

SAFETY DATA SHEET

NI-1111 products



Section 1. Identification

GHS product identifier	: NI-1111 products
Other means of identification	: NI-1111-4 (ZNI1111-04), NI-1111-5 (ZNI1111-05)
Product type	: Powder.

Relevant identified uses of the substance or mixture and uses advised against Not applicable.

Supplier's details	: Praxair Surface Technologies, Inc. 1555 Main Street Indianapolis, IN 46224 USA 317-240-2650
Emergency telephone	: 317-240-2484 7:00am - 3:30pm ET Mon-Fri

number (with hours of Chemtrec: 1-800-424-9300

operation)

Section 2. Hazards identification

OSHA/HCS status	 This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: CARCINOGENICITY - Category 2

GHS label elements

Hazard pictograms



Signal word	1	Warning
Hazard statements	:	Suspected of causing cancer.
Precautionary statements		
Prevention	:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required.
Response	:	IF exposed or concerned: Get medical attention.
Storage	:	Store locked up.
Disposal	:	Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified	:	Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.
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Section 3. Composition/information on ingredients

Substance/mixture	: Substance
Other means of identification	: NI-1111-4 (ZNI1111-04), NI-1111-5 (ZNI1111-05)

CAS number/other identifiers

CAS number	1	Not available.
Product code	:	NI-1111 products

Section 3. Composition/information on ingredients

Ingredient name	%	CAS number
NI-1111 products	100	-
Nickel	50 - 75	7440-02-0
chromium	5 - 20	7440-47-3
cobalt	5 - 20	7440-48-4
molybdenum	5 - 20	7439-98-7
titanium	1 - 5	7440-32-6
Aluminum	1 - 5	91728-14-2
boron	<1	7440-42-8
carbon	<1	7440-44-0

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
Inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Skin contact	: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	: Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects		
Eye contact	: Exposure to airborne concentrations above statutory or recommended exposure limit may cause irritation of the eyes.	ts
Inhalation	: Exposure to airborne concentrations above statutory or recommended exposure limit may cause irritation of the nose, throat and lungs.	ts
Skin contact	: No known significant effects or critical hazards.	
Ingestion	: No known significant effects or critical hazards.	
Over-exposure signs/sympto	<u>ms</u>	
Eye contact	: Adverse symptoms may include the following: irritation redness	
Inhalation	: Adverse symptoms may include the following: respiratory tract irritation coughing	
Skin contact	: No specific data.	
Ingestion	No specific data.	
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Section 4. First aid measures

Indication of immediate med	dical attention and special treatment needed, if necessary
Notes to physician	 Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: No specific treatment.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media	
Suitable extinguishing media	: Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: None known.
Specific hazards arising from the chemical	: No specific fire or explosion hazard.
Hazardous thermal decomposition products	: Decomposition products may include the following materials: metal oxide/oxides
Special protective actions for fire-fighters	 Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for fire-fighters	: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protec	tiv	e equipment and emergency procedures
For non-emergency personnel	:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	:	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Methods and materials for co	nt	ainment and cleaning up
Small spill	:	Move containers from spill area. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor.
Large spill	:	Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

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Precautions for safe handling		
Protective measures	Put on appropriate personal protective equipment (see Section 8). Avoid exposure obtain special instructions before use. Do not handle until all safety precautions has been read and understood. Do not get in eyes or on skin or clothing. Do not inges Avoid breathing dust. If during normal use the material presents a respiratory haza use only with adequate ventilation or wear appropriate respirator. Keep in the origi container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazar Do not reuse container.	ave st. ard, nal
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eatind drinking and smoking. Remove contaminated clothing and protective equipment be entering eating areas. See also Section 8 for additional information on hygiene measures.	
Conditions for safe storage, including any incompatibilities	Store in accordance with local regulations. Store in original container protected fro direct sunlight in a dry, cool and well-ventilated area, away from incompatible mate (see Section 10) and food and drink. Store locked up. Keep container tightly close and sealed until ready for use. Containers that have been opened must be careful resealed and kept upright to prevent leakage. Do not store in unlabeled containers Use appropriate containment to avoid environmental contamination.	erials ed ly
Storage	Store in accordance with local regulations. Store in original container protected fro direct sunlight in a dry, cool and well-ventilated area, away from incompatible mate (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and k upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.	erials il kept

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name		Exposure limits
Nickel		ACGIH TLV (United States, 6/2013). TWA: 1.5 mg/m ³ 8 hours. Form: Inhalable fraction OSHA PEL 1989 (United States, 3/1989). TWA: 1 mg/m ³ , (as Ni) 8 hours. NIOSH REL (United States, 10/2013). TWA: 0.015 mg/m ³ , (as Ni) 10 hours. OSHA PEL (United States, 2/2013). TWA: 1 mg/m ³ , (as Ni) 8 hours.
chromium		ACGIH TLV (United States, 6/2013). TWA: 0.5 mg/m ³ , (measured as Cr) 8 hours. OSHA PEL 1989 (United States, 3/1989). TWA: 1 mg/m ³ 8 hours. NIOSH REL (United States, 10/2013). TWA: 0.5 mg/m ³ 8 hours. OSHA PEL (United States, 2/2013). TWA: 1 mg/m ³ , (as Cr) 8 hours.
cobalt		OSHA PEL 1989 (United States, 3/1989). Notes: as Co TWA: 0.05 mg/m ³ , (as Co) 8 hours. OSHA PEL (United States, 2/2013). Notes: as Co TWA: 0.1 mg/m ³ , (as Co) 8 hours. NIOSH REL (United States, 10/2013). Notes as Co TWA: 0.05 mg/m ³ , (as Co) 10 hours. Form: Dust and fumes
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Section 8. Exposure controls/personal protection

	ACGIH TLV (United States, 6/2013). Notes:
	as Co
	TWA: 0.02 mg/m ³ , (as Co) 8 hours. Form:
	Inorganic
molybdenum	ACGIH TLV (United States, 6/2013).
	TWA: 10 mg/m ³ , (as Mo) 8 hours. Form:
	Inhalable fraction
	TWA: 3 mg/m ³ , (as Mo) 8 hours. Form:
	Respirable fraction
Aluminum	ACGIH TLV (United States, 6/2013).
	TWA: 1 mg/m ³ 8 hours. Form: Respirable
	fraction

Appropriate engineering controls	: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Environmental exposure controls	: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures	: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
Eye/face protection	: Safety eyewear complying with an approved standard should be used to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. If operating conditions cause high dust concentrations to be produced, use dust goggles.
Skin protection	
Hand protection	: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Body protection	: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Other skin protection	: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	: Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance	
<u>Appearance</u>	
Physical state	: Solid. [Powder.]
Color	: Gray.
Odor	: Odorless.
Odor threshold	: Not available.
рН	: Not available.
Melting point	: Not available.
Boiling point	: Not available.
Flash point	: Not available.
Evaporation rate	: Not available.
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Not available.
VOC content	: 0 lbs/gal (0 g/l)
Vapor pressure	: Not available.
Vapor density	: Not available.
Relative density	: Not available.
Solubility	: Insoluble in the following materials: cold water and hot water.
Partition coefficient: n- octanol/water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Viscosity	: Not available.

Section 10. Stability and reactivity

Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Incompatible materials	: No specific data.
Conditions to avoid	: No specific data.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Chemical stability	: The product is stable.
Reactivity	: No specific test data related to reactivity available for this product or its ingredients.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity				
Product/ingredient name	Result	Species	Dose	Exposure
boron	LD50 Oral	Rat	650 mg/kg	-

Irritation/Corrosion

Not available.

Sensitization

Not available.

Section 11. Toxicological information

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Nickel chromium cobalt	- -	2B 3 2B	Reasonably anticipated to be a human carcinogen. - -

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure	Routes of entry anticipated: Dermal, Inhalation.	
Potential acute health effect		
Eye contact	Exposure to airborne concentrations above statutory or recommended exposure may cause irritation of the eyes.	e limits
Inhalation	Exposure to airborne concentrations above statutory or recommended exposure may cause irritation of the nose, throat and lungs.	limits
Skin contact	No known significant effects or critical hazards.	
Ingestion	No known significant effects or critical hazards.	
Symptoms related to the phy	cal, chemical and toxicological characteristics	
Eye contact	Adverse symptoms may include the following: irritation redness	
Inhalation	Adverse symptoms may include the following: respiratory tract irritation coughing	
Skin contact	No specific data.	
Ingestion	No specific data.	
Delayed and immediate effect	and also chronic effects from short and long term exposure	
<u>Short term exposure</u>		
Potential immediate effects	Not available.	
Potential delayed effects	Not available.	
Long term exposure		
Potential immediate effects	Not available.	
Potential delayed effects	Not available.	

Section 11. Toxicological information

Potential chronic health effects

Not available.	
General	: Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
Carcinogenicity	 Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

<u>Toxicity</u>				
Product/ingredient name	Result	Species	Exposure	
Nickel	Acute EC50 2 ppm Marine water	Algae - Macrocystis pyrifera - Young	4 days	
	Acute EC50 450 µg/l Fresh water	Aquatic plants - Lemna minor	4 days	
	Acute EC50 1000 µg/l Marine water	Daphnia - Daphnia magna	48 hours	
	Acute IC50 0.31 mg/l Marine water	Crustaceans - Americamysis	48 hours	
		bahia - Juvenile (Fledgling, Hatchling, Weanling)		
	Acute LC50 47.5 ng/L Fresh water	Fish - Heteropneustes fossilis	96 hours	
	Chronic NOEC 100 mg/l Marine water	Algae - Glenodinium halli	72 hours	
	Chronic NOEC 3.5 µg/l Fresh water	Fish - Cyprinus carpio	4 weeks	
chromium	Acute EC50 0.2 ppm Marine water	Algae - Bacillariophyta	72 hours	
	Acute EC50 5 ppm Marine water	Algae - Macrocystis pyrifera -	4 days	
	Acute EC50 35000 µg/l Fresh water	Young Aquatic plants - Lemna minor	4 days	
	Acute LC50 45 µg/l Fresh water	Crustaceans - Ceriodaphnia	48 hours	
	Acute 2000 40 µg/r resh water	reticulata	40 110013	
	Acute LC50 22 µg/l Fresh water	Daphnia - Daphnia magna	48 hours	
	Acute LC50 13.9 ppm Fresh water	Fish - Anguilla rostrata	96 hours	
	Chronic NOEC 50 mg/l Marine water	Algae - Glenodinium halli	72 hours	
	Chronic NOEC 0.19 µg/l Fresh water	Fish - Cyprinus carpio	4 weeks	
cobalt	Acute LC50 4400 µg/l	Daphnia - Daphnia magna	48 hours	
	Acute LC50 3.4 mg/l Fresh water	Fish - Pimephales promelas	96 hours	
molybdenum	Acute LC50 200000 µg/l	Daphnia - Daphnia magna	48 hours	
-	Acute LC50 800 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours	
	Chronic NOEC 500 mg/l Marine water	Algae - Glenodinium halli	72 hours	
boron	Acute EC50 60000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days	

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
cobalt	-	15600	high
titanium	-	34 to 352	low

Section 12. Ecological information

Mobility in soil

Soil/water partition	
coefficient (Koc)	

: Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	ADR/RID	IMDG	ΙΑΤΑ
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-	-	-
Transport hazard class(es)	-	-	-	-	-	-
Packing group	-	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.	No.
Additional information	Reportable guantity 160 lbs / 72.64 kg Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.	-	-		-	-

Special precautions for user : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 14. Transport information

Transport in bulk according : Not available. to Annex II of MARPOL 73/78 and the IBC Code

Section 15. Regulatory information

•	-
U.S. Federal regulations	 TSCA 8(a) CDR Exempt/Partial exemption: Not determined United States inventory (TSCA 8b): Not determined. Clean Water Act (CWA) 307: Nickel; chromium
Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)	: Listed
Clean Air Act Section 602 Class I Substances	: Not listed
Clean Air Act Section 602 Class II Substances	: Not listed
DEA List I Chemicals (Precursor Chemicals)	: Not listed
DEA List II Chemicals (Essential Chemicals)	: Not listed
SARA 302/304	
Composition/information	on ingredients
No products were found.	
SARA 304 RQ	: Not applicable.

SARA 311/312

Classification : Delayed (chronic) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
NI-1111 products	100	No.	No.	No.	No.	Yes.
Nickel	50 - 75	No.	No.	No.	No.	Yes.
cobalt	5 - 20	No.	No.	No.	No.	Yes.
boron	<1	No.	No.	No.	Yes.	No.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Nickel	7440-02-0	50 - 75
	chromium	7440-47-3	5 - 20
	cobalt	7440-48-4	5 - 20
Supplier notification	Nickel	7440-02-0	50 - 75
	chromium	7440-47-3	5 - 20
	cobalt	7440-48-4	5 - 20

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations Massachusetts

New York New Jersey

- : The following components are listed: Nickel; Chromium
- : The following components are listed: NICKEL; CHROMIUM; COBALT; MOLYBDENUM; TITANIUM

Section 15. Regulatory information

Pennsylvania

: The following components are listed: NICKEL; CHROMIUM; COBALT FUME; MOLYBDENUM

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

Ingredient name		Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Nickel cobalt				No. No.	No. No.
Canada inventory	: No	t determined.	·	·	
International regulations					
International lists	Ch Jap Ko Ma Ne ^v Phi	ina inventory (IÉ pan inventory: No rea inventory: No laysia Inventory w Zealand Invento ilippines invento	ot determined. (EHS Register) : Not	ed. t determined. NZIoC) : Not determined ermined.	
Chemical Weapons Convention List Schedule I Chemicals	: Not	t listed			
Chemical Weapons Convention List Schedule II Chemicals	: Not	t listed			
Chemical Weapons Convention List Schedule III Chemicals	: Not	t listed			

Section 16. Other information

<u>History</u>	
Date of printing	: 6/11/2014.
Date of issue/Date of revision	: 6/11/2014.
Kau és ala bravisticas	
Key to abbreviations	: ATE = Acute Toxicity Estimate

	BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Internediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
References	UN = United Nations : Not available.

Notice to reader

Section 16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.