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STICK FAST™ CYANOACRYLATE ADHESIVES

Technical Data Sheet

Description:

TMI Products' Stick Fast™ Cyanoacrylate Adhesives are made in the U.S.A. and is a minimum of 99.5% pure to assure the highest quality. These products are single component, solvent-free systems and are rapid, room temperature cure. Stick Fast™ *CA-THIN*, *CA-MEDIUM*, *CA-THICK*, *GA-GEL* are surface-insensitive formulated for bonding a wide range of similar and dissimilar materials. *CA-FLEXIBLE*, a rubberized cyanoacrylate with similar properties, is also available

Application:

Stick Fast Cyanoacrylates should be applied in small amounts to one surface only. The parts should then be joined together under slight pressure. The pressure need only be applied for several seconds. Curing occurs rapidly, allowing for bonded parts to be handled within 4 to 60 seconds for most applications. Full cure is normally within 24 hours. For detailed and diverse applications, see Tech Marketing's User Guidelines.

Typical Properties of Uncured Materials:

Chemical Type:	Ethyl Cyanoacrylate
Appearance	Clear Liquid
Flash Point:	>176°F (80°C)
Vapor Pressure	<1 mbar
Viscosities	
CA-Thin	5 CPS @ 25°C
CA-Medium	500 CPS @ 25°C
CA-Thick	2000 CPS @ 25°C
CA-Gel	Paste

Cure Speed vs. Activator

Applying *ACTIVATOR* will reduce cure time. However, *ACTIVATOR* may reduce the overall strength of the bond depending on the amount used. Over use of activator will result in a high exothermic reaction, which creates foaming or bubbling, which further reduces overall strength. Testing, therefore, is recommended to confirm affect. Spraying activator on one surface and applying adhesive on the other, and then pressing the two together normally achieves the best bonding results. Lightly using *AEROSOL ACTIVATOR* to spray directly on cyanoacrylate normally achieves the best results with reduced or no foaming.

Strength Values

Values are without the use of Activator

	<u>Value</u>	<u>Shear Strength</u> <u>Range</u>
Grit Blasted Steel	3200	2600 to 3800
Etched Aluminum	2200	1600 to 2800
Zinc Dicromate	1000	600 to 1500
ABS	1900	900 to 3000
PVC	1900	900 to 3000
Poly Carbonate	1800	700 to 3000
Phenolic	1450	700 to 2200
Neoprene Rubber	1450	700 to 2200
Nitrile Rubber	1450	700 to 2200

Typical Environmental Resistance

Cure Procedure	One week at 22°C
Substrate	Grit Blasted Mild Steel 1 APS
Test Procedure	ASTM D1002/DIN 53283

Hot Strength:

<u>Temperature</u>	<u>% initial strength retained</u>
0°F	85%
50°F	95%
75°F	100%
100°F	93%
150°F	80%
200°F	70%

Heat Aging:

Shear strength Test Procedure: ASTM D1002 (DIN 53282)

<u>Temperature</u>	<u>% initial strength retained</u>					
	<u>0</u>	<u>1000</u>	<u>2000</u>	<u>3000</u>	<u>4000</u>	<u>5000</u>
60°C	100%	100%	100%	100%	100%	100%
80°C	100%	85%	82%	80%	79%	79%
100°C	100%	50%	48%	44%	40%	40%

Chemical/Solvent Resistance (Tested at 22°C):

<u>Solvent</u>	<u>Aged Temp</u>	<u>% of initial strength retained</u>		
		<u>100 HRS</u>	<u>500 HRS</u>	<u>1000 HRS</u>
Motor Oil	40°C	95%	95%	95%
Leaded Petrol	22°C	100%	100%	100%
Ethanol	22°C	100%	100%	100%
Isopropanol	22°C	100%	100%	100%
Freon TA	22°C	100%	100%	100%
Humidity 95% RH	40°C	70%	50%	40%
Humidity 95% RH (Polycarbonate)	40°C	70%	50%	40%

Cure Speed vs. Substrate

Cure speed will be dependent upon the substrate used. Higher the viscosity of cyanoacrylates results in longer cure times. The table below shows the fixture time on different substrates at 22°C and 50% relative humidity using *CA-THIN*.

Time to develop shear strength of 0.1 N/MM² (14.5psi)

<u>Substrate</u>	<u>Fixture Time (sec)</u>	<u>Substrate</u>	<u>Fixture Time (sec)</u>
Steel	3 to 18	PVC	1 to 8
Paper	1 to 8	ABS	1 to 8
Leather	3 to 13	Nitrile Rubber	< 4
Fabric	1 to 18	Neoprene	< 4
Wood (balsa)	1 to 3	Zinc Dichromate	8 to 18
Phenolic Material	1 to 8	Aluminum	1 to 8
Polycarbonate	8 to 38		

Cure Speed vs. Humidity

The following chart shows the tensile strength developed with time at different levels of humidity. The overall rate of cure is dependent upon the percentage of relative humidity.

Percent of full strength over time

Relative Humidity	<u>Cure Time in seconds</u>					
	<u>10 sec</u>	<u>20 sec</u>	<u>30 sec</u>	<u>40 sec</u>	<u>50 sec</u>	<u>60 sec</u>
60%	30%	76%	100%	100%	100%	100%
40%	25%	60%	80%	100%	100%	100%
20%	10%	20%	32%	45%	50%	64%

General

Cyanoacrylates should not be used in pure oxygen/oxygen rich environments. Also, it is not recommended as a sealant for chlorine or other strong oxidizing materials.

Surface Preparation

The surface of the substrate must be clean and free of rust inhibitors, grease, oil, mold release agents, and other contaminants in order to ensure a good bond. The overall bond strength on painted parts may be determined by the strength of adherence of the paint to the substrate.

Handling Precautions (see MSDS for more information)

All of the Stick Fast™ Cyanoacrylate adhesives are non-toxic and do not constitute a health hazard. Normal precautions should be observed. Fumes may be an irritant and should be used in areas where there is adequate ventilation.

KEEP AWAY FROM CHILDREN

Accidental skin bonding may occur. Use warm, soapy water to separate skin or use TMI's *DE-BONDER*. Gradually work skin free. Do not use excessive force to pull bonded area apart: this will only result in tearing skin and/or cause irritation that is not necessary.

Should eye contact occur, flush with water and **see a physician**. **Do not** use solvents or *DE-BONDER* or force the bonded area apart. When the corneal surface and eyelid are bonded together treat with a suitable anti-irritant ointment and allow the eye to remain closed. Bond separation will occur naturally with time.

Storage

Unopened container: Cyanoacrylates are ideally stored in a cold, dry environment in unopened containers. Optimal storage temperature is between 33°F and 50°F and may be stored in a refrigerator. Do not store in freezer.

Opened container: A dry environment will extend the shelf life. For optimal storage, place cyanoacrylate in a moisture barrier container (PET plastic or glass) with TMI's drying agent, *DRY PAK*. Do not put cyanoacrylate in freezer because moisture will condense within the bottle and reduce the shelf life. Colder temperatures will also affect viscosities. To prevent contamination of unused product, do not return any material to its original container. **Do not** store with or next to *ACTIVATOR*; fumes will migrate to cyanoacrylate bottles and cause premature curing.

DISCLAIMER

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of the data or the results to be obtained from the use thereof. Because the information contained herein may be applied under conditions beyond our control, we assume no responsibility for its use.

