

Huron

INDUSTRIES, INC.

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TECHNICAL DATA SHEET

NEOLUBE NO. 1 LUBRICANT - COLLOIDAL GRAPHITE IN ISOPROPANOL

APPLICATION: NUCLEAR POWER GENERATING PLANTS, NUCLEAR REACTORS, COMMERCIAL AND NAVAL

Neolube No. 1 is a dry film, conductive lubricant, used extensively at nuclear power generating plants and other nuclear facilities as an anti seize compound, thread lubricant and for lubricating moving parts and rubbing surfaces.

The composition of this material is 99% pure furnace graphite particles, a thermoplastic resin and isopropanol. The material has excellent radiation resistance and high chemical purity. The thin, non corrosive film of Neolube No. 1 prevents seizing, fretting, galling and resists abrasion. It is easy to apply by spray, dip or brush and has excellent adhesion after a fast air dry. The dry film of Neolube No. 1 will not migrate and it is non freezable.

Neolube No. 1 has satisfied the stringent requirements for lubricating the internal and auxiliary equipment mechanisms of commercial and naval nuclear reactor systems. Neolube No. 1 allows easy assembly, trouble-free operation and non destructive disassembly. Neolube No. 1 provides non corrosive, dry adherent lubrication for metal parts with limited clearances in applications where control of impurities is required.

Neolube No. 1 is **NOT RECOMMENDED FOR LUBRICATING THREADS IN THE REACTOR PRIMARY CONTAINMENT AREAS**, where operating temperatures for the fittings are greater than 400°F. Neolube No. 1260 is recommended for use in containment and/or secondary side in nuclear applications.

A Certificate of Quality Conformance and Analysis is available for each lot upon request.

Neolube No. 1 has been used successfully in applications where it has withstood radiation levels of 1×10^6 rads.

Physical and Chemical Requirements	MIL-L-24131C
Total Solids Content, weight percent Graphite Content, percent of total solids	3.3% ± 0.50% 75% ± 5%
Particle size, microns Maximum dimensions of 90% of the particles Maximum dimensions of any particle	4 Microns 10 Microns
Ash, weight percent, maximum on total solids Fluorine, parts per million, maximum on total solids Chlorine, parts per million, maximum on total solids Sulfur, parts per million, maximum on total solids Lead, parts per million, maximum on total solids	0.75% 20 PPM 200 PPM 200 PPM 150 PPM
Film Properties (regular & irregular surfaces): Adherence Spalling Appearance	The coated surface will be dry and will not become exposed when subjected to light abrasion. Film continuity will not be broken, and metal surfaces will not be exposed. Dry, nonoily.
Odor	Characteristic of isopropanol, no odor of halogenated solvents will be detected.

Mercury: Instruments and equipment containing mercury or compounds of mercury were not used in the

manufacture and packaging of the lubricant, nor in testing and inspection, unless samples were discarded after the test. During the manufacturing processes, tests, and inspection, Neolube No. 1 did not come in contact with mercury or any of its compounds nor any mercury-containing devices employing a single boundary of containment. Compounds containing boron were not used in cleaning, processing equipment, or containers.

There is no intentional addition of low melting point metals such as lead, bismuth, zinc, mercury, antimony, cadmium, tin, silicon, gallium, indium or arsenic to this product; nor of copper or silver.

Physical Properties:

Lubricant	Processed micro graphite	Service Temperature	400°F (204°C)
Binder	Thermoplastic Resin	Intermittent Temperature	850°F (454°C)
Diluent	Isopropanol	Color	Black
Consistency	Liquid	Solids Content	3.30% ± 0.50%
Density	6.6 lb./gal (0.791 kg/l)	Flash Point	52°F (11°C)
Shelf Life	No limit in a closed container	Coefficient of Friction	0.15 (Static)

Dilution:

Neolube No. 1, is supplied in a ready-for-use form conforming to the requirements of MIL-L-24131C. If further dilution is required by the application, add isopropanol while stirring thoroughly.

Usage:

Substrates should be clean and dry before application. A solvent wipe and air dry is usually sufficient. For critical applications requiring maximum adhesion, the following pretreatment is recommended:

Steel	Degrease, sand or vapor blast and/or phosphate coat.
Aluminum	Degrease, sand or vapor blast, degrease, Meta Etch or anodize.
Stainless Steel	Degrease, sand or vapor blast and/or Granodine 16 (Amchem)
Copper Alloys	Degrease, sand or vapor blast, degrease, dilute nitric acid dip and water rinse.
Rubber	Clean with appropriate solvent.
Plastic	Sand lightly, wipe with appropriate solvent.

NOT RECOMMENDED FOR USE IN OXYGEN SYSTEMS

Application:

Shake or agitate well before using. Apply with the brush in cap applicator or by conventional spray, brush or dip methods.

Cure Time:

Material dries in approximately five minutes to the touch depending on temperature and humidity. Full cure properties up to two hours depending on thickness, temperature and humidity.

Packaging:

Neolube No. 1 is packaged in 2 ounce and 8 ounce non halogenated plastic bottles with a brush in cap applicator. Qualification Approval: Approving organization is the Naval Ship Engineering Center, Hyattsville, Maryland 20782. The date of the approval letter is 21 June 1974, Test Report Number (QPL) 10744.

PLEASE NOTE: "NEOLUBE PRODUCTS ARE NOT CONSIDERED SAFETY-RELATED GOODS. AS SUCH, THEY ARE NOT DESIGNED, FABRICATED, HANDLED, SHIPPED, STORED, ETC., UNDER A QUALITY ASSURANCE PROGRAM THAT COMPLIES WITH THE REQUIREMENTS OF 10CFR50, APPENDIX B, 10CFR21, OR ANSI STANDARDS."

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Printed in U.S.A. Revised: 6/27/07

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MATERIAL SAFETY DATA SHEET

I. GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS: MIXTURE	TRADE NAME & SYNONYMS: NEOLUBE NO. 1
CHEMICAL FAMILY: GRAPHITE IN ISOPROPANOL	FORMULA: TRADE SECRET
PROPER SHIPPING NAME: ISOPROPANOL	HAZARD CLASS: 3 - FLAMMABLE LIQUID
UN NUMBER: UN1219	PACKING GROUP: II
MANUFACTURER: 03432 HURON INDUSTRIES, INC.	MANUFACTURER'S PHONE NUMBER: 810-984-4213
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UN1219, ISOPROPANOL, 3, II
ERG GUIDE 129 - FLAMMABLE LIQUID
NMFC NUMBER: 42690, SUB 2, FREIGHT CLASS 65

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

HAZARDOUS COMPONENTS:	OSHA PEL	ACGIH TLV	NTP	IRC	OSHA	%(OPTIONAL)
GRAPHITE (7782-42-5)	5.00 mg/m ³	2.00 mg/m ³	N	N	N	1 - 5
ISOPROPANOL (67-63-0)	400.00 PPM	200.00 PPM	N	N	N	60 - 100

THIS PRODUCT DOES NOT CONTAIN A CHEMICAL LISTED IN SECTION 313 AT OR ABOVE DE MINIMIS CONCENTRATES. ALL COMPONENTS LISTED ARE EXCLUDED FROM LISTING ON CANADIAN DSL INVENTORY AND THE TSCA INVENTORY.

III. PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: 100°F	SPECIFIC GRAVITY: 0.80
VAPOR PRESSURE (mm Hg.): 31.20 @ 20°C	VAPOR DENSITY: HEAVIER
VAPOR DENSITY (AIR = 1): HEAVIER	EVAPORATION RATE: < BUAC
SOLUBILITY IN WATER: NO	VOC: 766 g/l
APPEARANCE & ODOR: BLACK FLUID	REDUCED VOC: 766 g/l

IV. FIRE & EXPLOSION HAZARD DATA

FLASH POINT (TEST METHOD): 52°F (T.C.C.)	AUTO IGNITION TEMPERATURE: N/A
FLAMMABLE LIMITS: 2.0 - 12.0	LEL: 2.0 UEL: 12.0

EXTINGUISHING MEDIA: CAUTION: ALL THESE PRODUCTS HAVE A VERY LOW FLASH POINT: USE OF WATER SPRAY WHEN FIGHTING FIRE MAY BE INEFFICIENT. FOR MIXTURES CONTAINING A HIGH PERCENTAGE OF AN ALCOHOL OR POLAR SOLVENT, ALCOHOL-RESISTANT FOAM MAY BE MORE EFFECTIVE. **SMALL FIRES:** DRY CHEMICAL, CO2, WATER SPRAY OR REGULAR FOAM. **LARGE FIRES:** WATER SPRAY, FOG OR REGULAR FOAM. USE WATER SPRAY OR FOG; DO NOT USE STRAIGHT STREAMS. MOVE CONTAINERS FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK.

SPECIAL FIRE FIGHTING PROCEDURES: FIGHT FIRE FROM MAXIMUM DISTANCE OR USE UNMANNED HOSE HOLDERS OR MONITOR NOZZLES. COOL CONTAINERS WITH FLOODING QUANTITIES OF WATER UNTIL WELL AFTER FIRE IS OUT. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND FROM VENTING SAFETY DEVICES OR DISCOLORATION OF TANK. ALWAYS STAY AWAY FROM TANKS ENGULFED IN FIRE. FOR MASSIVE FIRE, USE UNMANNED HOSE HOLDERS OR MONITOR NOZZLES; IF THIS IS IMPOSSIBLE, WITHDRAW FROM AREA AND LET FIRE BURN.

UNUSUAL FIRE & EXPLOSION HAZARDS: HIGHLY FLAMMABLE: WILL BE EASILY IGNITED BY HEAT, SPARKS, OR FLAMES. VAPORS MAY FORM EXPLOSIVE MIXTURES WITH AIR. VAPORS MAY TRAVEL TO SOURCE OF IGNITION AND FLASH BACK. MOST VAPORS ARE HEAVIER THAN AIR. THEY WILL SPREAD ALONG GROUND AND COLLECT IN LOW OR CONFINED AREAS (SEWERS, BASEMENTS, TANKS). VAPOR EXPLOSION HAZARD INDORS, OUTDOORS OR IN SEWERS. THOSE SUBSTANCES DESIGNATED WITH A 'P' MAY POLYMERIZE EXPLOSIVELY WHEN HEATED OR INVOLVED IN A FIRE. RUNOFF TO SEWER MAY CREATE FIRE OR EXPLOSION HAZARD. CONTAINERS MAY EXPLODE WHEN HEATED. MANY LIQUIDS ARE LIGHTER THAN WATER. SUBSTANCE MAY BE TRANSPORTED HOT. IF MOLTEN ALUMINUM IS INVOLVED, REFER TO GUIDE 169.

FIRE FIGHTING EQUIPMENT: WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (SCBA). STRUCTURAL FIREFIGHTERS PROTECTIVE CLOTHING WILL ONLY PROVIDE LIMITED PROTECTION.

ESTIMATED HMIS RATINGS: HEALTH - 1 FLAMMABILITY - 3 REACTIVITY - 0 PERSONAL PROTECTION - B

ESTIMATED NFPA RATINGS: HEALTH - 1 FLAMMABILITY - 3 REACTIVITY - 0 SPECIFIC HAZARD - N/A

V. REACTIVITY DATA		
STABILITY X STABLE	UNSTABLE	CONDITIONS TO AVOID: NONE
INCOMPATIBILITY		MATERIAL TO AVOID: STRONG OXIDIZERS
HAZARDOUS POLYMERIZATION	MAY OCCUR X WILL NOT OCCUR	CONDITIONS TO AVOID: N/A
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: OXIDES OF CARBON		

VI. HEALTH HAZARD DATA		
CARCINOGENICITY: NTP? N/A	CARCINOGENICITY: IARC MONOGRAPHS? N/A	CARCINOGENICITY: OSHA REGULATED? N/A
<p>SIGNS AND SYMPTOMS OF EXPOSURE: <u>INHALATION:</u> VAPORS AND MISTS IRRITATE EYES, NOSE AND THROAT. EYE WATERING, HEADACHES, NAUSEA, DIZZINESS AND LOSS OF COORDINATION ARE INDICATIONS THAT VAPOR AND/OR MIST LEVELS ARE TOO HIGH. DUSTS GENERATED FROM SANDING AND GRINDING ON SURFACES COATED WITH THIS PRODUCT AND VAPORS AND MISTS GENERATED FROM THIS PRODUCT MAY BE HARMFUL IF INHALED. <u>INGESTION:</u> MAY BE HARMFUL IF SWALLOWED. <u>EYE:</u> CAUSES SLIGHT IRRITATION. <u>SKIN:</u> MAY CAUSE MODERATE IRRITATION. NOT EXPECTED TO BE ABSORBED THROUGH THE SKIN.</p>		
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: NONE KNOWN		
PRIMARY ROUTE(S) OF ENTRY: INHALATION		
<p>EMERGENCY AND FIRST AID PROCEDURES: <u>INHALATION:</u> IF EXCESSIVE AMOUNTS OF VAPORS OR MISTS ARE INHALED, REMOVE TO FRESH AIR. APPLY ARTIFICIAL RESPIRATION AND OTHER SUPPORTIVE MEASURES AS REQUIRED. CONSULT A POISON CENTER, EMERGENCY ROOM OR LUNG SPECIALIST FOR ADDITIONAL INFORMATION. <u>INGESTION:</u> DO NOT INDUCE VOMITING. <u>EYE:</u> FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTE. <u>SKIN:</u> IF EXCESSIVE SKIN CONTACT OCCURS, FLUSH IMMEDIATELY WITH PLENTY OF WATER, FOLLOWED BY WASHING WITH SOAP AND WATER.</p>		
<p>HEALTH HAZARDS: <u>CHRONIC:</u> THIS PRODUCT CONTAINS GRAPHITE WHICH CAN ACCUMULATE IN LUNG TISSUE AFTER LONG-TERM EXPOSURE TO THE DUST. THE POTENTIAL FOR SUCH EXPOSURE FROM THE USE OF THIS PRODUCT IS VERY LIMITED. THIS PRODUCT CONTAINS ISOPROPYL ALCOHOL. LONG TERM EXPOSURE TO ISOPROPYL ALCOHOL VAPORS HAVE PRODUCED LIVER, KIDNEYS AND TESTICULAR EFFECTS IN EXPERIMENTAL ANIMALS.</p>		

VII. PRECAUTIONS FOR SAFE HANDLING AND USE
<p>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: SHUT OFF IGNITION SOURCES; NO FLARES, SMOKING OR FLAMES IN HAZARD AREA. ALL EQUIPMENT USED WHEN HANDLING THE PRODUCT MUST BE GROUNDED. DO NOT TOUCH OR WALK THROUGH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. PREVENT ENTRY INTO WATERWAYS, SEWERS, BASEMENTS OR CONFINED AREAS. A VAPOR SUPPRESSING FOAM MAY BE USED TO REDUCE VAPORS. ABSORB OR COVER WITH DRY EARTH, SAND OR OTHER NON-COMBUSTIBLE MATERIAL AND TRANSFER TO CONTAINERS. USE CLEAN NON-SPARKING TOOLS TO COLLECT ABSORBED MATERIAL. LARGE SPILLS: DIKE FAR AHEAD OF LIQUID SPILL FOR LATER DISPOSAL. WATER SPRAY MAY REDUCE VAPOR; BUT MAY NOT PREVENT IGNITION IN CLOSED SPACES.</p>
WASTE DISPOSAL METHOD: CONSULT WITH FEDERAL, STATE AND LOCAL WASTE REGULATIONS.
<p>PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: STORAGE TEMPERATURE - AMBIENT. STORAGE PRESSURE - ATMOSPHERIC. KEEP CONTAINER CLOSED. LOOSEN CLOSURE CAUTIOUSLY BEFORE OPENING. STORE IN A COOL AND WELL VENTILATED PLACE AWAY FROM INCOMPATIBLE MATERIALS. SEE SECTION V. REACTIVITY DATA. EMPTY CONTAINERS MAY RETAIN HAZARDOUS PROPERTIES. FOLLOW ALL MSDS/LABEL WARNINGS EVEN AFTER CONTAINER IS EMPTIED.</p>

VIII. CONTROL MEASURES	
<p>EYE PROTECTION: VAPOR TIGHT CHEMICAL-TYPE SPLASH GOGGLES SHOULD BE WORN WHEN THE POSSIBILITY EXISTS FOR EYE CONTACT DUE TO SPLASHING OR SPRAYING OF LIQUID OR THE GENERATION OF AIRBORNE PARTICLES OR VAPORS.</p>	<p>SKIN PROTECTION: WEAR PROTECTIVE CLOTHING OR WORK UNIFORMS AND GLOVES CONSTRUCTED OF MATERIAL(S) WHICH ARE APPROPRIATE TO PREVENT CONTACT WITH THE CHEMICALS LISTED IN THE INGREDIENT SECTION OF THE MSDS.</p>
<p>ENGINEERING CONTROLS: PROVIDE SUFFICIENT MECHANICAL VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S). OVEREXPOSURES TO VAPORS AND MISTS MAY BE PREVENTED BY ENSURING VENTILATION CONTROLS, LOCAL EXHAUST AND/OR FRESH AIR ENTRY. NIOSH/MSHA SCHEDULE TC-23C-AIR PURIFYING OR A SCHEDULE TC-19C-AIR SUPPLIED RESPIRATOR MAY ALSO BE USED TO REDUCE EXPOSURES.</p>	

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N/E = NOT ESTABLISHED N/A = NOT APPLICABLE