



BETE FOG NOZZLE, INC.
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Material Safety Data Sheet

TO: Graham Corporation
FROM: BETE FOG NOZZLE, INC
PO#: B142246
BETE SO#: 335686-9
OTHER REF: 1441942

BETE PART: 3/4FWL-8 60@20
MATERIAL: 316L Stainless Steel
QUANTITY: 2

We hereby certify that the material accompanying this certificate is supplied in accordance with our ISO 9001:2008 Registered Quality Management System. The attached Material Safety Data Sheets (MSDS) are typical of the supplied material(s).

CERTIFIED BY:

DATE:

May 30, 2014

NOZZLES FOR INDUSTRY, POLLUTION CONTROL, AND FIRE PROTECTION

Visit our website: www.bete.com

MATERIAL SAFETY DATA SHEET

IDENTITY (AS USED ON LABEL AND LIST): STAINLESS STEEL SS316L

SECTION I

MANUFACTURER'S NAME: VARIOUS

DISTRIBUTED BY: MILLARD METAL SERVICE CENTER INC

ADDRESS (NUMBER, STREET, CITY, STATE, AND ZIP CODE)

240 SPRING STREET SUITE M - PO BOX 232 SOUTHTON CT 06489-0232

EMERGENCY TELEPHONE NUMBER: 860-621-0171

TELEPHONE NUMBER FOR INFORMATION: 860-621-0171

DATE PREPARED JAN 1996

SECTION II - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

HAZARDOUS COMPONENTS	SYMBOL	CAS NUMBER	OSHA-PEL 8-HOUR TWA MILLIGRAMS PER CUBIC METER OF AIR	ACGIH-TLV 8-HOUR TWA
CHROMIUM *	CR	(7440-47-3)	1	0.5
METAL				
IRON	FE	(7439-89-6)	10	5
IRON OXIDE FORM				
MANGANESE *	MN	(7439-96-5)	C5 COMPOUND	C5 DUST AND COMPOUNDS
			1 FUME	1 FUME
			3 FUME STEL	3 FUME STEL
MOLYBDENUM	MO	(7439-98-7)	10 TOTAL DUST	10
INSOLUBLE COMPOUNDS			5 RESPIRABLE FRACTION	--
NICKEL *	NI	(7440-02-0)	1	1
SILICON	SI	(7440-21-3)	10 TOTAL DUST	10 TOTAL NUISANCE DUST
			5 RESPIRABLE FRACTION	

NOTES:

C CEILING LIMIT

* REPORTABLE CHEMICAL UNDER THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT. CONSULT EPA REQUIREMENTS IN 40 CFR PARTS 355, 370, 372.

SECTION II - CONTINUED
% (OPTIONAL)

EXPECTED COMPOSITIONS BASED ON TYPICAL MANUFACTURING PRACTICES (1)
THIS INFORMATION IS GENERAL IN NATURE AND IS WITHOUT WARRANTY. SEE DISCLAIMER.

ALLOY SS316L

67	IRON (2)
.03	CARBON
16.00-18.00	CHROMIUM
2.00	MANGANESE
2.00-3.00	MOLYBDENUM
10.00-14.00	NICKEL
.045	PHOSPHORUS
.030	SULFUR
1.00	SILICON

NOTES:

- (1) COMPOSITION IS MAXIMUM PERCENT UNLESS SHOWN AS A RANGE OR A MINIMUM.
(2) NOMINAL PERCENT. IRON IS DETERMINED AS THE REMAINDER.

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

	IRON	UNITS OR BASIS
BOILING POINT:	3000	DEG C
SPECIFIC GRAVITY:	7.87	H2O=1
VAPOR PRESSURE:	N/A	
MELTING POINT:	1536	DEG C
VAPOR DENSITY:	N/A	
EVAPORATION RATE:	N/A	
SOLUBILITY IN WATER:	INSOLUBLE	

APPEARANCE AND ODOR: SILVER, BROWN TO BLACK METALLIC APPEARANCE WITH NO ODOR.
DEPENDENT ON COMPOSITION, PROCESSING METHOD, AND ANY COATINGS.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: N/A FLAMMABILITY LIMITS: N/A LEL: N/A UEL: N/A

EXTINGUISHING MEDIA: USE SPECIAL MIXTURES OF DRY CHEMICAL CLASS D.

SPECIAL FIRE FIGHTING PROCEDURES: DO NOT USE WATER OR MOIST SAND. FIRE FIGHTERS
SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.

UNUSUAL FIRE AND EXPLOSION HAZARDS: SOLID MASSIVE MATERIAL IS STABLE AT
ORDINARY TEMPERATURES. DUST PRESENTS MODERATE FIRE AND EXPLOSION HAZARDS WHEN
EXPOSED TO HEAT, FLAME, CHEMICAL REACTION, OR POWERFUL OXIDIZERS. MOLTEN METAL
MAY EXPLODE ON CONTACT WITH WATER. HIGH TEMPERATURES MAY PRODUCE TOXIC FUMES.

SECTION V - REACTIVITY DATA

STABILITY: STABLE. CONDITIONS TO AVOID: MOLTEN METAL MAY REACT VIOLENTLY WITH
WATER. INCOMPATIBILITY: AVOID CONTACT WITH ACIDS, BASES, OXIDIZERS.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: MANUFACTURING OPERATIONS ON MATERIAL MAY
PRODUCE HAZARDOUS DUST AND FUME. DUST MAY BE FLAMMABLE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR. CONDITIONS TO AVOID: N/A

SECTION VI. HEALTH HAZARD DATA

ROUTES OF ENTRY: INHALATION: YES. DUST AND FUME SKIN: YES INGESTION: YES

HEALTH HAZARDS:

UNDER NORMAL HANDLING CONDITIONS THE SOLID MATERIAL PRESENTS NO SIGNIFICANT HEALTH HAZARDS. HOWEVER, DURING MANUFACTURING OPERATIONS (E.G. MACHINING, GRINDING, WELDING, MELTING, ETC.) THERE MAY BE POTENTIALLY HAZARDOUS EXPOSURE TO DUST AND FUME. THE EXPOSURE LEVELS IN SECTION II ARE RELEVANT TO FUME AND DUST.

CARCINOGENICITY: NTP IARC MONOGRAPH OSHA REGULATED

NICKEL AND NICKEL COMPOUNDS ARE LISTED AS CARCINOGENS BY IARC AND NTP.

SIGNS AND SYMPTOMS OF EXPOSURE: EXPOSURE TO FUME AND DUST MAY RESULT IN IRRITATION OF THE EYES, SKIN, NOSE, AND THROAT. SYMPTOMS INCLUDE PAIN, SWELLING, AND REDDENING OF THE AFFECTED TISSUE. SEE ELEMENTS BELOW FOR ADDITIONAL HEALTH HAZARDS (SHORT AND LONG TERM) AND ADDITIONAL SIGNS AND SYMPTOMS OF EXPOSURE.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: ANY CONDITION EFFECTING THE RESPIRATORY SYSTEM, SKIN, OR EYES.

CHROMIUM -CR- EXCESSIVE AND REPEATED INHALATION OF CHROMIUM FUME OR DUST MAY CAUSE SEVERE IRRITATION, ULCERATION OR CANCER IN THE RESPIRATORY SYSTEM (NOSE, THROAT AND LUNGS). SYMPTOMS INCLUDE COUGHING AND WHEEZING, HEADACHE, DYSPNEA, PAIN ON DEEP BREATHS, FEVER, AND LOSS OF WEIGHT. CHROMIUM ACTS AS AN ALLERGEN AND MAY CAUSE DERMATITIS ON EXPOSED SKIN WITH PAIN, SWELLING, AND RASHES. TRACHEOBRONCHIAL IRRITATION AND EDEMA MAY PERSIST AFTER OTHER SYMPTOMS SUBSIDE. CHROMIUM IS RECOGNIZED AS A SUSPECT CARCINOGEN BY NTP AND IARC.

IRON -FE- FERRUM IN LATIN. REPEATED EXPOSURE TO IRON OXIDE FUME OVER A PERIOD OF YEARS MAY CAUSE X-RAY CHANGES OF THE LUNGS, WHICH ARE REPORTED NOT TO BE DISABLING BUT MAY MAKE DIAGNOSIS OF OTHER LUNG CONDITIONS DIFFICULT OR IMPOSSIBLE.

MANGANESE -MN- MANGANESE HAS CAUSED TUMORS AND MANGANESE OXIDE HAS CAUSED BIRTH DEFECTS IN ANIMAL TESTS. CHRONIC MANGANESE POISONING MAY CAUSE PERMANENT CENTRAL NERVOUS SYSTEM DAMAGE. SYMPTOMS BEGIN WITH SLEEPINESS AND WEAKNESS IN THE LEGS FOLLOWED BY MUSCULAR TREMORS AND NIGHTTIME LEG CRAMPS.

MOLYBDENUM - OXIDES OF MOLYBDENUM HAVE CAUSED WEIGHT LOSS, AND DIGESTIVE DISTURBANCES IN ANIMAL TESTS.

NICKEL -NI- NICKEL MAY CAUSE ALLERGIC SKIN AND RESPIRATORY REACTIONS. ALLERGIC SKIN SENSITIZATION IS INDICATED BY A SEVERE RASH AFTER A SMALL EXPOSURE. ALLERGIC RESPIRATORY SENSITIZATION IS INDICATED BY BREATHING DIFFICULTY AFTER A SMALL EXPOSURE. INGESTION OF LARGE DOSES OF NICKEL MAY CAUSE GASTROINTESTINAL DISORDERS AND CONVULSIONS. INHALATION OF NICKEL DUST AND FUME CAN CAUSE UPPER RESPIRATORY CANCER CHARACTERIZED BY PAIN, BLEEDING, NASAL OBSTRUCTION, IMPAIRMENT OF VISION, LOSS OF WEIGHT, AND CHANGE IN VOICE. NICKEL AND NICKEL COMPOUNDS HAVE BEEN LISTED AS CARCINOGENS BY IARC AND NTP.

SILICON -SI- SILICON EXPOSURE POSES LITTLE HEALTH RISK WITH ONLY MINIMAL EFFECTS ON THE LUNGS. SILICON DIOXIDE FORMED WHEN SILICON IS HEATED IN AIR MAY CAUSE PULMONARY FIBROSIS AND SILICOSIS ON CHRONIC EXPOSURE. SYMPTOMS INCLUDE COUGHING, DYSPNEA, WHEEZING, REPEATED NONSPECIFIC CHEST ILLNESSES AND PROGRESSIVE IMPAIRMENT OF PULMONARY FUNCTION. SYMPTOMS PERSIST EVEN AFTER DUST EXPOSURE CEASES.

EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT: FLUSH WELL WITH RUNNING WATER TO REMOVE MATERIAL. CONTINUE FOR 15-20 MINUTES LIFTING UPPER AND LOWER EYELID UNTIL NO MATERIAL REMAINS.

SKIN CONTACT: BRUSH OFF EXCESS MATERIAL. WASH AREA WELL WITH SOAP AND WATER.
INHALATION: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED. BE SURE AIRWAY IS CLEAR AND BLOOD PRESSURE IS MAINTAINED. QUALIFIED PERSONNEL MAY ADMINISTER OXYGEN FOR DIFFICULTY IN BREATHING.

INGESTION: IF VOMITING, KEEP HEAD LOWER THAN HIPS TO AVOID ASPIRATION.
IN ALL CASES IF RECOVERY IS NOT IMMEDIATE GET MEDICAL ATTENTION PROMPTLY.

SECTION VII - SPILL OR LEAK PROCEDURE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: NO SPECIAL PROCEDURES ARE CURRENTLY MANDATED FOR "RELEASE" OF BULK SOLID MATERIAL ON LAND. HEPA FILTER VACUUMING MAY BE USED TO CLEAN UP SPILLS OF FINE DUST - DO NOT USE COMPRESSED AIR. MOLTEN MATERIAL SPILLS SHOULD BE TREATED WITH EXTREME CAUTION. REMOVE EVERYONE FROM THE AREA AND DENY ENTRY. STAY UPWIND AND AVOID LOW AREAS. AVOID CONTACT. KEEP WATER AWAY FROM MATERIAL. NOTIFY AUTHORITIES AT ONCE.
WASTE DISPOSAL METHOD: MATERIAL MUST BE DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS. SCRAP METAL CAN BE RECYCLED.

SECTION VIII - SPECIAL PROTECTION INFORMATION / SPECIAL PRECAUTIONS

RESPIRATORY PROTECTION: RESPIRATORS MAY BE REQUIRED BY OSHA 29 CFR 1910.1324.

VENTILATION: USE LOCAL AND GENERAL VENTILATION TO MAINTAIN EXPOSURE BELOW LIMITS.
LOCAL EXHAUST: USE FOR ANY PROCESS THAT PRODUCES FUME OR DUST.

PROTECTIVE GLOVES: THE USE OF GLOVES TO PREVENT INJURY IS SUGGESTED. CONSULT OSHA REGULATION 29 CFR 1910.138.

EYE PROTECTION: EYE GLASSES OR GOGGLES. CONSULT OSHA REGULATION 29 CFR 1910.133.

OTHER PROTECTIVE CLOTHING AND EQUIPMENT: AS REQUIRED BY THE SPECIFIC OPERATION.

WORK/HYGIENIC PRACTICES: AVOID BREATHING FUME AND DUST. EATING, DRINKING AND SMOKING SHOULD NOT BE PERMITTED IN THE WORK AREA. WASH EXPOSED AREAS BEFORE EATING, DRINKING OR SMOKING. WASH AND CHANGE TO CLEAN CLOTHES BEFORE LEAVING WORK. DO NOT USE COMPRESSED AIR TO CLEAN OFF SKIN OR CLOTHING. SOILED CLOTHING SHOULD BE LAUNDERED BEFORE REUSE. CONSULT OSHA REGULATION 29 CFR 1910.141.

PRECAUTIONS TO BE TAKEN IN STORAGE: USE GOOD HOUSEKEEPING PRACTICES TO PREVENT ACCUMULATIONS OF DUST AND TO KEEP AIRBORNE DUST CONCENTRATIONS AT A MINIMUM.

STORE MATERIAL AWAY FROM INCOMPATIBLE MATERIALS, AND KEEP FINE MATERIAL AWAY FROM SOURCES OF IGNITION.

SECTION IX - COMMENTS

THIS MATERIAL IS POTENTIALLY CONTAMINATED WITH COATINGS, LUBRICANTS, OILS, PAINTS, PRESERVATIVES, AND OTHER CONTAMINANTS. IF THE MATERIAL IS CONTAMINATED, SPECIAL PRECAUTIONS (SUCH AS PROCESS CONTROL AND PERSONAL PROTECTIVE EQUIPMENT, APPROPRIATE TO THE NATURE OF THE SUSPECTED CONTAMINANTS) SHOULD BE TAKEN TO AVOID RESULTING EXPOSURES FROM HANDLING OR MANUFACTURING.

DISCLAIMER OF LIABILITY

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