MATERIAL SAFETY DATA SHEET

(Ⅰ) IDENTIFICATION

MANUFACTURED BY	:	BOTH-WELL STEEL FITTINGS CO., LTD.
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TELEPHONE NO.	:	886-7-371-1536
EMERGENCY NO.	:	886-7-372-0291
PRODUCT NAME	:	THREAD & SOCKET-WELDING FITTING
CHEMICAL FAMILY	:	CARBON STEEL
FORMULA	:	NOT APPLICABLE

(Ⅱ) PRODUCT DESCRIPTION & HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

ALLOYING ELEMENTS		CAS NUMBER
Aluminum	(Al)	(7429-90-5)
Cadmium	(Cd)	(7440-43-9)
*Carbon	(C)	(7440-44-0)
*Chromium	(Cr)	(7440-47-3)
Cobalt	(Co)	(7440-48-4)
*Copper	(Cu)	(7440-50-8)
Iron	(Fe)	(7439-89-6)
Lead	(Pb)	(7439-92-1)
Magnesium	(Mg)	(7439-95-4)
*Manganese	(Mn)	(7439-96-5)
*Molybdenum	(Mo)	(7439-98-7)
*Nickel	(Ni)	(7440-02-0)
Nitrogen	(N)	(7727-37-9)
*Phosphorus	(P)	(7723-14-0)
*Silicon	(Si)	(7740-21-3)
Silver	(Ag)	(7440-22-4)
*Sulphur	(S)	(7704-34-9)
Tantalum	(Ta)	(7440-25-7)
Tin	(Sn)	(7440-31-5)
Titanium	(Ti)	(7440-32-6)
Tungsten	(W)	(7440-33-7)
*Vanadium	(V)	(7440-62-2)
Columbium	(Nb)	
Zinc	(Zn)	(7440-66-6)

*BASIC CHEMISTRY CARBON STEEL ASTM(A105) REQUIREMENT .

(Ⅲ) PHYSICAL DATA

Carbon steel pipe fittings turn reddish-brown as a result of oxidation.

MELTING POINT F (C) : Aluminum alloys-1000°F min.(538)
: All other grades -2350°F min.(1282)
BOILING POINT : Extremely high
(aluminum alloys-4000°F min.)
SPECIFIC GRAVITY (H_2O=1) : Aluminum alloys-approx. 3
: All other grades-approx. 7.5 - 8.5
VAPOR PRESSURE : 1mm hg @ 2340°F (aluminum)
VAPOR DENSITY (AIR=1) : Not applicable
PERCENT VOLATILE BY VOLUME (%) : Not applicable
SOLUBILITY IN WATER : Negligible
APPEARANCE & ODOR : Odorless solid metallic articles with gray, silver, copper, brass, or blackish color depending on grade of material and heat treatment or surface condition.

(Ⅳ) FIRE AND EXPLOSION HAZARD DATA

FLASH POINT F(C) : Not applicable
EXTINGUISHING MEDIA : Use methods applicable to surrounding are
FLAMMABLE LIMITS : Not applicable
UNUSUAL FIRE OR EXPLOSION HAZARDS : None
SPECIAL FIRE FIGHTING PROCEDURES : Use self-contained breathing apparatus for protection against degradation products. use fire fighting techniques/media applicable to surrounding materials.

(Ⅴ) HEALTH HAZARD DATA

Applicable statutory or recommended occupational exposure limits. no. threshold limit valve(TLV) or permissible exposure limit(PEL) exist for steel see chart for listing of individual constituents.

V-(1) MATERIAL AND EXPOSURE

COMPONENT	EXPOSURE FORM	OSHA-PEL 8 HR. (mg/m^3)	ACGIH-TLV TWA 8 HR. (mg/m^3)	ACGIH-STEL 8 HR TWA (mg/m^3)
Aluminum (Al)	Dust	-	10.0	20.0
	Fume	-	5.0	-
Cadmium (Cd)	Dust	0.2	0.05	0.2
	Fume	0.1	0.05*	-
Carbon (C)	As Carbon Black	3.5	3.5	7.0
Chromium (Cr)**	As Soluble Cr Salts	0.5	0.5	-
	As Insoluble Cr Salts	1.0	0.5	-
Cobalt (Co)		0.1	0.1a	0.1
Copper (Cu)	Dust	1.0	1.0	2.0
	Fume	0.1	0.2	-
Iron (Fe)	As Iron	-	5.0	-
	As Iron Oxide Fume	10.0	5.0	10.0
Lead (Pb)		0.05	0.15	0.45
Magnesium (Mg)	As Magnesium Oxide Fume	15.0	10.0	-
Manganese (Mn)	Dust	5.0*	5.0*	-
	Fume	5.0*	1.0	3.0
Molybdenum (Mo)	Soluble Compounds	5.0	5.0	-
	Insoluble Compounds	15.0	10.0	20.0
Nickel (Ni)**		1.0	1.0	0.3
Nitrogen (N)		5ppm	9.0	-
Phosphorus (P)		0.1	0.1	-
Silicon (Si)	Total Dust	5.0	10.0	20.0
	Respirable Dust	5.0	5.0	20.0
Silver (Ag)		0.01	0.1	-
Sulphur (S)	As Sulphur Dioxide	13.0	5.0	-
Tantalum (Ta)		5.0	5.0	-
Tin (Sn)		2.0	2.0	4.0
Titanium (Ti)	As Titanium Dioxide	15.0	10.0	-
Tungsten (W)	Insoluble Compounds	-	5.0	-
Vanadium (V)	As Vanadium Pentoxide, Dust Fume	0.5*	0.05	-
		0.1*	0.05	-
Zinc (Zn)	As Zinc Oxide, Dust Fume	-	b	-
		5.0	5.0	10.0

NOTES:

A - ACGIH has published a TLV of 0.05 mg/m^3 in their notice of intended changes.

B - TLV = 5.0mg/m^3 respirable dust, 10.0 mg/m^3 total dust

* - Denotes ceiling limit

** - Known or suspected carcinogen in the form of fume or dust. see sec. VI.

V-(2) **NOTE:** The above listing is a summary of elements used in alloying steel, various grades of steel will contain different combinations of these elements. trace elements may also be present in minute amounts.

V-(3) **EFFECTS OF OVEREXPOSURE**

ACUTE: Dust or fume may cause irritation to the eyes nose or throat: leave a metallic taste in the mouth , result in metal fume fever or produce flu-like symptoms.

V-(4) **CHRONIC:**

Aluminum(Al) : May initiate fibrotic changes to lung tissue.

Chromium(Cr) : Skin ulceration, irritative dermatitis, allergic reaction, ulceration of the mucous membranes, perforation of the nasal septum, bronchial cercinoma adenocar-cinoma, mutagen(?) listed NTP and IARC monographs.

Copper(Cu) : No chronic debilitating symptoms indicated.

Iron(Fe) : Siderosis

Lead(Pb) : **Anemia**, urinary dysfunction, metallic taste in mouth, weakness, constipation, nausea, nervous disorder.

Manganese(Mn) : Bronchitis, pneumonitis, lack of coordination

Molybdenum(Mo): Morphological changes in the liver, kidneys, and spleen anemia, diarrhea, bone deformity and growth retardation.

Nickel(Ni): Inflammation of respiratory tract pneumonconiosis , Skin sensitizer, certain nickel com-pounds can cause cancer. listed NTP and IARC monographs.

Phosphorous(P): Necrosis of the mandible.

Sulfur (as sulfur dioxide): Edema of the lungs

Tellurium : Garlic odor of breath and perspiration, metallic taste in mouth, dryness of the mouth. inhibition of sweat function, anorexin, nausea

Titanium(Ti) : No chronic debilitating symptoms indicated

Vanadium(V) : Emphysema, pneumonia.

Zinc(Zn) : Chromosomal anomalies in leukocytes reported. arthritis. Lameness and inflammation of the gastrointestinal tract reported from animal studies.

Tin : Inorganic tin dust/fumes can cause benign pneumonconiosis of the lungs.

Silicon(Si) : This is cansidered to be a nuisance particulate by ACGIH.

V-(5) EMERGENCY AND FIRST AID PROCEDURES:

EYE CONTACT : flush well with running water. get medical attention.

SKIN CONTACT : wash exposed area well with soap and water.

INHALATION : remove to fresh air. provide artificial respiration or oxygen if necessary. get medical attention.

INGESTION : get medical attention.

VI. REACTIVITY DATA

STABILITY : Considered stable

HAZARDOUS DECOMPOSITION PROD. : Metallic oxides
HAZARDOUS POLYMERIZATION : Will not occur
MATERIALS TO AVOID : Strong acids, bases, and oxidizers. Molten metal will react violently with water.
CONDITIONS TO AVOID : Excessive generation of airborne dust, which may pose moderate fire and/or explosion data.

Ⅶ. SPILL PROCEDURES

No special precautions are necessary for spills of bulk material. if large quantities of dust are spilled, remove by vacuuming or wet-sweeping to prevent heavy concentration of airborne dust. clean-up personnel should wear respirators and protective clothing.

Dispose of material in accordance with federal, state, and local regulations. many steel products may be salvaged for reuse or recycling.

Ⅷ. SPECIAL PROTECTION INFORMATION

Respiratory Protection: Use general and local exhaust ventilation to keep airborne dust or fumes below established TLV's. employees should wear NIOSH approved respirators for protection against dust or fumes when established TLV's are exceeded. The TLV for total dust is 10 mg/m^3 and for respirable dust the TLV is 5 mg/m^3.

Other: Principles of good personal hygiene should be followed prior to changing into street clothes or eating. food should not be consumed in the work area.

Ⅸ. SPECIAL PRECAUTIONS

Minimize and control operations producing dust and fume.
use good housekeeping practices to prevent accumulation of dust and fume.
Store material away from incompatible materials.

X. TRANSPORTATION

Ship according to department of transportation regulations.

XI. DISCLAIMER

BOTH-WELL STEEL FITTING CO., LTD. makes no warranties, express or implied, including, but not limited to, implied warranties of merchantability and fitness for a particular purpose.

The information contained in the material safety data sheet (MSDS) is believed to be correct, but no representations, guarantees, or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material or the results to be obtained from the use thereof. user assumes all risk and liability of any use, processing or handling of any material. variations in methods, conditions, equipment used to store, handle, or process the material are solely the responsibility of the user and remain at its sole discretion.

BOTH-WELL STEEL FITTINGS CO., LTD. believes that the product described in this MSDS would be considered an article within the meaning of title 29 of the code of federal regulations. section 1910. 1200. this MSDS is intended to be used solely for the purpose of satisfying informational requests. it is not intended to preempt. replace or expand the terms contained in BOTH-WELL corporation conditions of sale. compliance with all applicable federal. state and local laws and regulations remains the responsibility of the user. and the user has the responsibility to provide a safe workplace to examine all aspects of its operation and to determine if or where precautions, in addition to those described herein are required

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XII. Rust Preventive Oil Coating

Fitting are Rust Prevented Internal and External Surface of Fitting with CPC No-Rust C
Attachment : MSDS of CPC No-Rust C