

Technical Data Sheet Cylinlock[®] 824

March 2006

Page 1 of 3

Product Description

Hernon[®] Cylinlock[®] 824 is a general purpose, single-component, anaerobic adhesive used primarily for joining cylindrical assemblies of all types. It is a low viscosity, self-hardening adhesive that cures when confined between ferrous or copper alloy metals. The cured adhesive is a thermoset plastic suitable for exposure to most solvents.

Typical Applications

- Retains keys and splines. eliminates backlash in worn assemblies.
- Retains bearings in place, preventing spin out.
- Retains rotor to shafts in fractional and subfractional horsepower motors.
- Retains bushing and sleeves in housings and on shafts.
- Augments press fits.
- Restores the fit to worn assemblies or out of tolerance parts.

PRODUCT BENEFITS

- Allow the use of slip fits instead of press and interference fits.
- Restores the fit to worn or out of tolerance assemblies.
- Easily joins dissimilar materials.
- Eliminates resizing of bushings due to close-in from pressing.
- Eliminates set screws.
- Prevents fretting and corrosion from occurring by strengthening and completely sealing assemblies.
- Increases the strength of interference fits and mechanical assemblies.

Typical Properties (Uncured)

Property	Value
Chemical Type	Methacrylate ester
Appearance	Green fluorescent liquid
Specific Gravity	1.09
Viscosity @ 25°C, cP	1500 to 2500
Flash Point	See MSDS

Typical Properties (Cured)

Property	Value
Coefficient of thermal expansion, ASTM D696, K ⁻¹	0.1
Coefficient of thermal conductivity, ASTM C177, W / m ² K	0.1
Temperature range, °C, (°F)	-55 to 150(-65 to 300)
Maximum diametral clearance, mm (in.)	0.254 (0.010)

Curing Specifications

Curing occurs when the resin is confined between metallic surfaces. The metal acts as a catalyst for the curing process. On nonmetallic surfaces the use of **Hernon[®] EF[®] Primer 49 or 50** or heat is necessary to effect a cure. Hot air oven heat or induction heat will fully cure these compounds.

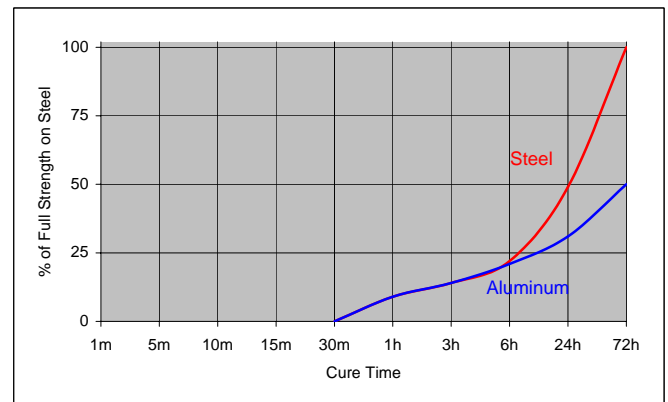
Performance Testing

Each batch of **Cylinlock[®] 824** is tested to the lot requirements of MIL-R-46082B (Type III), and to the detail requirements of ASTM D5363 (AN0421).

Typical Curing Performance

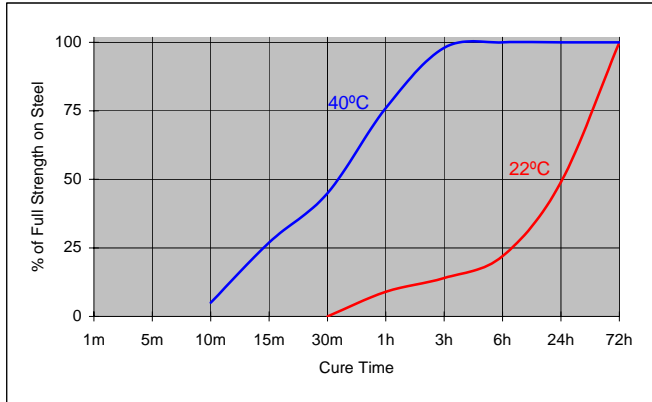
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows shear strength developed with time on steel pins and collars compared to different materials and tested according to ISO 10123.



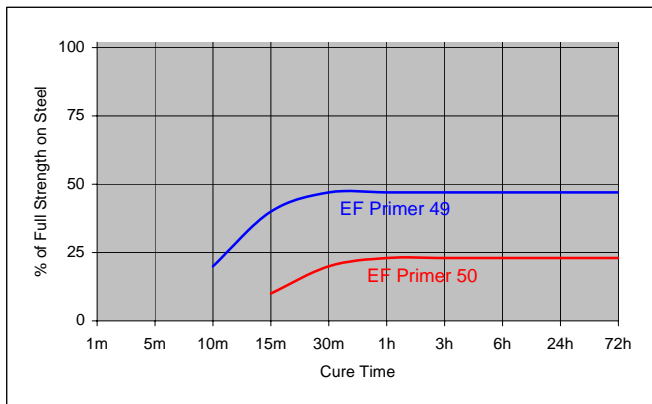
Cure Speed vs. Temperature

The rate of cure will depend on the ambient temperature. The graph shows the shear strength developed with time at different temperatures on steel pins and collars and tested according to ISO 10123.



Cure Speed vs. Primer

When cure speed is unacceptably long (because of substrate, temperature or gap), performance may be improved by treating the surface with **Hernon® EF® Primer 49 or 50**. The graph below shows shear strength developed with time on zinc dichromate steel pins and collars and tested according to ISO 10123.



Typical Cured Performance

Shear Strength, ISO 10123
 Steel Pins and Collars

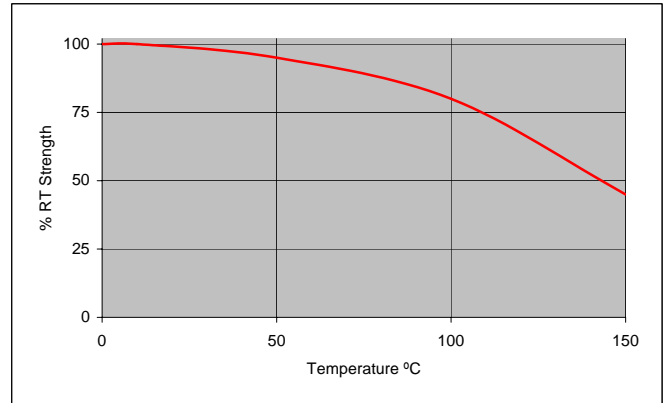
Cure Conditions	Shear Strength, N/mm ² (psi)
24 hours at 22°C	≥ 20 (2900)
1 hour at 93°C, tested at RT	≥ 31 (4495)

Typical Environmental Resistance

Cured for 1 week @ 22°C
 Shear Strength, ISO 10123
 Steel Pins and Collars

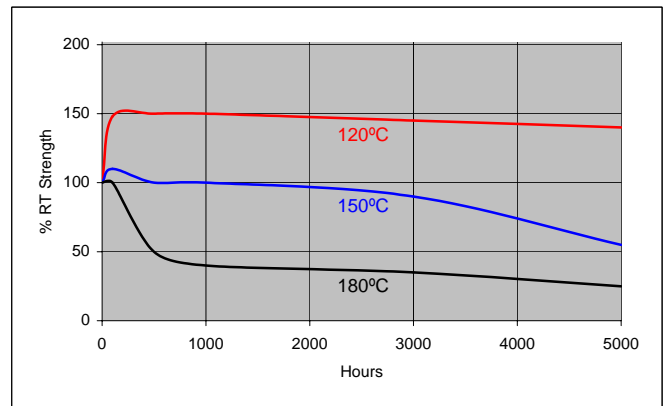
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated - Tested at (22°C).



Chemical/Solvent Resistance

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

Chemical/Solvent	Temp (°C)	% of Initial Strength		
		100 h	500 h	1000 h
Water Glycol 50/50	87	95	80	80
Brake fluid	22	100	90	80
Ethanol	22	100	100	75
Unleaded Gasoline	22	100	90	85
Motor Oil	125	100	100	100
Acetone	22	90	90	90

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).

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). It is recommended to confirm compatibility of the product with such substrates.

Directions For Use

In using **Cylinlock® 824**, several parameters must be considered:

- **Cleanliness**

Cylinlock® 824 relies upon keying into surfaces as well as chemical adhesion to develop its strength. Cleanliness is very important. If adhesive is applied to an oily or dirty substrate, ultimate strength will be low and inconsistent. For best results, clean all surfaces (external and internal) with a **Hernon®** cleaning solvent and allow to dry.

- **Bondline Thickness**

Bondlines of .001" to .002" are ideal. Larger gaps result in lower strength. For large gaps, care must be taken to maintain concentricity. Fixtures are recommended, since the adhesive provides minimal centering action.

- **Surface Finish**

Rougher surfaces generally produce higher strengths. For surface finishes below 20µ inches, cleanliness is extremely important for high strength. Surface finishes above 125µ inches create excessive gaps, which reduce strength. Also tolerances cannot be maintained with rougher finishes. Recommended finish range is 30-80µ inches.

- **Materials to be Bonded**

Cylinlock® 824 cures best on iron and steel surfaces. For maximum strength on nonferrous metallic surfaces, passivated coatings, oxide coatings or for lower temperature or larger gaps, the use of **Hernon® EF® Primer 49 or 50** is recommended.

- **Bond Area**

When the engagement area between two parts exceeds 5 square inches, a size correction factor must be used. This is necessary since with large bond area force is not

evenly distributed. The size of correction factor compensates for this uneven loading.

- **Operating Temperature and Differential Thermal Expansion**

At elevated temperatures, all adhesives experience a reduction in strength. If an assembly is to operate at an elevated temperature, heat aging must be accounted for. (Refer to section on Environmental Resistance) If thermal cycling occurs, heat aging data can then be used for accumulating total time at temperature.

Assembly

For Slip Fitted Assemblies, apply adhesive around the leading edge of the pin and the inside of the collar and use a rotating motion during assembly to ensure good coverage.

For Press Fitted Assemblies, apply adhesive thoroughly to both bond surfaces and assemble at high press on rates.

For Shrink Fitted Assemblies the adhesive should be coated onto the pin, the collar should then be heated to create sufficient clearance for free assembly.

Parts should not be disturbed until sufficient handling strength is achieved.

Disassembly and Cleanup

To aid in disassembly anaerobic compounds can be weakened by heating to at least 500°F (260°C). Once disassembled, cured adhesive can be removed with **Hernon® Gasket Remover 30**.

Storage

Cylinlock® 824 should be stored in a cool, dry location in unopened containers at a temperature between 46°F to 82°F (8°C to 28°C) unless otherwise labeled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused material, do not return any material 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.