



PRODUCT INFORMATION SHEET

MATERION

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name or designation of the mixture	Metallized Alumina Ceramic
Registration number	-
Document number	C22
Synonyms	Aluminum Oxide, Alumina, Al ₂ O ₃ , Durox AL, Durox UHP
Issue date	22-August-2018
Version number	03
Revision date	28-April-2021
Supersedes date	13-January-2021

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Not available.
Uses advised against	None known.

1.3. Details of the supplier of the product information sheet

Materion Brush Inc.
6070 Parkland Boulevard
Mayfield Heights, OH 44124
United States
ehs@materion.com
www.materion.com
+1.216.383.4019

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

The mixture has been assessed and/or tested for its physical, health and environmental hazards and the following classification applies.

Classification according to Regulation (EC) No 1272/2008 as amended

Health hazards

Serious eye damage/eye irritation	Category 2	H319 - Causes serious eye irritation.
Respiratory sensitisation	Category 1	H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitisation	Category 1	H317 - May cause an allergic skin reaction.
Carcinogenicity	Category 1A	H350 - May cause cancer.
Reproductive toxicity	Category 2	H361 - Suspected of damaging fertility or the unborn child.
Specific target organ toxicity - single exposure	Category 3 respiratory tract irritation	H335 - May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	Category 2 (Respiratory system)	H373 - May cause damage to organs through prolonged or repeated exposure.

Hazard summary May cause damage to organs through prolonged or repeated exposure. May cause cancer. May cause an allergic skin reaction. Possible reproductive hazard. Prolonged exposure may cause chronic effects. Occupational exposure to the substance or mixture may cause adverse health effects.

2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended**Contains:** Aluminium oxide, Gold, Molybdenum, NICKEL POWDER; [PARTICLE DIAMETER < 1MM], Silica, Titanium, Tungsten**Hazard pictograms****Signal word** Danger**Hazard statements**

H317 May cause an allergic skin reaction.
 H319 Causes serious eye irritation.
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 H335 May cause respiratory irritation.
 H350 May cause cancer.
 H361 Suspected of damaging fertility or the unborn child.
 H373 May cause damage to organs through prolonged or repeated exposure.

Precautionary statements**Prevention**

P201 Obtain special instructions before use.
 P202 Do not handle until all safety precautions have been read and understood.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P272 Contaminated work clothing should not be allowed out of the workplace.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P284 Wear respiratory protection.

Response

P302 + P352 IF ON SKIN: Wash with plenty of water.
 P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P308 + P313 IF exposed or concerned: Get medical advice/attention.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
 P342 + P311 If experiencing respiratory symptoms: Call a poison centre/doctor.
 P362 + P364 Take off contaminated clothing and wash it before reuse.

Storage

P405 Store locked up.

Disposal

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Supplemental label information

For further information, please contact the Product Stewardship Department at +1.216.383.4019.

2.3. Other hazards Not a PBT or vPvB substance or mixture.**SECTION 3: Composition/information on ingredients****3.2. Mixtures****General information**

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Aluminium oxide	80 - 95	1344-28-1 215-691-6	-	-	
Classification: -					
Molybdenum	0 - 10	7439-98-7 231-107-2	-	-	
Classification: -					
NICKEL POWDER; [PARTICLE DIAMETER < 1MM]	0 - 10	7440-02-0 231-111-4	01-2119438727-29-0049	028-002-00-7	
Classification: Skin Sens. 1;H317, STOT SE 3;H335, Carc. 2;H351, STOT RE 2;H373					7,S
Silica	0 - 4	14808-60-7 238-878-4	-	-	#
Classification: Carc. 1A;H350					

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	Index No.	Notes
Manganese	0 - 2	7439-96-5 231-105-1	-	-	#
Classification: -					
Titanium	0 - 2	7440-32-6 231-142-3	-	-	
Classification: -					
Tungsten	0 - 2	7440-33-7 231-143-9	-	-	
Classification: -					
Gold	0 - 1	7440-57-5 231-165-9	-	-	
Classification: -					

List of abbreviations and symbols that may be used above

#: This substance has been assigned Union workplace exposure limit(s).

SECTION 4: First aid measures

General information

If exposed or concerned: get medical attention/advice. IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

4.1. Description of first aid measures

Inhalation

Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.

Eye contact

Rinse with water. Get medical attention if irritation develops and persists.

Ingestion

Rinse mouth. Get medical attention if symptoms occur.

4.2. Most important symptoms and effects, both acute and delayed

May cause an allergic skin reaction. Dermatitis. Rash. Prolonged exposure may cause chronic effects.

4.3. Indication of any immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

SECTION 5: Firefighting measures

General fire hazards

No unusual fire or explosion hazards noted.

5.1. Extinguishing media

Suitable extinguishing media

Water fog. Foam. Dry chemical powder. Dry sand. Carbon dioxide (CO₂).

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire. Carbon dioxide (CO₂).

5.2. Special hazards arising from the substance or mixture

During fire, gases hazardous to health may be formed.

5.3. Advice for firefighters

Special protective equipment for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Special firefighting procedures

Move containers from fire area if you can do so without risk.

Specific methods

Use standard firefighting procedures and consider the hazards of other involved materials.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.

For emergency responders	Keep unnecessary personnel away.
6.2. Environmental precautions	Avoid discharge into drains, water courses or onto the ground.
6.3. Methods and material for containment and cleaning up	Put material in suitable, covered, labeled containers.
6.4. Reference to other sections	Not available.

SECTION 7: Handling and storage

7.1. Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep formation of airborne dusts to a minimum. Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.
7.2. Conditions for safe storage, including any incompatibilities	Store locked up. Store in original tightly closed container.
7.3. Specific end use(s)	Not available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

Austria. MAK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	MAK	5 mg/m ³	Respirable fraction.
		5 mg/m ³	Respirable fume.
		10 mg/m ³	Inhalable fraction.
	STEL	20 mg/m ³	Inhalable fraction.
		10 mg/m ³	Respirable fraction.
		10 mg/m ³	Respirable fume.
Manganese (CAS 7439-96-5)	MAK	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
		1,6 mg/m ³	Inhalable fraction.
	STEL	0,16 mg/m ³	Respirable fraction.
		10 mg/m ³	Inhalable fraction.
		20 mg/m ³	Inhalable fraction.
Silica (CAS 14808-60-7)	MAK	0,15 mg/m ³	Respirable dust.
		5 mg/m ³	Inhalable fraction.
		10 mg/m ³	Inhalable fraction.
Tungsten (CAS 7440-33-7)	MAK	5 mg/m ³	Inhalable fraction.
		10 mg/m ³	Inhalable fraction.
		10 mg/m ³	Inhalable fraction.

Austria. TRK List, OEL Ordinance (GwV), BGBl. II, no. 184/2001

Components	Type	Value	Form
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	STEL	2 mg/m ³	Inhalable dust.
	TWA	0,5 mg/m ³	Inhalable dust.

Belgium. Exposure Limit Values

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	1 mg/m ³	Respirable fraction.
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	
Molybdenum (CAS 7439-98-7)	TWA	10 mg/m ³	

Belgium. Exposure Limit Values Components

Components	Type	Value	Form
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	1 mg/m ³	
Silica (CAS 14808-60-7)	TWA	0,1 mg/m ³	Respirable dust.
Tungsten (CAS 7440-33-7)	STEL	10 mg/m ³	
	TWA	5 mg/m ³	

Bulgaria. OELs. Regulation No 13 on protection of workers against risks of exposure to chemical agents at work Components

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	3,5 mg/m ³	Respirable fraction.
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	TWA	10 mg/m ³	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,05 mg/m ³	
Silica (CAS 14808-60-7)	TWA	0,07 mg/m ³	Respirable fraction.
Titanium (CAS 7440-32-6)	TWA	1 mg/m ³	
Tungsten (CAS 7440-33-7)	STEL	10 mg/m ³	
	TWA	1 mg/m ³	

Croatia. Dangerous Substance Exposure Limit Values in the Workplace (ELVs), Annexes 1 and 2, Narodne Novine, 13/09

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	MAC	4 mg/m ³	Respirable dust.
		10 mg/m ³	Total dust.
Manganese (CAS 7439-96-5)	MAC	0,2 mg/m ³	Total dust.
		0,05 mg/m ³	Respirable dust.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	MAC	0,5 mg/m ³	
Silica (CAS 14808-60-7)	MAC	0,1 mg/m ³	
Tungsten (CAS 7440-33-7)	MAC	5 mg/m ³	
	STEL	3 mg/m ³	

Cyprus. OELs. Control of factory atmosphere and dangerous substances in factories regulation, PI 311/73, as amended.

Components	Type	Value
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	1 mg/m ³

Czech Republic. OELs. Government Decree 361 Components

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	0,1 mg/m ³	Respirable dust.
Manganese (CAS 7439-96-5)	Ceiling	0,4 mg/m ³	Aerosol, inhalable.
	TWA	0,2 mg/m ³	Aerosol, inhalable.
Molybdenum (CAS 7439-98-7)	Ceiling	25 mg/m ³	
	TWA	5 mg/m ³	

Czech Republic. OELs. Government Decree 361 Components

Components	Type	Value	Form
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	Ceiling	1 mg/m3	Aerosol, inhalable.
	TWA	0,5 mg/m3	Aerosol, inhalable.
Silica (CAS 14808-60-7)	TWA	0,1 mg/m3	Respirable dust.

Denmark. Exposure Limit Values Components

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TLV	5 mg/m3	Total
		2 mg/m3	Respirable.
Manganese (CAS 7439-96-5)	TLV	0,2 mg/m3	Dust.
		0,2 mg/m3	Inhalable fume.
		0,05 mg/m3	Respirable.
		0,05 mg/m3	Respirable fume.
Molybdenum (CAS 7439-98-7)	TLV	10 mg/m3	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TLV	0,05 mg/m3	Dust.
Silica (CAS 14808-60-7)	TLV	0,3 mg/m3	Total
		0,1 mg/m3	Respirable.
Tungsten (CAS 7440-33-7)	TLV	5 mg/m3	Dust.

Estonia. OELs. Occupational Exposure Limits of Hazardous Substances (Regulation No. 105/2001, Annex), as amended

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	4 mg/m3	Fine dust, respiratory fraction
		10 mg/m3	Total dust.
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m3	Total dust, respiratory fraction
		0,05 mg/m3	Fine dust, respiratory fraction
Molybdenum (CAS 7439-98-7)	TWA	5 mg/m3	Fine dust, respiratory fraction
		10 mg/m3	Total dust, respiratory fraction
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,5 mg/m3	
Silica (CAS 14808-60-7)	TWA	0,1 mg/m3	Fine dust, respiratory fraction
Tungsten (CAS 7440-33-7)	TWA	5 mg/m3	

Finland. Workplace Exposure Limits Components

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m3	Inhalable dust.
		0,02 mg/m3	Respirable.
Molybdenum (CAS 7439-98-7)	TWA	0,5 mg/m3	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,01 mg/m3	Respirable.
Silica (CAS 14808-60-7)	TWA	0,05 mg/m3	Respirable.
Tungsten (CAS 7440-33-7)	TWA	5 mg/m3	

France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	VME	10 mg/m ³	
Regulatory status: Indicative limit (VL)			
Manganese (CAS 7439-96-5)	VME	1 mg/m ³	Fume.
Regulatory status: Indicative limit (VL)			
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	VME	1 mg/m ³	
Regulatory status: Indicative limit (VL)			
Silica (CAS 14808-60-7)	VME	0,1 mg/m ³	Respirable fraction.
Regulatory status: Regulatory binding (VRC)			

Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG)

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	4 mg/m ³	Inhalable dust.
		1,5 mg/m ³	Respirable dust.
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,02 mg/m ³	Respirable fraction.

Germany. TRGS 900, Limit Values in the Ambient Air at the Workplace

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	AGW	10 mg/m ³	Inhalable fraction.
		1,25 mg/m ³	Respirable fraction.
Manganese (CAS 7439-96-5)	AGW	0,2 mg/m ³	Inhalable fraction.
		0,02 mg/m ³	Respirable fraction.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	AGW	0,03 mg/m ³	Inhalable fraction.
		0,006 mg/m ³	Respirable fraction.

Greece. OELs (Decree No. 90/1999, as amended)

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	5 mg/m ³	Inhalable
		10 mg/m ³	Respirable.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	1 mg/m ³	

Hungary. OELs. Joint Decree on Chemical Safety of Workplaces

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	6 mg/m ³	Respirable.
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	STEL	60 mg/m ³	
	TWA	15 mg/m ³	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	Ceiling	0,1 mg/m ³	
Silica (CAS 14808-60-7)	TWA	0,15 mg/m ³	Respirable.

Iceland. OELs. Regulation 154/1999 on occupational exposure limits

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	10 mg/m ³	
Manganese (CAS 7439-96-5)	STEL	5 mg/m ³	Total dust.
	TWA	2,5 mg/m ³	Total dust.
		1 mg/m ³	Respirable dust.
		0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	TWA	10 mg/m ³	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,05 mg/m ³	Dust.
Silica (CAS 14808-60-7)	TWA	0,3 mg/m ³	Total dust.
		0,1 mg/m ³	Respirable dust.
Tungsten (CAS 7440-33-7)	TWA	5 mg/m ³	Dust.

Ireland. Occupational Exposure Limits

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	4 mg/m ³	Respirable dust.
		10 mg/m ³	Total inhalable dust.
Manganese (CAS 7439-96-5)	STEL	3 mg/m ³	Inhalable fume.
	TWA	0,2 mg/m ³	Inhalable fume.
		0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
		0,02 mg/m ³	Respirable fume.
Molybdenum (CAS 7439-98-7)	TWA	3 mg/m ³	Respirable fraction.
		10 mg/m ³	Inhalable fraction.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,5 mg/m ³	
Silica (CAS 14808-60-7)	TWA	0,1 mg/m ³	Respirable dust.
Tungsten (CAS 7440-33-7)	STEL	10 mg/m ³	
	TWA	5 mg/m ³	

Italy. Occupational Exposure Limits

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	1 mg/m ³	Respirable fraction.
Manganese (CAS 7439-96-5)	TWA	0,1 mg/m ³	Inhalable fraction.
		0,02 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	TWA	3 mg/m ³	Respirable fraction.
		10 mg/m ³	Inhalable fraction.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	1,5 mg/m ³	Inhalable fraction.
Silica (CAS 14808-60-7)	TWA	0,025 mg/m ³	Respirable fraction.
Tungsten (CAS 7440-33-7)	TWA	3 mg/m ³	Respirable fraction.

Latvia. OELs. Occupational exposure limit values of chemical substances in work environment

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	6 mg/m ³	Decomposition aerosol.
		4 mg/m ³	
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,1 mg/m ³	Welding fume.
		0,05 mg/m ³	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,05 mg/m ³	
Titanium (CAS 7440-32-6)	TWA	10 mg/m ³	

Lithuania. OELs. Limit Values for Chemical Substances, General Requirements

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	TWA	5 mg/m ³	
		5 mg/m ³	Respirable fraction.
		10 mg/m ³	Inhalable fraction.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,5 mg/m ³	
Silica (CAS 14808-60-7)	TWA	0,1 mg/m ³	Respirable fraction.
Tungsten (CAS 7440-33-7)	TWA	5 mg/m ³	

Luxembourg. Binding Occupational exposure limit values (Annex I), Memorial A

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Alveolar fraction

Netherlands. OELs (binding)

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	STEL	0,05 mg/m ³	Respirable fraction.
	TWA	0,2 mg/m ³	Inhalable fraction.
Silica (CAS 14808-60-7)	TWA	0,075 mg/m ³	Respirable dust.

Norway. Administrative Norms for Contaminants in the Workplace

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TLV	10 mg/m ³	
Manganese (CAS 7439-96-5)	TLV	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	TLV	10 mg/m ³	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TLV	0,05 mg/m ³	
Silica (CAS 14808-60-7)	TLV	0,3 mg/m ³	Total dust.
		0,1 mg/m ³	Respirable dust.
Tungsten (CAS 7440-33-7)	TLV	5 mg/m ³	

Poland. Ordinance of the Minister of Labour and Social Policy on 6 June 2014 on the maximum permissible concentrations and intensities of harmful health factors in the work environment, Journal of Laws 2014, item 817

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	2,5 mg/m ³	Inhalable fraction.
		1,2 mg/m ³	Respirable fraction.
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	STEL	10 mg/m ³	
	TWA	4 mg/m ³	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,25 mg/m ³	
Silica (CAS 14808-60-7)	TWA	0,1 mg/m ³	Respirable fraction.
Titanium (CAS 7440-32-6)	STEL	30 mg/m ³	
	TWA	10 mg/m ³	
Tungsten (CAS 7440-33-7)	TWA	5 mg/m ³	Inhalable fraction.

Portugal. OELs. Decree-Law n. 290/2001 (Journal of the Republic - 1 Series A, n.266)

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.

Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796)

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	1 mg/m ³	Respirable fraction.
Manganese (CAS 7439-96-5)	TWA	0,1 mg/m ³	Inhalable fraction.
		0,02 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	TWA	3 mg/m ³	Respirable fraction.
		10 mg/m ³	Inhalable fraction.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	1,5 mg/m ³	Inhalable fraction.
Silica (CAS 14808-60-7)	TWA	0,025 mg/m ³	Respirable fraction.
Tungsten (CAS 7440-33-7)	STEL	10 mg/m ³	
	TWA	5 mg/m ³	

Romania. OELs. Protection of workers from exposure to chemical agents at the workplace

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	STEL	5 mg/m ³	Aerosol
	TWA	2 mg/m ³	Aerosol
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	STEL	10 mg/m ³	
	TWA	5 mg/m ³	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	STEL	0,5 mg/m ³	
Titanium (CAS 7440-32-6)	TWA	0,1 mg/m ³	
	STEL	15 mg/m ³	
	TWA	10 mg/m ³	

Romania. OELs. Protection of workers from exposure to chemical agents at the workplace

Components	Type	Value	Form
Tungsten (CAS 7440-33-7)	STEL	6 mg/m ³	
	TWA	2 mg/m ³	

Slovakia. OELs for carcinogens and mutagens. Regulation No. 46/2002 on carcinogenic and mutagenic substances

Components	Type	Value	Form
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,05 mg/m ³	Inhalable fraction.
Silica (CAS 14808-60-7)	TWA	0,1 mg/m ³	Respirable fraction.

Slovakia. OELs. Regulation No. 300/2007 concerning protection of health in work with chemical agents

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	4 mg/m ³	Inhalable fraction.
		1,5 mg/m ³	Respirable fraction.
		0,1 mg/m ³	
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	TWA	5 mg/m ³	Respirable fraction.
		5 mg/m ³	
		10 mg/m ³	Inhalable fraction.
Tungsten (CAS 7440-33-7)	TWA	5 mg/m ³	

Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	10 mg/m ³	Inhalable fraction.
		1,25 mg/m ³	Respirable fraction.
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,006 mg/m ³	Respirable fraction.

Spain. Occupational Exposure Limits

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	10 mg/m ³	
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	TWA	3 mg/m ³	Respirable fraction.
		10 mg/m ³	Inhalable fraction.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	1 mg/m ³	
Silica (CAS 14808-60-7)	TWA	0,05 mg/m ³	Respirable fraction.
Tungsten (CAS 7440-33-7)	STEL	10 mg/m ³	
	TWA	5 mg/m ³	

Sweden. OELs. Work Environment Authority (AV), Occupational Exposure Limit Values (AFS 2015:7)

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	5 mg/m ³	Total dust.

Sweden. OELs. Work Environment Authority (AV), Occupational Exposure Limit Values (AFS 2015:7)

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	TWA	2 mg/m ³	Respirable dust.
		0,2 mg/m ³	Inhalable dust.
Molybdenum (CAS 7439-98-7)	TWA	0,05 mg/m ³	Respirable dust.
		5 mg/m ³	Respirable dust.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	10 mg/m ³	Total dust.
		0,5 mg/m ³	Total dust.
Silica (CAS 14808-60-7)	TWA	0,1 mg/m ³	Respirable dust.
Tungsten (CAS 7440-33-7)	TWA	5 mg/m ³	Total dust.

Switzerland. SUVA Grenzwerte am Arbeitsplatz

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	STEL	24 mg/m ³	Respirable dust and/or fume.
	TWA	3 mg/m ³	Respirable dust.
Manganese (CAS 7439-96-5)	TWA	3 mg/m ³	Respirable dust and/or fume.
		0,5 mg/m ³	Inhalable fraction.
Molybdenum (CAS 7439-98-7)	TWA	10 mg/m ³	Inhalable fraction.
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,5 mg/m ³	Inhalable fraction.
Silica (CAS 14808-60-7)	TWA	0,15 mg/m ³	Respirable fraction.
Tungsten (CAS 7440-33-7)	TWA	5 mg/m ³	Inhalable fraction.

UK. EH40 Workplace Exposure Limits (WELs)

Components	Type	Value	Form
Aluminium oxide (CAS 1344-28-1)	TWA	4 mg/m ³	Respirable dust.
		10 mg/m ³	Inhalable dust.
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.
Molybdenum (CAS 7439-98-7)	STEL	20 mg/m ³	
	TWA	10 mg/m ³	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	TWA	0,5 mg/m ³	
		0,1 mg/m ³	Respirable.
Silica (CAS 14808-60-7)	TWA	0,1 mg/m ³	Respirable.
Tungsten (CAS 7440-33-7)	STEL	10 mg/m ³	
	TWA	5 mg/m ³	

EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU, 2017/164/EU

Components	Type	Value	Form
Manganese (CAS 7439-96-5)	TWA	0,2 mg/m ³	Inhalable fraction.
		0,05 mg/m ³	Respirable fraction.

EU. OELs, Directive 2004/37/EC on carcinogen and mutagens from Annex III, Part A

Components	Type	Value	Form
Silica (CAS 14808-60-7)	TWA	0,1 mg/m ³	Respirable fraction and dust

Biological limit values

Czech Republic. Limit Values for Indicators of Biological Exposure Tests in Urine and Blood, Annex 2, Tables 1 and 2, Government Decree 432/2003 Sb.

Components	Value	Determinant	Specimen	Sampling Time
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	0,077 µmol/mmol	Nickel	Creatinine in urine	*
	0,04 mg/g	Nickel	Creatinine in urine	*

* - For sampling details, please see the source document.

Finland. HTP-arvot, App 2., Biological Limit Values, (BRA/BGV), Social Affairs and Ministry of Health

Components	Value	Determinant	Specimen	Sampling Time
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	0,1 µmol/l	Nickel	Urine	*

* - For sampling details, please see the source document.

Hungary. Chemical Safety at Workplace Ordinance Joint Decree No. 25/2000 (Annex 2): Permissible limit values of biological exposure (effect) indices

Components	Value	Determinant	Specimen	Sampling Time
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	0,02 mg/g	Nickel	Creatinine in urine	*
	0,038 µmol/mmol	Nickel	Creatinine in urine	*

* - For sampling details, please see the source document.

Switzerland. BAT-Werte (Biological Limit Values in the Workplace as per SUVA)

Components	Value	Determinant	Specimen	Sampling Time
Aluminium oxide (CAS 1344-28-1)	60 µg/g	Aluminium	Creatinine in urine	*
Manganese (CAS 7439-96-5)	20 µg/l	Mangan	Blood	*
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)	45 µg/l	Nickel	Urine	*

* - For sampling details, please see the source document.

Recommended monitoring procedures

VENTILATION: Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Whenever possible, the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne particulate. Where utilized, exhaust inlets to the ventilation system must be positioned as close as possible to the source of airborne generation. Avoid disruption of the airflow in the area of a local exhaust inlet by equipment such as a man-cooling fan. Check ventilation equipment regularly to ensure it is functioning properly. Provide training on the use and operation of ventilation to all users. Use qualified professionals to design and install ventilation systems. Follow standard monitoring procedures.

Derived no effect levels (DNELs)

Not available.

Predicted no effect concentrations (PNECs)

Not available.

Exposure guidelines

Occupational exposure to nuisance dust (total and respirable) and respirable crystalline silica should be monitored and controlled.

Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)

NICKEL POWDER; [PARTICLE DIAMETER < 1MM]
(CAS 7440-02-0) Can be absorbed through the skin.

8.2. Exposure controls

Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Individual protection measures, such as personal protective equipment	
General information	Use personal protective equipment as required. Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.
Eye/face protection	If contact is likely, safety glasses with side shields are recommended. Wear approved safety glasses, goggles, face shield and/or welder's helmet when risk of eye injury is present, particularly during operations that generate dust, mist or fume.
Skin protection	
- Hand protection	Wear appropriate chemical resistant gloves. Wear gloves to prevent contact with particulate or solutions. Wear gloves to prevent metal cuts and skin abrasions during handling.
- Other	Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended. Protective overgarments or work clothing must be worn by persons who may become contaminated with particulate during activities.
Respiratory protection	Use a particulate filter respirator for particulate concentrations exceeding the Occupational Exposure Limit. When airborne exposures exceed or have the potential to exceed the occupational exposure limits, approved respirators must be used as specified by an Industrial Hygienist or other qualified professional. Respirator users must be medically evaluated to determine if they are physically capable of wearing a respirator. Quantitative and/or qualitative fit testing and respirator training must be satisfactorily completed by all personnel prior to respirator use. Users of tight fitting respirators must be clean shaven on those areas of the face where the respirator seal contacts the face. Use pressure-demand airline respirators when performing jobs with high potential exposures such as changing filters in a baghouse air cleaning device.
Thermal hazards	Not applicable.
Hygiene measures	Observe any medical surveillance requirements. Contaminated work clothing should not be allowed out of the workplace.
Environmental exposure controls	Environmental manager must be informed of all major releases.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Physical state	Solid.
Form	Solid. Various shapes.
Colour	White. Off-white. Grey. Gold.
Odour	None.
Odour threshold	Not applicable.
pH	Not applicable.
Melting point/freezing point	2050 °C (3722 °F) estimated / Not applicable.
Initial boiling point and boiling range	Not applicable.
Flash point	Not applicable.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not applicable.
Flammability limit - lower (%) temperature	Not applicable.
Flammability limit - upper (%)	Not applicable.
Flammability limit - upper (%) temperature	Not applicable.
Vapour pressure	Not applicable.
Vapour density	Not applicable.
Relative density	Not applicable.

Solubility(ies)	
Solubility (water)	Insoluble.
Partition coefficient (n-octanol/water)	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition temperature	Not applicable.
Viscosity	Not applicable.
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.

9.2. Other information

Density	3,95 g/cm ³ estimated
Flammability	Not applicable.

SECTION 10: Stability and reactivity

10.1. Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
10.2. Chemical stability	Material is stable under normal conditions.
10.3. Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
10.4. Conditions to avoid	Contact with incompatible materials.
10.5. Incompatible materials	Strong acids. Strong oxidising agents.
10.6. Hazardous decomposition products	No hazardous decomposition products are known.

SECTION 11: Toxicological information

General information Occupational exposure to the substance or mixture may cause adverse effects.

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	May cause an allergic skin reaction.
Eye contact	Direct contact with eyes may cause temporary irritation.
Ingestion	May cause discomfort if swallowed. However, ingestion is not likely to be a primary route of occupational exposure.

Symptoms May cause an allergic skin reaction. Dermatitis. Rash.

11.1. Information on toxicological effects

Acute toxicity	Not known.
Skin corrosion/irritation	Due to partial or complete lack of data the classification is not possible.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary irritation.
Respiratory sensitisation	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin sensitisation	May cause an allergic skin reaction.
Germ cell mutagenicity	Due to partial or complete lack of data the classification is not possible.
Carcinogenicity	In 1997, IARC (the International Agency for Research on Cancer) concluded that crystalline silica inhaled from occupational sources can cause lung cancer in humans. However in making the overall evaluation, IARC noted that "carcinogenicity was not detected in all industrial circumstances studied. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." (IARC Monographs on the evaluation of the carcinogenic risks of chemicals to humans, Silica, silicates dust and organic fibres, 1997, Vol. 68, IARC, Lyon, France.) In June 2003, SCOEL (the EU Scientific Committee on Occupational Exposure Limits) concluded that the main effect in humans of the inhalation of respirable crystalline silica dust is silicosis. "There is sufficient information to conclude that the relative risk of lung cancer is increased in persons with silicosis (and, apparently, not in employees without silicosis exposed to silica dust in quarries and in the ceramic industry). Therefore, preventing the onset of silicosis will also reduce the cancer risk..." (SCOEL SUM Doc 94-final, June 2003) According to the current state of the art, worker protection against silicosis can be consistently assured by respecting the existing regulatory occupational exposure limits. May cause cancer. Occupational exposure to respirable dust and respirable crystalline silica should be monitored and controlled.

Hungary. 26/2000 EüM Ordinance on protection against and preventing risk relating to exposure to carcinogens at work (as amended)

Not listed.

IARC Monographs. Overall Evaluation of Carcinogenicity

NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0) 2B Possibly carcinogenic to humans.
Silica (CAS 14808-60-7) 1 Carcinogenic to humans.

Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)

Aluminium oxide (CAS 1344-28-1) Carcinogenic, Category 1A
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0) Carcinogenic, Category 2.

Reproductive toxicity Suspected of damaging fertility or the unborn child.
Specific target organ toxicity - single exposure Not classified.
Specific target organ toxicity - repeated exposure May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard Not an aspiration hazard.
Mixture versus substance information No information available.
Other information Not available.

SECTION 12: Ecological information

12.1. Toxicity Based on available data, the classification criteria are not met for hazardous to the aquatic environment.

Product	Species	Test Results	
Metallized Alumina Ceramic			
Aquatic			
Crustacea	EC50	Daphnia	2000 mg/l, 48 hours estimated
Fish	LC50	Fish	897,9192 mg/l, 96 hours estimated

Components	Species	Test Results	
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)			
Aquatic			
<i>Acute</i>			
Fish	LC50	Rainbow trout,donaldson trout (Oncorhynchus mykiss)	0,06 mg/l, 4 days

* Estimates for product may be based on additional component data not shown.

12.2. Persistence and degradability No data is available on the degradability of this product.
12.3. Bioaccumulative potential No data available.
Partition coefficient n-octanol/water (log Kow) Not available.
Bioconcentration factor (BCF) Not available.
12.4. Mobility in soil No data available.
12.5. Results of PBT and vPvB assessment Not a PBT or vPvB substance or mixture.
12.6. Other adverse effects No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

12.7. Additional information

Estonia Dangerous substances in soil Data

Molybdenum (CAS 7439-98-7) Molybdenum (Mo) 10 mg/kg
Molybdenum (Mo) 20 mg/kg
Molybdenum (Mo) 200 mg/kg
NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0) Nickel (Ni) 150 mg/kg
Nickel (Ni) 50 mg/kg
Nickel (Ni) 500 mg/kg

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.
EU waste code	The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Disposal methods/information	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Special precautions	Dispose in accordance with all applicable regulations.

SECTION 14: Transport information

ADR

14.1. - 14.6.: Not regulated as dangerous goods.

RID

14.1. - 14.6.: Not regulated as dangerous goods.

ADN

14.1. - 14.6.: Not regulated as dangerous goods.

IATA

14.1. - 14.6.: Not regulated as dangerous goods.

IMDG

14.1. - 14.6.: Not regulated as dangerous goods.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU regulations

Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I and II, as amended

Not listed.

Regulation (EU) 2019/1021 On persistent organic pollutants (recast), as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 1 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 2 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex I, Part 3 as amended

Not listed.

Regulation (EU) No. 649/2012 concerning the export and import of dangerous chemicals, Annex V as amended

Not listed.

Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry, as amended

Aluminium oxide (CAS 1344-28-1)

NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)

Regulation (EC) No. 1907/2006, REACH Article 59(10) Candidate List as currently published by ECHA

Not listed.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorization, as amended

Not listed.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended

NICKEL POWDER; [PARTICLE DIAMETER < 1MM] (CAS 7440-02-0)

Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work, as amended.

Silica (CAS 14808-60-7)

Other EU regulations

Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended

Not listed.

Other regulations	Pregnant women should not work with the product, if there is the least risk of exposure. The product is classified and labelled in accordance with Regulation (EC) 1272/2008 (CLP Regulation) as amended.
National regulations	Follow national regulation for work with chemical agents. Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work, as amended.

15.2. Chemical safety assessment No Chemical Safety Assessment has been carried out.

SECTION 16: Other information

List of abbreviations	Not available.
References	Not available.
Information on evaluation method leading to the classification of mixture	The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available.
Training information	Follow training instructions when handling this material.
Further information	Transportation Emergency Call Chemtrec at: International: 703.741.5970 Spain: 900.868.538 Switzerland: 0800.564.402 Chemtrec's toll free, mobile-enabled number in Germany – 0800 1817059
Disclaimer	<p>This document has been prepared using data from sources considered to be technically reliable and the information is believed to be correct. Materion makes no warranties, expressed or implied, as to the accuracy of the information contained herein. Materion cannot anticipate all conditions under which this information and its products may be used and the actual conditions of use are beyond its control. The user is responsible to evaluate all available information when using this product for any particular use and to comply with all Federal, State, Provincial and Local laws, statutes and regulations.</p> <p>To avoid any misunderstandings or incorrect assumptions by the receiver of the safety information, it should be made clear that the supplied information is not in the form of a Safety Data Sheet (SDS), but is actually a voluntary Product Information Sheet closely following the guidelines of the Safety Data Sheet – COMMISSION REGULATION (EU) No 453/2010 of 20 May 2010 (REACH/SDS).</p>