

HAYNES INTERNATIONAL INC SUB OF CABOT CORP -- R30188, HAYNES 188 ALLOY --  
3439-01-149-0529

===== Product Identification =====

Product ID:R30188, HAYNES 188 ALLOY

MSDS Date:07/31/1999

FSC:3439

NIIN:01-149-0529

Status Code:A

MSDS Number: CLSHF

=== Responsible Party ===

Company Name:HAYNES INTERNATIONAL INC SUB OF CABOT CORP

Address:1020 W PARK AVE

Box:9013

City:KOKOMO

State:IN

ZIP:46902-9013

Countr

y:US

Info Phone Num:317-456-6000

Emergency Phone Num:(800)424-9300

Resp. Party Other MSDS Num.:H2071-3

Chemtrec Ind/Phone:(800)424-9300

CAGE:80357

=== Contractor Identification ===

Company Name:HAYNES INTERNATIONAL INC SUB OF CABOT CORP

Address:1020 W PARK AVE

Box:9013

City:KOKOMO

State:IN

ZIP:46904-9013

Country:US

Phone:318-263-2002;765-456-6614

CAGE:80357

===== Composition/Information on Ingredients =====

Ingred Name:COBALT

CAS:7440-48-4

RTECS #:GF8750000

= Wt:39.

OSHA PEL:

0.1 MG/M3  
ACGIH TLV:0.02 MG/M3

Ingred Name:CHROMIUM  
CAS:7440-47-3  
RTECS #:GB4200000  
= Wt:22.  
OSHA PEL:1 MG/M3  
ACGIH TLV:0.5 MG/M3  
EPA Rpt Qty:1 LB  
DOT Rpt Qty:1 LB

Ingred Name:IRON  
CAS:7439-89-6  
RTECS #:NO4565500  
Fraction by Wt: 3%MAX

Ingred Name:MANGANESE  
CAS:7439-96-5  
RTECS #:OO9275000  
Fraction by Wt: 1.25%MAX  
OSHA PEL:C5 MG/M3  
ACGIH TLV:5 MG/M3

Ingred Name:NICKEL  
CAS:7440-02-0  
RTECS #:QR5950000  
= Wt:22.  
OSHA PEL:]  
EPA Rpt Qty:100 LBS  
DOT Rpt Qty:100 LBS

Ingred Name:SILICON  
CAS:7440-21-3  
RTECS #:VW0400000  
= Wt:.35  
OSHA PEL:15 MG/M3  
ACGIH TLV:10 MG/M3

Ingred Name:TUNGSTEN  
CAS:7440-33-7  
RTECS #:YO7175000  
= Wt:14.  
ACGIH TLV:5 MG/M3  
ACGIH STEL:10 MG/M3

Ingred Name:LANTHANUM  
CAS:7439-91-0  
= Wt:.03

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===== Hazards Identification =====

Routes of Entry: Inhalation:YES Skin:YES Ingestion:YES  
Reports of Carcinogenicity:NTP:YES IARC:YES OSHA:YES  
Health Hazards Acute and Chronic:ACUTE: INHALATION-INHALED PARTICULATE  
MAY IRRITATE THE RESPIRATORY

TRACT. EXCESSIVE INHALATION OF ALUMINUM, COBALT, COPPER, MANGANESE, NICKEL & ZINC CAN CAUSE RESPIRATORY IRRITATION, COUGH, BRONCHITIS, CHILLS, "METAL FUME FEVER" & ASTHMA-LIKE SYMPTOMS. SKIN-SKIN CONTACT WITH THESE MATERIALS MAY CAUSE IRRITATION & IN SOME INDIVIDUALS AN ALLERGIC DERMATITIS WHEN ELEMENTS SUCH AS CHROME, COBALT & NICKEL ARE PRESENT. EYES-CONTACT WITH PARTICULATE METAL MAY INFLAME THE CONJUNCTIVA. CHRONIC: RESPIRATORY DISEASE WITH SYMPTOMS RANGING

FROM SHORTNESS OF BREATH & COUGH TO PERMANENT DISABILITY DUE TO LOSS OF LUNG FUNCTION; "SEE OTHER INFO"

Explanation of Carcinogenicity:CHROMIUM AND ITS COMPOUNDS, COBALT AND ITS COMPOUNDS, AND NICKEL AND ITS COMPOUNDS ARE CLASSIFIED AS CARCINOGENS BY NTP AND/OR IARC. WELDING FUMES-OSHA REQUIRES THAT WELDING FUMES BE CONSIDERED AS CARCINOGENS BECAUSE THEY ARE CLASSIFIED BY IARC.

Effects of Overexposure:INGESTION OF LARGE DOSES MAY CAUSE NAUSEA, VOMITING, AND DIARRHEA.

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Medical Cond Aggravated by Exposure:INDIVIDUALS WHO MAY HAVE HAD A ALLERGIC REACTION OR SENSITIVITY TO METAL MAY ENCOUNTER SKIN RASH OR DERMATITIS. PERSONS WITH IMPAIRED PULMONARY FUNCTION MAY INCUR FURTHER DISABILITY.

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===== First Aid Measures =====

First Aid:INHALATION-REMOVE TO FRESH AIR. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION & OBTAIN MEDICAL AID AT ONCE. INGESTION-NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON

CONTACT A POISON CONTROL CENTER (PCC). UNLESS THE PCC ADVISES OTHERWISE, HAVE CONSCIOUS PERSON DRINK 1-2 GLASSES OF WATER TO DILUTE. DO NOT INDUCE VOMITING UNLESS LARGE AMOUNTS ARE INGESTED. OBTAIN MEDICAL AID AT ONCE. SKIN-TREAT CUTS & ABRASIONS WITH STANDARD FIRST AID. IF IRRITATION OCCURS, OBTAIN MEDICAL AID. EYES-FLUSH DUST/POWDER FROM EYES WITH CLEAN WATER FOR 15 MINS. IF IRRITATION PERSISTS, OBTAIN MEDICAL AID.

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===== Fire Fighting Measures =====

Flash Point:NONE

Lower Limits:NONE

Upper Limits:NONE

Extinguishing Media:THESE ALLOYS IN SOLID WROUGHT FORM ARE NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO THE SURROUNDING FIRE.

Fire Fighting Procedures:TO EXTINGUISH A METAL POWDER FIRE USE DRY SAND, DRY GRAPHITE OR OTHER CLASS "D" EXTINGUISHING POWDER.

Unusual Fire/Explosion Hazard:NO UNUSUAL FIRE OR EXPLOSION HAZARDS.

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===== Accidental Release Measures =====

Spill R

Release Procedures: IN SOLID FORM THIS MATERIAL POSES NO SPECIAL CLEAN-UP PROBLEMS. IF THIS MATERIAL IS IN POWDER OR DUST FORM, DO NOT DRY SWEEP, NOTIFY SAFETY PERSONNEL, CLEAN-UP SHOULD BE CONDUCTED WITH A VACUUM SYSTEM UTILIZING A HIGH EFFICIENCY PARTICULATE AIR (HEPA) FILTRATION SYSTEM. CAUTION SHOULD BE TAKEN TO MINIMIZE AIRBORNE GENERATION OF POWDER OR DUST AND AVOID CONTAMINATION OF AIR AND WATER.

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===== Handling and Storage =====

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Handling and Storage Precautions: HANDLING-THIS PRODUCT MUST BE HANDLED ACCORDING TO THE SIZE, SHAPE AND QUANTITY OF MATERIAL INVOLVED. POWDERS SHOULD BE MOVED OR TRANSPORTED TO MINIMIZE SPILL OR RELEASE POTENTIAL. AVOID DUST INHALATION AND EYE OR SKIN CONTACT.

Other Precautions: STORAGE- IN SOLID FORM THIS MATERIAL POSES NO SPECIAL PROBLEMS. STORE METAL POWDER IN A DRY AREA AWAY FROM HEAT, IGNITION SOURCES AND INCOMPATIBLES. \*\*SPILL-CLEANUP PERSONNEL SHOULD PROTECT AGAINST D

UST INHALATION & SKIN OR EYE CONTACT. USE NON-SPARKING TOOLS. PROPERLY LABEL ALL MATERIALS COLLECTED IN WASTE CONTAINER.

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===== Exposure Controls/Personal Protection =====

Respiratory Protection: USE NIOSH APPROVED RESPIRATORS AS SPECIFIED BY AN INDUSTRIAL HYGIENIST OR QUALIFIED SAFETY PROFESSIONAL. LUNG FUNCTIONS TESTS ARE RECOMMENDED FOR USERS OF NEGATIVE PRESSURE DEVICES. USE A FUME RESPIRATOR OR AN AIR SUPPLIED RESPIRATOR WHERE LOCAL EXHAUST OR VENTILATION DOES NOT KEEP EXPOSURE BELOW THE OSHA LIMITS FOR AIR CONTAMINATION.

Ventilation: LOCAL EXHAUST VENTILATION SHOULD BE USED TO CONTROL EXPOSURE TO AIRBORNE DUST AND FUME EMISSIONS NEAR THE SOURCE BELOW THE EXPOSURE LIMITS CITED.

Protective Gloves: WEAR GLOVES TO PREVENT METAL CUTS & SKIN ABRASIONS.

Eye Protection: SAFETY GLASSES. (CONTACT LENSES SHOULD NOT BE WORN).

Other Protective Equipment: PROTECTIVE CLOTHING SUCH AS UNIFORMS, DISPOSABLE COVERALLS, SAFETY SHOES, ETC.

Work Hyg

ienic Practices: PRACTICE GOOD PERSONAL HYGIENE AFTER HANDLING DUST OR POWDER FORMS OF THIS MATERIAL, ESPECIALLY BEFORE EATING, DRINKING, SMOKING OR APPLYING COSMETICS.

Supplemental Safety and Health

IF PRIOR DAMAGE OR DISEASE TO THE NEUROLOGIC (NERVOUS), CIRCULATORY, HEMATOLOGIC (BLOOD) OR RENAL (KIDNEY) SYSTEMS HAS OCCURRED, PROPER SCREENING OR EXAMINATIONS SHOULD BE CONDUCTED ON INDIVIDUALS WHO MAY BE EXPOSED TO FURTHER RISK IF HANDLING AND USE OF THESE MATERIAL CAUSE

## EXCESSIVE EXPOSURE.

### ===== Physical/Chemical Properties =====

HCC:N1

Melt/Freeze Pt:=-1337.2C, #####F

Vapor Pres:NA

Vapor Density:NA

Spec Gravity:0.324

pH:NA

Viscosity:NA

Evaporation Rate & Reference:NA

Solubility in Water:NONE

Appearance and Odor:SOLID-SILVER GRAY COLOR OR NO COLOR

Percent Volatiles by Volume:NONE

### ===== Stability and Reactivity Data =====

Stability Indicator/Materials to Avoid:YES

AVOID CONTACT WITH MINERAL ACIDS AND  
OXIDIZING AGENTS WHICH MAY GENERATE

HYDROGEN GAS; THE EVOLUTION OF HYDROGEN MAY BE AN EXPLOSION HAZARD.

Stability Condition to Avoid:THESE ALLOYS ARE STABLE MATERIALS.

Hazardous Decomposition Products:VARIOUS ELEMENTAL METALS & METAL

OXIDES MAY BE GENERATED FROM WELDING, CUTTING, GRINDING, MELTING OR  
DROSS HANDLING OPERATIONS.

Conditions to Avoid Polymerization:DOES NOT OCCUR.

### ===== Toxicological Information =====

Toxicological Information:TOXICITY DATA

: LD50 RAT (COBALT): 6171 MG/KG.

TERATOLOGY: RAT (NICKEL) ORAL: TDLO: 158 MG/KG. RAT (MOLYBDENUM)  
ORAL: 5800 MG/KG GIVEN TO FEMALE 30 WEEKS PRIOR TO MATING AND DURING  
DAYS 1-20 OF PREGNANCY CAUSED SPECIFIC MUSCULOSKELETAL SYSTEM  
DEVELOPMENT ABNORMALITIES. REPRODUCTION: RAT (MOLYBDENUM) ORAL 6050  
MG/KG. GIVEN TO FEMALE 35 WEEKS PRIOR TO MATING PRODUCED PRE-, AND  
POST-IMPLANTATION MORTALITY. RAT (COBALT) UNSPECIFIED EXPOSURE  
ROUTE, 0.05 MG/KG CONTINUOUS, ADMINISTERED THROUGHOUT GESTATION TO

ROUGHOUT GASTATION TO

FEMALE WAS EMBRYOTOXIC. MUTAGENICITY: HAMSTER (CHROMIUM III) LUNG  
CELL: 34 MG/L CAUSED SISTER CHROMATID EXCHANGE.

### ===== Ecological Information =====

Ecological:ECOTOXICITY: FEW PLANTS ACCUMULATE COBALT AT GREATER THAN  
100 PPM, THE LEVEL AT WHICH SEVERE PHYTOXICITY WOULD OCCUR. THERE  
IS LITTLE TENDENCY FOR CHROMIUM III BIOACCUMULATION ALONG THE FOOD  
CHAIN. MOLYBDENUM: FATHEAD MINNOW), LC50: 370 MG/L/96 HOURS.

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RESTRIAL PLANTS CAN CONTAIN ENOUGH MOLYBDENUM TO BE TOXIC TO ANIMALS BUT STILL GROW NORMALLY. ENVIRONMENTAL DEGRADATION: IN WATER, COBALT IS ADSORBED GREATLY TO HYDROLYSATE OR OXIDATE SEDIMENTS. IT MAY BE TAKEN INTO SOLUTION IN SMALL AMOUNTS THROUGH BACTERIOLOGICAL ACTIVITY.

===== Disposal Considerations =====

Waste Disposal Methods:WHENEVER POSSIBLE, RECOVER ALLOYS FOR REUSE OR RECYCLING. IF NECESSARY, DISPOSE OF WASTE MATERIAL IN ACCORDANCE WITH LOCAL STATE OR FEDERAL REGULATIONS. FOR SPECIFIC LABELING, PACKING, STORAGE, TRANSPORTATION AND DISPOSAL PROCEDURES, CONTACT AN ENVIRONMENTAL ENGINEER OR CONSULTANT FAMILIAR WITH WASTE DISPOSAL REGULATIONS.

===== MSDS Transport Information =====

Transport Information:DOT SHIPPING REQUIREMENTS: SHIPPING NAME: NOT APPLICABLE. IDENTIFICATION NUMBER: NOT APPLICABLE. HAZARD CLASS: NOT APPLICABLE. LABEL(S) REQUIRED: NOT APPLICABLE.

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===== Regulatory Information =====

SARA Title III Information:CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OR TITLE II OF SARA AND 40 CFR PART 372: ALUMINUM (AS A FUME OR DUST), CHROMIUM, COBALT, COPPER, MANGANESE, NICKEL (AS A POWDER OR DUST), VANADIUM (AS A FUME OR DUST). SARA HAZARD CATEGORY: IMMEDIATE HAZARD AND DELAYED HAZARD.

Federal Regulatory Information:OSHA: LISTED AS AN AIR CONTAMINANT (29 CFR 1910.1000). HAZARDOUS BY DEFINITION OF HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200). TSCA (TOXIC SUBSTANCE CONTROL ACT): COMPONENTS OF THIS MATERIAL ARE LISTED ON THE TSCA INVENTORY. CERCLA: HAZARDOUS SUBSTANCE (40 CFR 302.4): CHROMIUM (AS A POWDER): NICKEL (AS A POWDER OR DUST). EXTREMELY HAZARDOUS SUBSTANCE (40 CFR 355): NOT LISTED.

State Regulatory Information:CALIFORNIA'S "SAFE DRINKING WATER & TOXIC ENFORCEMENT ACT OF 1986" (PROPOSITION 65): DURING WELDING, THERMAL CUTTING AND

MELTING THESE PRODUCTS MAY PRODUCE COBALT OXIDE, NICKEL COMPOUNDS, AND HEXAVALENT CHROMIUM COMPOUNDS WHICH ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER. PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW: ALUMINUM, CHROMIUM AND VANADIUM (FUME OR DUST) ARE DESIGNATED ENVIRONMENTAL HAZARDS ON THE HAZARDOUS SUBSTANCE LIST. TITLE 34, PART XIII, CHAPTER 323.

===== Other Information =====

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