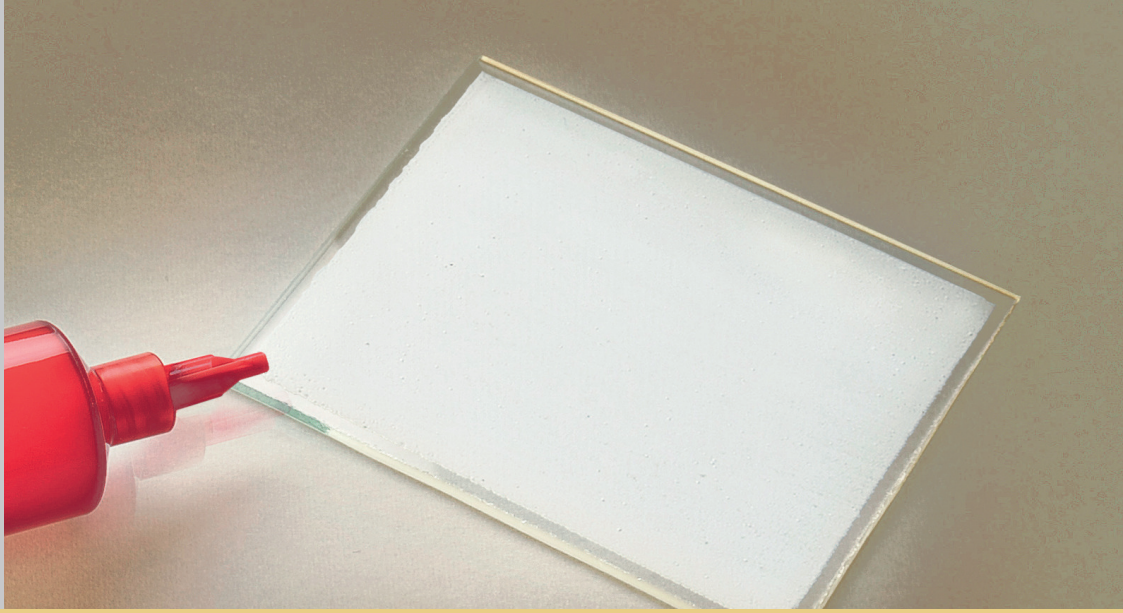
MicroDryer™ 2000
Dispensable Dryer



HIGHLIGHTS

General Features

- ☐ Handling and dispensing in air
- ☐ High moisture sorption capacity
- ☐ Resistant to air exposure
- ☐ Sticky film after curing
- ☐ High flexibility
- ☐ Thickness range from 10 µm to 1000 µm
- ☐ Solvent-free, epoxy base
- ☐ Extremely low outgassing
- ☐ No loose particles

Applications

- ☐ Quasi-hermetic packaging
- ☐ Microelectronic devices
- ☐ Optoelectronic devices
- ☐ Quartz crystal oscillators
- ☐ Implantable medical devices
- ☐ Organic lasers
- ☐ Flexible organic devices

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Product Description

MicroDryer™ 2000 is a high capacity, solventless, thermally curable, dispensable dryer, designed for use in hermetically sealed electronic and medical devices. Due to its viscosity it can be applied by screen printing, blading or syringe.
MicroDryer2000 films work as irreversible moisture getter.

MicroDryer2000 Moisture Sorption

Calculation example

Typical Sorption capacity in air: 16% of dry weight
1cm x 1cm x 50 µm= 0.005 cm^3 x 1.3 g/cc= 0.0065 g= 6.5 mg
Moisture capacity = 6.5 mg x 16% = 1.04 mg

Material Property	Typical value	
	Paste	Cured Film
Appearance	White paste	White film
Viscosity at 25 °C (cP) (*)	~ 85,000	NA
Density (g/cm^3)	1.3	1.3
Weight loss at 100 °C	NA	< 0.1 %
Moisture capacity (wt %)	> 16	> 16
Storage temperature (°C)	+2 to +8	-30 to +170
Shelf life (months)	6	NA
Storage atmosphere	Dry if bag is opened	Dry

(*) at a shear rate of 5 s^{-1}

Processing

Bring MicroDryer2000 to room temperature before use.

Deposition

Apply via screen printing, blading or dispense by syringe on the desired surface.
No mixing is required.

Compatible surfaces are:

- Glass
- Stainless Steel and other metals
- Plastics (PET, PEN, engineered films)

Example of syringe dispensing parameters are:

- Needle size 600 micron
- Pressure 6 bar
- Speed 20 mm/s

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Thermal curing

- Curing conditions are 170 °C for 30' or 160 °C for 1h or 120 °C for 3 hours
- Inert flowing gas or vacuum is recommended
- Curing in air is possible, but with reduced performances
- No solvent is evolved during curing
- No curing is also possible, a soft film will form
- Z-axis shrinkage about 5%.

Moisture Sorption

MicroDryer2000 typical weight gain due to moisture sorption is > 16 wt% at 25 °C, 55% RH.
If the curing process it is not performed, a small increase in sorption capacity can be observed (matrix effect).
Typical weight gain at 25 °C, 55% RH on uncured film is approx. 20 wt%.

Sorption Properties (typical)

Thickness (µm)	Sorption Capacity (mg cm^{-2})
50	1
100	2
200	4

Typical sorption speed for a 50 µm thick film cured at 160 °C for 1h in N_2 at 25 °C and 55% RH is:

6.0 x10^{-4} mg cm^{-2} min^{-1} (for a period of 30 min)

Cleaning

Typical solvent used for cleaning is Hexamethyldisiloxane (HMDS).
Acetone also can be used.

Shipping and Storage

Shelf life of MicroDryer2000 is 6 months if properly stored (keeping the barrier bag sealed or the container in glove box).
MicroDryer2000 recommended temperature storage condition is between 2 and 8 °C. Long periods of time can be tolerated also at RT.

Handling and Air Exposure

Once removed from the barrier bag, MicroDryer2000 must be deposited within 8 hours (if packed in a syringe).

Exposure to air of cured film induces a reduction of moisture capacity.
Example[1]:

- curing at 160 °C x 1h: capacity loss about 6% in the first 3 hours (@25 °C / 55% RH)

Ordering information

Code: 5X0702 Description: MicroDryer2000/SMT50 (Musashi syringe -50cc)
Code: 5X0703 Description: MicroDryer2000/SET50 (EFD syringe -50cc)
Code: 5X0704 Description: MicroDryer2000/SET10 (EFD syringe -10cc)
Other configurations available.

[1] Tested on 50µm thick layer.

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