

SAFETY DATA SHEET

BOOSTER-BI-DIRECTIONAL HMX

Product Trade Name:**Revision Date:** 17-Jun-2015**Revision Number:** 8**1. Identification****1.1. Product Identifier**

Product Trade Name: BOOSTER-BI-DIRECTIONAL HMX
Synonyms: None
Chemical Family: Explosive
Internal ID Code HM000131

1.2 Recommended use and restrictions on use

Application: Explosive Charge
Uses Advised Against No information available

1.3 Manufacturer's Name and Contact Details

Manufacturer/Supplier Halliburton Energy Services Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Emergency Telephone: (281) 575-5000

Prepared By Chemical Stewardship
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number

Emergency Telephone Number (281) 575-5000

2. Hazard(s) Identification**2.1 Classification in accordance with paragraph (d) of §1910.1200**

Acute Toxicity - Dermal	Category 3 - H311
Specific Target Organ Toxicity - (Single Exposure)	Category 1 - H370
Explosives.	Division 1.4 - H204

2.2. Label Elements**Hazard Pictograms**

**Signal Word**

Danger

Hazard Statements

H204 - Fire or projection hazard
 H311 - Toxic in contact with skin
 H370 - Causes damage to organs

Precautionary Statements**Prevention**

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
 P240 - Ground/Bond container and receiving equipment
 P250 - Do not subject to grinding/shock/friction
 P260 - Do not breathe dust/fume/gas/mist/vapors/spray
 P264 - Wash face, hands and any exposed skin thoroughly after handling
 P270 - Do not eat, drink or smoke when using this product
 P280 - Wear protective gloves/eye protection/face protection

Response

P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
 P312 - Call a POISON CENTER or doctor/physician if you feel unwell
 P362 - Take off contaminated clothing and wash before reuse
 P307 + P311 - IF exposed: Call a POISON CENTER or doctor/physician
 P370 + P380 - In case of fire: Evacuate area
 P372 - Explosion risk in case of fire
 P373 - DO NOT fight fire when fire reaches explosives

Storage

P401 - Store in accordance with local/regional/national/international regulations
 P405 - Store locked up

Disposal

P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

Contains**Substances**

2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)
 Cyclotetramethylene tetranitramine (HMX)

CAS Number

38082-89-2
 2691-41-0

2.3 Hazards not otherwise classified

None known

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
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2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	5 - 10%	Expl. 1.1 (H201)
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	5 - 10%	Acute Tox. 3 (H311) STOT SE 1 (H370) Expl. 1.1 (H201)

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First-Aid Measures

4.1. Description of first aid measures

Inhalation	If inhaled, move victim to fresh air and seek medical attention.
Eyes	In case of contact, or suspected contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention immediately after flushing.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Ingestion	Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

4.2 Most important symptoms/effects, acute and delayed

Toxic in contact with skin. May cause damage to internal organs.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

Do NOT fight fire. Isolate area and evacuate personnel to a safe area. Guard against intruders. Allow fire to burn itself out.

Extinguishing media which must not be used for safety reasons

None known.

5.2 Specific hazards arising from the substance or mixture

Special Exposure Hazards

May detonate with impact or on heating. May explode and throw fragments 1 mile or more in fire. Evacuate all persons, including emergency responders.

5.3 Special protective equipment and precautions for fire-fighters

Special Protective Equipment for Fire-Fighters

Not applicable.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Use only competent persons for cleanup.
See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Isolate area and remove sources of friction, impact, heat, low level electrical current, and RF energy. Remove ignition sources and work with non-sparking tools.

7. Handling and storage

7.1. Precautions for Safe Handling

Handling Precautions

Do NOT consume food, drink, or tobacco in contaminated areas. Avoid contact with eyes, skin, or clothing. Wash hands after use. Launder contaminated clothing before reuse.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Information

Store only in ATF approved magazines. Keep away from friction, impact, and heat.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	Not applicable	Not applicable
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	Not applicable	Not applicable

8.2 Appropriate engineering controls

Engineering Controls Use in a well ventilated area.

8.3 Individual protection measures, such as personal protective equipment

Personal Protective Equipment If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection Dust/mist respirator. (N95, P2/P3)

Hand Protection Cloth gloves.

Skin Protection Cotton coveralls, undergarments, and socks. Conductive soled shoes.

Eye Protection Wear safety glasses or goggles to protect against exposure.

Other Precautions None known.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Solid **Color:** Metallic
Odor: Odorless **Odor Threshold:** No information available

Property Remarks/ - Method	Values
pH:	No data available
Freezing Point/Range	No data available
Melting Point/Range	No data available
Boiling Point/Range	No data available
Flash Point	No data available
Flammability (solid, gas)	No data available
upper flammability limit	No data available
lower flammability limit	No data available
Evaporation rate	No data available
Vapor Pressure	No data available

Vapor Density	No data available
Specific Gravity	No data available
Water Solubility	Insoluble in water
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

VOC Content (%)	No data available
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10. Stability and Reactivity**10.1. Reactivity**

Not expected to be reactive.

10.2. Chemical Stability

Stable

10.3. Possibility of Hazardous Reactions

Will Not Occur

10.4. Conditions to Avoid

May detonate with friction, impact, heat, and low level electrical current.

10.5. Incompatible Materials

Strong acids. Strong alkalis.

10.6. Hazardous Decomposition Products

Shrapnel. Oxides of nitrogen. Metal oxides. Carbon monoxide and carbon dioxide.

11. Toxicological Information**11.1 Information on likely routes of exposure**

Principle Route of Exposure	Eye or skin contact, inhalation. Product does not present exposures health hazards during normal handling and use. However, this product is an explosive material and uncontrolled detonation may cause severe physical injury including death. All explosives are dangerous and must be handles carefully and used following approved safety procedures under the direction of competent, experience persons in accordance with all applicable regulations and ordinances.
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11.2 Symptoms related to the physical, chemical and toxicological characteristics**Acute Toxicity****Inhalation**

May cause effects to the blood and blood system. May cause central nervous system depression including headache, dizziness, drowsiness, incoordination, slowed reaction time, slurred speech, giddiness and unconsciousness. May cause damage to the nervous, urinary, and reproductive systems. Nitrogen oxides generated during use are irritating to the respiratory system.

Eye Contact

May cause eye irritation.

Skin Contact

Toxic in contact with skin. May be absorbed through the skin and contribute to the symptoms listed under ingestion. Nitrogen oxides generated during use are skin irritants.

Ingestion

May cause abdominal pain, vomiting, nausea, and diarrhea.

Chronic Effects/Carcinogenicity Prolonged or repeated exposure may cause blood forming system, nervous, urinary tract and reproductive system damage. Prolonged or repeated exposure may cause embryo and fetus toxicity.

11.3 Toxicity data**Toxicology data for the components**

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	> 5000 mg/kg (Rat)	No data available	No data available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	6490 mg/kg (Rat) 2300 mg/kg (Rat)	5 g/kg (Rat) 630 mg/kg (Rabbit) 982 mg/kg (Rabbit)	No data available

Substances	CAS Number	Skin corrosion/irritation
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available.
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	Not irritating to skin in rabbits.

Substances	CAS Number	Eye damage/irritation
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available.
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	Non-irritating to rabbit's eye

Substances	CAS Number	Skin Sensitization
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	Did not cause sensitization on laboratory animals (guinea pig)

Substances	CAS Number	Respiratory Sensitization
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	No data of sufficient quality are available.

Substances	CAS Number	Mutagenic Effects
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	In vitro tests did not show mutagenic effects. In vivo tests did not show mutagenic effects. (similar substances)

Substances	CAS Number	Carcinogenic Effects
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available.
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	No information available.

Substances	CAS Number	Reproductive toxicity
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances)

Substances	CAS Number	STOT - single exposure
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available

Cyclotetramethylene tetranitramine (HMX)	2691-41-0	May cause disorder and damage to the Central Nervous System (CNS)
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Substances	CAS Number	STOT - repeated exposure
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	Aspiration hazard
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available Not applicable
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	Not applicable

12. Ecological Information

12.1. Toxicity

Ecotoxicity Effects

Product Ecotoxicity Data

No data available

Substance Ecotoxicity Data

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available	No information available	No information available	No information available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	EC50 (96h) > 22 umol/L (Scenedesmus capricornutum)	LC50 8.8-26 mg/L (Pimephales promelas) LC50 (96h) >15 mg/L (Pimephales promelas) LC50 (96h) > 32 mg/L (Lepomis macrochirus) NOEC (32d) > 3.3 mg/L (Pimephales promelas)	No information available	EC50 (48h) > 15 mg/L (Daphnia magna) NOEC (28d) > 3.9 mg/L (Daphnia magna)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	Not readily biodegradable (2% @ 29d)

12.3. Bioaccumulative potential

Substances	CAS Number	Log Pow
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	0.165

12.4. Mobility in soil

Substances	CAS Number	Mobility
2,6-Bis(picrylamino)-3,5-dinitro-pyridine (PYX)	38082-89-2	No information available
Cyclotetramethylene tetranitramine (HMX)	2691-41-0	No information available.

12.5 Other adverse effects

No information available

13. Disposal Considerations**13.1. Waste treatment methods**

Disposal Method Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging Do NOT reuse container. Store only in ATF approved magazines.

14. Transport Information**US DOT**

UN Number: UN0367
UN Proper Shipping Name: Fuze, Detonating
Transport Hazard Class(es): 1.4S
Packing Group: II
EX Number: EX-8904003
Environmental Hazards: Not applicable
NAERG: NAERG 114

US DOT Bulk

DOT (Bulk) Not applicable

Canadian TDG

UN Number: UN0367
UN Proper Shipping Name: Fuze, Detonating
Transport Hazard Class(es): 1.4S
Packing Group: II
EX Number: EX-8904003
Environmental Hazards: Not applicable

IMDG/IMO

UN Number: UN0367
UN Proper Shipping Name: Fuze, Detonating
Transport Hazard Class(es): 1.4S
Packing Group: II
EX Number: EX-8904003
Environmental Hazards: Not applicable
EMS: EmS F-B, S-X

IATA/ICAO

UN Number: UN0367
UN Proper Shipping Name: Fuze, Detonating
Transport Hazard Class(es): 1.4S
Packing Group: II
EX Number: EX-8904003
Environmental Hazards: Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

Special Precautions for User: None

15. Regulatory Information**US Regulations**

US TSCA Inventory All components listed on inventory or are exempt.

EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard Fire Hazard Sudden Release of Pressure Hazard
EPA SARA (313) Chemicals	This product contains toxic chemical(s) listed below which is(are) subject to the reporting requirements of Section 313 of Title III of SARA and 40 CFR Part 372: Lead//7439-92-1 Copper//7440-50-8
EPA CERCLA/Superfund Reportable Spill Quantity	EPA Reportable Spill Quantity is 400 Pounds based on Lead (CAS: 7439-92-1).
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does meet the criteria of a hazardous waste as defined by the US EPA, because of: Reactivity D003
California Proposition 65	All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law	Does not apply.
NJ Right-to-Know Law	One or more components listed.
PA Right-to-Know Law	Does not apply.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory or are exempt.
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16. Other information

Preparation Information

Prepared By	Chemical Stewardship Telephone: 1-580-251-4335 e-mail: fdunexchem@halliburton.com
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Revision Date: 17-Jun-2015

Reason for Revision SDS sections updated:
2

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms

bw – body weight
CAS – Chemical Abstracts Service
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
h - hour
mg/m³ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
w/w - weight/weight
d - day

Key literature references and sources for data

www.ChemADVISOR.com/

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End of Safety Data Sheet