

## MATERIAL SAFETY DATA SHEETS.

### GLOSSARY

ACGIH	AMERICAN CONFERENCE OF GOVERNMENT INDUSTRIAL HYGIENISTS
CAS	CHEMICAL ABSTRACTS SERVICE REGISTRY NUMBER
MSDS	MATERIAL SAFETY DATA SHEETS
NIOSH	NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PEL	PERMISSIBLE EXPOSURE LIMIT
PPM	PARTS PER MILLION
TDG	TRANSPORTATION OF DANGEROUS GOODS
TLV	8 HOUR AVERAGE THRESHOLD LIMIT VALUE
WHMIS	WORKPLACE HAZARDOUS MATERIAL INFORMATION SYSTEM

#### LD50 OF MATERIAL

LD = LETHAL DOSE; THE DOSE OF THE MATERIAL THAT CAUSES DEATH OF 50% OF A GROUP OF TEST ANIMALS WHEN GIVEN A SINGLE DOSE. THE LD50 CAN BE MEASURED FOR ANY ROUTE OF EXPOSURE BUT THE DERMAL (SKIN APPLICATION) AND THE ORAL VALUES ARE MOST RELEVANT TO THE WORK PLACE.

#### LC50 OF MATERIAL

LC = LETHAL CONCENTRATION; THE CONCENTRATION OF A MATERIAL IN AIR WHICH CAUSES THE DEATH OF 50% OF A GROUP OF TEST ANIMALS WHEN GIVEN OVER A SET PERIOD OF TIME, USUALLY 1 TO 4 HOURS. THE LC50 APPLIES TO MATERIALS THAT CAN BE INHALED.

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SECTION I - MA	TERIAL IDE	NTIFICATION	AND USE		
MATERIAL NAM	ле: 		HR & CF CARBON STE	ELS	
			HR & CF ALLOY STEEL	-	
BAR, HOLLOW BAR	R & PLATE				
SECTION II-H	AZARDOUS	INGREDIENT	S		
NGREDIENTS	CAS NUMBER	% WEIGHT	EXPOSURE	LIMITS	LD50/LC50
			OSHA PEL (MG/M3)	ACGIH TVL (MG/M3)	ROUTE
RON (FE)	7439-89-6	95-99	10 AS OXIDE FUME	5 AS IRON OXIDE	NOT APPLICABLE
ALLOYING ELEMENTS					
ALUMINUM (AL)	7429-90-5	< 2	15 DUST	10 (DUST)	NOT APPLICABLE
	7440-44-0	< 2	NONE LISTED	NONE LISTED	NOT APPLICABLE
	7440-47-3	< 2	1.0 AS CHROME	.5 METAL	
COBALT (CO) COPPER (CU)	7440-48-4	8 MAX. < 1	0.1 0.2	.05 AS FUME 1 AS DUST AND MIST	NOT APPLICABLE
LEAD (PB)	7440-50-8 7439-92-1	< 1 < .35	0.2	1 AS DUST AND MIST	
LEAD (PB) MANGANESE (MN)	7439-92-1 7439-96-5	< .35 < 2.5	0.05 5 MANGANESE	5 AS DUST AND FUME	LD50 9MG/KG
MOLYBDENUM (MO)	7439-98-7	< 2	15 AS INSOLUBLE COMPDS.	10 AS INSOLUBLE COMPE	
	7440-02-0	<1	10 AO INGOLOBLE CONI DO.		NOT APPLICABLE
PHOSPHORUS (P)	7723-14-0	0.15 MAX.	0.1 AS PHOSPHOR	0.1 AS PHOSPHOR	NOT APPLICABLE
SILICON (SI)	7440-21-3	< 2.3	15 AS DUST	10 AS DUST	NOT APPLICABLE
SULFUR (S)	7704-34-9	< 1	13 SULFUR DIOXIDE	5 SULFUR DIOXIDE	NOT APPLICABLE
TUNGSTEN (W).	7440-33-7	0-18	NONE LISTED	5 INSOLUBLE COMPDS	NOT APPLICABLE
VANADIUM (V)	1314-62-1	< 1	0.5 DUST; 0.1 FUME	0.05 DUST AND FUME	NOT APPLICABLE
ZINC (ZN) COATING	1314-13-2	10 MAX.	5.0 AS FUME	5.0 AS FUME	NOT APPLICABLE
	. NO PERMISSIBL	E EXPOSURE LIMITS	E ELEMENTS. TRACE ELEMEN S (PEL) OR THRESH OLDS LIMI		T IN MINUTE
PHYSICAL STATE	ODOR AND APPEA			ODOR THRESHOLD (PPM)	SPECIFIC GRAVITY
GAS [ ]LIQUID[ ]SOLID [>	SILVER / GRA	Y METALLIC	NOT APPLICABLE	NOT APPLICABLE	7.6-7.8
APOR PRESSURE (MM)	VAPOR DENSITY	AIR = 1)	EVAPORATION RATE	BOILING POINT (°C)	FREEZING POINT (°C)
NOT APPLICABLE	NOT APPLICA	BLE	NOT APPLICABLE	NOT APPLICABLE	MELTING PT 1530°C
SOLUBILITY IN WATER (20°C)	% VOLATILE ( BY V	OLUME)	pН	COEFFICIENT OF WATER/OIL DIST	RIBUTION
NOT APPLICABLE	NOT APPLICA	BLE	NOT APPLICABLE	NOT APPLICABLE	
SECTION I V FIR	RE AND EXP	LOSION DATA	4		
LAMMABILITY	IF YES, UNDER			MEANS OF EXTIN	ICTION
/ES: [] NO: [X]	WHICH CONDITIO			NOT APPLICA	
SPECIAL PROCEDURES		FLASHPOINT (°C) AND ME	ETHOD	UPPER EXPLOSION LIMIT (% BY VC	
		NOT APPLICABLE		NOT APPLICA	
OWER EXPLOSION LIMIT (% B	r volume)	AUTO IGNITION TEMPERA	ATURE ("C)	HAZARDOUS COMBUSTION PRODU	
NOT APPLICABLE		NOT APPLICABLE RATE OF BURNING	EXPLOSIVE POWER		ABLE STATIC DISCHARGE
TO CHEMICAL IMPACT	NO	NOT APPLICABLE			DIATIC DISCHARGE
SECTION V - RE	-				
CHEMICAL STABILITY	IF NO, UNDER				
YES: [X] NO: []	WHICH CONDITIO	N			
	JBSTANCES	IF SO, WHICH ONES ?			
NCOMPATIBILITY TO OTHER SU		IF SO, WHICH ONES ?	CONTACT WITH MINERAL AC		GEN GAS
NCOMPATIBILITY TO OTHER SU		IF SO, WHICH ONES ?		CIDS WILL RELEASE HYDRC	OGEN GAS



# MATERIAL SAFETY DATA SHEETS.

### **SECTION VI - TOXICOLOGICAL PROPERTIES OF PRODUCTS**

ROUTE OF ENTRY [] SKIN CONTACT [X] SKIN ABSORPTION [] EYE CONTACT [X] INHALATION ACUTE [X] INHALATION CHRONIC [X] INGESTION STEEL PRODUCTS IN A NORMAL STATE POSE NO INHALATION, INGESTION OR CONTACT HAZARD, HOWEVER THESE MAY OCCUR WITH BURNING, WELDING OR GRINDING OPERATIONS, PROLONGED CONTACT WITH COATING MATERIALS MAY CAUSE SKIN IRRITATION AND/OR DERMATITIS.

#### EFFECTS OF ACUTE EXPOSURE TO PRODUCT

NONE TO SHIPPED PRODUCT, WELDING OR BURNING OF MATERIAL WILL GENERATE METAL FUMES, INHALATION OVER EXPOSURE TO FUMES MAY CAUSE FLU-LIKE SYMPTOMS (I.E. CHILLS, FEVER) CALLED METAL FUME FEVER, EYE, NOSE OR THROAT IRRITATION. EYE IRRITATION AS A RESULT OF CONTACT WITH LIME COATING.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT

NONE TO SHIPPED PRODUCT, WELDING, BURNING, GRINDING GENERATES METAL FUME OR OXIDE DUST. PROLONGED INHALATION OVEREXPOSURE TO DUST OR FUME (IRON OXIDE) MAY RESULT IN THE ACCUMULATION OF IRON OXIDE DUST IN THE LUNGS; A CONDITION KNOWN AS SIDEROSIS, WITH FEW OR NO SYMPTOMS. CERTAIN NICKEL AND CHROMIUM COMPOUNDS HAVE BEEN LISTED WITH (ARC AS NASAL) AND LUNG CARCINOGENS, PROLONGED SKIN CONTACT MAY CAUSE DERMATITIS IN SENSITIVE INDIVIDUALS (FROM NICKEL, CHROMIUM & COBALT CONTENT IN STEEL). PROLONGED OVEREXPOSURE TO COBALT DUST MAY RESULT IN AN ASTHMA-LIKE CONDITION (COUGH, SHORTNESS OF BREATH).

- ()	,		
IRRITANCY OF PRODUCT		EXPOSURE LIMITS OF PRODUCT	
NOT APPLICABLE		SEE SECTION 11	
SENSITIZATION TO PROD	DUCT	SYNERGISTIC MATERIALS	
NO KNOWN EFFECTS		NO KNOWN EFFECTS	
FFECTS []	TERATOGENICITY []	MUTAGENICITY []	
FFECTS	NO KNOWN EFFECTS	NO KNOWN EFFECTS	
	NOT APPLICABLE SENSITIZATION TO PROE	NOT APPLICABLE SENSITIZATION TO PRODUCT NO KNOWN EFFECTS FFECTS [] TERATOGENICITY []	

### SECTION VII - PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

DEPENDS ON THE PROCESS BEING PERFORMED ON THE MATERIAL. EACH OPERATION MUST BE ASSESSED FOR

GLOVES (SPECIFY)		RESPIRATORY (SPECIFY)	EYE (SPECIFY)		FOOTWEAR (SPECIFY)		
LEATHER FACED OF	R EQUIVALENT	SEE BELOW	SAFETY GLASSES OR		SAFETY SHOES/BOOTS		
			FACE SHIELD AS REQUIRED A		AS REQUIRED		
CLOTHING (SPECIFY)		OTHER (SPECIFY)	•		•		
			OSH APPROVED AIR PURIFYING FOR DUST MIST OR FUME WHERE REQUIRED				
ENGINEERING CONTROLS	(E.G. VENTILATION, ENC	LOSED PROCESS, SPECIFY)					
GENERAL OR LOCA	L VENTILATION DU	RING WELDING, BURNING, OF	R GRINDING.				
LEAK AND SPILL PROCEDU	JRE	WASTE DISPOSAL	HAN	DLING PRO	CEDURES AND EQUIPMENT		
NOT APPLICABLE		NOT APPLICABLE	NO	T APPLIC	ABLE		
STORAGE REQUIREMENT		•	SPECIAL SHIPPING INFOR	RMATION			
NOT APPLICABLE			NOT APPLICABLE				
SECTION VI	II-FIRSTAI	D MEASURES					
SKIN							
	WASH AFFE	CTED AREA WITH SOAP AND	WATER. SEEK MEDICAL A	TTENTIO	N IF IRRITATION PERSISTS		
EYE	FOR IRRITA	TION FROM COATING MATERI	ALS, FLUSH EYES WITH PL	ENTY OF	WATER WHILE HOLDING EYE		
	LIDS OPEN.	SEEK MEDICAL ATTENTION IF	F IRRITATION PERSISTS				
INHALATION							
	FOR 0VERE	XPOSURE TO METAL FUMES,	REMOVE TO FRESH AIR. S	EEK MED	ICAL ATTENTION.		
INGESTION							
		NOT APPLICABLE					
GENERAL ADVISE	SOME OF T	HE STEEL GRADES MAY HAV	E AN OIL COATING APPLIEI	D FOR RL	IST PREVENTION PURPOSES		
	OR A LIME (	COATING. THE OIL IS 95-98% P	ETROLEUM OIL. USE IMPE	RVIOUS (	GLOVES WHEN HANDLING		
	TO PREVEN	T SKIN IRRITATION					
SECTION I X							
PREPARED BY		PHON	E NUMBER		DATE		
VANGUARD STE	EEL LTD	(905)	821-1100		September 2006		



<b>€</b>	VANGUARD STEEL LTD.
PRODUCT	MANUAL

# MATERIAL SAFETY DATA SHEETS.

MATERIAL NAME ALLOY TOOL STEEL BAR, HOLLOW BAR	S	HOT ROLLED TOOL STEELS GROUND TOOL STEELS				
SECTION II - HA		<b>INGREDIENT</b>	S			
INGREDIENTS	-	R % WEIGHT	-	SURE LIMITS	LD50/LC50	
			OSHA PEL (MG/M3)	ACGIH TVL (MG/M3)	ROUTE	
RON (FE)	7439-89-6	95-99	10 (OXIDE FUME)	5 (AS IRON OXIDE)	NOT APPLICABLE	
ALLOYING ELEMENTS				o (,		
CHROMIUM (CR)	7440-47-3	25	1 METAL	.5 METAL	NOT APPLICABLE	
COBALT (CO)	7440-48-4	8	0.1	0.05	NOT APPLICABLE	
MANGANESE (MN)	7439-96-5	15	C 5 DUST	C 5 AS DUST; 1 AS FUME	LD50 9MG/KG	
MOLYBDENUM (MO)	7439-98-7	5	15	10	NOT APPLICABLE	
NICKEL (NI)	7440-02-0	5	1 METAL	1 METAL	NOT APPLICABLE	
SILICON (SI)	7440-21-3	2.5	5	10	NOT APPLICABLE	
/ANADIUM (V)	1314-62-1	5	C .5	C .05	NOT APPLICABLE	
CONTAIN DI				TEEL. VARIOUS GRADES OF ST	FEEL WILL	
		LE EXPOSURE LIMIT		EMENTS MAY ALSO BE PRESEN B LIMIT (TVL) EXIST FOR STEEL.	T IN MINUTE	
SECTION I I I - PH		LE EXPOSURE LIMIT			T IN MINUTE	
SECTION I I I - PH	ODOR AND APPE	LE EXPOSURE LIMIT		S LIMIT (TVL) EXIST FOR STEEL.		
SECTION III - PH HYSICAL STATE GAS []LIQUID[]SOLID [X]	ODOR AND APPE	LE EXPOSURE LIMIT DATA ARANCE AY METALLIC	S (PEL) OR THRESH OLDS	ODOR THRESHOLD (PPM)	SPECIFIC GRAVITY	
SECTION III - PH HYSICAL STATE GAS []LIQUID[]SOLID [X] APOR PRESSURE (MM)	ODOR AND APPE	ARANCE AY METALLIC (AIR = 1)	S (PEL) OR THRESH OLDS	ODOR THRESHOLD (PPM) NOT APPLICABLE	SPECIFIC GRAVITY 7.6-7.8 FREEZING POINT (°C)	
BECTION III - PH HYSICAL STATE GAS []LIQUID[]SOLID [X] APOR PRESSURE (MM) IOT APPLICABLE	ODOR AND APPE SILVER / GRA	LE EXPOSURE LIMIT DATA ARANCE AY METALLIC (AIR = 1) ABLE	S (PEL) OR THRESH OLDS NOT APPLICABLE	ODOR THRESHOLD (PPM) NOT APPLICABLE BOILING POINT (°C)	SPECIFIC GRAVITY 7.6-7.8 FREEZING POINT (°C) MELTING PT 1530 %	
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SECTION III - PH PHYSICAL STATE GAS []LIQUID[]SOLID [X] VAPOR PRESSURE (MM) NOT APPLICABLE SOLUBILITY IN WATER (20°C) NOT APPLICABLE SECTION I V FIRE FLAMMABILITY YES: [] NO: [X] SPECIAL PROCEDURES NOT APPLICABLE OWER EXPLOSION LIMIT (% BY V NOT APPLICABLE EXPLOSION DATA SENSITIVITY TO CHEMICAL IMPACT SECTION V - REA CHEMICAL STABILITY YES: [X] NO: [] NCOMPATIBILITY TO OTHER SUB	VSICAL C ODOR AND APPE SILVER / GR/ VAPOR DENSITY NOT APPLIC/ % VOLATILE ( BY NOT APPLIC/ <b>E AND EXI</b> IF YES, UNDER WHICH CONDITIC FOLUME) IF NO, UNDER WHICH CONDITIC STANCES ONDITIONS	LE EXPOSURE LIMIT DATA ARANCE AY METALLIC (AIR = 1) ABLE VOLUME) ABLE PLOSION DAT N FLASHPOINT (°C) AND M NOT APPLICABLE AUTO IGNITION TEMPER NOT APPLICABLE RATE OF BURNING NOT APPLICABLE COATA	S (PEL) OR THRESH OLDS NOT APPLICABLE EVAPORATION RATE NOT APPLICABLE PH NOT APPLICABLE A NOT APPLICABLE ETHOD RATURE (°C) EXPLOSIVE PC NOT APPLI CONTACT WITH MINERA	B LIMIT (TVL) EXIST FOR STEEL.	SPECIFIC GRAVITY 7.6-7.8 FREEZING POINT (°C) MELTING PT 1530 °C RIBUTION ABLE NOTION ABLE DLUME) ABLE UCTS ABLE STATIC DISCHARGE	



# MATERIAL SAFETY DATA SHEETS.

#### SECTION V I - TOXICOLOGICAL PROPERTIES OF PRODUCTS

ROUTE OF ENTRY [] SKIN CONTACT [X] SKIN ABSORPTION [] EYE CONTACT [X] INHALATION ACUTE [X] INHALATION CHRONIC [X] INGESTION STEEL PRODUCTS IN A NORMAL STATE POSE NO INHALATION, INGESTION OR CONTACT HAZARD, HOWEVER THESE MAY OCCUR WITH BURNING, WELDING OR GRINDING OPERATIONS, PROLONGED CONTACT WITH COATING MATERIALS MAY CAUSE SKIN IRRITATION AND/OR DERMATITIS.

EFFECTS OF ACUTE EXPOSURE TO PRODUCT

NONE TO SHIPPED PRODUCT, WELDING OR BURNING OF MATERIAL WILL GENERATE METAL FUMES, INHALATION OVER EXPOSURE TO FUMES MAY CAUSE FLU-LIKE SYMPTOMS (I.E. CHILLS, FEVER) CALLED METAL FUME FEVER, EYE, NOSE OR THROAT IRRITATION. EYE IRRITATION AS A RESULT OF CONTACT WITH LIME COATING.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT

NONE TO SHIPPED PRODUCT, WELDING, BURNING, GRINDING GENERATES METAL FUME OR OXIDE DUST. PROLONGED INHALATION OVEREXPOSURE TO DUST OR FUME (IRON OXIDE) MAY RESULT IN THE ACCUMULATION OF IRON OXIDE DUST IN THE LUNGS; A CONDITION KNOWN AS SIDEROSIS, WITH FEW OR NO SYMPTOMS. CERTAIN NICKEL AND CHROMIUM COMPOUNDS HAVE BEEN LISTED WITH (ARC AS NASAL) AND LUNG CARCINOGENS, PROLONGED SKIN CONTACT MAY CAUSE DERMATITIS IN SENSITIVE INDIVIDUALS (FROM NICKEL, CHROMIUM & COBALT CONTENT IN STEEL). PROLONGED OVEREXPOSURE TO COBALT DUST MAY RESULT IN AN ASTHMA-LIKE CONDITION (COUGH, SHORTNESS OF BREATH).

LD50 OF PRODUCT (SPECIES AND	DUCT (SPECIES AND ROUTE) IRRITA			EXPOSURE LIMITS OF PRODUCT	
9 MG/KG (ORAL-RAT)	/KG (ORAL-RAT) NOT APPLICABLE			SEE SECTION 11	
LC50 OF PRODUCT (SPECIFY SPEC	CIES)	S) SENSITIZATION TO PRODUCT		SYNERGISTIC MATERIALS	
NOT AVAILABLE		NO KNOWN EFFECTS		NO KNOWN EFFECTS	
CARCINOGENICITY [X]	REPRODUCTIVE EFFECTS []		TERATOGENICITY []	MUTAGENICITY []	
SEE ABOVE	NO KNOWN EF	FECTS	NO KNOWN EFFECTS	NO KNOWN EFFECTS	

## SECTION VII - PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

DEPENDS ON THE PROCESS BEING PERFORMED ON THE MATERIAL. EACH OPERATION MUST BE ASSESSED FOR SUITABLE PROTECTIVE EQUIPMENT.

GLOVES (SPECIFY)		RESPIRATORY (SPECIFY)		EYE (SPECIFY)	FOOTWEAR (SPECIFY)		
LEATHER FACED OR EQUIVA	ALENT	SEE BELOW		SAFETY GLASSES OR	SAFETY SHOES/BOOTS		
			FACE SHIELD AS REQUIRED A		AS REQUIRED		
CLOTHING (SPECIFY)		OTHER (SPECIFY)	HER (SPECIFY)				
NOT APPLICABLE	RESPIRATORY-NIO	ESPIRATORY-NIOSH APPROVED AIR PURIFYING FOR DUST MIST OR FUME WHERE REQUIRED					
ENGINEERING CONTROLS (E.G. VENTILATION, ENCLOSED PROCESS, SPECIFY)							
GENERAL OR LOCAL VENTIL	ATION DURI	NG WELDING, BURN	ING, OR GRIN	DING.			
LEAK AND SPILL PROCEDURE		WASTE DISPOSAL		HANDLING PROC	EDURES AND EQUIPMENT		
NOT APPLICABLE		NOT APPLICABLE		NOT APPLIC	ABLE		
STORAGE REQUIREMENT		-		SPECIAL SHIPPING INFORMATION			
NOT APPLICABLE				NOT APPLICABLE			
SECTION VIII-FI	<b>RST AID</b>	MEASURES					
SKIN							
W	ASH AFFEC	TED AREA WITH SOA	P AND WATE	R. SEEK MEDICAL ATTENTION	N IF IRRITATION PERSISTS		
EYE FO	OR IRRITATIO	ON FROM COATING N	/ATERIALS, F	LUSH EYES WITH PLENTY OF	WATER WHILE HOLDING EYE		
LI	IDS OPEN. SE	EEK MEDICAL ATTEN	TION IF IRRITATION PERSISTS				
INHALATION							
F	OR 0VEREXP	OSURE TO METAL F	UMES, REMO	VE TO FRESH AIR. SEEK MED	ICAL ATTENTION.		
INGESTION							
		NOT APPLICABLE					
GENERAL ADVISE SO	OME OF THE	STEEL GRADES MA	Y HAVE AN O	IL COATING APPLIED FOR RU	IST PREVENTION PURPOSES		
0	R A LIME CO	ATING. THE OIL IS 95	-98% PETROL	EUM OIL. USE IMPERVIOUS O	LOVES WHEN HANDLING		
TO PREVENT SKIN IRRITATION							
SECTION I X							
PREPARED BY			PHONE NUM	BER	DATE		
VANGUARD STEEL LTI	D		(905) 821-	1100	September 2006		
			. ,				



# MATERIAL SAFETY DATA SHEETS.

MATERIAL NAME: CHROME PLATED -		-	CHROME PLATED 1045, 1050					
CARBON STEEL								
SECTION II-HA	-							
INGREDIENTS	CAS NUMBE	R % WEIGHT		RELIMITS	LD50/LC50			
			OSHA PEL (MG/M3)	ACGIH TVL (MG/M3)	ROUTE			
RON (FE)	7439-89-6	95-99	10 AS OXIDE FUME	5 AS IRON OXIDE	NOT APPLICABLE			
		Lia						
	7429-90-5	< 2	15 DUST	10 (DUST)	NOT APPLICABLE			
	7440-44-0	< 2		3.5 AS CARBON BLACK	NOT APPLICABLE			
CHROMIUM (CR.)	7440-47-3	< 1	1 (CR. & INSOL. SALT)	.5 METAL	NOT APPLICABLE			
COBALT (CO)	7440-48-4	< 1	0.1	.05 AS FUME	NOT APPLICABLE			
COPPER (CU)	7440-50-8	< 1	0.2	1 AS DUST AND MIST	NOT APPLICABLE			
BISMUTH (BL)	7440-69-9	< 1	NOT APPLICABLE		NOT APPLICABLE			
MANGANESE (MN)	7439-96-5	< 2	5	5 AS DUST; 1 AS FUME	LD50 9MG/KG			
MOLYBDENUM (MO)	7439-98-7	< 1	5	10 (INSOL. SALTS)	NOT APPLICABLE			
	7440-02-0	< 1	1.0	1.0	NOT APPLICABLE			
PHOSPHORUS (P)	7723-14-0	< 1	0.1	0.1	NOT APPLICABLE			
SILICON (SI)	7440-21-3	< 1	15 DUST	10 TOTAL DUST	NOT APPLICABLE			
SULFUR (S)	7704-34-9	< 1	13 SULFUR DIOXIDE	5 SULFUR DIOXIDE	NOT APPLICABLE			
VANADIUM (V)	7440-62-2	< 1	0.5 DUST; 0.1 FUME	0.05 DUST	NOT APPLICABLE			
METAL COATING								
NOTE: THE ABOVE CONTAIN D	IFFERENT CON	BINATIONS OF TH	1 ( CR. & INSOL. SALTS) MENTS USED IN ALLOYING STI HESE ELEMENTS. TRACE ELEM MITS (PEL) OR THRESH OLDS I	IENTS MAY ALSO BE PRESE	NT IN MINUTE			
NOTE: THE ABOVE CONTAIN D AMOUNTS. SECTION III - PI	LISTING IS A S IFFERENT COM NO PERMISSIE	SUMMARY OF ELE IMBINATIONS OF TH BLE EXPOSURE LIN	MENTS USED IN ALLOYING ST	EEL. VARIOUS GRADES OF S IENTS MAY ALSO BE PRESE	STEEL WILL NT IN MINUTE			
CONTAIN D	LISTING IS A S IFFERENT COM	SUMMARY OF ELE IMBINATIONS OF TH BLE EXPOSURE LIN	MENTS USED IN ALLOYING STR HESE ELEMENTS. TRACE ELEM	EEL. VARIOUS GRADES OF S IENTS MAY ALSO BE PRESE	STEEL WILL NT IN MINUTE			
NOTE: THE ABOVE CONTAIN D AMOUNTS. SECTION I I I - PI PHYSICAL STATE GAS [ ]LIQUID[ ]SOLID [X	LISTING IS A S IFFERENT COM NO PERMISSIE <b>HYSICAL [</b> ODOR AND APPE SILVER / GR	SUMMARY OF ELE MBINATIONS OF TH BLE EXPOSURE LIN DATA MATANCE AY METALLIC	MENTS USED IN ALLOYING STI HESE ELEMENTS. TRACE ELEM MITS (PEL) OR THRESH OLDS L NOT APPLICABLE	EEL. VARIOUS GRADES OF S IENTS MAY ALSO BE PRESE IMIT (TVL) EXIST FOR STEEL ODOR THRESHOLD (PPM) NOT APPLICABLE	STEEL WILL NT IN MINUTE  SPECIFIC GRAVITY 7.6-7.8			
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# MATERIAL SAFETY DATA SHEETS.

#### **SECTION VI - TOXICOLOGICAL PROPERTIES OF PRODUCTS**

ROUTE OF ENTRY [] SKIN CONTACT [X] SKIN ABSORPTION [] EYE CONTACT [X] INHALATION ACUTE [X] INHALATION CHRONIC [X] INGESTION STEEL PRODUCTS IN A NORMAL STATE POSE NO INHALATION, INGESTION OR CONTACT HAZARD, HOWEVER THESE MAY OCCUR WITH BURNING, WELDING OR GRINDING OPERATIONS, PROLONGED CONTACT WITH COATING MATERIALS MAY CAUSE SKIN IRRITATION AND/OR DERMATITIS.

EFFECTS OF ACUTE EXPOSURE TO PRODUCT

NONE TO SHIPPED PRODUCT, WELDING OR BURNING OF MATERIAL WILL GENERATE METAL FUMES, INHALATION OVER EXPOSURE TO FUMES MAY CAUSE FLU-LIKE SYMPTOMS (I.E. CHILLS, FEVER) CALLED METAL FUME FEVER, EYE, NOSE OR THROAT IRRITATION. EYE IRRITATION AS A RESULT OF CONTACT WITH LIME COATING.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT

NONE TO SHIPPED PRODUCT, WELDING, BURNING, GRINDING GENERATES METAL FUME OR OXIDE DUST. PROLONGED INHALATION OVEREXPOSURE TO DUST OR FUME (IRON OXIDE) MAY RESULT IN THE ACCUMULATION OF IRON OXIDE DUST IN THE LUNGS; A CONDITION KNOWN AS SIDEROSIS, WITH FEW OR NO SYMPTOMS. CERTAIN NICKEL AND CHROMIUM COMPOUNDS HAVE BEEN LISTED WITH (ARC AS NASAL) AND LUNG CARCINOGENS, PROLONGED SKIN CONTACT MAY CAUSE DERMATITIS IN SENSITIVE INDIVIDUALS (FROM NICKEL, CHROMIUM & COBALT CONTENT IN STEEL). PROLONGED OVEREXPOSURE TO COBALT DUST MAY RESULT IN AN ASTHMA-LIKE CONDITION (COUGH, SHORTNESS OF BREATH).

LD50 OF PRODUCT (SPECIES AND	DUCT (SPECIES AND ROUTE) IRRITA			EXPOSURE LIMITS OF PRODUCT	
9 MG/KG (ORAL-RAT)	/KG (ORAL-RAT) NOT APPLICABLE			SEE SECTION 11	
LC50 OF PRODUCT (SPECIFY SPEC	CIES)	S) SENSITIZATION TO PRODUCT		SYNERGISTIC MATERIALS	
NOT AVAILABLE		NO KNOWN EFFECTS		NO KNOWN EFFECTS	
CARCINOGENICITY [X]	REPRODUCTIVE EFFECTS []		TERATOGENICITY []	MUTAGENICITY []	
SEE ABOVE	NO KNOWN EF	FECTS	NO KNOWN EFFECTS	NO KNOWN EFFECTS	

## SECTION VII - PREVENTIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

DEPENDS ON THE PROCESS BEING PERFORMED ON THE MATERIAL. EACH OPERATION MUST BE ASSESSED FOR SUITABLE PROTECTIVE EQUIPMENT.

GLOVES (SPECIFY)	RESPIRATORY (SPECIFY	() EYE (SPECIFY)		FOOTWEAR (SPECIFY)		
LEATHER FACED OR EQUIVAL	ENT SEE BELOW	SAFETY GLASS	SES OR	SAFETY SHOES/BOOTS		
		FACE SHIELD A	S REQUIRED	AS REQUIRED		
CLOTHING (SPECIFY)	OTHER (SPECIFY)					
NOT APPLICABLE	RESPIRATORY-NIC	PIRATORY-NIOSH APPROVED AIR PURIFYING FOR DUST MIST OR FUME WHERE REQUIRED				
ENGINEERING CONTROLS (E.G. VENTIL/	ATION, ENCLOSED PROCESS, SPECIFY)					
GENERAL OR LOCAL VENTILA	TION DURING WELDING, BURN	NING, OR GRINDING.				
LEAK AND SPILL PROCEDURE	WASTE DISPOSAL		HANDLING PROC	EDURES AND EQUIPMENT		
NOT APPLICABLE	NOT APPLICABLE		NOT APPLIC	ABLE		
STORAGE REQUIREMENT		SPECIAL SHIPPING I	NFORMATION			
NOT APPLICABLE		NOT APPLICAB	LE			
SECTION VIII-FIR	ST AID MEASURES					
SKIN						
WA	SH AFFECTED AREA WITH SO	AP AND WATER. SEEK MEDIC	AL ATTENTION	IF IRRITATION PERSISTS		
EYE FOR	R IRRITATION FROM COATING I	MATERIALS, FLUSH EYES WIT	H PLENTY OF	WATER WHILE HOLDING EYE		
LID	S OPEN. SEEK MEDICAL ATTEN	NTION IF IRRITATION PERSIST	S			
INHALATION						
FOF	R 0VEREXPOSURE TO METAL F	FUMES, REMOVE TO FRESH A	IR. SEEK MED	ICAL ATTENTION.		
INGESTION						
	NOT APPLICABLE					
GENERAL ADVISE SON	ME OF THE STEEL GRADES MA	AY HAVE AN OIL COATING APP	PLIED FOR RU	ST PREVENTION PURPOSES		
OR	A LIME COATING. THE OIL IS 9	5-98% PETROLEUM OIL. USE II	MPERVIOUS O	LOVES WHEN HANDLING		
то						
SECTION I X						
PREPARED BY		PHONE NUMBER		DATE		
VANGUARD STEEL LTD		(905) 821-1100		September 2006		
		l`´´				