



INSTRUCTION MANUAL

KWIK-CAST™ & KWIK-SIL™

Silicone Elastomers Cure in Five Minutes



WARNING: MAY CAUSE AN ALLERGIC SKIN REACTION.

If the silicone elastomers make skin contact, wash with plenty of soap and water. If skin irritation or rash occurs, seek medical advice or attention. Remove contaminated clothing and wash before reuse. Wash thoroughly after handling this product. Wear protective gloves, protective clothing, eye protection and face protection.

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ABOUT THIS MANUAL

The following symbols are used in this guide:



This symbol indicates a CAUTION. Cautions warn against actions that can cause damage to equipment. Please read these carefully.



This symbol indicates a WARNING. Warnings alert you to actions that can cause personal injury or pose a physical threat. Please read these carefully.

NOTES and TIPS contain helpful information.



Fig. 1—**KWIK-SIL** (left) and **KWIK-CAST** (right) are packaged in an easy-to-use dual-syringe applicator which eliminates the introduction of air bubbles during mixing and causes a more consistent curing time.

INTRODUCTION

KWIK-SIL and **KWIK-CAST** silicones are based on technology with vinyl terminated siloxane and platinum complex catalysts. In order to gain enough speed to cure at room temperature, special cross linkers and high catalyst concentration is used. Although the high concentration of catalysts makes these products more costly than traditional RTV silicones and less attractive for general usage, they provide an excellent value in applications for the biological research field.

Both **KWIK-SIL** and **KWIK-CAST** have very low toxicity before, during and after curing. In traditional RTV silicone systems, a by-product of the condensation (curing) is either acetic acid or alcohol, which are toxic to living cells. In vinyl systems, the by-product of condensation is a small amount of hydrogen gas, which is much less toxic to the cell.

KWIK-SIL and **KWIK-CAST** curing speed is hundreds of times faster than traditional RTV silicones. A curing time of a few minutes at room temperature is especially useful for encapsulation of live tissue or implanting into a live animal.

Unlike many vinyl-based silicones in which the platinum complex catalysts are easily poisoned by contamination from amines and animal tissue, **KWIK-SIL** and **KWIK-CAST** are not sensitive to contamination from animal tissue.

KWIK-SIL

KWIK-SIL is a translucent, medium-viscosity silicone adhesive, developed for chronic peripheral nerve studies such as anterograde tracing with fluorescent indicators or electrode recording. Good adhesion and mechanical properties (tear strength and elongation) allow days of study without breaking of the bonding. Curing speed is very reproducible.

KWIK-CAST

KWIK-CAST is a very low viscosity silicone sealant developed to embed peripheral nerves with electrodes for acute multi-fiber recordings. It flows easily, filling the small spaces around the nerve and leaving no channels through which peritoneal fluid can travel and thus short the nerve/electrode contact. Equally important is the ability of the material to flow into itself and create one continuous mass from underneath the nerve all the way to the top of the nerve/electrode contact to ensure long-term recording stability.

KWIK-CAST is color-coded to make the mixing foolproof. The catalyst is yellow and the base is blue. When uniformly mixed, it is green. **KWIK-CAST** can be applied and cured underneath mineral oil. After recording, electrodes are easily recovered due to the low tear strength.

NOTE: Modifications were made to the adhesives to improve the longevity and shelf-life of the product, beginning with Lot 12D for KWIK-SIL and Lot 10D for KWIK-CAST. The adhesive components did not change, but the compound ratios are slightly different. Additionally, to prevent the colors from separating over time, the pigment weight in KWIK-CAST was altered. KWIK-CAST is lighter in color now. As a result, the cure times may vary slightly, but they still conform to the specifications and are fully cured within 15 minutes.

OPERATING INSTRUCTIONS

Mixing and Application

NOTE: To remove air bubbles from tip area, place capped syringe upright for several hours or over-night before use.

The cap is keyed so that it can only be applied in one direction, to avoid cross-contamination of catalyst and base. The dual-syringe applicator mixes the silicone as you apply it.

1. Remove the protective cap from the syringe. Hold onto the handle and twist the cap 90° to line up the tab on the cap with the notch on the applicator.

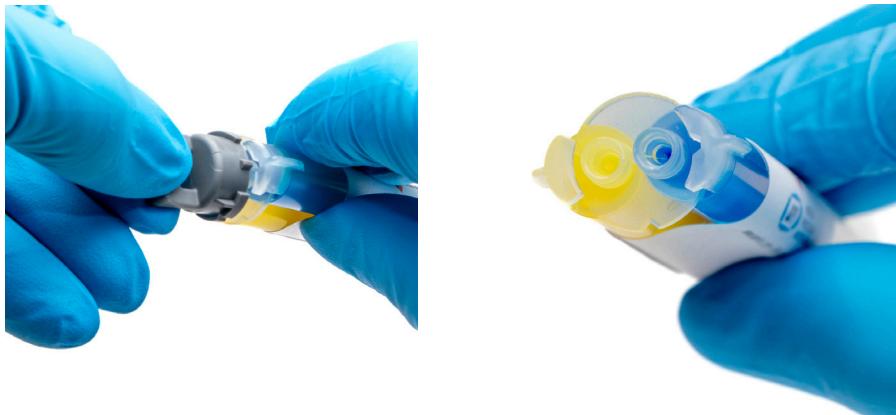


Fig. 2—Remove protective cap from syringe. You can see the notch on the blue side of the KWIK-CAST applicator. After use, remove tip and re-cap the applicator.

2. Slip on a mixer tip (supplied in a separate bag). Align the tab on the tip with the notch on the applicator to position it. Then, turn it 90° to lock the tip in position. As the silicone is extruded from the syringe and applied directly onto the subject, it is automatically mixed by the tip. (The disposable mixer tip can only be used once because the silicone inside becomes solid very quickly. Only a very small amount of silicone is wasted in the tip, because its dead volume is less than 0.12 mL.)



Fig. 3—Align the tip, press into place, and twist to lock it. Baffles in applicator tip ensure thorough mixing of expressed silicone.

3. Dispense and discard the first few drops of material from the mixing tip before using the adhesive. The two materials travel through the tip at different rates, and the first drops of adhesive may not be mixed 1:1, which alters the cure time.
4. After dispensing the silicone, the mixer tip may be left on the syringe until next application and replaced by a new one. However, if the silicone is not going to be used for several days, we recommend covering the syringe with the protective cap. Please note that the cap is keyed so that it can only be put on in one direction.

Curing

Silicones are formulated to cure with a number of catalysts, and each catalyst cures under its own set of conditions. The curing process may be inhibited by your material preparation, device components or even assembly processes. The "poisoning" could leave a slight surface tack or cause a complete failure to cure. In some cases, the effects can be reversed, but often the inhibitors permanently arrest the cure.

The platinum catalyst used in the **KWIK-SIL** and **KWIK-CAST** silicones is susceptible to poisoning. The following list details the most common inhibitors (but not all):

Sulfur containing compounds

- Latex rubber (gloves & tubing)
- Neoprene rubber
- Natural Rubber
- Polysulfides
- Wood (spatulas and tongue depressors)
- Plasticized PVC
- Organic oils

Epoxy & amine cured materials

- Some phenolic resins
- Epoxy resins
- Some polyurethane materials

Nitrogen containing compounds

- Amines
- Amides
- Nitriles
- Cyanates

Tin containing compounds

- Condensation cured silicones
- Acetoxy cured silicones
- Oxime cured silicones
- Tin Plasticizers (some plastics and PVC)

Metals

- Various metals including silver, tin, lead and mercury

NOTE: Temperature and humidity may also have some impact on curing time.

MAINTENANCE

Storing

Store below 27°C. Keep the applicator capped to avoid air contamination when not in use.

Sterilization of Standard KWIK-SIL/KWIK-CAST

The silicone adhesive inside the syringes cannot be sterilized by any means including UV, gamma, H_2O_2 , autoclaving or EtO. The exterior and the tips can be immersed in or wiped with 70/30 alcohol, or you can use a liquid sterilant like Cidex OPA (WPI #**7364-4**) or Rapicide OPA (WPI #**504611**).

NOTE: Sterile versions of both adhesives are available, **KWIK-SIL-S** and **KWIK-CAST-S**.

SPECIFICATIONS

This unit conforms to the following specifications:

UNMIXED:	KWIK-SIL ¹	KWIK-CAST
Mix Ratio	1:1	1:1
Working time	<5 min. ²	4 min.
Setting time (room temperature, 1:1 ratio)	5-10 min. ³	<10 min.
Cure time	~15 min.	
Viscosity, cps	15,000	10,000
Shelf life at 23 °C	6 months	6 months
Volume	5 mL	5 mL
Number of mixing tip ⁴	10	10
Dead volume of the mixing tip	<0.12 mL	<0.12 mL

AFTER CURING 24 HOURS:

Tear Strength, ppi	90	44
Elongation %	650	60
Durometer (shore A-2)	30	36
Color	translucent	green
Volume Resistivity	$1 \times 10^{15} \Omega/\text{cm}^2$	$1 \times 10^{15} \Omega/\text{cm}^2$

¹ 0-90 sec.	Liquid State	mixed silicone is able to flow under gravity
90-180 sec., <5 min.	Working Time	glue is firm, but still workable
5-10 min.	Firm Set	glue may be sticky
15-18 min.	Full Set	silicone is cured and is not sticky

² Three minutes is average, with about 90 seconds of liquidity.

³ No longer mixable at this point.

⁴ Ten mixer tips are included. If additional mixer tips are needed, order WPI part #600022 (package of 10).

We define working/setting/cure times as follow:

- Working time: The adhesive is in a liquid state and mixed silicone can flow under gravity. This is less than 5 minutes.
- Setting time: The adhesive is firm but still workable. It may be sticky. This is less than 10 minutes.
- Cure time: The adhesive is fully set. The silicone is cured and is not sticky. This is less than 15 minutes.

WARRANTY

WPI (World Precision Instruments) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of 6 months from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

Claims and Returns

Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within ten (10) days after receipt of shipment. Claims for lost shipments must be made within thirty (30) days of receipt of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim is settled. In some instances, photographic documentation may be required. Some items are time-sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container.

Do not return any goods to us without obtaining prior approval and instructions from our Returns Department. Goods returned (unauthorized) by collect freight may be refused. Goods accepted for restocking will be exchanged or credited to your WPI account. Goods returned which were ordered by customers in error are subject to a 25% restocking charge. Equipment which was built as a special order cannot be returned.

Repairs

Contact our Customer Service Department for assistance in the repair of apparatus. Do not return goods until instructions have been received. Returned items must be securely packed to prevent further damage in transit. The Customer is responsible for paying shipping expenses, including adequate insurance on all items returned for repairs. Identification of the item(s) by model number, name, as well as complete description of the difficulties experienced should be written on the repair purchase order and on a tag attached to the item.

** Electrodes, batteries and other consumable parts are warranted for 30 days only from the date on which the customer receives these items.*



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