

3M

Scotch-Weld™

Instant Adhesives

Technical Data

May, 2004

Product Description 3M™ Scotch-Weld™ Instant Adhesives are single component, high strength cyanoacrylate adhesives.

Features

- One component, high strength adhesives that cure at room temperature.
- Products provide varying cure times, bond strengths, and viscosities.
- Can be used to bond a variety of substrates including many rubbers, plastics, and metals.
- Economical to use as it requires only drops of adhesive to provide strong bonds to many metals, plastics, and rubbers.

Description

3M™ Scotch-Weld™ Instant Adhesive CA4 is a high-strength, very fast setting, multi-purpose cyanoacrylate adhesive that cures at room temperature with very low bonding pressures. It has particularly good adhesion to most cured rubbers.

3M™ Scotch-Weld™ Instant Adhesive CA5 is a high-strength, slow setting cyanoacrylate adhesive that cures at room temperature. Its relatively high viscosity is especially useful where some gap filling is desired for bonding rough or uneven surfaces. The longer set rate allows more time for proper alignment of parts to be bonded. Meets CID A-A-3097, Type II, Class 3.

3M™ Scotch-Weld™ Instant Adhesive CA7 is a high-strength, extremely fast setting cyanoacrylate adhesive that cures quickly at room temperature. It has excellent adhesion to many metals, plastics and rubbers, and produces bonds with more shock and impact resistance than many typical cyanoacrylate adhesives.

3M™ Scotch-Weld™ Instant Adhesive CA8 is a high-strength, rapid-setting cyanoacrylate adhesive that cures at room temperature. It has excellent adhesion to many metals, plastics and rubbers, and produces bonds with more shock resistance than many typical cyanoacrylate adhesives. Meets CID A-A-3097, Type II, Class 2.

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Description (*continued*)

3M™ Scotch-Weld™ Instant Adhesive CA9 is a high-strength cyanoacrylate adhesive that cures slower than many cyanoacrylates at room temperature. The longer set rate allows more time for proper alignment of parts before bonding takes place. It has excellent adhesion to many metals, plastics and rubbers, and produces bonds with more shock and impact resistance than many typical cyanoacrylate adhesives. Meets CID A-A-3097, Type II, Class 3.

3M™ Scotch-Weld™ Instant Adhesive CA40 is a high-strength, very fast-setting cyanoacrylate adhesive that cures at room temperature with very low bonding pressures. It has particularly good adhesion to many difficult to bond substrates such as EPDM rubber, aluminum and flexible vinyl.

3M™ Scotch-Weld™ Instant Adhesive CA40H is a high-strength cyanoacrylate adhesive. It is a higher viscosity, slightly slower setting version of Scotch-Weld CA40. It has particularly good adhesion to many difficult to bond substrates, such as aluminum, EPDM rubber, and flexible vinyl. Scotch-Weld CA40H exhibits good resistance to soap solutions and isopropyl alcohol. Its high viscosity helps prevent run off during application, and its slower set time allows additional time for proper alignment of parts.

3M™ Scotch-Weld™ Instant Adhesive Gel CA50 is a high-strength, surface insensitive, gel cyanoacrylate adhesive. Its gel consistency allows it to be used in many non-sag vertical applications, and to fill gaps up to .020 inches. The very slow cure rate allows plenty of time to reposition parts.

3M™ Scotch-Weld™ Instant Adhesive CA100 is a high-strength cyanoacrylate adhesive. Its relatively high viscosity (approximately 3000 cps) allows gap-filling capability up to .020 inches. It has high T-Peel strength, thermal shock resistance, impact resistance, and excellent metal bonding capabilities.

Scotch-Weld™ Instant Adhesives

Typical Physical Properties (uncured)

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| Product | 3M™ Scotch-Weld™ Instant Adhesive | | | | | | | | |
|----------------------|-----------------------------------|-------|--------|--------|-----------|--------|---------|---------------|-----------|
| | CA4 | CA5 | CA7 | CA8 | CA9 | CA40 | CA40H | Gel CA50 | CA100 |
| Color | Clear | Clear | Clear | Clear | Clear | Yellow | Clear | Clear | Clear |
| Base | Ethyl | Ethyl | Methyl | Ethyl | Ethyl | Ethyl | Ethyl | Ethyl | Ethyl |
| Viscosity (cps) | 150 | 2000 | 15-40 | 70-130 | 1000-1700 | 20 | 400-600 | 45,000-85,000 | 2500-4500 |
| Specific Gravity | 1.05 | 1.05 | 1.05 | 1.05 | 1.05 | 1.05 | 1.05 | 1.07 | 1.05 |
| Net Weight (lbs/gal) | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.7 | 8.9 | 8.7 |

Typical Physical Properties (cured)

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| Product | Scotch-Weld | | | | | | | | |
|-------------------------------------|-------------|-------|------|------|-------|------|-------|----------|-------|
| | CA4 | CA5 | CA7 | CA8 | CA9 | CA40 | CA40H | Gel CA50 | CA100 |
| Time to Handling Strength (seconds) | 5-40 | 12-60 | 1-30 | 5-40 | 20-70 | 3-20 | 5-40 | 60-120 | 20-70 |

Overlap Shear Strength Tested at 75°F [23°C] (psi)

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| Product | Scotch-Weld | | | | | | | | |
|-------------------|-------------|------|-------|-------|-------|------|-------|----------|-------|
| | CA4 | CA5 | CA7 | CA8 | CA9 | CA40 | CA40H | Gel CA50 | CA100 |
| Steel | 2300 | 2500 | 2500 | 2000 | 2000 | 1700 | 1500 | 2000 | 2000 |
| Aluminum - etched | 2800 | 600 | 2400 | 2100 | 2400 | 2600 | 1500 | 900 | 2900 |
| ABS | 800* | 800* | 900* | 900* | 900* | 800* | 900* | 800* | 600* |
| PVC | 800* | 800* | 1000* | 1000* | 1000* | 800* | 1000* | 600* | 700* |

Overlap Shear Metal to Metal Bond Strength tested @ 75°F (23°C) (psi)

Tensile Shear Strength (as defined in ASTM-D-1002) - cured 48 hours at 68°F (20°C) - 60% Relative Humidity - abraded and acetone wiped - test specimen is 1/2 sq. in. bond tested @ .1 in./minute loading rate.

*Substrate Failure

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Surface Preparation

For optimum strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. However, the amount of surface preparation depends on the required bond strength and the environmental aging resistance desired by the user.

Metals (Steel and Aluminum):

1. Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol.*
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with solvent to remove loose particles.

Aluminum Etching:

1. Alkaline Degrease: Oakite 164 solution (9-11 oz./gallon water) at 190°F ± 10°F (88°C ± 5°C) for 10-20 minutes. Rinse immediately in large quantities of cold running water.
2. Acid Etch: Place panels in the following solution for 10 minutes at 150°F ± 5°F (66°C ± 2°C).

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|--------------------------------|------------------------|
| Sodium Dichromate | 4.1 - 4.9 oz./gallon |
| Sulfuric Acid, 66°Be | 38.5 - 41.5 oz./gallon |
| 2024-T3 aluminum (dissolved) | 0.2 oz./gallon minimum |
| Tap water as needed to balance | |

3. Rinse: Rinse panels in clear running tap water.
4. Dry: Air dry 15 minutes; force dry 10 minutes at 150°F ± 10°F (66°C ± 5°C).
5. If primer is to be used, it should be applied within 4 hours after surface preparation.

Plastics/Rubber:

1. Wipe with Isopropyl Alcohol.*
2. Abrade using clean fine grit abrasives.
3. Wipe with Isopropyl Alcohol.*

***Note:** When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

Handling

For short term storage (30 days), keep adhesive in a cool, dry place 60 to 80°F (16-27°C). For long term storage, refrigeration (40°F [4°C] or below) is suggested. Keep containers tightly covered and free of moisture. Polymerization is accelerated by sunlight, so avoid direct exposure to sun. **One Ounce Bottles:** At end of day, clear tip of dispensing nozzle by inserting a needle to prevent clogging. Wipe outside of nozzle to remove excess adhesive with a folded non-cotton cloth or tissue. Replace cap. **One Pound Bottles:** At end of day, remove cap-stem assembly and place overnight in nitromethane or methyl ethyl ketone.* Seal bottle with shipping cap.

***Note:** When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

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| Storage | Store in original containers at or below 80°F (27°C). |
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| Shelf Life | These products can be expected to have at least nine months shelf life. At lower temperature, the shelf life will be longer. Lower temperatures cause increased viscosity of a temporary nature and also will cause water to condense on the container. Therefore, containers stored at low temperatures should be allowed to return to room temperature before opening so that water does not come in contact with the adhesive and cause adhesive gelation. |
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| Precautionary Information | Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501. |
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| Product Use | All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application. |
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