

Technical Data Sheet Quantum® 138

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Product Description

Hernon® Quantum® 138 is a surface insensitive cyanoacrylate adhesive formulated to improve adhesion properties and fixture time as well as gap filling capabilities over conventional cyanoacrylate adhesives. This advanced formulation improves adhesion to difficult to bond plastics, wood, leather, ceramics, elastomers, and acidic surfaces such as freshly plated components.

Quantum® 138 is a state-of-art single component, solventless, room temperature curing adhesives that polymerize rapidly when pressed into a thin film between parts. The presence of surface moisture commences the cure of the adhesive. **Quantum® 138** will develop handling strength within seconds and full cure within a few hours.

Typical Applications

Bonding

Rubber bumpers
Permanent locking of plastic
Fasteners
Speaker components
Shock mounts
Gears to shaft
Wiper blades
Acrylic windows
Name plates
Catheters
Honing stones
Security collars
O-rings
insulation pads

Fixturing

Filter caps
Jumper wires
Heat sinks
Gaskets
Golf club parts
Tennis racquet parts
P.C. boards
Wire tacking

Potting

Transistors
Tamper proofing
Adjustable components
Fiberglass molds

Product Benefits

- Single component.
- 100% Solventless.
- Instant setting.
- Improved gap filling capability.
- Improved adhesion to difficult to bond surfaces

Typical Properties (Uncured)

Property	Value
Chemical Type	Modified Cyanoacrylate Ester
Appearance	Clear Liquid
Specific Gravity	1.13
Viscosity, cP	Thixotropic Gel
Flash Point	See MSDS

Typical Properties (Cured)

Cured 24 Hours @ 22°C

Physical Properties

Property	Value
Coefficient of thermal expansion, K ⁻¹ , ASTM D696	80×10 ⁻⁶
Coefficient of thermal conductivity, W/(m·K), ASTM C177	0.1
Gap Fill, mm (in.)	0.254 (0.010)

Electrical Properties

Property	Value
Dielectric Strength, kV/mm ASTM D149	25
Dielectric Constant @ 0.10 kHz ASTM D150	2.65 2.75 2.65
Dissipation Factor @ 0.10 kHz ASTM D150	< 0.02 < 0.02 < 0.02
Volume Resistivity, Ω·cm ASTM D257	10×10 ¹⁵
Surface Resistivity, Ω ASTM D257	10×10 ¹⁵

Typical Curing Performance

Under normal conditions, the atmospheric moisture initiates the curing process. Although full functional strength is developed in a relatively short time, curing continues for at least 24 hours before full chemical/solvent resistance is developed.

Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The table below shows the fixture time achieved on different materials at 22°C / 50% relative humidity. Fixture time is defined as the time to develop a shear strength of 0.1 N/mm².

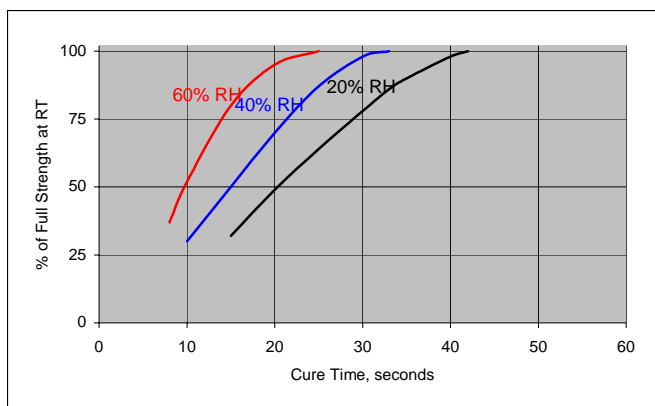
Substrate	Fixture (seconds)	Substrate	Fixture (seconds)
Steel (degreased)	15	Neoprene	20
Aluminum	20	Nitrile Rubber	20
Zinc Dichromate	25	Teak	17
ABS	7	Pine	20
Phenolic	7	Paper	4
PVC	10	Fabric	13
Polycarbonate	20	Leather	20
G-10 Epoxy Glass	35		

Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. Thin bond lines result in high cure speeds, increasing the bond gap will decrease the rate of cure.

Cure Speed vs. Humidity

The rate of cure will depend on the ambient relative humidity. The following graph shows the tensile strength developed with time on Buna N rubber at different levels of humidity.



Cure Speed vs. Accelerator

Where cure speed is unacceptably long due to large gaps, applying accelerator to the surface will improve cure speed. However, this can reduce ultimate strength of the bond and therefore testing is recommended to confirm effect.

Typical Cured Performance

Shear Strength

Cured 24 Hours @ 22°C - tested according to ISO 4587

Substrate	Shear Strength N/mm ² (psi)
Steel (gritblasted)	17.9 to 26.2 (2600 to 3800)
Aluminum (etched)	11.0 to 19.3 (1600 to 2800)
Zinc Dichromate	4.1 to 10.3 (600 to 1500)
ABS	6.2 to 20.0 (900 to 2900)
PVC	6.2 to 20.0 (900 to 2900)
Polycarbonate	5.0 to 20.0 (730 to 2900)
Phenolic	5.0 to 15.2 (730 to 2200)
Neoprene	5.0 to 15.2 (730 to 2200)
Nitrile	5.0 to 15.2 (730 to 2200)

Tensile Strength

Tested according to ISO 6922

Substrate	Cure Time @ 22°C	Tensile Strength N/mm ² (psi)
Buna-N	30 seconds	≥ 6.9 (≥ 1000)
	24 hours	12.1 to 25.2 (1750 to 3650)
Steel	24 hours	12.1 to 25.2 (1750 to 3650)

Typical Environmental Resistance

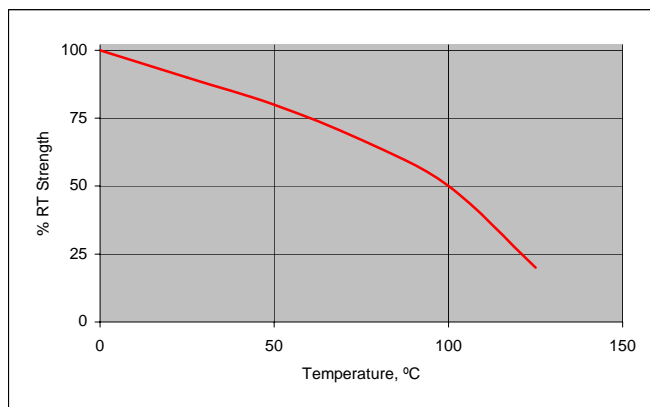
Cured for 1 week @ 22°C

Shear Strength, ISO 4587

Steel lap-shear specimens

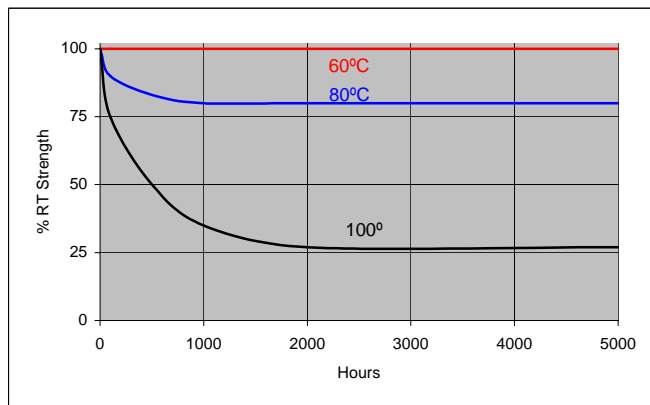
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested at 22°C



Chemical/Solvent Resistance

Aged under condition indicated - Tested at 72°F (22°C).

Chemical/Solvent	Temp (°C)	% of Initial Strength		
		100h	500h	1000h
Motor Oil	40	85	85	75
Gasoline	22	100	100	100
Ethanol	22	100	100	100
Isopropanol	22	100	100	100
Freon TA	22	100	100	100

General Information

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

Directions For Use

For best performance bond surfaces should be clean and free from grease. This product performs best in thin bond gaps (0.05 mm).

Disassembly and Cleanup

Liquid Cyanoacrylate should not be wiped with rags or tissue. The fabric will cause polymerization and large quantities of adhesive will heat or cure causing smoke and strong irritating vapors. Always flood with excess water to clean up spill conditions.

Storage

Cyanoacrylate adhesives must be stored under refrigeration at a temperature of 40°F ± 5°F for extended shelf life. Before opening, the containers must be warmed to room temperature, otherwise, water may condense into the bottle and cause hardening of the adhesive. To prevent contamination of unused adhesive, do not return product to its original container.

Dispensing Equipment

Hernon® offers a complete line of semi and fully automated dispensing equipment. Contact **Hernon® Sales** for additional information.

These suggestions and data are based on information we believe to be reliable and accurate, but no guarantee of their accuracy is made. HERNON MANUFACTURING, INC. shall not be liable for any damage, loss or injury, direct or consequential arising out of the use or the inability to use the product. In every case, we urge and recommend that purchasers, before using any product in full scale production, make their own tests to determine whether the product is of satisfactory quality and suitability for their operations, and the user assumes all risk and liability whatsoever, in connection therewith. Hernon's Quality Management System for the design and manufacture of high performance adhesives and sealants is registered to the ISO9001:2000 Quality Standard.