MATERIAL SAFTEY DATA SHEET

		I. PROD	UCT IDENT	IFICATION			
MANUFACTURER'S NAME:	Metallurgical Process	ing, Inc				TELEPHONE NO	D: (860) 224-2648
ADDRESS:	68 Arthur Street New Britain, CT 0605	50				DATE PREPARED	: September, 1997
TRADE NAME: CHEMICAL NAME:	BETA TiN Titanium Nitride (TiN)						
		II. HAZA		REDIENTS			<u></u>
The terms "hazardous" and hazar Standard (29 CFR Part 1910, 120	dous materials" as used w 00) including cited Append	vithin this MSDS ices, Lists, Refe	S should be interp erences, etc., all c	reted as defined b of which hereby inc	by, and in accorda	ance with, the OSHA Ha erence.	zard Communications
MATERIAL OR COMPONENT		CAS NO. Wt%		OSHA PEL (Mg/M³)		ACGIH TLV(Mg/M ^β)	
Titanium (Ti) Nitrogen (№)	7 7	7440-32-6 727-37-9	77.3 22.7		15 N/A	5 N/A	
		III.	PHYSICAL	DATA			
BOILING POINT: SPECIFIC GRAVITY (H2O=1 VAPOR DENSITY (AIR=1) % VOLATILES BY VOLUME:	8 4 N N	8000° F Approx. 7.0-9.0 VA VA	0 (60º F)	Melting Poin Vapor Press Solubility II Evaporation	NT: SURE: N HŁO: N (BUTYL ACE	ETATE=1)	5306° F N/A Insoluble N/A
APPEARANCE:	G T	Golden colorec	d coating about le is a chemical		dorless ce.		
	T n	his extremely nolds and wea	thin film of Tita ar parts for exte	anium Nitride coa ending part life.	ating is applied	to cutting tools, forn	ning tools,
		IV. FIRE A	AND EXPLO	SION DATA			
FLASH POINT:	Ν	lone		FIRE POINT:			None
		V. HEALTH	HAZARD	NFORMATIC	ON • • • • •		
WE DO NOT CONSIDER THE C SUCH AS ABREADING, MELTIN POTENTIALLY HAZARDOUS DI FUMES WHICH CAN BE INHALE THE COATED OBJECT (SUBST HEALTH HAZARD EFFECTS FR	COATING IN THE FORM I IG, WELDING, CUTTING UST OR FUMES WHICH ED, WILL CONSIST OF E RATE MATERIAL). USE OM MATERIAL OF COAT	IT IS SOLD TO OR PROCESS CAN BE INHA XTREMELY MIN RS OF COATE ED OBJECT.	CONSTITUTE A SING IN ANY OT ALED, SWALLOV NUTE PARTICLE D TOOLS SHOL	A PHYCIAL HAZAF HER FASHION, A VED, OR COME S OF TITANIUM M JLD CHECK MSD	RD OR A HEALT A TITANIUM NIT IN CONTACT W NITRIDE TOGET IN SHEETS FOR	TH HAZARD. SUBSEC RIDE COATING OBJE /ITH THE SKIN OR E HER WITH ARTICLES SUBSTRATE MATER	UENT OPERATIONS CT, MAY PRODUCE (ES. THE DUST OF OF MATERIAL FROW IAL FOR POSSIBLE
PRIMARY ROUTES OF ENT	RY: Ir	nhalation		EMERGENCY	FIRST AID:	Remove to fresh air continues, consult p	, if condition hysician.
	E	ye Contact				Flush well with runr	ing water to

EFFECT OF EXPOSURE: No toxic effects would be expected from exposure to the solid form of Titanium Nitride coated tools. Prolonged, repeated exposure to fumes or dusts generated during heating, cutting, brazing of welding may or may not cause adverse health effects associated with the listed constituents in excess of OSHA permissible exposure limits established in 29 CFR Subpart Z. See Section II)

remove particulate. Get medical

Brush off excess dust. Wash out area with soap and water.

Seek medical help if large quantities of material have been ingested.

attention.

Ingestion

Skin Contact

EXPOSURE LIMITS:	Section II lists specific ingredients and permissible exposure limits.				
IMPORTANT:	Determine actual exposure by industrial hygiene monitoring.				
POSSIBLE SIGNS AND SYMPTOMS OF EXPOS	SURE TO DUST, WELDING, FUME AND GASES:				
SHORT TERM EXPOSURE:	Metallic taste; nausea, tightness of chest; fever; irritation of eyes, nose, throat and skin; loss of consciousness / death due to welding gases of lack of oxygen.				
LONG TERM EXPOSURE:	There are no adverse effects for Titanium Nitride coated products in their solid form. Adverse effects may or may not result from long-term (chronic) exposure to dust, fume, gases, etc. that occur by way of subsequent operations on the Titanium Nitride coated product. It is believed there are no reliable scientific studies which show that workers exposed to operations upon Titanium Nitride coated products suffer increased incidence of lung cancer or other disease because of exposure to Titanium Nitride.				
	Some studies would associate elements form various substrate materials (material the coated object is made of) with the potential for neurologic, pulmonary, respiratory, skin or other disease. Chromium, cobalt and nickel in various chemical compounds have been identified as suspect human carcinogens by the I.A.R.C., N.T.P Annual Report. Users of Titanium Nitride coated products should check MSDS sheets of substrate material for possible health hazard effects from material of coated object.				
AGGRAVATION OF PREEXISTING F	RESPIRATORY OR ALLERGIC CONDITIONS MAY OCCUR IN SOME WORKERS.				
STABILITY: INCOMPATIBILITY:	Chemically Stable Reacts with Strong Acids Metallic Oxides				
HAZARDOUS DECOMPOSITION PRODUCTS:	VII SPILL OR LEAK PROCEDURES				
HAZARDOUS DECOMPOSITION PRODUCTS: STEPS TO BE TAKEN IN CASE OF RELEASE C WASTE DISPOSAL METHOD:	VII. SPILL OR LEAK PROCEDURES DR SPILL: N/A Solids - Sale as scrap for reuse Dust, etc Follow federal, state and local regulations regarding disposal				
HAZARDOUS DECOMPOSITION PRODUCTS: STEPS TO BE TAKEN IN CASE OF RELEASE C WASTE DISPOSAL METHOD:	VII. SPILL OR LEAK PROCEDURES DR SPILL: N/A Solids - Sale as scrap for reuse Dust, etc Follow federal, state and local regulations regarding disposal II. SPECIAL PROTECTION INFORMATION				
HAZARDOUS DECOMPOSITION PRODUCTS: STEPS TO BE TAKEN IN CASE OF RELEASE O WASTE DISPOSAL METHOD: VI VENTILATION REQUIREMENTS:	VII. SPILL OR LEAK PROCEDURES DR SPILL: NA Solids - Sale as scrap for reuse Dust, etc Follow federal, state and local regulations regarding disposal II. SPECIAL PROTECTION INFORMATION General - Recommended (to keep airborne concentration of dust and fumes below ACGIH TLV's Local - As Required				
HAZARDOUS DECOMPOSITION PRODUCTS: STEPS TO BE TAKEN IN CASE OF RELEASE O WASTE DISPOSAL METHOD: VII VENTILATION REQUIREMENTS: PERSONAL PROTECTIVE EQUIPMENT:	Reacts with Strong Acids Metallic Oxides VII. SPILL OR LEAK PROCEDURES DR SPILL: NA Solids - Sale as scrap for reuse Dust, etc Follow federal, state and local regulations regarding disposal II. SPECIAL PROTECTION INFORMATION General - Recommended (to keep airborne concentration of dust and fumes below ACGIH TLV's Local - As Required				
HAZARDOUS DECOMPOSITION PRODUCTS: STEPS TO BE TAKEN IN CASE OF RELEASE O WASTE DISPOSAL METHOD: VENTILATION REQUIREMENTS: PERSONAL PROTECTIVE EQUIPMENT: Respiratory Protection:	Reacts with Strong Acids Metallic Oxides VII. SPILL OR LEAK PROCEDURES DR SPILL: NA Solids - Sale as scrap for reuse Dust, etc Follow federal, state and local regulations regarding disposal II. SPECIAL PROTECTION INFORMATION General - Recommended (to keep airborne concentration of dust and fumes below ACGIH TLV's Local - As Required If fumes, misting or dust condition occurs and TLV as indicated in Section II is exceeded, provide NIOSH approved respirators.				
HAZARDOUS DECOMPOSITION PRODUCTS: STEPS TO BE TAKEN IN CASE OF RELEASE C WASTE DISPOSAL METHOD: VENTILATION REQUIREMENTS: PERSONAL PROTECTIVE EQUIPMENT: Respiratory Protection: Eye Protection:	VII. SPILL OR LEAK PROCEDURES DR SPILL: N/A Solids - Sale as scrap for reuse Dust, etc Follow federal, state and local regulations regarding disposal II. SPECIAL PROTECTION INFORMATION General - Recommended (to keep airborne concentration of dust and fumes below ACGIH TLV's Local - As Required If fumes, misting or dust condition occurs and TLV as indicated in Section II is exceeded, provide NIOSH approved respirators. Recommended approved safety glasses of goggles when working with dusty material.				
HAZARDOUS DECOMPOSITION PRODUCTS: STEPS TO BE TAKEN IN CASE OF RELEASE OF WASTE DISPOSAL METHOD: VENTILATION REQUIREMENTS: PERSONAL PROTECTIVE EQUIPMENT: Respiratory Protection: Eye Protection: Gloves:	Weating Acids Metallic Oxides VII. SPILL OR LEAK PROCEDURES DR SPILL: N/A Solids - Dust, etc Follow federal, state and local regulations regarding disposal I. SPECIAL PROTECTION INFORMATION General - Recommended (to keep airborne concentration of dust and fumes below ACGIH TLV's Local - As Required If fumes, misting or dust condition occurs and TLV as indicated in Section II is exceeded, provide NIOSH approved respirators. Recommended approved safety glasses of goggles when working with dusty material. As required				

IX. SPECIAL PRECAUTIONS

USE GOOD HOUSEKEEPING PRACTICES TO PREVENT ACCUMULATIONS OF DUSTS AND TO KEEP AIRBORNE DUST CONCENTRATIONS AT A MINIMUM.

THIS MATERIAL IS POTENTIALLY CONTAMINATED WITH COATINGS SUCH AS OILS FOR 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 SUSSPECTED CONTAMINANTS SHOULD BE TAKEN TO AVOID RESULTING EXPOSURES WHEN HANDLING, CUTTING (THERMAL OF MECHANICAL) AND/OR HEATING OR MELTING.

While the information set forth in this material safety date sheet is believed to be accurate, as of the effective date. We make no representations regarding the accuracy or completeness of the information and assumes no liability for any loss, damage, or injury of any kind which may result from or arise out of the use or reliance on the information by any person. N/A = NOT APPLICABLE