Conforms to US OSHA Hazard Communication 29CFR1910.1200

SAFETY DATA SHEET

Agilent Technologies

Initial calibration verification standard part B, Part Number 190064900B

Section 1. Identification

1.1 Product identifier

Product name : Initial calibration verification standard part B, Part Number 190064900B

Part no. : 190064900B

Validation date : 5/9/2018

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

Material uses : Reagents and Standards for Analytical Chemistry Laboratory Use
500 ml

1.3 Details of the supplier of the safety data sheet

Supplier/Manufacturer : Agilent Technologies, Inc.
5301 Stevens Creek Blvd
Santa Clara, CA 95051, USA
800-227-9770

1.4 Emergency telephone number

In case of emergency : CHEMTREC®: 1-800-424-9300

Section 2. Hazards identification

2.1 Classification of the substance or mixture

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture

H290	CORROSIVE TO METALS - Category 1
H330	ACUTE TOXICITY (inhalation) - Category 2
H314	SKIN CORROSION - Category 1
H318	SERIOUS EYE DAMAGE - Category 1
H334	RESPIRATORY SENSITIZATION - Category 1
H317	SKIN SENSITIZATION - Category 1
H350	CARCINOGENICITY - Category 1A
H360	TOXIC TO REPRODUCTION (Fertility) - Category 1A
H360	TOXIC TO REPRODUCTION (Unborn child) - Category 1A
H373	SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (teeth) - Category 2

2.2 GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : H290 - May be corrosive to metals.
H330 - Fatal if inhaled.
H314 - Causes severe skin burns and eye damage.
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 - May cause an allergic skin reaction.
H350 - May cause cancer.
H360 - May damage fertility or the unborn child.

Section 2. Hazards identification

H373 - May cause damage to organs through prolonged or repeated exposure. (teeth)

Precautionary statements

Prevention : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P280 - Wear protective gloves. Wear eye or face protection. Wear protective clothing.
P284 - Wear respiratory protection.
P234 - Keep only in original container.
P271 - Use only outdoors or in a well-ventilated area.
P260 - Do not breathe vapor.
P264 - Wash hands thoroughly after handling.
P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace.

Response : P390 - Absorb spillage to prevent material damage.
P314 - Get medical attention if you feel unwell.
P308 + P313 - IF exposed or concerned: Get medical attention.
P304 + P341 (OSHA) + P310 - IF INHALED: If breathing is difficult, remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician.
P342 + P311 - If experiencing respiratory symptoms: Call a POISON CENTER or physician.
P301 + P310 + P330 + P331 - IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 + P363 + P310 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician.
P302 + P352 + P363 - IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse.
P333 + P313 - If skin irritation or rash occurs: Get medical attention.
P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : P405 - Store locked up.
P406 - Store in a corrosion resistant container with a resistant inner liner.

Disposal : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements : Do not taste or swallow. Wash thoroughly after handling.

2.3 Other hazards

Hazards not otherwise classified : Causes digestive tract burns.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	%	CAS number
nitric acid	≥10 - <20	7697-37-2
Manganese dinitrate	≤0.3	10377-66-9
Antimony trioxide	≤0.3	1309-64-4
Diarsenic trioxide	≤0.3	1327-53-3
Lead	≤0.3	7439-92-1
Nickel	≤0.3	7440-02-0
Beryllium	≤0.3	7440-41-7
Cadmium	≤0.3	7440-43-9
Cobalt	≤0.3	7440-48-4
Chromium(III) nitrate, nonahydrate (1:3:9)	≤0.3	7789-02-8

Section 3. Composition/information on ingredients

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

4.1 Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. 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. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. 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. 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. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. In the event of any complaints or symptoms, avoid further exposure.

Skin contact : Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. 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. Chemical burns must be treated promptly by a physician. 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.

4.2 Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Fatal if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : Corrosive to the digestive tract. Causes burns.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Section 4. First aid measures

Inhalation : Adverse symptoms may include the following:
wheezing and breathing difficulties
asthma
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
stomach pains
reduced fetal weight
increase in fetal deaths
skeletal malformations

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
nitrogen oxides

5.3 Advice for firefighters

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.

Remark : Flammable hydrogen gas may be produced on prolonged contact with metals such as aluminum, tin, lead and zinc.

Section 6. Accidental release measures

6.1 Personal precautions, protective 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. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized 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".

6.2 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).

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Stop leak if without risk. Move containers from spill area. The spilled material may be neutralized with sodium carbonate, sodium bicarbonate or sodium hydroxide. Absorb spillage to prevent material damage. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

7.1 Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from alkalis. Empty containers retain product residue and can be hazardous. Do not reuse container. Absorb spillage to prevent material damage.

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 eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store in a corrosion resistant container with a resistant inner liner. Store locked up. Separate from alkalis. Keep away from metals. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

7.3 Specific end use(s)

Recommendations : Industrial applications, Professional applications.

Industrial sector specific solutions : Not applicable.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
nitric acid	**ACGIH TLV (United States, 3/2017).** TWA: 2 ppm 8 hours. TWA: 5.2 mg/m³ 8 hours. STEL: 4 ppm 15 minutes. STEL: 10 mg/m³ 15 minutes. **OSHA PEL 1989 (United States, 3/1989).** TWA: 2 ppm 8 hours. TWA: 5 mg/m³ 8 hours. STEL: 4 ppm 15 minutes. STEL: 10 mg/m³ 15 minutes. **NIOSH REL (United States, 10/2016).** TWA: 2 ppm 10 hours. TWA: 5 mg/m³ 10 hours. STEL: 4 ppm 15 minutes. STEL: 10 mg/m³ 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 2 ppm 8 hours. TWA: 5 mg/m³ 8 hours.
Manganese dinitrate	**NIOSH REL (United States, 10/2016).** TWA: 1 mg/m³, (as Mn) 10 hours. Form: Fume STEL: 3 mg/m³, (as Mn) 15 minutes. Form: Fume **OSHA PEL 1989 (United States, 3/1989).** CEIL: 5 mg/m³, (as Mn) **ACGIH TLV (United States, 3/2017).** TWA: 0.1 mg/m³, (as Mn) 8 hours. Form: Inhalable fraction TWA: 0.02 mg/m³, (as Mn) 8 hours. Form: Respirable fraction **OSHA PEL (United States, 6/2016).** CEIL: 5 mg/m³, (as Mn)
Antimony trioxide	**ACGIH TLV (United States, 3/2017).** TWA: 0.5 mg/m³, (as Sb) 8 hours. **OSHA PEL 1989 (United States, 3/1989).** TWA: 0.5 mg/m³, (as Sb) 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 0.5 mg/m³, (as Sb) 8 hours. **NIOSH REL (United States, 10/2016).** TWA: 0.5 mg/m³, (as Sb) 10 hours.
Diarsenic trioxide	**ACGIH TLV (United States, 3/2017).** TWA: 0.01 mg/m³, (as As) 8 hours. **OSHA PEL 1989 (United States, 3/1989).** TWA: 10 µg/m³, (as As) 8 hours. **NIOSH REL (United States, 10/2016).** CEIL: 0.002 mg/m³, (as As) 15 minutes. **OSHA PEL (United States, 6/2016).** TWA: 10 µg/m³, (as As) 8 hours.
Lead	**ACGIH TLV (United States, 3/2017).** TWA: 0.05 mg/m³, (as Pb) 8 hours. **NIOSH REL (United States, 10/2016).** TWA: 0.05 mg/m³ 8 hours.

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	OSHA PEL (United States, 6/2016). TWA: 50 µg/m³, (as Pb) 8 hours. **OSHA PEL 1989 (United States, 3/1989).** TWA: 50 µg/m³, (as Pb) 8 hours.
Nickel	**OSHA PEL 1989 (United States, 3/1989).** TWA: 1 mg/m³, (as Ni) 8 hours. **NIOSH REL (United States, 10/2016).** TWA: 0.015 mg/m³, (as Ni) 10 hours. **ACGIH TLV (United States, 3/2017).** TWA: 1.5 mg/m³ 8 hours. Form: Inhalable fraction **OSHA PEL (United States, 6/2016).** TWA: 1 mg/m³, (as Ni) 8 hours.
Beryllium	**ACGIH TLV (United States, 3/2017). Inhalation sensitizer.** TWA: 0.00005 mg/m³, (as Be) 8 hours. Form: Inhalable fraction **OSHA PEL Z2 (United States, 2/2013).** AMP: 25 mg/m³ 30 minutes. CEIL: 5 mg/m³ TWA: 2 mg/m³ 8 hours. **NIOSH REL (United States, 10/2016).** CEIL: 0.0005 mg/m³, (as Be) **OSHA PEL 1989 (United States, 3/1989). Notes: as Be** AMP: 25 µg/m³, (as Be) 30 minutes. CEIL: 5 µg/m³, (as Be) TWA: 2 µg/m³, (as Be) 8 hours.
Cadmium	**OSHA PEL 1989 (United States, 3/1989). Notes: as Cd** CEIL: 0.6 mg/m³, (as Cd) Form: Dust TWA: 0.2 mg/m³, (as Cd) 8 hours. Form: Dust CEIL: 0.3 mg/m³, (as Cd) Form: Fume TWA: 0.1 mg/m³, (as Cd) 8 hours. Form: Fume **ACGIH TLV (United States, 3/2017). Notes: as Cd** TWA: 0.002 mg/m³, (as Cd) 8 hours. Form: Respirable fraction **OSHA PEL (United States, 6/2016). Notes: as Cd** TWA: 5 µg/m³, (as Cd) 8 hours. **OSHA PEL Z2 (United States, 2/2013).** TWA: 0.2 mg/m³ 8 hours. Form: Dust CEIL: 0.6 mg/m³ Form: Dust CEIL: 0.3 mg/m³ Form: Fume TWA: 0.1 mg/m³ 8 hours. Form: Fume **ACGIH TLV (United States, 3/2017).** TWA: 0.01 mg/m³, (as Cd) 8 hours. Form: Inhalable fraction **OSHA PEL 1989 (United States, 3/1989).** TWA: 5 µg/m³ 8 hours.
Cobalt	**ACGIH TLV (United States, 3/2017).** TWA: 0.02 mg/m³, (as Co) 8 hours. TWA: 0.005 mg/m³ 8 hours. Form: Thoracic fraction **OSHA PEL 1989 (United States, 3/1989).**

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Chromium(III) nitrate, nonahydrate (1:3:9)	TWA: 0.05 mg/m³, (as Co) 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 0.1 mg/m³, (as Co) 8 hours. **NIOSH REL (United States, 10/2016).** TWA: 0.05 mg/m³, (as Co) 10 hours. Form: Dust and fumes **OSHA PEL 1989 (United States, 3/1989).** TWA: 0.5 mg/m³, (as Cr) 8 hours. **NIOSH REL (United States, 10/2016).** TWA: 0.5 mg/m³, (as CR) 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 0.5 mg/m³, (as Cr) 8 hours.

8.2 Exposure controls

Appropriate engineering controls : Use only with adequate ventilation. 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. Contaminated work clothing should not be allowed out of the workplace. 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 when a risk assessment indicates this is necessary 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: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. 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 : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state : Liquid. [Clear.]

Color : Light

Odor : Odorless.

Odor threshold : Not available.

pH : <2

Melting point : 0°C (32°F)

Boiling point : 100°C (212°F)

Flash point : Not available.

Evaporation rate : Not available.

Flammability (solid, gas) : Not applicable.

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Relative density : 1

Density : 1 g/cm³

Solubility : Easily soluble 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

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability : The product is stable.

10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid : No specific data.

10.5 Incompatible materials : Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air.
Reactive or incompatible with the following materials:
alkalis
metals

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
nitric acid	LC50 Inhalation Vapor	Rat	2500 ppm	1 hours
	LC50 Inhalation Vapor	Rat	130 mg/m³	4 hours
Manganese dinitrate	LD50 Oral	Rat - Female	>300 mg/kg	-
Antimony trioxide	LD50 Oral	Rat	>20 g/kg	-
Diarsenic trioxide	LD50 Oral	Rat	10 mg/kg	-
Nickel	LD50 Oral	Rat	>9000 mg/kg	-
Cobalt	LC50 Inhalation Dusts and mists	Rat - Male, Female	<0.05 mg/l	4 hours
	LD50 Oral	Rat	550 mg/kg	-
Chromium(III) nitrate, nonahydrate (1:3:9)	LD50 Oral	Rat	3250 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Antimony trioxide	Eyes - Mild irritant	Rabbit	-	100 milligrams	-

Sensitization

Not available.

Conclusion/Summary

Skin : May cause skin sensitization.

Respiratory : May cause sensitization by inhalation.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Manganese dinitrate	-	2A	-
Antimony trioxide	-	2B	-
Diarsenic trioxide	+	1	Known to be a human carcinogen.
Lead	-	2B	Reasonably anticipated to be a human carcinogen.
Nickel	-	2B	Reasonably anticipated to be a human carcinogen.
Beryllium	-	1	Known to be a human carcinogen.
Cadmium	+	1	Known to be a human carcinogen.
Cobalt	-	2B	Reasonably anticipated to be a human carcinogen.
Chromium(III) nitrate, nonahydrate (1:3:9)	-	2A	-

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
nitric acid	Category 3	Not applicable.	Respiratory tract irritation
Beryllium	Category 3	Not applicable.	Respiratory tract irritation
Chromium(III) nitrate, nonahydrate (1:3:9)	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
nitric acid	Category 2	Not determined	teeth
Manganese dinitrate	Category 2	Inhalation	brain
Antimony trioxide	Category 2	Not determined	cardiovascular system and lungs
Diarsenic trioxide	Category 2	Not determined	blood system, cardiovascular system, central nervous system (CNS), heart, immune system, kidneys, liver, lungs, lymphatic system and muscle tissue
Lead	Category 1	Not determined	blood system, cardiovascular system, immune system, kidneys and nervous system
Nickel	Category 1	Inhalation	respiratory tract
Beryllium	Category 1	Inhalation	lungs
Cadmium	Category 1	Not determined	bones, kidneys and lungs
Chromium(III) nitrate, nonahydrate (1:3:9)	Category 2	Not determined	blood

Aspiration hazard

Not available.

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : Fatal if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin contact : Causes severe burns. May cause an allergic skin reaction.

Ingestion : Corrosive to the digestive tract. Causes burns.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

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Inhalation : Adverse symptoms may include the following:
wheezing and breathing difficulties
asthma
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
stomach pains
reduced fetal weight
increase in fetal deaths
skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : May damage the unborn child.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : May damage fertility.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Inhalation (vapors) Inhalation (dusts and mists)	1.3 mg/l 16.11 mg/l

Section 12. Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
nitric acid	Acute LC50 180000 µg/l Marine water	Crustaceans - Carcinus maenas - Adult	48 hours
	Acute LC50 72 ppm Fresh water	Fish - Gambusia affinis - Adult	96 hours
Antimony trioxide	Acute EC50 730 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 740 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 560 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute EC50 423450 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 >530 mg/l Fresh water	Fish - Lepomis macrochirus - Young of the year	96 hours
	Chronic NOEC 200 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
Diarsenic trioxide	Acute EC50 34.7 mg/l Fresh water	Algae - Scenedesmus subspicatus	72 hours
	Acute EC50 2.5 mg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 3380 µg/l Marine water	Fish - Terapon jarbua - Juvenile (Fledgling, Hatchling, Weanling)	96 hours
	Chronic EC10 9.4 mg/l Fresh water	Algae - Scenedesmus subspicatus	72 hours
	Chronic IC10 1.3 mg/l Fresh water	Daphnia - Daphnia magna - Neonate	21 days
Lead	Acute EC50 105 ppb Marine water	Algae - Chaetoceros sp. - Exponential growth phase	72 hours
	Acute EC50 0.489 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Acute EC50 8000 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute LC50 530 µg/l Fresh water	Crustaceans - Ceriodaphnia reticulata	48 hours
	Acute LC50 4400 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 0.44 ppm Fresh water	Fish - Cyprinus carpio - Juvenile (Fledgling, Hatchling, Weanling)	96 hours
	Chronic NOEC 0.25 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Chronic NOEC 0.03 µg/l Fresh water	Fish - Cyprinus carpio	4 weeks
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 bahia - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	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
Beryllium	Acute LC50 1000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 37.9 mg/l Fresh water	Fish - Pimephales promelas	96 hours
Cadmium	Acute EC50 97 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata - Exponential growth phase	72 hours
	Acute EC50 0.095 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Acute EC50 200 µg/l Fresh water	Aquatic plants - Lemna minor	4 days
	Acute EC50 13.5 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 0.072 µg/l Marine water	Crustaceans - Amphipoda - Adult	48 hours
	Acute LC50 1 µg/l Fresh water	Fish - Pimephales promelas - Juvenile (Fledgling, Hatchling,	96 hours

Section 12. Ecological information

		Weanling)	
	Chronic NOEC 2 µg/l Fresh water	Algae - Parachlorella kessleri - Exponential growth phase	72 hours
	Chronic NOEC 0.02 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

12.2 Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
nitric acid	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
nitric acid	-0.21	-	low
Diarsenic trioxide	-	0.143	low
Cobalt	-	15600	high

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

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

Section 13. Disposal considerations

13.1 Waste treatment methods

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.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IMDG	IATA
UN number	UN3264	UN3264	UN3264	UN3264	UN3264
UN proper shipping name	Corrosive liquid, acidic, inorganic, n.o.s. (nitric acid)	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid)	LIQUIDO CORROSIVO, ACIDO, INORGANICO, N.E.P. (nitric acid)	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (nitric acid)	Corrosive liquid, acidic, inorganic, n.o.s. (nitric acid)
Transport hazard class(es)	8 	8 	8 	8 	8 
Packing group	III	III	III	III	III
Environmental hazards	No.	Yes.	Yes. The environmentally hazardous substance mark is not required.	Yes.	Yes. The environmentally hazardous substance mark is not required.

Additional information

DOT Classification : **Reportable quantity** 1000 lbs / 454 kg [119.93 gal / 454 L]. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.
Limited quantity Yes.
Packaging instruction Exceptions: 154. Non-bulk: 203. Bulk: 241.
Quantity limitation Passenger aircraft/rail: 5 L. Cargo aircraft: 60 L.
Special provisions IB3, T7, TP1, TP28

TDG Classification : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.40-2.42 (Class 8), 2.7 (Marine pollutant mark).
The marine pollutant mark is not required when transported by road or rail.
Explosive Limit and Limited Quantity Index 5
Passenger Carrying Road or Rail Index 5
Special provisions 16

Mexico Classification : **Special provisions** 223, 274

IMDG : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.
Emergency schedules F-A, S-B
Special provisions 223, 274

IATA : The environmentally hazardous substance mark may appear if required by other transportation regulations.
Quantity limitation Passenger and Cargo Aircraft: 5 L. Packaging instructions: 852. Cargo Aircraft Only: 60 L. Packaging instructions: 856. Limited Quantities - Passenger Aircraft: 1 L. Packaging instructions: Y841.
Special provisions A3, A803

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 to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

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

U.S. Federal regulations : **TSCA 6 proposed risk management**: Lead

TSCA 8(a) CDR Exempt/Partial exemption: Not determined

Clean Water Act (CWA) 307: Antimony trioxide; Diarsenic trioxide; Lead; Nickel; Silver; Thallium; Beryllium; Cadmium; Copper; Zinc; Selenium; Chromium(III) nitrate, nonahydrate (1:3:9)

Clean Water Act (CWA) 311: nitric acid; Antimony trioxide; Diarsenic trioxide

Clean Air Act (CAA) 112 regulated toxic substances: nitric acid

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

Name	%	EHS	SARA 302 TPQ (lbs)	SARA 302 TPQ (gallons)	SARA 304 RQ (lbs)	SARA 304 RQ (gallons)
nitric acid	≥10 - <20	Yes.	1000	85.7	1000	85.7
Diarsenic trioxide	≤0.3	Yes.	100 / 10000	-	1	-

SARA 304 RQ : 1000 lbs / 454 kg [119.9 gal / 454 L]

SARA 311/312

Classification : CORROSIVE TO METALS - Category 1
ACUTE TOXICITY (inhalation) - Category 2
SKIN CORROSION - Category 1
SERIOUS EYE DAMAGE - Category 1
RESPIRATORY SENSITIZATION - Category 1
SKIN SENSITIZATION - Category 1
CARCINOGENICITY - Category 1A
TOXIC TO REPRODUCTION (Fertility) - Category 1A
TOXIC TO REPRODUCTION (Unborn child) - Category 1A
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (teeth) - Category 2
HNOC - Corrosive to digestive tract

Composition/information on ingredients

Section 15. Regulatory information

Name	%	Classification
nitric acid	≥10 - <20	OXIDIZING LIQUIDS - Category 2 CORROSIVE TO METALS - Category 1 ACUTE TOXICITY (inhalation) - Category 1 SKIN CORROSION - Category 1A SERIOUS EYE DAMAGE - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (teeth) - Category 2 HNOC - Corrosive to digestive tract
Manganese dinitrate	≤0.3	OXIDIZING SOLIDS - Category 2 ACUTE TOXICITY (oral) - Category 4 SKIN CORROSION - Category 1C SERIOUS EYE DAMAGE - Category 1 CARCINOGENICITY - Category 1B SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (brain) (inhalation) - Category 2
Antimony trioxide	≤0.3	EYE IRRITATION - Category 2A CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (cardiovascular system, lungs) - Category 2
Diarsenic trioxide	≤0.3	ACUTE TOXICITY (oral) - Category 2 SKIN CORROSION - Category 1B SERIOUS EYE DAMAGE - Category 1 CARCINOGENICITY - Category 1A SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (blood system, cardiovascular system, central nervous system (CNS), heart, immune system, kidneys, liver, lungs, lymphatic system, muscle tissue) - Category 2 HNOC - Corrosive to digestive tract
Lead	≤0.3	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 CARCINOGENICITY - Category 2 TOXIC TO REPRODUCTION (Fertility) - Category 1A TOXIC TO REPRODUCTION (Unborn child) - Category 1A SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (blood system, cardiovascular system, immune system, kidneys, nervous system) - Category 1
Nickel	≤0.3	SKIN SENSITIZATION - Category 1 CARCINOGENICITY - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (respiratory tract) (inhalation) - Category 1
Beryllium	≤0.3	FLAMMABLE SOLIDS - Category 1 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (inhalation) - Category 2 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SKIN SENSITIZATION - Category 1 CARCINOGENICITY (inhalation) - Category 1A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 1 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (lungs) (inhalation) - Category 1
Cadmium	≤0.3	ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (inhalation) - Category 2 GERM CELL MUTAGENICITY - Category 2 CARCINOGENICITY - Category 1B TOXIC TO REPRODUCTION (Fertility) - Category 2 TOXIC TO REPRODUCTION (Unborn child) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (bones, kidneys, lungs) - Category 1
Cobalt	≤0.3	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (inhalation) - Category 1 RESPIRATORY SENSITIZATION - Category 1 SKIN SENSITIZATION - Category 1 CARCINOGENICITY - Category 2
Chromium(III) nitrate, nonahydrate (1:3:9)	≤0.3	OXIDIZING SOLIDS - Category 3 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A CARCINOGENICITY - Category 1B SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract

Section 15. Regulatory information

		irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (blood) - Category 2

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	nitric acid Antimony trioxide Diarsenic trioxide Lead Nickel Beryllium Cadmium Cobalt	7697-37-2 1309-64-4 1327-53-3 7439-92-1 7440-02-0 7440-41-7 7440-43-9 7440-48-4	≥10 - <20 ≤0.3 ≤0.3 ≤0.3 ≤0.3 ≤0.3 ≤0.3 ≤0.3
Supplier notification	nitric acid Antimony trioxide Diarsenic trioxide Lead Nickel Beryllium Cadmium Cobalt	7697-37-2 1309-64-4 1327-53-3 7439-92-1 7440-02-0 7440-41-7 7440-43-9 7440-48-4	≥10 - <20 ≤0.3 ≤0.3 ≤0.3 ≤0.3 ≤0.3 ≤0.3 ≤0.3

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 : The following components are listed: NITRIC ACID

New York : The following components are listed: Nitric acid; Antimony trioxide; Arsenic trioxide; Arsenic (III) oxide; Lead; Nickel; Beryllium; Cadmium

New Jersey : The following components are listed: NITRIC ACID; ANTIMONY TRIOXIDE; ANTIMONY OXIDE (Sb2O3); ARSENIC TRIOXIDE; ARSENIC OXIDE (As2O3); LEAD; NICKEL; BERYLLIUM; CADMIUM; COBALT; CHROMIUM COMPOUNDS

Pennsylvania : The following components are listed: NITRIC ACID; ANTIMONY OXIDE; ARSENIC OXIDE; LEAD COMPOUNDS; NICKEL CATALYST; BERYLLIUM DUST; CADMIUM DUST; COBALT FUME; CHROMIUM COMPOUNDS

California Prop. 65

⚠ **WARNING**: This product can expose you to chemicals including Lead, Cadmium, which are known to the State of California to cause cancer and birth defects or other reproductive harm. This product can expose you to chemicals including Antimony oxide, Arsenic (inorganic arsenic compounds), Nickel, Beryllium, Cobalt metal powder, which are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

Ingredient name	No significant risk level	Maximum acceptable dosage level
Antimony oxide	-	-
Arsenic (inorganic arsenic compounds)	Yes.	-
Lead	Yes.	Yes.
Nickel	-	-
Beryllium	Yes.	-
Cadmium	Yes.	Yes.
Cobalt metal powder	-	-

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Section 15. Regulatory information

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Ingredient name	List name	Status
Lead (Pb)	Heavy metals - Annex 1	Listed
Cadmium (Cd)	Heavy metals - Annex 1	Listed

Inventory list

Australia : All components are listed or exempted.

Canada : All components are listed or exempted.

China : All components are listed or exempted.

Europe : All components are listed or exempted.

Japan : **Japan inventory (ENCS)**: All components are listed or exempted.
Japan inventory (ISHL): All components are listed or exempted.

Malaysia : Not determined.

New Zealand : All components are listed or exempted.

Philippines : Not determined.

Republic of Korea : All components are listed or exempted.

Taiwan : All components are listed or exempted.

Thailand : Not determined.

Turkey : Not determined.

United States : All components are listed or exempted.

Viet Nam : Not determined.

Section 16. Other information

History

Date of issue : 05/09/2018

Date of previous issue : 04/25/2016

Version : 4

Procedure used to derive the classification

Classification	Justification
CORROSIVE TO METALS - Category 1	Expert judgment
ACUTE TOXICITY (inhalation) - Category 2	Calculation method
SKIN CORROSION - Category 1	On basis of test data
SERIOUS EYE DAMAGE - Category 1	On basis of test data
RESPIRATORY SENSITIZATION - Category 1	Calculation method
SKIN SENSITIZATION - Category 1	Calculation method
CARCINOGENICITY - Category 1A	Calculation method
TOXIC TO REPRODUCTION (Fertility) - Category 1A	Calculation method
TOXIC TO REPRODUCTION (Unborn child) - Category 1A	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (teeth) - Category 2	Calculation method

Indicates information that has changed from previously issued version.

Section 16. Other information

Notice to reader

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