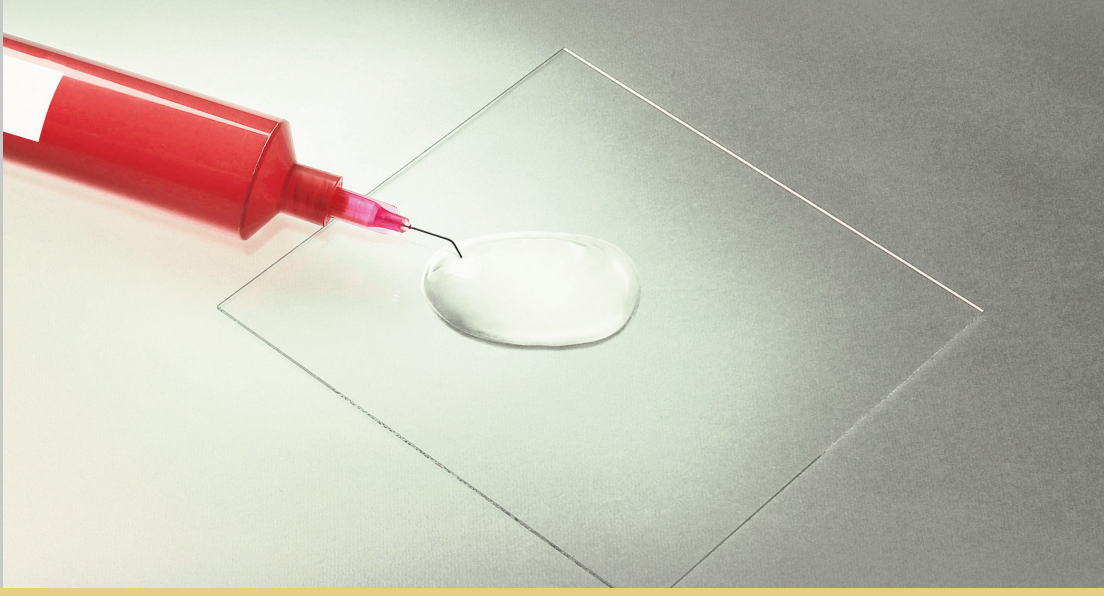
AqvaDry®- OCA

Transparent Dispensable Dryer Adhesive



HIGHLIGHTS

General Features

- ☐ High moisture sorption capacity to assure long life to organic devices
- ☐ The material can be used as film and filler
- ☐ Optical transparency in the visible region during and after moisture adsorption
- ☐ Strong adhesion properties and mechanical flexibility for plastic electronics applications
- ☐ Solvent-free, acrylic base

Applications

- ☐ Active Matrix OLED displays
- ☐ Passive Matrix OLED displays
- ☐ OLED lighting systems
- ☐ Organic photovoltaic devices
- ☐ Organic sensors
- ☐ OFETs
- ☐ OLETs
- ☐ Organic lasers
- ☐ Flexible organic devices

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Product Description

AqvaDry®-OCA is a medium-viscosity, thermally curable, optically clear dispensable dryer adhesive, designed for use in OPV and organic electronics applications. Due to its rheological properties, it is suitable for needle dispensing, screen printing, blading and lacquering processing. The acrylic based formulation is optimized to have extremely good adhesion on plastic substrates.

Thermally cured AqvaDry-OCA films wo rk as transparent moisture getters and active layers.

Material Property	Typical value	
	Paste	**Cured Film**
Appearance	Transparent	Transparent
Viscosity at 25 °C (cP)	1,400 (*)	NA
Density (g/cm^3)	1.2	1.2
Moisture capacity (wt %)	> 10	> 10
Storage temperature (°C)	2 to 5	-30 to +100
Shelf life (months)	> 2 (**)	NA
Storage atmosphere	Dry air if bag is opened	NA
Peel off Force (N/cm)	NA	> 2

(*) at shear rates between 0.1 and 200 s^{-1}
(**) tests are ongoing. Expected shelf life is 3 - 6 months

Processing

AqvaDry-OCA shows typical viscosity of 1,400 cP at a shear rate of 5 s^{-1} (at 25 °C). Newtonian behavior is maintained in a wide shear rate range (between 0.1 and 200 s^{-1}).

Contact angle values recorded by sessile drop method are reported in the following table:

Substrate Material	Contact Angle (degrees)
PET	18 ± 1
PET/SiO_x	14 ± 1

In order to preserve getter performances, air exposure time in wet thin film configuration has to be limited (few minutes).
Longer time can be considered for liquid storage in processing reservoirs.

Deposition

Apply via needle dispensing, screen printing, blading and lacquering on the desired surface.

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Curing conditions

Thermal curing is required

- Suggested curing conditions are 80 °C for 30 minutes or 90 °C for 10 minutes
- Oxygen can work like a curing inhibitor slowing the polymerization process
- Curing should take place in glove box (< 10 ppm H_2O)
- No outgassing is observed during curing.

In multilayer structures production, the preferred approach is to cure the AqvaDry-OCA after completing the lamination process.

Adhesion properties are promoted during the curing process.

Cleaning

Typical solvent used for cleaning both cured and uncured AqvaDry-OCA is acetone. Polyethylene glycol monoethyl ether acetate (PGMEA) or ethylene glycol dimethacrylate (EGDMA) can be also adopted as flushing solvents.

Shipping and Storage

A shelf life of 3 months has been verified. Tests are ongoing in order to investigate the shelf life for longer periods.

Storage conditions are temperature of 2 - 5 °C and dry atmosphere.
AqvaDry-OCA can be stored in a normal refrigerator provided that the original packaging is not open, or it is sealed in dry atmosphere.
Exposure to temperature higher than 35 °C can induce the polymerization process. In case viscosity increasing is observed, AqvaDry-OCA must be discarded.

Handling and Air Exposure

Air exposure has to be limited in order to preserve the sorption capacity.
Before use, AqvaDry-OCA must be left at room temperature for at least 2 hours, otherwise viscosity could be higher than the nominal value.

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