

PRODUCT DATA SHEET: C-Lube Ceramic Dry Film Lubricant

SELECTION DATA

CHEMICAL NAME/SYNONYMS: Previously known as CermaLube.

PRODUCT DESCRIPTION:

C-Lube is a thermally cured Dry Film Lubricant. **C-Lube** has been designed to provide high pressure lubrication to surfaces subject to sliding, rotating or oscillating motion. **C-Lube** makes use of several design characteristics in managing friction. It applies in a thin film that is based on a ceramic metallic resin system that allows the coating to be burnished to a film less than .0001" in thickness, allowing extremely tight clearances to be utilized. **C-Lube** may be pre-burnished prior to installation/assembly of a part or will burnish during operation. The coating is also designed to aid in the more even transfer of heat, reducing hot spots. The low 350°F cure temperature allows for the coating to be used on a variety of substrates. **C-Lube** may be used on both wet and non-wetted surfaces.

RECOMMENDED USES:

C-Lube is recommended for use on any component where heat and friction are an issue. Gears, Shafts, Hubs, Cams, Splined Shafts, Wear Blocks, Springs, Bearings (Note for Babbitt type bearings use DFL-1), Pistons, Cylinder Walls, Rotors and more.

NOT RECOMMENDED FOR: Magnesium and any substrate that cannot handle the cure temperature.

PROPERTIES

APPLIED FILM THICKNESS: .0005" to .0015"
(Burnishes upon use)

HRC (Equivalent Rockwell C Scale): N/A

ADHESION (Tape Test ASTM D 3359): 5B

PENCIL HARDNESS TEST: N/A

IMPACT TEST (ASTM D 2794 2 lb. Weight): OK at 48"

FLEXIBILITY/BENDING ADHESION: 90 and 180 degree bends no delamination.

THERMAL TEMPERATURE RESISTANCE: Over 1000°F Constant and over 2000°F intermittent environmental.

SALT SPRAY RESISTANCE: N/A

CORROSION TEST DATA: Good

ACCEPTABLE SUBSTRATES FOR

APPLICATION: Not to be used on Magnesium; fine for ferrous and non-ferrous substrates, plastics and composites that can handle the cure temperature.

ELECTRICAL PROPERTIES: N/A

CHEMICAL RESISTANCE: Good

FILM TYPE: C-Lube is a soft lubricious material that is designed to burnish to a near zero film buildup while still providing full properties, allowing normal clearances to be maintained. C-Lube is a conformal coating and can burnish in use to achieve the running clearances that are optimal. In addition C-Lube is impregnated into a properly prepared surface.

Note: N/A refers to characteristics that are not applicable to this type of coating.

C-Lube solved a major thread failure issue:

Gary Sartor of Sartor Brothers Engineering, South Africa

An unforeseen problem has occurred in the South African mines. Large pumps with over three km heads, capable of pumping high volumes of acid mine water found to be leaking between the casings. Due to the extreme pressure the leak is a major hazard to personnel, as the leak off is equivalent to a water jet cutter.

The pump casing is assembled with studs and nuts. In order to seal they are fastened to the prescribed torque. The realization of the problem is here, the threads of the studs and nuts when mated begin to seize. This increased pressure means that the mating faces of the casing are not seeing the correct torque and not fully sealing.

To remedy this problem Tech Line Coatings C-Lube is applied to both the stud and nut threads. For over a year there has been no further failures, all threads for these pumps are now coated with C-Lube as standard procedure.

(Testing below was done on similar formulations)

TECH LINE Coatings

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Cryogenic and heat test:

1. Plates fully immersed in liquid nitrogen (-273°C) for one hour.
2. Plates immediately heated by blow torch to (+1300°C).
3. Plates re immersed in liquid nitrogen.

Continues cycle of test for 8 hours.

Coating	Adhesion (ASTM D4541)	Flexibility (ASTM D522)	Impact (SABS 16)
C-Lube	4.0 Very Good	180° Full load	14 Joules

Note: After completion of tests there were no signs of coating failure.

Adhesion testing: ASTM 4541

An alcometer adhesion tester was used to evaluate the adhesive properties of the coatings. To quantify bonding strength between the coating and the substrate, ASTM standard D4541 was employed.

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Coating Adhesivity results (MPa), average

C-Lube 4

Dry Film evaluation (DFT): ASTM D1186-87

Test procedure: The test method covers the measurement of DFT of coating applied to a ferrous-based metal. An average of 10 readings were taken using the Quanix 1500. Readings were taken approximately 25mm from the edge of the sample and the results are given in Table 5.

Coating	Average DFT , i m
C-Lube	21.05

Flexibility Test: ASTM D522

Coating	Flexibility As-Received Plate	Flexibility Post exposure
C-Lube	90 and 180° full load flexibility	no delamination.