



Material Safety Data Sheet
ArcMelt™ 4300 Performance Enhanced Alloys

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name:	ArcMelt™ 4300 Series Performance Enhanced Alloys (4301, 4302, 4303, 4305)
Other/generic names:	Powdered metal mixtures.
Product use:	Alloys for use in welding and thermal spraying.
Manufacturer:	ArcMelt Company, LLC 4734 Earth City Expressway Bridgeton, MO. 63044 314-801-6900

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Silver to grey metal wire not normally considered hazardous as shipped. Gloves should be worn when handling as certain individuals can develop allergic skin reactions to some metals.

Potential Health Hazards

Skin:	Although not normally hazardous, some individuals can develop allergic skin reactions to nickel, cobalt and other metallic ingredients. Fumes generated by welding and spraying operations may be irritating to the skin.
Eyes:	As shipped, product does not pose a hazard to the eyes. Fumes generated by welding and spraying processes can be irritating to the eye. Failure to administer first aid can result in injury to the structure of the eye.
Inhalation:	Fumes generated by welding and spraying processes can be irritating and toxic.
Ingestion:	Not a likely route of entry. Metal ingestion can cause toxic effects.
Delayed effects:	Inhalation of welding fumes or sprayed metallic particles may cause damage to the lungs and respiratory tract including but not limited to fibrosis of the lung which can reduce lung capacity and produce difficulty breathing. Nickel is an animal carcinogens and inhalation of fumes and dusts should be avoided.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

Ingredient Name	NTP Status	IARC Status	OSHA List
Nickel	Reasonably anticipated to be a carcinogen	2B – Possibly carcinogenic to humans	-----

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	Weight %			
		4301	4302	4303	4305
Aluminum	7429-90-5	< 20	< 20	< 20	< 20
Boron	7440-42-8	< 10	-----	< 10	< 10
Chromium	7440-47-3	< 50	-----	-----	< 50
Iron	7439-89-6	< 60	-----	< 70	< 60
Molybdenum	7436-98-7	-----	-----	-----	< 30
Nickel	7440-02-0	< 30	< 90	< 50	< 30
Silicon	7440-21-3	< 1	-----	-----	< 1

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

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4. FIRST AID MEASURES

Skin:	Wash skin with soap and water to remove any metallic particles. If a rash develops, seek medical attention.
Eyes:	Flush particles from eyes with clean water for at least 15 minutes. If irritation persists, seek medical attention.
Inhalation:	Remove from exposure. If respiratory irritation persists, seek medical attention.
Ingestion:	If metallic particles are swallowed, seek medical assistance.
Advice to physician:	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash Point & Method	Solid material – No flash point
Autoignition Temperature:	Not flammable
Flame Propagation Rate (solids):	Not flammable
OSHA Flammability Class:	None – solid material
Extinguishing Media:	Use agent appropriate for surrounding fire.
Unusual Fire And Explosion Hazards:	None
Special Fire Fighting Precautions/Instructions:	Wear self contained breathing apparatus. Metallic fumes can be generated in a fire.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: Wear proper protective clothing. Pick up spilled articles and place into container.

7. HANDLING AND STORAGE

Normal Handling:	Avoid handling with bare hands. Some individuals can develop allergic reactions to metal after repeated handling. Do not breathe fumes from welding and spraying operations. (Always wear recommended personal protective equipment.)
Storage Recommendations:	Store in a dry place and protect from contamination with other materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Provide general ventilation and local exhaust to maintain concentrations of metal dusts and/or fumes below allowable exposure values.

Personal Protective Equipment

Skin Protection:	Work gloves, face protection and flame retardant clothing during welding and spraying operations.
Eye Protection:	Eye protection is recommended when cutting, grinding, welding or spraying.
Respiratory Protection:	For welding and spraying operations, use an air purifying respirator or an air supplied respirator to maintain exposures below safe limits. See exposure guidelines in this section.
Additional Recommendations:	Source of running water to wash skin and eyes.

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Exposure Guidelines

Ingredient Name	ACGIH TLV	OSHA PEL	Other *
Aluminum	10 mg/m ³ TWA (metal dust) 5 mg/m ³ TWA (welding fumes)	15 mg/m ³ TWA (total dust) 5 mg/m ³ TWA (respirable fraction)	10 mg/m ³ TWA (total dust) 5 mg/m ³ TWA (respirable fraction)
Boron	Not established	Not established	Not established
Chromium	0.5 mg/m ³ TWA	1mg/m ³ TWA	0.5 mg/m ³ TWA
Iron	None established	None Established	None Established
Molybdenum	10 mg/m ³ TWA (inhalable fraction) 3 mg/m ³ TWA (respirable fraction)	Not established	Not established
Nickel	1.5 mg/m ³ TWA (inhalable fraction)	1 mg/m ³ TWA	0.015 mg/m ³ TWA
Silicon	10 mg/m ³ TWA	15 mg/m ³ TWA (total dust) 5 mg/m ³ TWA (respirable fraction)	15 mg/m ³ TWA (total dust) 5 mg/m ³ TWA (respirable fraction)

* = NIOSH REL

** = Workplace Environmental Exposure Level (AIHA).

*** = Biological Exposure Index (ACGIH).

Other Exposure Limits For Potential Decomposition Products:

Decomposition Product	ACGIH TLV	OSHA PEL
Small quantities of hexavalent chromium oxides (lung carcinogens) may be produced by the use (oxidation) of this product.	0.05 mg/m ³ TWA (as Cr)	0.1 mg/m ³ Ceiling (as CrO ₃) Effective: 10/27/2006 0.005 mg/m ³ TWA (as Cr)

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Silver to grey wire
Physical State:	Solid
Molecular Weight:	Mixture
Chemical Formula:	Mixture
Odor:	Odorless
Specific Gravity (water = 1.0):	6.5
Solubility In Water (wt. %):	0%
Melting Point:	Not determined
Flash Point	None

10. STABILITY AND REACTIVITY

Normally Stable? (Conditions To Avoid):	Normally stable.
Incompatibilities:	Nickel can react with carbon monoxide to form highly toxic nickel carbonyl gas.
Hazardous Decomposition Products:	Thermal decomposition: Oxides of metals present in formulation.
Hazardous Polymerization:	Will not occur.

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11. TOXICOLOGICAL INFORMATION

Immediate (acute) effects:

Aluminum	LD ₅₀ (oral) = Not established. Aluminum metal is relatively non-toxic.
Boron	LD ₅₀ (oral, rat) = 650 mg/kg. Moderately toxic by ingestion.
Chromium	LD ₅₀ (oral) = Not established. Relatively non-toxic. Repeated skin contact may cause allergic skin reactions in some individuals.
Iron	LD ₅₀ (oral) = Not established.
Molybdenum	LD ₅₀ (oral) = Not established.
Nickel	LD ₅₀ (oral, rat) = > 9,000 mg/kg. Repeated skin contact may cause allergic skin reactions in some individuals.
Silicon	LD ₅₀ (oral, rat) = 3,160 mg/kg.

Delayed (subchronic and chronic) effects:

Aluminum	Repeated and prolonged exposure to aluminum dusts may cause lung effects. There have been reports of lung fibrosis in workers producing and working with aluminum powders in the absence of proper ventilation.
Boron	Continuous over-exposure over a long period of time can result in a system toxicity similar to ingestion
Chromium	The International Agency for Research on Cancer (IARC) considers hexavalent chromium to be a carcinogen (lung, nasal) but does not have adequate evidence for chromium metal and trivalent chromium. Fumes have been associated with lung fibrosis.
Iron	Prolonged inhalation of iron oxide fumes can lead to siderosis, which presents as a benign pneumoconiosis.
Molybdenum	Repeated inhalation of fumes has caused kidney damage, respiratory irritation and liver damage in animals.
Nickel	Nickel metal is “reasonably anticipated to be a human carcinogen” (National Toxicology Program’s 10 th Report). IARC states that nickel metal is possibly carcinogenic to humans. Epidemiological studies of workers exposed to nickel powders, dusts and fumes in the nickel alloy and stainless steel producing industries do not indicate a significant respiratory cancer hazard. Inhalation of nickel powder produced malignant tumors in rodent studies. Single intratracheal installations of nickel powder at level close to the LD ₅₀ have caused malignancies in hamsters.
Silicon	Considered to be a nuisance dust (unlike crystalline silica which is a know inhalation carcinogen.)

Other Data: None listed.

12. ECOLOGICAL INFORMATION

As a solid metal object, this product is not considered toxic to aquatic species. However, metals can leach out of the product over time and present a hazard to groundwater.

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded?	Yes for 4301 and 4305
If yes, the RCRA ID number is:	Characteristic Toxic Hazardous Waste - D007 (Chromium) 4301,4305

Other Disposal Considerations: Observe all Federal, State, and Local Environmental regulations.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

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14. TRANSPORT INFORMATION

US DOT Proper Shipping Name:	Not regulated
US DOT Hazard Class & Packing Group:	Not applicable
US DOT ID Number:	Not applicable

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION

Toxic Substances Control Act (TSCA)

TSCA Inventory Status:	All ingredients are listed on the TSCA chemical inventory.
Other TSCA Issues:	None

SARA Title III/CERCLA

Reportable Quantities (RQs) and/or Threshold Planning Quantities (TPQs) exist for the following ingredients.

Ingredient Name	SARA/CERCLA RQ (lb)	SARA EHS TPQ (lb)
Product is distributed in the form of a solid article.	-----	-----

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

Section 311 Hazard Class:	As shipped: immediate. In use: immediate, delayed.
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SARA 313 Toxic Chemicals:

The following metallic components are listed as SARA 313 "Toxic Chemicals" and potential subject to annual SARA 313 reporting. Weight percents are found in Section 3.

Ingredient Name	Comment
Aluminum	Disclosure threshold: 1.0 % de minimis concentration
Chromium	Disclosure threshold: 1.0 % de minimis concentration
Nickel	Disclosure threshold: 0.1 % de minimis concentration

State Right-To-Know

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

Ingredient Name	Weight %	Comment
No ingredients listed in this section.		

The following materials are regulated by California's Proposition 65:

Ingredient	Proposition 65 Status
Nickel	Carcinogen

Other Regulatory Information:

WHMIS Classification (Canada):	As shipped: D2B This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.
Foreign Inventory Status:	All ingredients are listed on the following inventories: Australia, Canada, China, European Union, Japan, Korea and Philippines

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16. OTHER INFORMATION

Current Issue Date:	May 24, 2006
Previous Issue Date:	April 26, 2006
Changes To MSDS From Previous Issue Date Are Due To The Following:	Corrected typo in section 8 regarding current OSHA PEL for Cr+6
MSDS prepared by ArcMelt Technical Department.	