



ADHESION TEST

Date: September 18, 1994

Test Status: Statistic

Test Area: 1.57 cm²

Indication: Break

Average: 27.21

Std Dev.: 1.10

Max: 27.98 MPa (>4000 psi)

A thin-film Ceramic Epoxy Coating Technology with advanced performance properties...

THE "BE THERE" PROPERTY:

Adhesion: measured at >4,000 psi (27.98 MPa) over carbon steel with very high adhesion values on most substrates. CeRam-Kote 54® also provides excellent adhesion over hydro-blasted surfaces.

MECHANICAL PERFORMANCE PROPERTIES:

Abrasion resistance: CeRam-Kote 54® will either solve the abrading problem or deliver four (4) or five (5) times the abrasion protection of competing thin-film coatings.

Flexibility: measured at 15% elongation

Lubricity: measured at a static coefficient of friction value similar to Teflon (PTFE) coating materials, which when coupled with its toughness and extremely high *adhesion*, creates a performance property delivering Teflon-like lubricity for service in all tough and abrasive working environments.

CORROSION RESISTANCE PROPERTIES: TOP OF THE SCALE

OTHER PERFORMANCE PROPERTIES:

Dielectric strength: measured at >1750 volts per mil (>68 volts per micron).

Surface burning characteristics: Class 1 Fire and Smoke Rating over steel.

Field repairable: CeRam-Kote 54® chemically bonds to itself with minimal surface preparation.

Machineable: When cured, CeRam-Kote 54® can be honed to achieve tight tolerances.

Time-saving application: CeRam-Kote 54® is a one-coat, two-pass, ambient cured system which is applied directly to the properly prepared substrate without need of a primer.

...for performance properties beyond comparison, ask for **CeRam-Kote 54® - The Flexible Ceramic** - for use in the toughest environments to protect expensive equipment.

•EXTREMELY HIGH ADHESION TO:

CARBON STEEL
STAINLESS STEEL
ALUMINUM
TITANIUM
FIBERGLASS
COMPOSITE MATERIALS
PLASTICS
CONCRETE

•HIGH ABRASION RESISTANCE

•FLEXIBLE

•HIGH CORROSION RESISTANCE

•HIGH LUBRICITY

•HIGH DIELECTRIC STRENGTH (NATURAL ELECTRICAL INSULATOR)

•LOW PERMEABILITY

•CLASS 1 FIRE AND SMOKE RATING

•ABS TYPE APPROVAL as per certificate #99-HS27360-X and ABS Certificate of Design Assessment #03-HS391002-PDA

•FIELD REPAIRABLE WHEN DAMAGED

•MACHINEABLE WHEN CURED

•ALL INGREDIENTS FOOD GRADE WHEN CURED

•THIN-FILM

•ENVIRONMENTALLY FRIENDLY- 1.63 LB/GAL (196 G/LIT) VOC's



The *FLEXIBLE* Ceramic

CERAMIC PARTICLE LOADING

The CeRam-Kote 54® **patented** coating technology, **ceramic particle loading**, results from CERAM-KOTE COATINGS' unique ability developed over fifteen years and the trial of hundreds of formulas. Ceramic particle loading is the addition of a complex series of ceramic particles into a resin solution which causes the resin solution to out-perform its basic chemistry.

In addition to improving the chemical performance of resin systems, ceramic particle loading significantly enhances the dynamic mechanical performance properties of the resin system.

Total performance characteristics of CeRam-Kote 54®, both chemical and mechanical, are significantly better than liquid epoxy, fusion-bond epoxy and other high performance coating systems.

CeRam-Kote 54® protects by binding ceramic particles to a unique resin system, thus creating an **encapsulating ceramic shell**. Each ceramic particle is resin coated and becomes tightly packed in the cured film.



The *FLEXIBLE* Ceramic

ENCAPSULATING CERAMIC SHELL

The **compact density** of the cured film of CeRam-Kote 54® yields dynamic intangible benefits such as:

- ◆ **high surface lubricity** producing a lower drag coefficient on a variety of surfaces, and
- ◆ **extraordinary sliding abrasion** resistance providing protection against the forces of erosion/corrosion and abrasion.

TOUGH BARRIER COATING

CeRam-Kote 54® is a **tough barrier coating** for total immersion service that is compatible with antifouling bottom coatings.

CeRam-Kote 54®'s **direct-to-substrate** one-coat, two-pass system translates to increased production efficiency and significantly reduced down-time, essential in industry today.

CeRam-Kote 54® is formulated for atmospheric corrosion service as well as for immersion service in very harsh environments. CeRam-Kote 54® currently protects expensive and critical equipment in industries serving Oil and Gas, Offshore, Marine, Petrochemical and Industrial Markets with proven documented results. Applications have expanded into the Food and Beverage, Paper and Pulp, Wastewater Treatment, Electrical Power, Transportation and Mining Industries.

Extremely high adhesion to virtually any substrate combined with extraordinary mechanical properties, make CeRam-Kote 54® a superior protective coating where high abrasion and severe corrosion problems exist.

Note: More detailed information is available in the Summary Test Data or is available upon request.



PHYSICAL PROPERTIES - TEST DATA	
Adhesion (ASTM D4541, elcometer pull-off)	>3,680 psi (25.37 MPa)
Adhesion (ISO 4624)	> 5,560 psi (38.33 MPa)
Abrasion Resistance (ASTM D 4060, Tabor Test 1,000 cycles, CS 17 wheel, 1kg)	27 milligrams loss
Surface Roughness (Profilometer value)	20 Ra
Flexibility (ASTM D 522)	15% elongation
Impact Resistance - Direct (ASTM D 2794)	50 inch-pounds
Impact Resistance - Reverse (ASTM D 2794)	13 inch-pounds
Impact Resistance - Direct (ASTM G 14)	97 inch-pounds
Static Coefficient of Friction (ASTM D 4518)	0.152 mean static friction value
Dielectric Strength (ASTM D 149)	>1,750 volts/mil (>68 volts/micron)
Salt Spray (ISO 7253)	6,000 hours
Cyclic Corrosion (ASTM D5894)	Pass
Fire Rating Over Steel (ASTM E84-91a)	Smoke Density-Class I Flame Spread-Class I
Chemical Testing (ASTM G 20 - modified to 30 days at 75° F / 23.9°C) HCl in H ₂ O: pH of 2.9 HF in H ₂ O: pH of 2.9 H ₂ SO ₄ in H ₂ O: pH of 2.1 NaCl (10%) + H ₂ SO ₄ : pH of 2.9 NaCl (10%) in H ₂ O	No Change No Change No Change No Change No Change
VOC (Volatile Organic Compounds)	1.63 lb/gal (196 g/lit)

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