HYDROGEN - HYDROGEN, TECHNICAL
MATERIAL SAFETY DATA SHEET
FSC: 6830
NIIN: (to be supplied by manufacturer)
Manufacturer's CAGE: (to be supplied by manufacturer)
Part No. Indicator: A
Part Number/Trade Name: HYDROGEN

General Information

Item Name: HYDROGEN, TECHNICAL
Company's Name: (to be supplied by manufacturer)
Company's Street: (to be supplied by manufacturer)
Company's City: (to be supplied by manufacturer)
Company's State: (to be supplied by manufacturer)
Company's Country: (to be supplied by manufacturer)
Company's Zip Code: (to be supplied by manufacturer)
Company's Emer Ph #: (to be supplied by manufacturer)
Company's Info Ph #: (to be supplied by manufacturer)
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 003
Status: SM
Date MSDS Prepared: (to be supplied by manufacturer)
Safety Data Review Date: (to be supplied by manufacturer)
Supply Item Manager: (to be supplied by manufacturer)
MSDS Serial Number: (to be supplied by manufacturer)
Specification Number: (to be supplied by manufacturer)
Spec Type, Grade, Class: TYPE I
Hazard Characteristic Code: G2
Unit of Issue: CF
Unit of Issue Container Qty: (to be supplied by manufacturer)
Type of Container: CYLINDER
Net Unit Weight: UNKNOWN
NRC/State License Number: NONE
Net Propellant Weight-Ammo: NONE

Ingredients/Identity Information

Proprietary: NO
Ingredient: HYDROGEN
Ingredient Sequence Number: 01
%: 100
NIOSH (RTECS) Number: MW8900000
CAS Number: 1333-74-0
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE RECOMMENDED
Physical/Chemical Characteristics

Appearance And Odor: COLORLES GAS AT NORMAL TEMPERATURE AND PRESSURE; ODORLESS
Boiling Point: -422F,-252C
Melting Point: -434F,-259C
Vapor Pressure (MM Hg/70 F): GAS
Vapor Density (Air = 1): 0.696
Specific Gravity: GAS
Decomposition Temperature: UNKNOWN
Evaporation Rate and Ref: N/A
Solubility in Water: NEGLIGIBLE
Viscosity: UNKNOWN
Corrosion Rate (IPY): UNKNOWN
Autoignition Temperature: 968F

Fire and Explosion Hazard Data

Flash Point: FLAMMABLE GAS
Lower Explosive Limit: 4
Upper Explosive Limit: 75
Extinguishing Media: CO2, DRY CHEMICALS, WATER SPRAY OR FOG
Special Fire Fighting Proc: EVACUATE AREA. COOL CONTAINER W/WATER SPRAY (MAX DISTANCE). DO NOT EXTINGUISH FLAMES, ALLOW TO BURN OUT! USE SCBA. STOP GAS FLOW & REMOVE CONTAINERS IF W/O RISK
Unusual Fire And Expl Hazards: FLAME NEARLY INVISIBLE. FORMS EXPLOSIVE MIXTURES W/AIR & OXIDIZERS. KEEP CONTAINERS BELOW 125F. ESCAPING GAS MAY IGNITE SPONTANEOUSLY, HAS LOW IGNITION ENERGY.

Reactivity Data

Stability: YES
Cond to Avoid (Stability): FOLLOW COMPRESSED GAS ASSN INSTRUCTIONS IN PAMPHLET “SAFE HANDLING OF COMPRESSED GAS IN CONTAINERS”.
Materials to Avoid: OXIDIZING AGENTS, LITHIUM, HALOGENS
Hazardous Decomp Products: NONE
Hazardous Poly Occur: NO
Conditions to Avoid (Poly): WILL NOT OCCUR.

Health Hazard Data

LD50-LC50 Mixture: LD50 (ORAL RAT) IS UNKNOWN
Route of Entry - Inhalation: YES
Route of Entry - Skin: NO
Route of Entry - Ingestion: NO
Health Haz Acute And Chronic: INGESTED:UNLIKELY ROUTE OF EXPOSURE. SKIN: NO EVIDENCE OF ADVERSE EFFECTS. INHALED:SIMPLE ASPHYXIAN. MODERATE CONCENTRATIONS. MAY CAUSE HEADACHE, DROWSINESS, EXCITATION, EXCESS SALIVATION, VOMITING & UNCONSCIOUSNESS. EYE: NO EVIDENCE OF ADVERSE EFFECTS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: MFR LISTED NO INFORMATION ABOUT THE
CARCINOGENICITY OF THIS MATERIAL. HMIS DOES NOT EXPECT IT TO BE CARCINOGENIC.
Signs/Symptoms Of Overexp: INGESTED: UNLIKELY ROUTE OF EXPOSURE. SKIN: NO EVIDENCE OF ADVERSE EFFECTS. INHALED: SIMPLE ASPHYXIANT. HEADACHE, NO EVIDENCE OF ADVERSE EFFECTS.
Med Cond Aggravated By Exp: A KNOWLEDGE OF THE AVAILABLE TOXICOLOGY INFORMATION AND OF THE PHYSICAL & CHEMICAL PROPERTIES OF THE MATERIAL SUGGEST THAT OVEREXPOSURE IS UNLIKELY TO AGGRAVATE EXISTING MEDICAL CONDITIONS.
Emergency/First Aid Proc: INGESTED: PRODUCT IS A GAS AT NORMAL TEMPERATURE & PRESSURE. SKIN: WASH WITH SOAP & WATER. INHALED: REMOVE TO FRESH AIR. GIVE OXYGEN IF BREATHING IS DIFFICULT, ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION. EYE: FLUSH W/WATER. NOTE TO PHYSICIAN: THERE IS NO SPECIFIC ANTIDOTE. PRODUCT IS RELATIVELY INERT. TREATMENT SHOULD CONTROL SYMPTOMS AND CLINICAL CONDITION.

Precautions for Safe Handling and Use

Steps if Matl Released/Spill: DANGER! FORMS EXPLOSIVE MIXTURES W/AIR! EVACUATE AREA. USE SCBA. REMOVE SOURCES OF IGNITION IF W/O RISK. STOP LEAK IF W/O RISK. VENTILATE AREA OR MOVE CONTAINER TO WELL-VENTILATED AREA IF W/O RISK. CHECK ATMOSPHERE FOR EXPLOSIVENESS BEFORE ENTERING.
Neutralizing Agent: NO INFORMATION GIVEN BY MFR ON MSDS.
Waste Disposal Method: PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PRODUCT, RESIDUE, DISPOSABLE CONTAINER OR LINER IN AN ENVIRONMENTALLY ACCEPTABLE MANNER IN FULL COMPLIANCE FEDERAL, STATE & LOCAL REGULATIONS.
Precautions-Handling/Storing: FOLLOW COMPRESSED GAS ASSN INSTRUCTIONS IN PAMPHLET “SAFE HANDLING OF COMPRESSED GAS IN CONTAINERS”. NEVER WORK ON A PRESSURIZED SYSTEM.
Other Precautions: PROTECT CYLINDERS FROM DIRECT SUNLIGHT & STORE IN A WELL VENTILATED AREA. PROTECT FROM PHYSICAL DAMAGE. ISOLATE CYLINDERS FROM OXYGEN & CHLORINE. DO NOT LOAD WITH EXPLOSIVES, POISONS, RADIOACTIVE MATERIALS & ORGANIC PEROXIDES.

Control Measures

Ventilation: USE EXPLOSION PROOF GENERAL/LOCAL EXHAUST SUFFICIENT TO CONTROL WORKER EXPOSURE.
Protective Gloves: PREFERRED FOR CYLINDER HANDLING
Eye Protection: SELECT PER OSHA 29CFR1910.133
AVOID UNNECESSARY EXPOSURE. WASH THOROUGHLY BEFORE EATING OR DRINKING
Suppl. Safety & Health Data: NONE
Transportation Data

Trans Data Review Date: 94365
DOT PSN Code: HLR
DOT Proper Shipping Name: HYDROGEN, COMPRESSED
DOT Class: 2.1
DOT ID Number: UN1049
DOT Label: FLAMMABLE GAS
IMO PSN Code: IGH
IMO Proper Shipping Name: HYDROGEN, COMPRESSED
IMO Regulations Page Number: 2148
IMO UN Number: 1049
IMO UN Class: 2(2.1)
IMO Subsidiary Risk Label: -
IATA PSN Code: NSD
IATA UN ID Number: 1049
IATA Proper Shipping Name: HYDROGEN, COMPRESSED
IATA UN Class: 2.1
IATA Label: FLAMMABLE GAS
AFI PSN Code: NSD
AFI Symbols: 0
AFI Prop. Shipping Name: HYDROGEN, COMPRESSED
AFI Class: 2.1
AFI ID Number: UN1049
AFI Label: FLAMMABLE GAS
AFI Basic Pac Ref: 6-6,6-10

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 31DEC94
MFR Label Number: NONE
Label Status: F
Common Name: HYDROGEN
Signal Word: DANGER!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: **TARGET ORGANS: RESPIRATORY SYSTEM**
INGESTED: UNLIKELY ROUTE OF EXPOSURE. SKIN: NO EVIDENCE OF ADVERSE EFFECTS.
INHALED: SIMPLE ASPHYXIANT. MODERATE CONCENTRATIONS MAY CAUSE HEADACHE,
DROWSINESS, EXCITATION, EXCESS SALIVATION, VOMITING & UNCONSCIOUSNESS.
EYE: NO EVIDENCE OF ADVERSE EFFECTS.
FOLLOW COMPRESSED GAS ASSN INSTRUCTIONS IN DANGER! FORMS EXPLOSIVE MIXTURES
W/AIR! EVACUATE AREA, USE SCBA. REMOVE SOURCES OF IGNITION & STOP LEAK IF W/O
RISK. VENTILATE AREA OR MOVE CONTAINER TO WELL VENTILATED AREA IF W/O RISK.
CHECK ATMOSPHERE FOR EXPLOSIVENESS ENTERING AREA.
Protect Eye: Y
Protect Skin: Y
Label Name: (to be supplied by manufacturer)
Label Street: (to be supplied by manufacturer)
Label City: (to be supplied by manufacturer)
Label State: (to be supplied by manufacturer)
Label Zip Code: (to be supplied by manufacturer)
LIQUID HYDROGEN - CRYOGENIC LIQUID
MATERIAL SAFETY DATA SHEET
FSC: 9135
NIIN: (to be supplied by manufacturer)
Manufacturer's CAGE: (to be supplied by manufacturer)
Part No. Indicator: A
Part Number/Trade Name: LIQUID HYDROGEN

General Information

Item Name: CRYOGENIC LIQUID
Company's Name: (to be supplied by manufacturer)
Company's Street: (to be supplied by manufacturer)
Company's City: (to be supplied by manufacturer)
Company's State: (to be supplied by manufacturer)
Company's Country: (to be supplied by manufacturer)
Company's Zip Code: (to be supplied by manufacturer)
Company's Emerg Ph #: (to be supplied by manufacturer)
Company's Info Ph #: (to be supplied by manufacturer)
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 002
Status: SE
Date MSDS Prepared: (to be supplied by manufacturer)
Safety Data Review Date: (to be supplied by manufacturer)
Preparer's Company: (to be supplied by manufacturer)
Preparer's St or P. O. Box: (to be supplied by manufacturer)
Preparer's City: (to be supplied by manufacturer)
Preparer's State: (to be supplied by manufacturer)
Preparer's Zip Code: (to be supplied by manufacturer)
MSDS Serial Number: (to be supplied by manufacturer)

Ingredients/Identity Information

Proprietary: NO
Ingredient: HYDROGEN
Ingredient Sequence Number: 01
%: 100
NIOSH (RTECS) Number: MW8900000
CAS Number: 1333-74-0
ACGIH TLV: SIMPLE ASPHYXANT
Physical/Chemical Characteristics

Appearance And Odor: COLORLESS, ODORLESS CRYOGENIC LIQUID.
Boiling Point: -422.99F
Melting Point: -434.6F
Vapor Density (Air=1): 0.0696
Specific Gravity: 0.07
Evaporation Rate And Ref: (BU AC =1): >3
Solubility In Water: NEGLIGIBLE
% Volatiles By Volume: 100
Autoignition Temperature: 968F

Fire and Explosion Hazard Data

Flash Point: FLAMMABLE GAS
Lower Explosive Limit: 4
Upper Explosive Limit: 75
Extinguishing Media: CO2, DRY CHEMICAL, WATER SPRAY/FOG.
Special Fire Fighting Proc: EVACUATE AREA. IMMEDIATELY COOL CONTAINERS
W/WATER SPRAY FROM MAXIMUM DISTANCE W/O EXTINGUISHING FLAMES. REMOVE ALL
IGNITION SOURCES SAFELY. WEAR SCBA WHERE NEEDED.
SAFELY STOP LEAK WHILE COOLING W/WATER SPRAY. SAFELY REMOVE ALL CONTAINERS
FROM AREA. ALLOW FIRE TO BURN OUT.
Unusual Fire And Expl Hazards: MAY FORM EXPLOSIVE MIXTURES W/AIR &
OXIDIZING AGENTS. LIQUID WILL SOLIDIFY AIR & CREATE EXPLOSION HAZARD.
CONTAINER MAY RUPTURE DUE TO HEAT OF FIRE. FLAME ALMOST INVISIBLE. FIREBALL IS
FORMED IF GAS CLOUD IS IGNITED. EXPLOSIVE ATMOSPHERES MAY LINGER.

Reactivity Data

Stability: YES
Cond to Avoid (Stability): HEAT, FIRE & OTHER IGNITION SOURCES.
Materials to Avoid: OXYGEN, OXIDIZING AGENTS, AIR, LITHIUM, HALOGENS.
Hazardous Decomp Products: NONE
Hazardous Poly Occur: NO

Health Hazard Data

Route of Entry - Inhalation: YES
Route of Entry - Skin: NO
Route of Entry - Ingestion: YES
Health Haz Acute And Chronic: INGESTION: CONTACT W/LIQUID MAY CAUSE
FROSTBITE OF LIPS & MOUTH. EYES/SKIN: LIQUID CONTACT MAY CAUSE FROSTBITE.
INHALATION: ASPHYXIANT. CAN CAUSE RAPID SUFOCATION/DEATH DUE TO OXYGEN
DEFICIENCY.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Signs/Symptoms of Overexp: HEADACHE, DROWSINESS, DIZZINESS, EXCITATION,
EXCESS SALIVATION, VOMITING, UNCONSCIOUSNESS. 
Emergency/First Aid Proc: SKIN: IMMEDIATELY WARM FROSTBITE AREA W/WARM WATER. DON'T EXCEED 105F. INHALATION: REMOVE TO FRESH AIR. GIVE CPR/OXYGEN IF NEEDED.
EYES: IMMEDIATELY FLUSH W/WATER FOR 15 MIN.
OBTAIN MEDICAL ATTENTION IN ALL CASES. NOTE TO PHYSICIAN: NO SPECIFIC ANTIDOTE. PRODUCT IS RELATIVELY INERT. TREATMENT OF OVEREXPOSURE SHOULD BE DIRECTED AT CONTROL OF SYMPTOMS & CLINICAL CONDITION.

Precautions for Safe Handling and Use

Steps if Matl Released/Spill: IMMEDIATELY EVACUATE AREA. WEAR SCBA WHERE NEEDED. REMOVE IGNITION SOURCES. REDUCE VAPORS W/FOG/FINE WATER SPRAY. BEFORE ENTERING AREA, CHECK ATMOSPHERE W/APPROPRIATE DEVICE. VENTILATE AREA/MOVE LEAKING CONTAINER TO WELL-VENTILATED AREA SAFELY.
Waste Disposal Method: PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PRODUCT/RESIDUE/DISPOSABLE CONTAINER/LINER IN AN ENVIRONMENTALLY ACCEPTABLE MANNER IAW/FEDERAL, STATE & LOCAL REGULATIONS. SAFELY SHUT OFF LEAK.
Other Precautions: DON'T GET LIQUID IN EYES, ON SKIN/CLOTHING. USE PIPING & EQUIPMENT DESIGNED TO WITHSTAND PRESSURES/TEMPS TO BE ENCOUNTERED. ONLY USE SPARK/EXPLOSION PROOF EQUIPMENT. GROUND ALL EQUIPMENT. NEVER WORK ON A PRESSURIZED SYSTEM.

Control Measures

Respiratory Protection: NONE REQUIRED UNDER NORMAL USE. WEAR AIR SUPPLIED RESPIRATOR WHILE WORKING IN CONFINED AREAS W/THIS PRODUCT.
Ventilation: EXPLOSION PROOF LOCAL EXHAUST SYSTEM W/SUFFICIENT AIR FLOW VELOCITY RECOMMENDED. GENERAL EXHAUST MAY BE ACCEPTABLE.
Protective Gloves: LOOSE FITTING CRYOGENIC
Eye Protection: SAFETY GLASSES & FULL FACE SHIELD
Other Protective Equipment: METATARSAL SHOES FOR CYLINDER HANDLING, CUFFLESS TROUSERS OUTSIDE SHOES, HIGH TOP SHOES ARE PREFERRED.
Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

Suppl. Safety & Health Data: NONE

Transportation Data

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Label Data

Label Required: YES
Label Status: G
Common Name: LIQUID HYDROGEN
Special Hazard Precautions: INGESTION: CONTACT W/LIQUID MAY CAUSE FROSTBITE OF LIPS & MOUTH. EYES/SKIN: LIQUID CONTACT MAY CAUSE FROSTBITE. INHALATION: ASPHYXIANT. CAN CAUSE RAPID SUFFOCATION/DEATH DUE TO OXYGEN DEFICIENCY. HEADACHE, DROWSINESS, DIZZINESS, EXCITATION, EXCESS SALIVATION, VOMITING, UNCONSCIOUSNESS.
Label Name: (to be supplied by manufacturer)
Label Street: (to be supplied by manufacturer)
Label City: (to be supplied by manufacturer)
Label State: (to be supplied by manufacturer)
Label Zip Code: (to be supplied by manufacturer)
Label Country: (to be supplied by manufacturer)
Label Emergency Number: (to be supplied by manufacturer)