



# Technical Data Sheet

Light-Curable Adhesives, Sealants, and Masks

## Product 109-Gel

### Activator-cure adhesive for high strength bonding of metals and glass.

**Tangent Product 109-Gel** is a solvent-free adhesive formulated to develop bonds with high tensile shear and peel strength between glass, steel, stainless steel, ferrite, ceramic and some plastics. Bonds prepared with 109-Gel are clear, resistant to moisture, and are well suited for operating conditions that involve thermal cycling. This product's gel viscosity will not migrate, which enables dispensing onto vertical surfaces.

Product 109-Gel will fixture very rapidly when exposed to chemical activators. Fixture time is typically less than one minute, often as quickly as 20-30 seconds (depending on the volume of adhesive, bond gap, and strength of the activator). After fixture, assembled components may be handled for further processing. Full cure and bond strength is attained in 24 hours.

### UNCURED PROPERTIES

COMPOSITION	Aliphatic Urethane Acrylate / Monomer Blend
VISCOSITY	Thixotropic gel, 70,000 - 90,000 cP at 25° C
APPEARANCE	Transparent gel, with slight yellow tint
SPECIFIC GRAVITY	1.1 - 1.2 at 25° C.
FLASH POINT	200° F.
TOXICITY	Refer to Material Safety Data Sheet
SHELF LIFE	One year

### CURED PROPERTIES

SHORE HARDNESS, DUROMETER	D75 - 80
WATER ABSORPTION, % 24 hour immersion at 22° C	< 1%
TEMPERATURE RANGE	-40° C – 140° C
LINEAR SHRINKAGE, %	< 3 %

**THE VALUES NOTED IN THIS TECHNICAL DATA SHEET ARE TYPICAL PROPERTIES.  
THEY ARE NOT INTENDED TO BE USED AS PRODUCT SPECIFICATIONS.**

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**CURE DATA / GUIDELINES**

**Activator curing:**

Prior to assembly, mating surfaces should be clean and free of debris. Wiping with isopropyl alcohol is highly recommended. Apply a thin film of activator on one of the surfaces to be bonded. Activator is typically applied with an applicator or sprayed onto the surface. Activators containing solvent require a few seconds for the solvent to “flash-off”, (evaporate), before attachment to the mating surface. Apply a bead of adhesive to the center of the mating surface that possesses sufficient volume to cover the entire surface area after pressing the two surfaces together. The adhesive should not be spread over the mating surface. The adhesive bead should roll through the activator as the surfaces are pressed together, ensuring 100% contact between activator and adhesive. The assembled components must be clamped or held in place without movement until fixture occurs, (20-60 seconds). Any squeeze-out of adhesive or activator should be wiped away. Bond strength will continue to build over time, but the properly fixtured components can provide sufficient bond strength to continue handling and additional product assembly. It is the User’s responsibility to determine the appropriate dwell time before further handling can be performed.

**Heat Curing:**

Incorporating a thermal curing cycle will accelerate curing and can improve overall bond strength. After components are sufficiently fixtured to allow handling, they may be placed into an oven for curing. The following is a typical curing schedule:

<u>Temperature</u>	<u>Time</u>
110°C (230°F)	60 minutes
121°C (250°F)	30 minutes
150°C (300°F)	15 minutes

Note: Heat cure times are a guideline and may vary based on part size, configuration, adhesive volume, and temperature control. Please consult with Tangent Applications Engineering for assistance with curing equipment selection and process optimization. The actual heat cure schedule must be established and qualified by the User.

**FACTORS THAT CAN AFFECT CURING**

**Surface Cleanliness/Integrity-** Clean surfaces will produce the highest and longest lasting bond strength. Some surface oxidation, staining, or dirtiness can be tolerated, however heavy grime, oils, silicone coatings, and rust inhibitors will negatively affect adhesion and bond strength. Plated surfaces can be bonded, but the adhesive bond strength is contingent upon the integrity of the plating's adhesion to the surface beneath it.

**Bondline Thickness/Gap Size-** The viscosity of this adhesive will assist in mitigating minor gaps and irregularities between two surfaces. However, excessive gaps can contribute to lower bond strength and bond failure. It is recommended that gaps between mating surfaces be kept below 0.020 inches, (0.508 mm). Fixture time increases as the thickness of the adhesive bondline increases.

**Clamping/Holding during fixture-** Components must not move or vibrate after initial assembly to attain proper fixture. Any movement during this period can cause reduced bond strength or bond failure.

**PACKAGING OPTIONS -** Standard packaging for this product includes 10 and 30 gram syringes, 300 gram cartridges, one kilogram bottles, and 17 kilogram pails. Other packaging options may be available upon request.

**STORAGE – This is light sensitive material. Containers must remain covered when not in use.** Minimize exposure of uncured material to daylight, artificial light, and UV light during storage and handling. Store uncured product in its original, closed container in a dry location. Unless otherwise indicated on the product label, optimal storage temperatures are 10 to 30°C, (50 to 86°F). Any material removed from the original container must not be returned to the container as it could be contaminated. Tangent Industries cannot assume responsibility for products that were improperly stored, contaminated, or repackaged into other containers.

**HANDLING AND CLEAN-UP –** For safe handling information, consult this product's **Material Safety Data Sheet (MSDS)** prior to use. Uncured material may be wiped away from surfaces with organic solvents. Do not use solvents to remove material from eyes or skin!

**USING THE PRODUCT –** Prior to dispensing, ensure that each surface coming in contact with this product is clean and free of grease, mold release, or other contaminants. Dispense directly from the package, or utilize appropriate dispensing equipment that is compatible with light-curable adhesives and coatings. Fluid lines and dispense tips must be 100% light blocking. Curing stations should be equipped with air exhaust systems to evacuate vapors and heat generated during the curing process. After curing, this product must be allowed to cool to ambient temperature before testing the product's performance.

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