

Ostemer® 324 Flex



Overview

Name	Ostemer® 324 Flex
Description	A dual cure polymer (UV + heat) with high transparency, minimal coloration and low shrinkage. Ostemer 324 is made for application where flexibility is important.
Recommended applications	<ul style="list-style-type: none">• Metallized polymer MEMS• Hybrid material integration• Flexible substrate for electronics
Storage	Room temperature, optimal shelf life if refrigerated. Let components reach room temperature before use
Handling	Read the MSDS before use. Work in fume hood when mixing the components. Use gloves.

Process compatibility

Micro/nano structuring	<ul style="list-style-type: none">• UV-casting/molding in rubber molds• UV Reaction Injection Molding• Nano imprint lithography with rubber molds
Post-processing	<ul style="list-style-type: none">• Dry bonding to many materials (during final cure)• Direct surface grafting (after first cure)

Material specifications*Curing process*

Curing	Two-step cure
First cure	365 nm (i-line) - Approximate dose: 1 mm thickness 1000 mJ/cm ²
Second cure	110 °C - Approximate time: 2-3 hours

Liquid material before patterning

Mixing ration A:B	1.24 to 1
Pot-life after mixing	6 hours if kept protected from UV-light and heat
Solvent content	0 %
Viscosity (mPas)	2000

Material properties

Shrinkage during cure	1 %
Optical property	Colorless > 97% transmittance from 370 nm to 1200 nm
Auto-fluorescence	Low > 400 nm
Young's modulus (MPa)	30
Strain until break	30%
Glass transition temp.	70 °C
Outgassing	Begins at 320 °C
Acid resistance	10% H ₂ SO ₄ more than 1 month
Solvent resistance	Toluene, Acetone, DMSO, Ethanol and Methanol
Surface chemistry after first cure	SH- and Epoxy groups
Surface chemistry after full cure	OH-groups

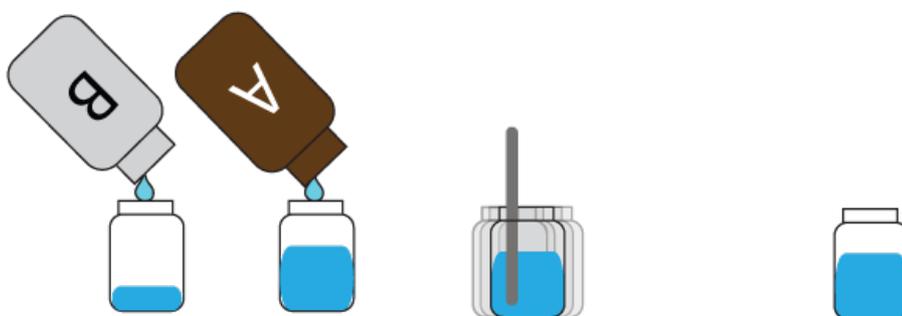
[1] Sticker et al. Multi-layered, membrane-integrated microfluidics based on replica molding of a thiol-ene epoxy thermoset for Organ-on-a-Chip applications. DOI: 10.1039/c5lc01028

Processing guidelines

The Ostemer® 324 consist of two components: A (hardener) and B (base). The mixing ratio is always specified on the bottle of the B component. After A and B components are mixed the pot life is at least 6 hours. During this window the mixture can be UV-casted to form micro patterned articles that can be assembled before the final hardening/bonding, which is done at 110 °C. The Ostemer® 325 can bond to most substrates that standard epoxy glue can bond to (glass, silicon, many metals and some plastics).

Mixing

Be in a well-ventilated area when handling the liquid resin. Component A has a distinct smell which may be unpleasant but is not dangerous. After first the first cure the smell disappears.

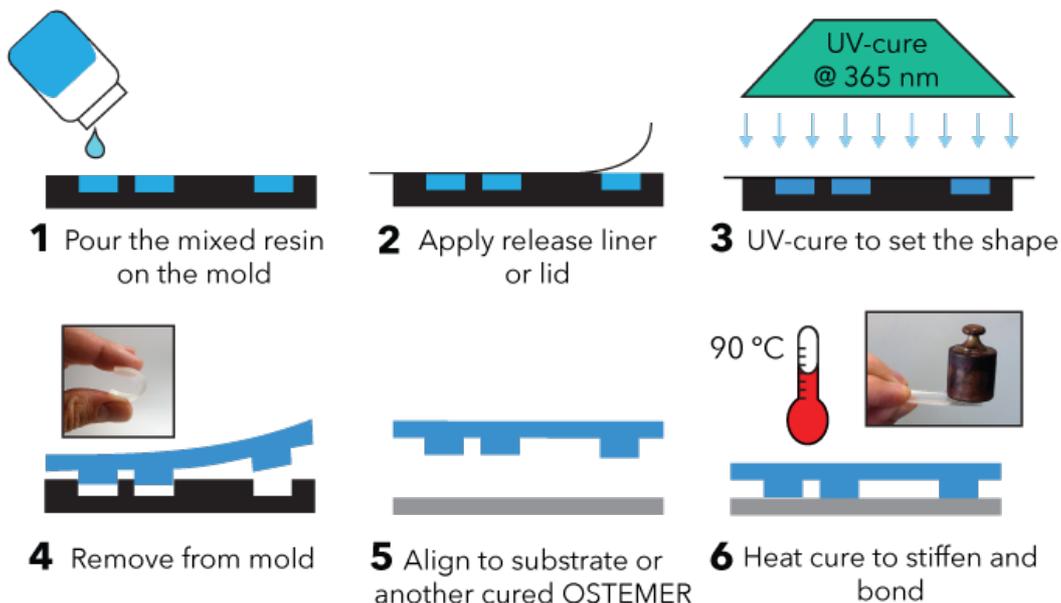


1 Mix the components **2** Mix thoroughly **3** Bubble free in minutes

- If component B has not been used for a long time stir it with a spatula
- Mix component A and B according to ratio stated on component B, be sure to mix well or the resin may not cure properly.
- Large bubbles disappear by themselves after 10-15 minutes if you let the bottle stand in a dark place. For complete bubble free, degas the prepolymer in a vacuum chamber or speed mixer.

Casting

Ostemer 325 has a low viscosity, which makes it easier to debubble and fill small mold cavities. The mixed resin can be UV-casted and releases easy from rubber molds such as PDMS (or preferably sturdier ones like Quantum Silicones QM260 [2]) or Teflon treated/fluorinated silicon/SU8 masters. Avoid metal molds with Ostemer 325.



[2] <http://www.quantumsilicones.com/wp-content/uploads/2012/02/QM-2602.pdf>

First pour the mixed resin on the mold and apply a release liner. We offer a release liner (Ostemer Release Liner) that has the right surface energy to easily remove the Ostemer chip from the mold and facilitate handling. Optionally, press a glass or UV-transparent flat plastic piece on top to ensure flatness during UV-cure. The exposure time will depend on what lamp you have and how thick device you have. A standard Hg mask aligner lamp will require about 60 seconds for a complete UV-cure of a 1 mm thick device. If you use LED UV lamp, use 365 nm. Make sure your lamp can give at least 8 mW/cm² at 365 nm. After UV-cure, demold, align to a clean substrate and heat cure in oven. Most of the time 100 °C for 2-3 hours is enough to completely cure and bond but it will depend on the thickness. Do not use higher temperatures than 110 °C as it may cause discoloration. *Wait until the device has cooled down before testing the bond-strength.*

NOTE ON EXPOSURE: Curing times can be VERY different depending on the UV-lamp you use. Generally Hg mask aligner lamps require 20 – 80 seconds. If you have a plastic cover on your mold the curing time can be longer. If the polymer is very hot after UV-cure you must decrease the UV-intensity to avoid early triggering of second thermal cure.

You might have to try different exposure times, as a comparison a 12 mW/cm² Hg-lamp, need roughly 60 seconds. LED-lamps with 365 nm wave-length will also work.

NOTE ON USE: The Ostemer® is for research and development use. It may not be used in implants or in direct or indirect with human tissue. Always wear protective gloves and splash goggles, work in a ventilated environment and avoid contact to skin and eyes. If exposed on skin, clean with large amount of water and soap. If exposed in the eyes clean with water for at least 15 min. If swallowed get medical assistance.

For incorporation in commercial products contact Mercene Labs AB for bulk orders and to register a commercial license for your specific product. Ostemer polymers are patent protected (US8927664, EP 2622002 and several patents pending).

For more information and continuously updated instructions of use and MSDS, please check www.Ostemers.com. If you have questions or feedback about the processing do not hesitate to mail support@mercenelabs.com we are always eager to help!

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