable dry film specifically designed to be exposed with LDI but usable also with standard UV lamps.

FLR 4000 is developable and strippable in mildly alkaline solutions and offers superior performances and resistance to leaching in all the most commonly used plating bath in PCB manufacturing.

Ordyl FLR 4000 has good adhesion on copper surface and for this reason is indicated for direct plating process and in case of surface preparation is not good. This type of dry film ensure good tenting performances even on large tooling holes; this can be achieved starting from 40 μm thickness.

FLR 4040



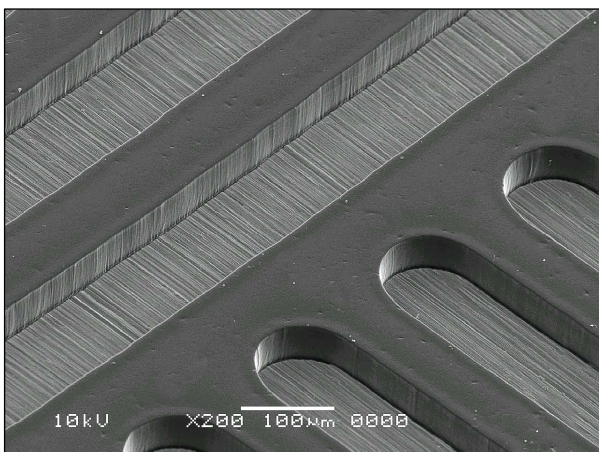
Main Features:

- Excellent through cure polymerization also with LDI exposure machine
- Good adhesion properties
- High Photospeed
- High flexibility and conformability

Typical Application:

- Acid etching
- Tenting process
- Copper, tin, tin/lead plating

FLR 4050



Available Thickness:

- 30 μm (1.2 mils), 40 μm (1.6 mils) and 50 μm (2 mils) for standard application

PROCESS INFORMATION

Surface preparation

FLR 4000 guarantee good adhesion on the following surface:

- Vendor copper
- Electroless copper and panel plated copper, both unscrubbed and treated with pumice and brush
- Direct metallization surface
- Chemical microetched surface

We recommend good surface cleaning in order to obtain optimal performance.

Lamination

Panels must be thoroughly dry prior to lamination.

	MANUAL LAMINATOR	AUTOMATIC LAMINATOR
Pre-heat	(OPTIONAL)	(OPTIONAL)
Hot roll temperature	105 – 125°C (221 – 257°F)	105 – 125°C (221 – 257°F)
Lamination roll pressure	2.5 – 3.5 bar (36 – 50 Psi)	2.5 – 6.0 bar (36 – 87 Psi)
Lamination speed	1 – 3 m/min (3 – 10 feet/min)	1 – 3 m/min (3 – 10 feet/min)
Seal temperature	---	40 – 80°C (104 – 176°F)
Seal pressure	---	3.0 – 6.0 bar (44 – 87 Psi)
Seal time	---	1 – 4 sec.

Board exit temperature

Inner layer 50 – 70°C (122 – 158°F)

Outer layer 45 – 60°C (113 – 140°F)

Post lamination Hold Time

We recommend a hold time of at least 20 min, or in any case the minimum hold time necessary to allow panels to cool down to room temperature.

Hold time should not be over 1 week.

Exposure

We recommend using UV lamps or laser source with emission peak at 355 – 405 nm.

Optimal exposure at 8 Solid STEP of SST21 (13-15 Solid STEP of RST25).

We recommend to stay between 7-9 Solid STEP of SST21 (10-18 Solid STEP of RST25).

The following parameters are referred to:

8 Solid STEP of SST21

	FLR 4030	FLR 4040	FLR 4050
Energy (mJ/cm²)	20-25	25-30	30-35
Resolution	30 µm (1.2 mils)	40 µm (1.6 mils)	50 µm (2 mils)

Hold Time after exposure

We recommend a minimum hold time after exposure of at least 15 minutes.

Developing

	Na ₂ CO ₃		K ₂ CO ₃	
	Range	Optimal	Range	Optimal
Concentration	0.8 – 1.2%	0.9%	0.6 – 1.0%	0.8%
Temperature	26–32°C (79–90°F)	29°C (84°F)	26–30°C (79–86°F)	28°C (82°F)
Spray pressure	1.2–1.8 bar (17–26 Psi)	1.5 bar (22 Psi)	1.2–1.8 bar (17–26 Psi)	1.5 bar (22 Psi)
Break Point	50 – 65%			
Rinsing water	9-15°dH (150–250 ppm CaCO ₃)	12°dH (213 ppm CaCO ₃)	9-15°dH (150–250 ppm CaCO ₃)	12°dH (213 ppm CaCO ₃)

We recommend a rinse module with a length of a least 2/3 of the developing module.

The rinse water temperature should be preferably between 15-25°C (59-77°F), optimal at 20°C (68°F).

Developing time (B.P. 60%)

	FLR 4030	FLR 4040	FLR 4050
Developing time	25 sec.	35 sec.	50 sec.
Dry Film load 1 g/l (0.13 oz/gal)	0.03 m ² /l (1.2 ft ² /gal)	0.025 m ² /l (1.0 ft ² /gal)	0.017 m ² /l (0.7 ft ² /gal)

We recommend a maximum Dry Film load of 5 g/l (0.65 oz/gal).

We recommend the use of "Ordyl Antifoam C".

Stripping conditions

Stripper	NaOH / KOH
Concentration	1.0 – 3.0%
Temperature	40–60°C (104–140°F)
Spray pressure	1.5 – 4.0 Bar (22–58 Psi)
Break Point	40 – 60%

We recommend the use of "Ordyl Antifoam C".

Stripping time (B.P. 50%)

	FLR 4030	FLR 4050
Stripping time	25 sec.	58 sec.

Stripping flakes



The picture represents stripping flakes of **FLR 4050** obtained with dipping test in a beaker under laboratory conditions with NaOH 3%.

Proprietary strippers

Can be used in order to obtain smaller flakes, higher stripping speed, reduce copper oxidation and Tin or Tin/Lead attack.

We recommend the use of "Ordyl Stripper 5600".

For any other technical information (storage conditions, packaging information, etc.) refer to the Ordyl Specification (Form EE.P11.CV.02-ww)

The information stated in this Data Sheet regarding the use of materials is based upon experience under laboratory controls. Elga Europe makes no guaranty or warranty, express or implied, to such use, handling or possession of such materials, or of the application of any process described in our bulletins of the results sought to be obtained, whether in accordance with the directions or claimed so to be. Any information or statements contained herein are expressly made subject to the foregoing provisions and the terms and conditions embodied in our invoice covering such materials with are to be deemed part herein. The publication hereof describing any process is not to be deemed not taken as license to operate under, nor recommendation to infringe, any patent.

The seller binds itself only to deliver goods in accordance with the general description upon which they are sold whether or not any special particular description shall have been given or implied by law.

Any such special or particular description shall be taken only as the expression of seller's opinion in that behalf. The seller does not give any warranty as to the quality (save that the goods are of merchantable quality), state condition fitness of the goods or use to which the goods may be put.

Claims on account of weight, loss of or damage to the goods in transit (so far as seller is liable) shall be made in writing to the seller within the period of 30 days of receipt thereof.

No claim shall be entertained after the expiration of the appropriate period mentioned above and the seller's liability by reason of any such claim shall not in any event the purchase price of the goods in respect of which a claim is made. Goods shall not be returned to the seller without the seller's express written permission.



HEADQUARTER

Via della Merlata, 8
20014 Nerviano (MI) ITALY
T. +39 0331 58 69 47
F. +39 0331 58 77 51

UNI EN ISO 9001:2015
UNI EN ISO 14001:2015



MANUFACTURING SITE

Via C. Chiesa, 30
20010 Pogliano M.se (MI) ITALY
T. + 39 02 93 55 90 06
F. +39 02 93 55 90 07

elgaeurope@pec.it
R.E.A. Milano n. 861433
Reg. Imp. di Milano n. 154339
C.F. /P.IVA 01857060154
Cap. Soc. € 3.014.026,00 I.V.

www.elgaeurope.it