



# WS-104

## Flexible Epoxy Working Stamp Resins for Photo Imprint

**PRODUCT DESCRIPTION:** UV-curable epoxy working stamp resin.

**APPLICATIONS:** Working Stamp fabrication

**ADVANTAGES FEATURES:**

- PFAS-Free
- **Excellent Chemical Resistance** (high resistance to etching from imprint resins): minimal height gain for multiple imprints
- Excellent mechanical and thermal stability
- **ANTI-STICK Layer IS NOT needed for imprint process**
- Solvent Free – ready to use
- Long shelf life at room temperature

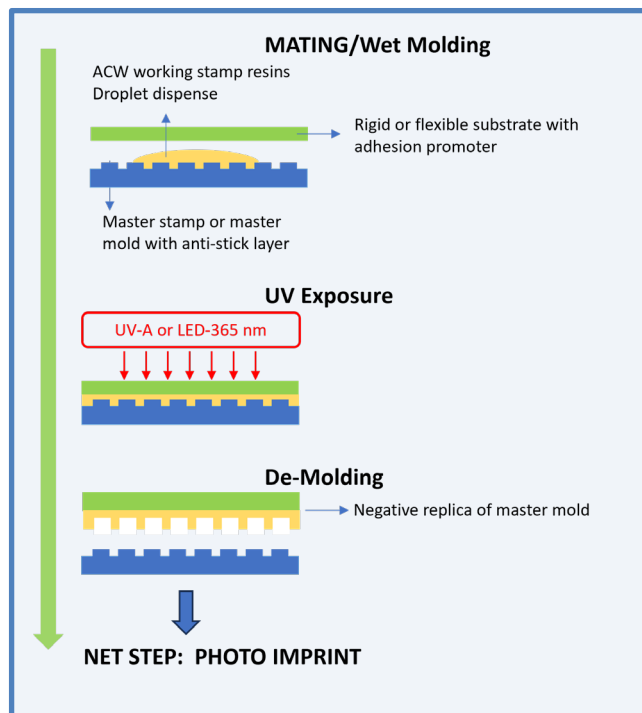
**GENERAL USAGE INFORMATION:**

**Storage:** room temperature storage (15-30°C) in the original container is required.

**SAFETY AND HANDLING**

The uncured resins can be cleaned with isopropyl alcohol (IPA), methyl ethyl ketone (MEK), acetone, or xylene. Avoid direct skin and eye contact. Use only in well ventilated areas. Use protective clothing, **gloves and safety goggles**. Read [Safety Data Sheet](#) before handling.

**WORKING STAMP PROCESS FLOW:**



**APPLICATION NOTES:**

**Master Stamp or Master Mold preparation:**

To protect the master Stamp/Mold surface the use of a release agent or antistick agent is recommended. The common anti-stick or release agents are trichloro(1H,1H,2H,2H-perfluorooctyl)silane (CAS # 78560-45-9) or trimethoxy(1H,1H,2H,2H-perfluorooctyl)silane (CAS# 85857-16-5).

**Substrate conditions:** It is important that the substrates (glass or PET film) should be free of impurities and moisture prior to coating of WS-104. Acidic adhesion promoters or acidic silanes can be used to prime the substrates to improve adhesion strength between WS-104 with substrates. Alternatively, plasma treatments can also be used to improve adhesion.

WS-104 polymerizes by an acid-catalyzed pathway. Basic type adhesion promoters including amino silanes should not be used to prime the substrates. Basic agents will stop the cure of WS-104.

**Dispense process:** droplet dispense method for capillary flow, or casting method, or spin coating method are suitable for film forming

- Suggested spin conditions for spin coating method for 10 micron layer thickness:  
Speed: 2,000 to 2,500 rpm / Time: 30 to 60 seconds / Acceleration: 800 to 1,000 rpm/sec
- A droplet dispense / Casting method can avoid excess use of working stamp resin

**Layer thickness:** 10 to 200 micron



# WS-104 (continue)

## UV CURING CONDITIONS: UV dose (J/cm<sup>2</sup>) = 38 to 50

- Metal halide / Mercury UV: UV-A (320-400 nm), intensity: 200-1,000 mW/cm<sup>2</sup>  
Suggested curing conditions: 250 mW/ cm<sup>2</sup> x 150 to 200 sec
- or LED-365 nm, UV light intensity: 200 to 1,000 mW/ cm<sup>2</sup>  
Suggested curing conditions: 250 mW/ cm<sup>2</sup> x 150 to 200 sec

After UV-cure, wait 10 to 20 minutes before detachment

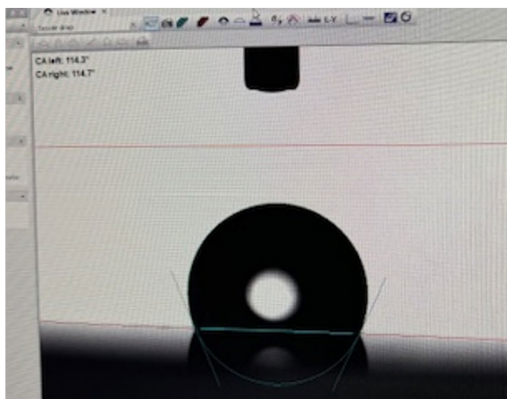
Generally, detachment of PET flexible backplane is easier in comparison to rigid glass backplane. For rigid glass backplane an optional heating step of 60 to 70 °C for 15 to 20 minutes then cooling to room temperature for 20 to 30 minutes can promote easy detachment.

**Processing environment:** process at temperature between 20 – 30 °C at relative humidity of 40-60% and process under yellow light.

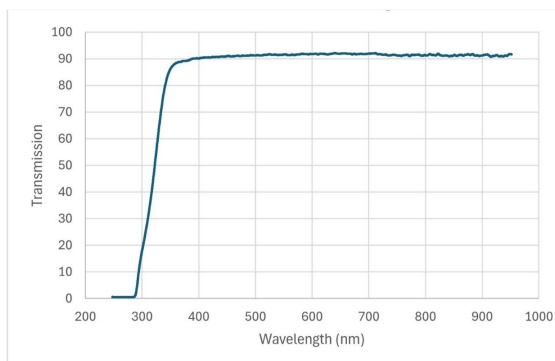
## TYPICAL PROPERTIES:

Before cure (liquid)	WS-104
Viscosity (cps, 25 °C)	300 - 400
Appearance	Very light translucent
Density (g/mL)	1.1
Shelf life (15 - 25 °C)	6 months
Working life (20 - 30 °C)	3 months
After curing - cured film	WS-104
Volume shrinkage (%)	2 - 3
Tg (DMA, °C)	78
Young's Modulus (MPa)	1,000
Elongation (%)	20
Contact angle of water on working stamp (°)	115
% Transmission (400 to 900 nm)	>90

Water contact angle: 115°



UV spectra – no correction for surface reflection



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