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MATERIAL SAFETY DATA SHEET

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Latest Revision: 4 August 1998; Superseding 17 June 1997

Thiokol Corporation P.O. Box 707 Brigham City, UT 84302-0707	Emergency Phone No. (801) 863-8545 Product Information (801) 863-3325
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Section 1.

CHEMICAL PRODUCT IDENTIFICATION

NAME: Trade Name: CL-20
Synonyms: CL-20 Explosive, Alpha CL-20,
Epsilon CL-20,
Epsilon CL-20 Energetic Filler
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Section 2.

COMPOSITION AND INFORMATION ON INGREDIENTS

Ingredients	Percent	PEL (TWA)	STEL	TLV
CL-20 ¹ CAS NO. 135285-90-4	*	NE	NE	NE
NE: Not established. *: The safety data provided should be sufficient for most handling and exposure situations. Additional data may only be provided if appropriate DOD approval is granted. Chemical Names: A 5,2,6-(Iminomethenimino)-1H-imidazo[4,5-b]pyrazine, octahydro-1,3,4,7,8,10-hexanitro B 2,4,6,8,10,12-Hexanitro-2,4,6,8,10,12-hexaazatetracyclo[5.5.0.05,9.03.11]-dodecane C Hexanitrohexaazaisowurtzitane				

Section 3.

HAZARDS IDENTIFICATION

Exposure Limits: Not applicable.

Effects of Exposure:

Inhalation: Not known. Explosives similar to CL-20 may sensitize susceptible individuals, causing asthma-like allergic reactions.

Eyes: Not known.

Skin: Not known.

Ingestion: Not known. May be highly toxic if ingested.

Existing conditions which may be aggravated:



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Section 4.

FIRST AID MEASURES

Inhalation: Contact physician. Give oxygen or artificial respiration if needed. For thermal burns contact physician.

Eyes: Flush immediately with water for a least 15 minutes. Contact physician.

Skin: Wash with soap and water. Contact physician.

Ingestion: Contact physician.

Section 5.

FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA: Do not attempt to fight CL-20 explosive fires.

SPECIAL FIRE FIGHTING PROCEDURES: Do not fight fires involving this CL-20 explosive. If ignited, this explosive may detonate. Thrust and overpressure created while burning may give this CL-20 explosive uncontrollable ballistic properties. Fire fighting should be limited to evacuating an area proportional to the amount of CL-20 explosive which may detonate or burn, and preventing the spread of fire beyond the isolated area.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS: Static discharge, impact, friction and pinch points between hard surfaces may initiate a conflagration or detonation.

Overpressures associated with rapidly burning CL-20 explosive can be explosive-like, creating fireballs and shock waves.

Section 6.

ACCIDENTAL RELEASE MEASURES

Precautions if Container is Damaged or Material Spilled: CL-20 explosive must be protected from sources of ignition (see Section 7). If ignited accidentally, a detonation should be anticipated, causing a shock wave, spreading burning material over a wide area, and producing toxic decomposition fumes. Contact appropriate authorities.

Section 7.

HANDLING AND STORAGE

Buildings and transporting equipment must be protected from lightning and other forms of static discharge. Protect CL-20 explosive from ignition sources, static charge buildup, mechanical shock, friction. Burning characteristics may only be predicted when the environmental history is known, and aging and temperature limits set by design and aging studies have not been exceeded. CL-20 should be shipped wet-packed to minimize sensitivity.

Other Precautions: CL-20 explosive is federally controlled. CL-20 explosive should be controlled and handled only by personnel properly trained and authorized to handle explosive materials.

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Section 8.

EXPOSURE CONTROLS - PERSONAL PROTECTION

Ventilation: Provide sufficient mechanical (general and/or exhaust ventilation to limit vapor inhalation.

Respiratory Protection: A NIOSH/MSHA approve air supplied respirator is advised in the absence of proper environmental control. Engineering and/or administrative controls may be implemented to reduce exposure.

Protective Gloves: Wear nonporous gloves such as natural rubber or neoprene for handling.

Eye Protection: Protect from exposure to dust. Chemical monogoggles should be worn for most applications. Workers who risk exposure should have access to an eye fountain and safety shower.

Other Protective Equipment: Clothing combinations which may create static discharges must be avoided. Workers handling this explosive should be grounded, wearing conductive shoes or equivalent on a clean conductive floor. Flame resistant clothing is advised. CL-20 explosive should be contained in conductive containers. Glassware, metal tools, and grainy or gritty surfaces should be avoided.

Section 9.

PHYSICAL AND CHEMICAL PROPERTIES

VAPOR DENSITY: N/A

SPECIFIC GRAVITY: >1.8 g/cc

SOLUBILITY IN WATER: NIL

VAPOR PRESSURE: N/A

EVAPORATION RATE: N/A

MELTING POINT: Decomposes.

BOILING POINT: Decomposes.

APPEARANCE AND COLOR: White crystalline solid.

DETECTION METHODS: N/A

pH: N/A

FLASHPOINT: Not applicable.

Section 10.

STABILITY AND REACTIVITY

STABILITY: Unstable, if heated.

Conditions to Avoid: Shock, impact, friction, and static charge buildup and high temperatures.

INCOMPATIBILITY (MATERIALS TO AVOID): Not known.

HAZARDOUS DECOMPOSITION PRODUCTS:

HAZARDOUS POLYMERIZATION: Will not occur.

OTHER HAZARDS:

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Section 11.

TOXICOLOGICAL INFORMATION**ACUTE EFFECTS:** See Section 3.**CHRONIC EFFECTS:** May sensitize susceptible individuals causing asthma-like allergic reactions.**TARGET ORGAN(S):** Unknown.

Section 12.

ECOLOGICAL INFORMATION

No data available.

Section 13.

DISPOSAL CONSIDERATIONS

Dispose of in accordance with federal, state, and local regulations. This material is an explosive and may detonate.

Section 14.

TRANSPORTATION INFORMATION

Transport in accordance with federal, state, and local regulations. See 49 CFR - Rules governing transportation.

CL-20 Dry**Proper Shipping Names:** Substances, explosive, n.o.s., (Hexanitrohexaazaisowurtzitane)**Hazard Class:** 1.1D**I.D. Number:** UN0475**Packing Group:** II**Label:** Explosive 1.1 D**Packing Method:** E-5 49 CFR 173.62(C)**EX- Number:** EX-9410242**CL-20, Wetted with 15% Water****Proper Shipping Names:** Substances, explosive, n.o.s., (Hexanitrohexaazaisowurtzitane)**Hazard Class:** 1.1D**I.D. Number:** UN0475**Packing Group:** II**Label:** Explosive 1.1 D**Packing Method:** (E-6 (a)(i)), (E-6(a)(ii)) 49 CFR 173.62(C)**EX- Number:** EX-9405294

Section 15.

REGULATORY INFORMATION**Toxic Substances Control Act (TSCA)****NOTICE:** CL-20 is not registered on the TSCA Inventory and therefore this chemical material is for **Research and Development Use Only** under the supervision of a technically qualified individual.

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Section 16.

OTHER INFORMATION

For R&D use only. To the best of our knowledge the information contained herein is correct. All chemicals may present unknown health hazards and must be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of the suitability of the chemical is the sole responsibility of the user. Users of any chemical should satisfy themselves that the conditions and methods of use assure that the chemical is used safely.

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