



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**ENGINEER RESEARCH AND DEVELOPMENT CENTER, CORPS OF ENGINEERS**  
**COLD REGIONS RESEARCH AND ENGINEERING LABORATORY**  
**72 LYME ROAD**  
**HANOVER, NEW HAMPSHIRE 03755-1290**

9 June 2017

CEERD-RRG

**Materials and coatings evaluated at CRREL to measure the adhesive shear strength of ice**

<b>Material</b>	<b>Composition</b>
	<b>Paints and coatings</b>
Kiss-Cote 1083	Kiss-Cote 1083 (polydimethyl siloxane) used on aluminum samples. KISS-COTE, Inc. 12515 Sugar Pine Way Tampa, FL 33624 Phone: (813) 962-2703 <a href="http://www.kiss-cote.com/">http://www.kiss-cote.com/</a>
Kiss-Cote ML	Kiss-Cote MegaGuard LiquiCote (polydimethyl siloxane) used on aluminum samples and painted steel samples. KISS-COTE, Inc. 12515 Sugar Pine Way Tampa, FL 33624 Phone: (813) 962-2703 <a href="http://www.kiss-cote.com/">http://www.kiss-cote.com/</a>
BMS 10-60	BMS (Boeing Material Spec) 10-60 polyurethane over BMS 10-11 epoxy primer. <a href="http://www.boeing.com/companyoffices/doingbiz/environmental/high_solids.html">http://www.boeing.com/companyoffices/doingbiz/environmental/high_solids.html</a>
Wearlon	Wearlon Super F1 (water-based, methyl silicone copolymer epoxy). Environmental Coatings P.O. Box 405 Maryville, IL 62062 Phone: 888-Wearcon <a href="http://www.environmentalcoatings.com">www.environmentalcoatings.com</a>
Type V MIL-PRF24635E Navy Coating or PSX-700	Siloxane and polyurethane epoxy produced by: Ameron International Protective Coatings Group 201 North Berry Street Brea, CA 92821 Phone: (714) 529-1951 <a href="http://www.psx700.com/">http://www.psx700.com/</a>
Interlux Brightside	Polyurathane alkyd. International Paint Inc. 2270 Morris Ave Union NJ 07083 Phone: (908) 686-1300 <a href="http://www.yachtpaint.com/usa/">http://www.yachtpaint.com/usa/</a>

Material	Composition
TroyGuard	<p>Fluoropolymer suspension and mineral spirits in clear acrylic urethane paint.            The additive is produced by:            Troy Corporation            8 Vreeland Road            Florham Park, NJ 07932-0955            Phone: (973) 443-4200 <a href="http://www.troycorp.com">http: www.troycorp.com</a></p> <p>Tested coating with Troyguard EX527 additive was produced by:            Niles Chemical Paint Company, 225 Fort Niles, MI 49120 Phone:            (616) 683-3377</p>
TroyGuard/ polyurethane	<p>Fluoropolymer suspension and mineral spirits in BMS 10-60 polyurethane paint            The additive is produced by:            Troy Corporation            8 Vreeland Road            Florham Park, NJ 07932-0955            Phone: (973) 443-4200 <a href="http://www.troycorp.com">http: www.troycorp.com</a></p>
Inertia 160	<p>Trimethyl hexamethylenediamine epoxy.            International Paint Inc.            6001 Antoine Dr            Houston TX 77091 Phone:            (713) 684-1254  <a href="http://www.international-marine.com/">http://www.international-marine.com/</a></p>
Envelon	<p>Resin-based ethylene acrylic acid copolymer thermoplastic.            Thermoset Applications Group            Dow Plastics            The Dow Chemical Co.            2040 Willard H. Dow Center            Midland, MI 48674 Phone: (800) 441-4369 <a href="http://www.dow.com/plastics/">http://www.dow.com/plastics/</a></p>
Slip Plate #1	<p>Natural graphite coating in mineral spirits.            Superior Graphite Co.            10 South Riverside Plaza-Suite 1600            Chicago, IL 60606            Phone: (312) 559-2999  <a href="http://www.graphitesgc.com/">http://www.graphitesgc.com/</a></p>

Material	Composition
WC-1-ICE	Saturated polyester resins in fluoropolyol with PTFE and organofunctional silicone fluid additives, modified with a fluorotelomer intermediate, and activated with a trimer of HDI. 21st Century Coatings, Inc. 4701 Willard Ave., Suite 109 Chevy Chase, MD 20815 Phone: (301) 657-6230 <a href="http://www.fpu-coatings.com">http://www.fpu-coatings.com</a>
SA-RIP-4004	Saturated polyester resins modified with fluorotelomer intermediates activated with a biuret of HDI. S&A Fernandina, Inc. 3601 Crow Court Jacksonville, FL 32259 Phone: (904) 230-1799
51PC951	A fluorinated polyurethane coating, suitable for both in-air and inwater immersion, produced and sold by 21 <sup>st</sup> Century Coatings (Canada) LLC
R-2180	A two-part silicone elastomer dispersed in xylene, produced and sold by NuSil Technology, LLC ( <a href="http://www.nusil.com/PDF/PP/R2180P.pdf">http://www.nusil.com/PDF/PP/R2180P.pdf</a> ).
HybridShield	A one-part, moisture cured resin that cures to form a clear film and is produced and sold by NanoSonic, Inc. ( <a href="http://www.nanosonic.com/product/hybridshield-icephobic/">http://www.nanosonic.com/product/hybridshield-icephobic/</a> )
Antice	An anhydra coating produced and sold by Oceanit ( <a href="http://www.oceanit.com/products/anhydra">http://www.oceanit.com/products/anhydra</a> )

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**Corps Paints**

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V-103c	Vinyl resin, type 3 (20), carbon black (1.5), diisodecyl phthalate (3.4), methyl isobutyl ketone (36.0), toluene (39.1% by weight). Indmar Coatings Corporation 237 West Main St Wakefield VA 23888 Phone: (757) 899-3807
V-766e	Vinyl resin, type 3 (5.6) and type 4(11.6), titanium dioxide and carbon black (13.0), diisodecyl phthalate (2.9), methyl isobutyl ketone (32.0), toluene (34.7) ortho phosphoric acid (0.2 % by weight). Indmar Coatings Corporation 237 West Main St Wakefield VA 23888 Phone: (757) 899-3807

V-102e Vinyl resin, type 3 (18.2), aluminum powder (8.3) diisodecyl phthalate (3.1) methyl isobutyl ketone (33.8), toluene (36.6 % by weight).  
Indmar Coatings Corporation  
237 West Main St  
Wakefield VA 23888  
Phone: (757) 899-3807

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C-200a A coal tar epoxy formulation commonly used on U.S. Army Corps of Engineers hydraulic structures exposed to brackish or salt waters. Tested coating was "Bitumastic 300M", and was produced by:  
Carboline Company  
350 Hanley Industrial Court  
St Louis MO 63144  
Phone: (314) 644-1000

MIL-P-24441C Type III A polyamide epoxy formulation commonly used on U.S. Army Corps of Engineers hydraulic structures where VOC-compliance is mandatory. Tested coating was produced by: Indmar Coatings Corporation 237 West Main St.  
Wakefield VA 23888  
Phone: (757) 899-3807

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#### Materials

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Teflon™	Polytetrafluoroethylene (PTFE) thermoplastic
Polyethylene	Ultra-high-molecular-weight polyethylene thermoplastic
Acetal	Acetal copolymer thermoplastic
Titanium	ASTM B348 - Grade 5 (6% aluminum, 4% vanadium)
Dupont Delrin™	Polyoxymethylene homopolymer thermoplastic
Carbon Steel	Cold-rolled 1018
Stainless Steel	Type 410
Aluminum	Type 7075

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