

VFI®-4581 82 D UV STABLE CLEAR POLYURETHANE

VFI-4581 82 D UV Stable Clear Polyurethane is a two-component liquid urethane plastic that offers ample time to cast parts that are water-clear with no distortion. The cured plastic is highly rigid and durable, making castings tough and impact resistant. The plastic is UV color stable for use in indoor or outdoor environments. VFI-4581 is best used for applications that require transparency, such as prototype models, decorative pieces, and industrial parts. VFI also offers 10-minute (VFI-4580) and 120-minute (VFI-4582) formulas for various processing needs.

- Crystal clear castings perfect for prototyping applications
- High heat deflection temperature at 145°F (62.8°C)
- Long working time provides sufficient time to mix, degas, and pour by hand
- Can be vacuum degassed and pressure potted for bubble-free castings

PHYSICAL PROPERTIES	TEST METHOD	TEST RESULTS
Hardness Shore D	ASTM D 2240	82 D
Tensile Strength	ASTM D 638	8,500 psi
Tensile Modulus	ASTM D 638	340,000 psi
Elongation	ASTM D 638	35%
Flexural Strength	ASTM D 790	14,000 psi
Flexural Modulus	ASTM D 790	386,000 psi
Shrinkage Linear (12" x 1/2" x 1/2")	ASTM D 2566	<0.005 in/in
Izod Impact, Notched	ASTM D 256	1.06 ft-lb/in
Heat Deflection Temperature (@ 66 psi)	ASTM D 648-18	145 °F ± 2 °F
Color	N/A	transparent

LIQUID PROPERTIES	TEST METHOD	TEST RESULTS
Specific Gravity A Side	ASTM D 1475	1.07 g/mL
Specific Gravity B Side	ASTM D 1475	1.04 g/mL
Mixed Specific Gravity	ASTM D 1475	1.06 g/mL
Ratio by Volume (A:B)	N/A	116.65A:100B
Ratio by Weight (A:B)	N/A	120A:100B
Viscosity A Side (cps @ 77°F)	ASTM D 2196	550 cps
Viscosity B Side (cps @ 77°F)	ASTM D 2196	600 cps
Mixed Viscosity (cps @ 77°F)	N/A	600 cps
Work Time (150g mass @ 77°F)	N/A	50 min
Gel Time (150g mass @ 77°F)	N/A	60 min

MANUFACTURER OF HIGH PERFORMANCE POLYMERS

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THICKNESS REQUIREMENTS

We recommend pouring at a thickness of ½ of an inch to 3 inches to create the necessary film to demold the part and prevent shrinking at corners or bubbles from forming. Pour the material into a single spot at the lowest point of the mold and allow it to seek its level. A consistent pour will minimize air bubbles.

MOLD PREPARATION

All surfaces should be clean, dry, and free of dirt, dust, or debris. Porous surfaces should be properly sealed before casting. Spraying a release agent is recommended to extend the life of the mold and prevent unwanted adhesion. When working with prototyping urethane molds, release is required. VFI recommends using Chem-Trend's MR-515 Aerosol or a similar release agent. Be careful not to overspray the release, as this may result in a shiny/glossy surface or loss of detail transferred to the casting.

For smaller molds, we recommend heating the mold up to 150°F for 4 hours before casting. Heated molds can help to reduce bubbles and demold times. Compatible molds include aluminum and platinum silicone. A platinum silicone mold is the preferred molding type to allow for the full transfer of detail, but post-curing VFI-4581 is required when using a silicone mold.

MIXING

The material should be used at room temperature for proper mixing and application. Premix the B side (Poly) material before each use. Avoid introducing extra moisture or air into the mix. The A side (Iso) does not need to be premixed.

Vacuum degassing and pressure potting the material is required for bubble-free castings. Prepare a container that is an appropriate size for degassing with at least 2/3 of headspace. Measure the A side material and pour it into the mixing container. Then, measure the B side material and pour it into the same container. Slowly hand-mix the material until uniform. Make sure to scrape the sides and bottom of the container. To avoid an uneven mix, pour the material into a different, clean container and mix again. VFI-4581 provides ample time to mix, degas, pour, and pressurize your pressure pot before the end of the 50-minute pot life.

POST-CURE

Castings should be kept in the mold until fully cured to prevent warping. Demold time is dependent on the volume of material used and pour thickness. Thin-walled parts may not cure as well without heat or pressure. VFI-4581 should sit for at least 12 hours at room temperature before demolding. Post-curing in an oven for 8 hours at 170°F is required to achieve full physical properties.

STORAGE/SHELF LIFE

Store in a clean, dry place between 60°F - 90°F. The shelf life of unopened containers is 12 months from the date of manufacture. To extend the shelf life of opened containers, you must keep the containers sealed and nitrogen purge both sides of the material.

PRECAUTIONS

VFI-4581 contains isocyanate, which may be irritating to the skin and is toxic if inhaled as particulate matter. Avoid prolonged breathing of vapors and repeated skin contact. Use only with adequate ventilation. The material is moisture sensitive and may foam if exposed to too much moisture. Do not add foreign material to the product. See Safety Data Sheet for complete safety information.