

# Material Safety Data Sheet

Issuing Date 23-Nov-2011

Revision Date

Revision Number 0

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name** Nickel Alloys

**Synonyms** Ni.

### Distributor

ThyssenKrupp Materials NA, Inc.  
22355 W. Eleven Mile Road  
Southfield, Michigan 48034  
TEL: 248-233-5681

**Emergency Telephone Number** 248-233-5681

## 2. HAZARDS IDENTIFICATION

### **WARNING!**

### **Emergency Overview**

Non-combustible as supplied.  
Small chips, fines and dust from processing may be readily ignitable.  
Hazardous fumes can also occur in post-processing operations  
Product dust may be irritating to eyes, skin and respiratory system.  
Dust may form explosive mixture in air  
Possibly cancer hazard by inhalation

**Appearance** Silver to grayish black

**Physical State** Solid.

**Odor** Odorless

### **OSHA Regulatory Status**

**General Hazard Statement:** Solid metallic products are generally classified as "articles" and do not constitute hazardous materials in solid form under the definitions of the OSHA Hazard Communication Standard (29 CFR 1910.1200). Any articles manufactured from these solid products would be generally classified as non-hazardous. However, some hazardous elements contained in these products can be emitted under certain processing conditions such as but not limited to: burning, melting, cutting, sawing, brazing, grinding, machining, milling, and welding.

### **Potential Health Effects**

#### **Principle Routes of Exposure**

Eye contact. Skin contact. Inhalation.

#### **Acute Toxicity**

**Eyes**  
**Skin**

Dust contact with the eyes can lead to mechanical irritation.  
Contact with dust can cause mechanical irritation or drying of the skin. Contact with oils from processing may cause irritation. Prolonged skin contact may defat the skin and produce dermatitis. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons.

**Inhalation**

May be harmful if inhaled. Inhalation of dust in high concentration may cause irritation of respiratory system. Inhalation of fumes may cause metal-fume fever.

**Ingestion**

May be harmful if swallowed. May cause additional affects as listed under "Inhalation".

<b>Chronic Effects</b>	Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.  Elevated temperature processing such as welding and plasma arc cutting may release hazardous fumes. Overexposure to metal fumes may cause pulmonary edema (fluid in the lungs) and methemoglobinemia. May also cause pulmonary fibrosis and lung cancer.
<b>Aggravated Medical Conditions</b>	Allergies. Skin disorders. Respiratory disorders. Central nervous system. Pre-existing eye disorders. Blood disorders. Kidney disorders. Liver disorders. Nasal cavities. Lungs.
<b>Interactions with Other Chemicals</b>	Irritants. Sensitizers. Epoxies. Use of alcoholic beverages may enhance toxic effects.
<b>Environmental Hazard</b>	See Section 12 for additional Ecological Information.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Each alloy may contain one or more of the following ingredients. Consult the Technical Data Sheet for the composition of specific alloys.

Chemical Name	CAS-No	Weight %
Nickel	7440-02-0	30.0-99.0
Chromium	7440-47-3	0.01-48.0
Copper	7440-50-8	0.01-45.0
Iron	7439-89-6	0.01-44.0
Molybdenum	7439-98-7	0.01-16.0
Cobalt	7440-48-4	0.01-13.0
Niobium	7440-03-1	0.01-5.0
Aluminum	7429-90-5	0.00-5.0
Manganese	7439-96-5	0.01-5.0
Tantalum	7440-25-7	0.01-5.0
Titanium	7440-32-6	0.01-5.0
Tungsten	7440-33-7	0.00-5.0
Silicon	7440-21-3	0.01-2.0
Carbon	7440-44-0	0.01-2.0
Yttrium	7440-65-5	0.00-1.0
Boron	7440-42-8	0.001-0.004

Nickel alloys may be comprised of all or variations of the alloys shown here.

### 4. FIRST AID MEASURES

<b>Eye Contact</b>	Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Consult a physician.
<b>Skin Contact</b>	Wash skin with soap and water. In the case of skin irritation or allergic reactions see a physician.
<b>Inhalation</b>	Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Consult a physician.
<b>Ingestion</b>	Do NOT induce vomiting. Call a physician or Poison Control Center immediately. Drink plenty of water. Never give anything by mouth to an unconscious person.
<b>Notes to Physician</b>	May cause sensitization of susceptible persons. Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

<b>Flammable Properties</b>	This product does not present fire or explosion hazards as shipped. Small chips, fines, and dust from processing may be readily ignitable.			
<b>Flash Point</b>	Not applicable.			
<b>Suitable Extinguishing Media</b>	Class D extinguishing agents on fines, dust or molten metal. Use coarse water spray on chips and fines.			
<b>Unsuitable Extinguishing Media</b>	DO NOT use halogenated extinguishing agents on small chips or fines. DO NOT use water for fires involving molten metal. These fire extinguishing agents will react with burning material.			
<b>Explosion Data</b>				
<b>Sensitivity to Mechanical Impact</b>	None			
<b>Sensitivity to Static Discharge</b>	None			
<b>Specific Hazards Arising from the Chemical</b>	Thermal decomposition can lead to release of irritating gases and vapors. In the event of fire and/or explosion do not breathe fumes. May cause sensitization by inhalation and skin contact.			
<b>Protective Equipment and Precautions for Firefighters</b>	As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.			
<b>NFPA</b>	<b>Health Hazard 2</b>	<b>Flammability 0</b>	<b>Instability 0</b>	<b>Physical and Chemical Hazards -</b>
<b>HMIS</b>	<b>Health Hazard 2*</b>	<b>Flammability 0</b>	<b>Physical Hazard 0</b>	<b>Personal Protection X</b>

\*Indicates a chronic health hazard.

## 6. ACCIDENTAL RELEASE MEASURES

<b>Personal Precautions</b>	Use personal protective equipment. Keep people away from and upwind of spill/leak.
<b>Environmental Precautions</b>	Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.
<b>Methods for Containment</b>	Prevent further leakage or spillage if safe to do so.
<b>Methods for Cleaning Up</b>	Avoid dust formation. Collect scrap for recycling.  If product is molten, contain the flow using dry sand or salt flux as a dam. All tools and containers which come in contact with molten metal must be preheated or specially coated and rust free. Allow the spill to cool before remelting as scrap.

## 7. HANDLING AND STORAGE

<b>Handling</b>	Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Avoid dust formation. Keep material dry. Avoid contact with sharp edges or heated material. Hot and cold aluminum are not visually different. Hot aluminum does not always glow red.
<b>Storage</b>	Keep container tightly closed in a dry and well-ventilated place.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Aluminum 7429-90-5	TWA: 1 mg/m <sup>3</sup> respirable fraction	TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 15 mg/m <sup>3</sup> total dust (vacated) TWA: 5 mg/m <sup>3</sup> respirable fraction	TWA: 10 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable dust
Manganese 7439-96-5	TWA: 0.2 mg/m <sup>3</sup>	(vacated) TWA: 1 mg/m <sup>3</sup> fume (vacated) STEL: 3 mg/m <sup>3</sup> fume (vacated) Ceiling: 5 mg/m <sup>3</sup> Ceiling: 5 mg/m <sup>3</sup> fume (vacated) TWA: 10 mg/m <sup>3</sup>	IDLH: 500 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup> fume STEL: 3 mg/m <sup>3</sup>
Molybdenum 7439-98-7	TWA: 10 mg/m <sup>3</sup> inhalable fraction TWA: 3 mg/m <sup>3</sup> respirable fraction	(vacated) TWA: 10 mg/m <sup>3</sup>	IDLH: 5000 mg/m <sup>3</sup>
Nickel 7440-02-0	TWA: 1.5 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> (vacated) TWA: 1 mg/m <sup>3</sup>	IDLH: 10 mg/m <sup>3</sup> TWA: 0.015 mg/m <sup>3</sup>
Silicon 7440-21-3		TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction (vacated) TWA: 10 mg/m <sup>3</sup> total dust (vacated) TWA: 5 mg/m <sup>3</sup> respirable fraction	TWA: 10 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable dust
Tantalum 7440-25-7		TWA: 5 mg/m <sup>3</sup> (vacated) TWA: 5 mg/m <sup>3</sup>	IDLH: 2500 mg/m <sup>3</sup> dust TWA: 5 mg/m <sup>3</sup> dust STEL: 10 mg/m <sup>3</sup> dust
Tungsten 7440-33-7	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	(vacated) TWA: 5 mg/m <sup>3</sup> (vacated) STEL: 10 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>
Cobalt 7440-48-4	TWA: 0.02 mg/m <sup>3</sup>	TWA: 0.1 mg/m <sup>3</sup> dust and fume (vacated) TWA: 0.05 mg/m <sup>3</sup> dust and fume	IDLH: 20 mg/m <sup>3</sup> dust and fume TWA: 0.05 mg/m <sup>3</sup> dust and fume
Copper 7440-50-8	TWA: 0.2 mg/m <sup>3</sup> fume	TWA: 0.1 mg/m <sup>3</sup> fume TWA: 1 mg/m <sup>3</sup> dust and mist (vacated) TWA: 0.1 mg/m <sup>3</sup> Cu dust, fume, mist	IDLH: 100 mg/m <sup>3</sup> dust, fume and mist TWA: 1 mg/m <sup>3</sup> dust and mist TWA: 0.1 mg/m <sup>3</sup> fume
Yttrium 7440-65-5	TWA: 1 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> (vacated) TWA: 1 mg/m <sup>3</sup>	IDLH: 500 mg/m <sup>3</sup> TWA: 1 mg/m <sup>3</sup>

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health.

#### Other Exposure Guidelines

Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992). Hexavalent chrome may be formed during welding.

#### Engineering Measures

Showers  
Eyewash stations  
Ventilation systems

#### Personal Protective Equipment

##### Eye/Face Protection Skin and Body Protection Respiratory Protection

Safety glasses with side-shields.  
Impervious clothing. Impervious gloves.  
If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

#### Hygiene Measures

Do not breathe vapors/dust. When using, do not eat, drink or smoke. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Keep away from food, drink and animal feeding stuffs.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	Silver to grayish black.	<b>Odor</b>	Odorless.
<b>Odor Threshold</b>	No information available	<b>Physical State</b>	Solid
<b>pH</b>	No information available.		
<b>Flash Point</b>	Not applicable.	<b>Autoignition Temperature</b>	No information available.
<b>Decomposition Temperature</b>	No information available.	<b>Boiling Point/Boiling Range</b>	No information available
<b>Melting Point/Range</b>	1260°C / 2300°F		
<b>Flammability Limits in Air</b>	No information available.		
<b>Specific Gravity</b>	7.6-7.8	<b>Solubility</b>	No information available.
<b>Evaporation Rate</b>	No information available	<b>Vapor Pressure</b>	No data available.
<b>Vapor Density</b>	No data available.		

## 10. STABILITY AND REACTIVITY

<b>Stability</b>	Stable under recommended storage conditions.
<b>Incompatible Products</b>	Acids. Alkalies. Metal oxides. Oxidizing agents.
<b>Conditions to Avoid</b>	Dust formation. Heat, flames and sparks. Liberates flammable hydrogen gas on contact with water, alcohols, acidic or basic materials, and metals or metallic compounds.
<b>Hazardous Decomposition Products</b>	Metal fume. Chromium oxides. Iron oxides. Nickel oxides.
<b>Hazardous Polymerization</b>	Hazardous polymerization does not occur.

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity

#### Product Information

#### Inhalation

May cause irritation of respiratory tract. Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count.

#### Eye Contact

Dust contact with the eyes can lead to mechanical irritation.

Chemical Name	LD50 Oral	LD50 Dermal	LC50 Inhalation
Iron	= 984 mg/kg ( Rat )		
Nickel	> 9000 mg/kg ( Rat )		
Cobalt	= 6170 mg/kg ( Rat )		> 10 mg/L ( Rat ) 1 h

### Chronic Toxicity

#### Chronic Toxicity

Repeated contact may cause allergic reactions in very susceptible persons. Avoid repeated exposure. Prolonged exposure may cause chronic effects. Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination. May cause adverse effects on the bone marrow and blood-forming system. May cause adverse liver effects.

Elevated temperature processing such as welding and plasma arc cutting may release hazardous fumes. Overexposure to metal fumes may cause pulmonary edema (fluid in the lungs) and methemoglobinemia. May also cause pulmonary fibrosis and lung cancer.

#### Carcinogenicity

This product contains one or more substances which are classified by IARC as carcinogenic to humans (Group I), probably carcinogenic to humans (Group 2A) or possibly carcinogenic to humans (Group 2B).

Chemical Name	ACGIH	IARC	NTP	OSHA
Nickel		Group 2B Group 1	Reasonably Anticipated	X
Chromium		Group 3		
Cobalt	A3	Group 2A Group 2B		X

#### **ACGIH: (American Conference of Governmental Industrial Hygienists)**

A3 - Animal Carcinogen

#### **IARC: (International Agency for Research on Cancer)**

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

#### **NTP: (National Toxicity Program)**

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

#### **OSHA: (Occupational Safety & Health Administration)**

X - Present

#### Target Organ Effects

Blood. Central nervous system (CNS). Eyes. Kidney. Liver. Lungs. Nasal cavities. Respiratory system. Skin.

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Chemical Name	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Daphnia Magna (Water Flea)
Nickel	EC50 96 h: 0.174 - 0.311 mg/L static (Pseudokirchneriella subcapitata) EC50 72 h: = 0.18 mg/L (Pseudokirchneriella subcapitata)	LC50 96 h: = 1.3 mg/L semi-static (Cyprinus carpio) LC50 96 h: = 10.4 mg/L static (Cyprinus carpio) LC50 96 h: > 100 mg/L (Brachydanio rerio)	-	EC50 48 h: = 1 mg/L Static (Daphnia magna) EC50 48 h: > 100 mg/L (Daphnia magna)
Copper	EC50 96 h: 0.031 - 0.054 mg/L static (Pseudokirchneriella subcapitata) EC50 72 h: 0.0426 - 0.0535 mg/L static (Pseudokirchneriella subcapitata)	LC50 96 h: 0.0068 - 0.0156 mg/L (Pimephales promelas) LC50 96 h: < 0.3 mg/L static (Pimephales promelas) LC50 96 h: = 0.052 mg/L flow-through (Oncorhynchus mykiss) LC50 96 h: = 0.112 mg/L flow-through (Poecilia reticulata) LC50 96 h: = 0.2 mg/L flow-through (Pimephales promelas) LC50 96 h: = 0.3 mg/L semi-static (Cyprinus carpio) LC50 96 h: = 0.8 mg/L static (Cyprinus carpio) LC50 96 h: = 1.25 mg/L static (Lepomis macrochirus)	-	EC50 48 h: = 0.03 mg/L Static (Daphnia magna)
Iron	-	LC50 96 h: = 0.56 mg/L semi-static (Cyprinus carpio) LC50 96 h: = 13.6 mg/L static (Morone saxatilis)	-	-
Cobalt	-	LC50 96 h: > 100 mg/L static (Brachydanio rerio)	-	-

### 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Methods** Dispose of in accordance with local regulations.

**Contaminated Packaging** Do not re-use empty containers.

**US EPA Waste Number** D007

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Nickel - 7440-02-0	(hazardous constituent - no waste number)	Included in waste streams: F006, F039		
Chromium - 7440-47-3		Included in waste streams: F032, F034, F035, F037, F038, F039	5.0 mg/L regulatory level	

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste
Nickel	Toxic powder Ignitable powder
Chromium	Toxic Corrosive Ignitable
Copper	Toxic
Molybdenum	Ignitable powder
Cobalt	Toxic powder Ignitable powder
Aluminum	Ignitable powder
Manganese	Ignitable powder
Titanium	Ignitable powder

### 14. TRANSPORT INFORMATION

**DOT** Not regulated

**TDG** Not regulated

**MEX** Not regulated

### 15. REGULATORY INFORMATION

#### International Inventories

TSCA	Complies
DSL	Complies
EINECS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

#### Legend

## 15. REGULATORY INFORMATION

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory  
 DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

### U.S. Federal Regulations

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

Chemical Name	CAS-No	Weight %	SARA 313 - Threshold Values %
Nickel	7440-02-0	99	0.1
Aluminum	7429-90-5	5	1.0
Chromium	7440-47-3	48	1.0
Cobalt	7440-48-4	13	0.1
Copper	7440-50-8	45	1.0
Manganese	7439-96-5	5	1.0

### SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

### Clean Water Act

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Nickel		X	X	
Copper		X	X	

### CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302):

Chemical Name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Nickel	100 lb		RQ 100 lb final RQ RQ 45.4 kg final RQ
Chromium			RQ 5000 lb final RQ RQ 2270 kg final RQ
Copper	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ

### U.S. State Regulations

#### California Proposition 65

This product contains the following Proposition 65 chemicals:

Chemical Name	CAS-No	California Prop. 65
Nickel	7440-02-0	Carcinogen
Cobalt	7440-48-4	Carcinogen

### U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania	Illinois	Rhode Island
Aluminum	X	X	X		X
Manganese	X	X	X	X	X
Molybdenum	X	X	X		X
Nickel	X	X	X	X	X
Silicon	X	X	X		X

Chemical Name	New Jersey	Massachusetts	Pennsylvania	Illinois	Rhode Island
Tantalum	X	X	X		X
Titanium	X				
Tungsten	X	X	X		X
Boron	X				
Carbon			X		X
Chromium		X			X
Cobalt	X	X	X	X	X
Copper	X	X	X	X	X
Yttrium	X	X	X		X

### International Regulations

Chemical Name	Carcinogen Status	Exposure Limits
Aluminum		Mexico: TWA= 10 mg/m <sup>3</sup>
Manganese		Mexico: TWA 0.2 mg/m <sup>3</sup> Mexico: TWA 1 mg/m <sup>3</sup> Mexico: STEL 3 mg/m <sup>3</sup>
Nickel		Mexico: TWA 1 mg/m <sup>3</sup>
Silicon		Mexico: TWA 10 mg/m <sup>3</sup> Mexico: STEL 20 mg/m <sup>3</sup>
Tantalum		Mexico: TWA 5 mg/m <sup>3</sup> Mexico: STEL 10 mg/m <sup>3</sup>
Tungsten		Mexico: TWA 5 mg/m <sup>3</sup> Mexico: STEL 10 mg/m <sup>3</sup>
Carbon		Mexico: TWA 2 mg/m <sup>3</sup>
Chromium		Mexico: TWA 0.5 mg/m <sup>3</sup>
Cobalt	A3	Mexico: TWA= 0.1 mg/m <sup>3</sup>
Copper		Mexico: TWA= 1 mg/m <sup>3</sup> Mexico: TWA= 0.2 mg/m <sup>3</sup> Mexico: STEL= 2 mg/m <sup>3</sup>
Yttrium		Mexico: TWA 1 mg/m <sup>3</sup> Mexico: STEL 3 mg/m <sup>3</sup>

### Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

### WHMIS Hazard Class

Non-controlled

Chemical Name	NPRI
Aluminum	X
Nickel	X
Chromium	X
Cobalt	X

### Legend

NPRI - National Pollutant Release Inventory

**16. OTHER INFORMATION**

**Prepared By** Product Stewardship  
23 British American Blvd.  
Latham, NY 12110  
1-800-572-6501

**Issuing Date** 23-Nov-2011

**Revision Date**

**Revision Note** Initial Release.

**General Disclaimer**

The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

**End of Safety Data Sheet**