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	3MTM Scotch-WeldTM 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.						
	3MTM Scotch-WeldTM 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.						
	3MTM Scotch-WeldTM 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.						
	3MTM Scotch-WeldTM 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.						

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.					
	3MTM Scotch-WeldTM 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 TM Scotch-Weld TM 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.					
	3MTM Scotch-WeldTM 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.					
	3MTM Scotch-WeldTM 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.					

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.

	3M™ Scotch-Weld™ Instant Adhesive								
Product	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.

	Scotch-Weld								
Product	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.

	Scotch-Weld								
Product	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

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.								
	 Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol.* Sandblast or abrade using clean fine grit abrasives. 								
	3. Wipe again with solvent to remove loose particles.								
	Aluminum Etching:								
	 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. 								
	 Acid Etch: Place panels in the following solution for 10 minutes at 150°F ± 5°F (66°C ± 2°C). 								
	Sodium Dichromate	4.1 - 4.9 oz./gallon							
	Sulfuric Acid, 66°Be	38.5 - 41.5 oz./gallon							
	2024-T3 aluminum (dissolved) Tap water as needed to balance	0.2 oz./gallon minimum							
	 Rinse: Rinse panels in clear running tap water. 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 adhesiv (16-27°C). For long term storage, refrigeration Keep containers tightly covered and free of mo	e in a cool, dry place 60 to 80°F a (40°F [4°C] or below) is suggested. bisture. Polymerization is accelerated							

(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.

Storage	Store in original containers at or below 80°F (27°C).					
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.					
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.					
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.					
Warranty and Limited Remedy	Unless stated otherwise in 3M's product literature, packaging inserts or product packaging for individual products, 3M warrants that each 3M product meets the applicable specifications at the time 3M ships the product. Individual products may have additional or different warranties as stated on product literature, package inserts or product packages. 3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's application. If the 3M product is defective within the warranty period, your exclusive remedy and 3M's and seller's sole obligation will be, at 3M's option, to replace the product or refund the purchase price.					
Limitation of Liability	Except where prohibited by law, 3M and seller will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.					



Industrial Business Industrial Adhesives and Tapes Division

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Material Safety Data Sheet

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:3M(TM) Scotch-Weld(TM) Instant Adhesive CA-40H**MANUFACTURER:**3M**DIVISION:**Industrial Adhesives and Tapes Division

ADDRESS: 3M Center St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 11/20/2006 **Supercedes Date:** 07/30/2004

Document Group: 10-2990-9

Product Use:

Intended Use:Structural Strength Instant AdhesiveSpecific Use:Cyanoacrylate Adhesive

Formerly known as 3M(TM) Pronto(TM) Instant Adhesive CA-40H

SECTION 2: INGREDIENTS

Ingredient	<u>C.A.S. No.</u>	<u>% by Wt</u>
ethyl cyanoacrylate	7085-85-0	93 - 100
poly(methyl methacrylate)	9011-14-7	< 5
hydroquinone	123-31-9	< 0.2

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Liquid

Odor, Color, Grade: clear, colorless, sharp irritating odor

General Physical Form: Liquid

Immediate health, physical, and environmental hazards: Combustible liquid and vapor. Closed containers exposed to heat from fire may build pressure and explode. Vapors may travel long distances along the ground or floor to an ignition source and flash back. Hazardous polymerization may occur. May cause severe eye irritation. May cause allergic skin reaction. May bond tissue rapidly.

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:

Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Bonds eyelids rapidly.

Skin Contact:

Moderate Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

Bonds skin rapidly.

Prolonged or repeated exposure may cause:

Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Inhalation:

Upper Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Ingestion:

Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, nausea, diarrhea and vomiting.

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention. DO NOT force eyelids open.

Skin Contact: FOR SKIN BONDS: Quickly soak in warm water and avoid use of excessive force to free bonded area. If unable to free bonded area, or if lips or mouth are bonded, get medical attention. If irritation persists, get medical attention.

Inhalation: Remove person to fresh air. If signs/symptoms develop, get medical attention.

If Swallowed: Do not induce vomiting. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get immediate medical attention.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature Flash Point Flammable Limits - LEL Flammable Limits - UEL No Data Available 176 °F [Test Method: Tagliabue Closed Cup] No Data Available No Data Available

5.2 EXTINGUISHING MEDIA

Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture. Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Combustible liquid and vapor. Closed containers exposed to heat from fire may build pressure and explode. Vapors may travel long distances along the ground or floor to an ignition source and flash back.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. Contain spill. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Collect as much of the spilled material as possible. Collect as much of the spilled material as possible using non-sparking tools. Place in a closed container approved for transportation by appropriate authorities. DO NOT wipe spill or residue with cleanup materials containing cotton.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

Keep out of the reach of children. Avoid contact with oxidizing agents. Avoid eye contact. Avoid eye contact with vapors, mists, or spray. Avoid breathing of vapors, mists or spray. Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Keep away from heat, sparks, open flame, pilot lights and other sources of ignition.

7.2 STORAGE

Store away from acids. Store away from heat. Store out of direct sunlight. Store away from flammable and combustible materials. Store away from oxidizing agents.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Use with appropriate local exhaust ventilation. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits and/or control mist, vapor, or spray. If ventilation is not adequate, use respiratory protection equipment.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection

Avoid eye contact with vapors, mists, or spray.

The following eye protection(s) are recommended: Safety Glasses with side shields, Indirect Vented Goggles.

8.2.2 Skin Protection

Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials. Gloves made from the following material(s) are recommended: Butyl Rubber, Polyvinyl Alcohol (PVA), Polyethylene/Ethylene

Vinyl Alcohol. The following material(s) are recommended: Butyl Rubber, Polyvinyl Alcohol (PVA), Polyethylene/Ethylene Vinyl Alcohol. The following protective clothing material(s) are recommended: Apron - Polyethylene ethylene vinyl alcohol. DO NOT wear cotton gloves.

8.2.3 Respiratory Protection

Avoid breathing of vapors, mists or spray.

Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half facepiece air-purifying respirator with organic vapor cartridges. Consult the current 3M Respiratory Selection Guide for additional information or call 1-800-243-4630 for 3M technical assistance.

8.2.4 Prevention of Swallowing

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

8.3 EXPOSURE GUIDELINES

Ingredient	<u>Authority</u>	Type	<u>Limit</u>	Additional Information
ethyl cyanoacrylate	ACGIH	TWA	0.2 ppm	
hydroquinone	ACGIH	TWA	2 mg/m3	Table A3
hydroquinone	CMRG	STEL	4 mg/m3	
hydroquinone	OSHA	TWA	2 mg/m3	Table Z-1

SOURCE OF EXPOSURE LIMIT DATA:

ACGIH: American Conference of Governmental Industrial Hygienists CMRG: Chemical Manufacturer Recommended Guideline OSHA: Occupational Safety and Health Administration

AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form: Odor, Color, Grade: General Physical Form: Autoignition temperature Flash Point Flammable Limits - LEL Flammable Limits - UEL Liquid clear, colorless, sharp irritating odor Liquid *No Data Available* 176 °F [*Test Method:* Tagliabue Closed Cup] *No Data Available No Data Available*

Boiling point Density Vapor Density

Vapor Pressure

Specific Gravity pH

Solubility in Water Evaporation rate Hazardous Air Pollutants Volatile Organic Compounds Kow - Oct/Water partition coef Percent volatile VOC Less H2O & Exempt Solvents Viscosity 131 °F [@ 2 mmHg] 1.05 g/ml [*Ref Std:* WATER=1] 4.5 [*Ref Std:* AIR=1]

0.05 mmHg [@ 20 °C]

1.05 [*Ref Std:* WATER=1] *Not Applicable*

Nil Negligible 0 g/l 0 % weight *No Data Available* 0.00 % weight 0 g/l 400.0 - 600.0 centipoise

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: Strong bases; Amines

Hazardous Polymerization: Hazardous polymerization may occur. Additional Information: May occur in large quantities only.

Hazardous Decomposition or By-Products

Substance Carbon monoxide Carbon dioxide Oxides of Nitrogen <u>Condition</u> During Combustion During Combustion During Combustion

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Not determined.

CHEMICAL FATE INFORMATION

Not determined.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Reclaim if feasible. Dispose of completely cured (or polymerized) wastes in a sanitary landfill. Incinerate in an industrial or commercial facility. As a disposal alternative, dispose of waste product in a facility permitted to accept chemical waste.

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14:TRANSPORT INFORMATION

ID Number(s):

62-3829-0330-0, 62-3829-0335-9, 62-3829-3830-6

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - Yes Delayed Hazard - No

STATE REGULATIONS

Contact 3M for more information.

CHEMICAL INVENTORIES

The components of this product are in compliance with the chemical notification requirements of TSCA.

All applicable chemical ingredients in this material are listed on the European Inventory of Existing Chemical Substances (EINECS), or are exempt polymers whose monomers are listed on EINECS.

Contact 3M for more information.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 2 Flammability: 2 Reactivity: 1 Special Hazards: None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

Revision Changes:

- Section 1: Division name was modified.
- Copyright was modified.
- Section 3: Immediate physical hazard(s) was modified.
- Section 3: Potential effects from eye contact was modified.
- Section 3: Potential effects from skin contact information was modified.
- Section 5: Unusual fire and explosion hazard information was modified.
- Section 6: Release measures information was modified.
- Section 7: Handling information was modified.
- Section 7: Storage information was modified.
- Section 8: Engineering controls information was modified.
- Section 15: Inventories information was modified.
- Section 9: Property description for optional properties was modified.

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