DJ MICROLAMINATES, Inc
Dry Film Sheets

ADEX Epoxy Thin Film Rolls/Sheets

Preliminary Data Sheet

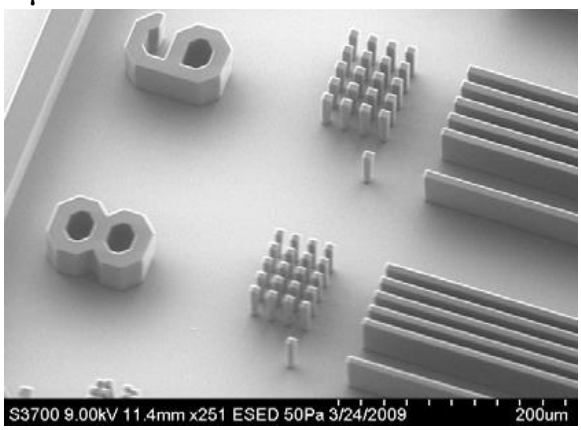
Product Description
ADEX is a high performance, chemically amplified, i-line sensitive negative dry film epoxy photoresist offering the user exceptional resolution, aspect ratio, adhesion and performance. ADEX is available in 5, 10, 15, 20, 25, 30, 40, 50 and 75µm thicknesses and in roll or sheet format in various shapes and sizes up to 250mm widths.

Advantages
Wide lamination window
Easy transfer from PET carrier sheet
<5% Thickness variation
Excellent "tenting" capability
Capable of >5 aspect ratios
Extremely low roughness average
High operating temperatures
Excellent chemical resistance

Applications
ADEX is suitable for use in a variety of applications including, but not limited to: microfluidics, CMOS, bio sensors, force/load sensors accelerometers and gyroscopes; and where any 3D, permanent MEMS structure is needed. It may also be used as a plating mold or in defining metal circuitry such as copper redistribution layers in wafer level packaging. ADEX can also be stacked or supplied in other film thickness to produce thicker features and has shown excellent image quality up to 100µm. The use of ADEX dry film will allow for lower capital investment and operating costs when compared to a spin coat process.

Typical Process Procedure
Precut sheets can be used as received and rolls can be cut at room temperature either before or after lamination. A typical process would include lamination, exposure, PEB, develop and hardbake (recommended for best chemical resistance and stress relief).

40µm ADEX



Process guideline *:

Remove PP cover sheet	Peel at room temperature
Laminate, hot roll or vacuum	50-70ºC @ 1ft/min (0.3m/min)
Remove Carrier PET	Peel at room temperature
Expose	i-line (best with a short wavelength exclusion filter)
Post Exposure Bake	95ºC for 5-10min or 85ºC for 10-20min
Develop	Cyclohexanone
Hardbake (optional)	150-200ºC for 1-2 hr

**These guidelines are for reference only.*
***IPA rinse.*

Typical process conditions:

Thickness	Dose**	Devl Time	Resolution
µm	mJ/cm^2	min	µm
5	90	5	2
10	125	10	4
15	150	10	5
20	175	12	5
25	200	15	5
40	250	20	6
50	325	20	7

***On Silicon*

Typical Uncured Film Properties

Coated, Uncured Property	Test Method	Typical Value
Storage Modulus @ 25ºC	DMA	1.5GPa
Softening Point (Onset to Tg)	DMA	28ºC
Residual solvent	Gravimetric	<1%
Film thickness		+/-5%

Typical Cured Film Properties

Property	Test Method	Typical Value
Operating Temperature		-60 to 200°C
Glass Transition Temperature	DMA, Tan Delta	145°C
CTE Alpha 1 (<Tg) Alpha 2 (>Tg)	TMA	 60µm/mºC 160µm/mºC
Storage Modulus @ 25°C @ 100°C @ 150°C	DMA	 4.5 GPa 3.5 GPa 2.5 GPa

Storage and Handling

● This material is UV sensitive and should be stored in a dark, dry location. When not in use, we recommend covering the product with black polyethylene to ensure no UV transmission during storage.

● It is also recommended that this product be stored at or below 25ºC for maximum shelf life.

● Avoid exposure to high temperatures which could result in an increase of mw and affect the performance and stability of the product.

Recommended Shelf Life

Storage Temperature	Shelf Life
0°C (32°F)	12 months
18-23°C (64-73°F)	6 months

Longer shelf life at room temperature is expected but control testing is not yet complete.

Clean Up

● ADEX can be easily cleaned with acetone oprior to cure. Other less stringent solvents and cleaners may be used but may not be as effective at cleaning.

● In case of a spill, activate available exhaust ventilation equipment in the immediate spill area. Wipe up or absorb spilled material with vermiculite or other similar material. Wash area with soapy water to remove residue. Collect absorbed material and water rinse in appropriate containers. It is important to dispose this material in accordance with current federal, state, and local regulations.

● Removal after cure is difficult. In certain cases films can be removed in hot NMP.

Health and Safety

● ADEX can cause severe eye irritation including stinging, redness and eye swelling. Consult a physician immediately if symptoms occur after use.

● Avoid skin contact. ADEX can cause mild skin irritations.

● If ingested, consult a physician immediately. Do not induce vomiting. The victim's mouth may be rinsed out with water or milk.

● Consult the Product Material Safety Data Sheet for additional information on ADEX.

Application Assistance

Application specialists are available to assist with the start-up use of ADEX dry film products. Custom resist formulations can be prepared based upon your particular needs. For information, please contact DJ MicroLamiantes.

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