

SAFETY DATA SHEET**Product:** HIGH PURITY ACETONITRILE

Version: 01

Date: 05/25/2021

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SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Identification of the product	HIGH PURITY ACETONITRILE.
Recommended uses	Industrial use.
Restrictions on use	Not recommended for other uses.
Company	COMPANHIA BRASILEIRA DE ESTIRENO.
Address:	Rua Hidrogênio, 824 - Polo Petroquímico – Camaçari – BA - CEP: 42816-140, Brasil.
Telephone number	(71) 3878-6313.
Emergency telephone number	0800 110 8270 Pró-Química

SECTION 2: HAZARDS IDENTIFICATION

Most important hazards	Highly flammable liquid and vapor. Harmful if swallowed. Harmful in contact with skin. Causes serious eye irritation. Harmful if inhaled. It is suspected of causing genetic defects.
Product effects	
Adverse effects to the human health	Harmful if swallowed, if in contact with skin and if inhaled. Causes severe eye irritation with pain, redness, and watery eyes. It is suspected of causing genetic defects. Signs and symptoms after exposure: flushing of the face and feeling of constriction in the chest; irritating to the nose and throat. Exposures in high concentrations can cause irritability, rash, confusion, delirium, seizures, paralysis, and death from central nervous system depression.
Environmental effects	The product is not expected to have effects on the environment.
Physical and chemical	Highly flammable liquid and vapor.

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hazards

Chemical product-specific hazards Sparks can ignite liquids and vapors. It may cause a fire or an explosion.

Important symptoms Signs and symptoms after exposure: flushing of the face and feeling of constriction in the chest; irritating to the nose and throat. Exposures in high concentrations can cause irritability, rash, confusion, delirium, seizures, paralysis, and death from central nervous system depression. Harmful if swallowed, if in contact with skin and if inhaled. Causes severe eye irritation with pain, redness, and watery eyes. It is suspected of causing genetic defects.

Classification of the chemical product Flammable liquids – Category 2.
Acute Toxicity Oral – Category 4.
Acute Toxicity Dermal – Category 4.
Acute Toxicity Inhalation – Category 4.
Serious eye damage/eye irritation – Category 2A.
Germ cell mutagenicity – Category 2.

Classification system adopted Globally Harmonized System of Classification and Labeling of Chemicals (GHS), United Nations, 2019.

Adequate labeling elements

Pictograms 

Signal word **DANGER**

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H319 causes serious eye irritation.

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H332 Harmful if inhaled.

H341 Suspected of causing genetic defects.

PREVENTION

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

P264 Wash hands thoroughly after handling.

P270 Do not eat, drink, or smoke when using this product.

P280 Wear protective gloves, protective clothing, eye protection, face protection and hearing protection.

RESPONSE TO EMERGENCIES

P318 IF exposed or concerned, get medical advice.

Precautionary statement(s)

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P370 + P378 In case of fire: Use foam, dry chemical and carbon dioxide (CO₂) for extinguishing.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water or shower.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

STORAGE

P405 Store locked up.

P403 + P235 Store in a well-ventilated place. Keep cool.

DISPOSAL

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P501 Dispose of contents and container in accordance with current regulations.

Outline of an anticipated emergency

HIGHLY FLAMMABLE LIQUID HAZARDOUS TO HUMAN HEALTH.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**SUBSTANCE**

Systematic chemical or trivial name

Acetonitrile (99%).

Common or generic name

Ethanonitrile, Methyl Cyanide, Cyanomethane.

CAS Number

75-05-8.

Impurities and stabilizing additives contributing to the hazard

It does not present impurities that contribute to the hazardous.

SECTION 4: FIRST-AID MEASURES**Exposure routes**

Inhalation

Take the victim to a ventilated place and keep him at rest in a position that does not impede breathing. If you are unwell, contact a POISON CENTER or doctor. Take this SDS.

Skin contact

IN CASE OF CONTACT WITH SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with soap and water or take a shower. Contact a POISON CENTER or doctor immediately. Take this SDS.

Eye contact:

Rinse with plenty of water for several minutes. If you wear contact lenses, remove them if easy and rinse again. Seek medical help immediately. Take this SDS.

Ingestion

Do not induce vomiting. Do not give anything by mouth to an

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unconscious person. Wash the victim's mouth with plenty of water. If vomiting occurs, tilt the patient forward or place him on the left side (upward if possible) to keep the airway open and avoid aspiration. Keep the patient silent and maintain normal body temperature. Consult a TOXICOLOGY CENTER or a doctor. Take this SDS.

Anticipated acute effects
and/or anticipated delayed
effects

Harmful if swallowed, if in contact with skin and if inhaled. Causes severe eye irritation with pain, redness, and watery eyes. It is suspected of causing genetic defects.

Signs and symptoms after exposure: flushing of the face and feeling of constriction in the chest; irritating to the nose and throat. Exposures in high concentrations can cause irritability, rash, confusion, delirium, seizures, paralysis, and death from central nervous system depression.

Most important
symptoms/effects

Signs and symptoms after exposure: flushing of the face and feeling of constriction in the chest; irritating to the nose and throat. Exposures in high concentrations can cause irritability, rash, confusion, delirium, seizures, paralysis, and death from central nervous system depression.

Protection of first aiders
and/or special notes to a
physician

Avoid contact with the product when helping the victim. Exposure treatment should be directed at controlling the symptoms and the clinical condition of the patient. In case of skin contact, do not rub the affected area.

Acetonitrile decomposes when heated and produces cyanide gas, it is recommended to consult medical protocol for treatment in case of exposure to cyanide.

After contact with the product, the effects can take up to 3 hours to start and can persist for three days. Avoid contact with the product when helping the victim. In case of contact of the product with the skin

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or clothes of the victim, remove them immediately and wash them with plenty of water.

If the victim shows symptoms, antidotes may be needed. Administer according to clinical picture:

- Oxygen - Offer 100% concentration when possible.
- Amyla Nitrite - Place next to victim's nostril for 15 seconds. If breathing does not return to normal, repeat every 2 minutes.
- Sodium Nitrite: Start with 50 mg IV, with an average treatment dose of 300 mg, not to exceed 600 mg.
- Sodium thiosulfate: start with a dose of 12.5 g of EV that does not exceed 175 g.
- Cyanokit® (hydroxocobalamin): start with a 5 g dose of EV, not to exceed 10 g.
- Methylene blue: 100 to 200 mg EV should be used when the methemoglobin level exceeds 30%.

NOTE: All antidotes applied to EV can be diluted in 5% glycated serum or 0.9% saline.

Here is a suggestion for treatment with antidotes:

DEGREE OF INTOXICATION	SYMPTOM	ANTIDOTE TREATMENT	ANTIDOTE
Mild	Absence of symptoms, or mild symptoms: headache, asthenia, altered smell and taste and dyspnea.	Use a supportive treatment + O ₂ 100%	1 antidote
Moderate	It usually presents headache, vomiting and cardiac arrhythmias.	Use a supportive treatment + O ₂ 100% + sodium thiosulfate	2 antidotes
Serious	In addition to the symptoms described above, hot flashes, altered consciousness, seizures,	Use a supportive treatment + O ₂ 100% and / or amyl nitrite and / or sodium thiosulfate and	3 antidotes

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	and severe dyspnea may occur.	/ or sodium nitrite.	
Very serious	Presents loss of consciousness and respiratory and / or cardiorespiratory arrest.	Use a supportive treatment + O ₂ 100% and / or amyl nitrite and / or sodium thiosulfate and / or sodium nitrite and / or cyanokit.	3 ou more antidotes

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media	Suitable: foam, dry chemical or carbon dioxide (CO ₂). Not suitable: jets of water directly under the product.
Specific hazards arising from the chemical product	Very dangerous when exposed to excessive heat or other sources of ignition such as: sparks, open flames or flames from matches and cigarettes, welding operations, pilot lamps and electric motors. Static charge can build up by flow or agitation. Vapors from heated liquid can be ignited by static discharge. Vapors can be denser than air and tend to collect in low-lying or confined areas, such as manholes and basements. They can travel long distances causing the flame to recede or new sources of fire, both in open and closed environments. Containers can explode if heated. Thermal decomposition or combustion can release carbon oxides, cyanide, and nitrogen oxides.
Specific extinguishing methods	Fight fire as much as possible or control nozzles. If possible, fight the fire downwind. Do not extinguish fire before containing leak. Containers and tanks involved in the fire must be cooled with water mist.
Special equipment for the protection of firefighters	Self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing.

SECTION 6: ACCIDENTAL RELEASE MEASURES

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Personal precautions	Avoid sparks or flames. No Smoking. Do not touch damaged containers or spilled material without wearing suitable clothing. Avoid exposure to the product. Use personal protective equipment as described in section 8.
Protective equipment:	Use protective equipment as described in Section 8.
Emergency procedures	Wear full PPE with goggles, protective gloves, safety shoes, and suitable protective clothing. Isolate spills from sources of ignition. Evacuate the area within a radius of at least 50 meters. Keep unauthorized people away from the area. Stop leak if it can be done without risk. In case of large leaks, where the exposure is great, it is recommended to use a respiratory protection mask with filter against mists and vapors.
Environmental precautions	Prevent the product from reaching the ground and water courses. Inform the relevant authorities if the product has caused environmental contamination (if it has reached water courses or if it has contaminated the soil or vegetation).
Methods and materials for containment	Stop leak if without risk. Contain spilled product with sand, earth, or vermiculite dikes and transfer to a suitable container, which should be properly labeled.
Methods and materials for cleaning up	To clean the floor and all objects contaminated by this product, use an appropriate product. Collect the product remains with inert material. The water used to clean the place must be collected for later disposal, incineration is recommended. For the final destination, proceed in accordance with Section 13 of this SDS.
Secondary disaster prevention measures	The same actions are recommended for large and small leaks of this product.

SECTION 7: HANDLING AND STORAGE

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Handling

Precautions for safe handling

Handle in a ventilated area or with a general local exhaust / ventilation system. Avoid the formation of mists and vapors. Do not mix with incompatible materials. Avoid exposure to the product. Wear personal protective equipment as described in Section 8. Use of the product is restricted to professionals. Caution: avoid exposure; obtain special instructions before use.

Technical measures for prevention of exposure of the handler

Use personal protective equipment as described in Section 8.

Technical measures for prevention of fire and explosion

Schedule a first aid action before starting product activity. The use of the product is restricted to professionals. Caution - Avoid exposure - obtain special instructions before use. Handle in a ventilated area or with a general local exhaust / compliance system.

Suitable precautions

Contaminated clothing should be changed and washed before reuse. Remove clothing and protective equipment contaminated before entering eating areas.

Prevention of contact

Wash hands and face thoroughly after handling and before eating, drinking, smoking, or going to the bathroom.

Storage

Conditions for safe storage

Keep away from heat, sparks, open flames, and hot surfaces. - No Smoking. Keep the container closed. Ground the product container and receiver during transfers. Use only non-sparking tools. Avoid the accumulation of electrostatic charges. Use explosion-proof electrical, ventilation, and lighting equipment.

Store in a cool, dry place with adequate ventilation. Keep away from open flames, high temperatures and incompatible materials. Store in unopened original packaging. This product may react, in a hazardous

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	manner, with some incompatible materials as described in Section 10.
Technical measures	Keep away from high temperatures, ignition sources and incompatible materials.
Incompatible substances and mixtures	Strong oxidizers, such as chlorine, bromine, and fluorine; chlorosulfonic acid; oleum or sulfuric acid. It can build up static electrical charges and can ignite its vapors.
Packaging materials	
Recommended material	Similar to the original packaging.
Unsuitable material	It is not known unsuitable materials.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION
Permissible concentration

	Chemical or common name	TLV – TWA (ACGIH, 2019)	PEL – TWA (OSHA, 2019)	REL – TWA (NIOSH, 2019)
Occupational exposure limit	Acetonitrile* A4	20 ppm	40 ppm (ST) 60 ppm	20 ppm

A4: Not classified as carcinogenic to humans.

* Skin - absorption through the skin.

ST: ST = Short term exposure limit.

IDLH Acetonitrile: 137 ppm (NIOSH, 2017).

Biological limit Not established.

Engineering controls measures Promote mechanical ventilation and a direct exhaust system to the outside environment. These measures help to reduce product exposure. Maintain atmospheric concentrations, of the constituents of the product, below the occupational exposure limits indicated.

Appropriate personal protective equipment

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Respiratory protection	Supplied air semi-facial respirator (10 x occupational exposure limit). A risk assessment is recommended to adequately define respiratory protection in view of the conditions of use of the product.
Hand protection	Neoprene, butyl rubber or polyethylene waterproof gloves.
Eye protection	Wide vision safety glasses.
Skin and body protection	Suitable safety clothing and closed shoes. The material used should be waterproof.
Special precautions	Not established.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid, clear and colorless
Odour	Acre.
pH	7.
Melting point/freezing point	- 46°C.
Boiling point, initial boiling, and boiling range	82°C.
Flashpoint	5.6°C.
Upper/lower flammability or explosive limits	Major: 16%. Lower: 4.4%.
Vapour pressure	Not available.
Vapour density	1.43.
Relative density	0.79 g / cm ³ (20 ° C).
Solubility(ies)	Fully miscible in water.
n-octanol/water partition coefficient	Log kow: -0.34.
Auto-ignition temperature	254°C.
Decomposition temperature	Not available.
Odour threshold	Not available.

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Evaporation rate	Not available.
Flammability	Not available.
Viscosity	0.352 cP at 20 ° C.
Other information	Not available.

SECTION 10: STABILITY AND REACTIVITY

Chemical stability	Product is stable under normal conditions of temperature and pressure.
Hazardous reactions	Acetonitrile decomposes when heated to produce cyanide gas and nitrogen oxides, which are strongly reactive. May react vigorously with strong oxidizing agents, sulfuric acid, chlorosulfonic acid, sulfur trioxide, perchlorates, nitrating reagents, and nitric acid. Potentially explosive in contact with nitrogen-fluorine compounds (eg tetrafluorourea).
Conditions to avoid	High temperatures, heat, friction and contact with incompatible materials.
Incompatible materials	Strong oxidizers, such as chlorine, bromine, and fluorine; chlorosulfonic acid; oleum or sulfuric acid. It can build up static electrical charges and can ignite its vapors.
Hazardous decomposition products	Thermal decomposition can release hydrogen cyanide, in addition to carbon monoxide and dioxide, cyanide.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity	Harmful if swallowed, if in contact with skin and if inhaled. <u>Acetonitrile:</u> LD ₅₀ (oral, rats): 617 mg / kg. LD ₅₀ (dermal, rabbits): 2,000 mg / kg. LC ₅₀ (inhalation, rats, 4h): 6022 mg / m ³ .
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Skin irritation/corrosion	<p>The product is not expected to cause skin irritation.</p> <p><u>Acetonitrile:</u> Rabbit skin irritation test - negative results.</p>
Eye damage/irritation	<p>Contact with the product causes eye irritation with redness and tearing.</p>
Respiratory or skin sensitization	<p>Not expected to cause respiratory or skin sensitization.</p> <p><u>Acetonitrile:</u> Guinea pig skin sensitization test - Buehler - negative result (OECD 406).</p>
Reproductive cell mutagenicity	<p>It is suspected of causing genetic defects.</p> <p><u>Acetonitrile:</u> Results from a subchronic inhalation study in rats show a NOAEL of 100 ppm. Acetonitrile did not induce genetic mutations in bacteria and showed little clastogenic activity in mammalian cells. Weak positive results have been reported for an in vivo mutagenicity test. In male rats, inhalation exposure to 400 ppm caused an increase in neoplasms based on a higher incidence of hepatocellular adenomas and carcinomas.</p>
Carcinogenicity	<p>The product is not expected to cause cancer.</p> <p><u>Acetonitrile:</u> ACGIH classifies Acetonitrile as Group A4: Not classified as carcinogenic to humans.</p>
Reproductive toxicity	<p>The product is not expected to cause reproductive toxicity.</p> <p><u>Acetonitrile:</u> A study conducted with inhaled rats showed no adverse effects on reproduction.</p>
Specific target organ toxicity – single exposure	<p>Signs and symptoms after exposure: flushing of the face and feeling of constriction in the chest; irritating to the nose and throat. Exposures in</p>

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	high concentrations can cause irritability, rash, confusion, delirium, seizures, paralysis, and death from central nervous system depression.
Specific target organ toxicity – repeated exposure	The product is not expected to cause specific target organ toxicity through repeated or prolonged exposure.
Aspiration hazard	It is not expected that the product presents aspiration hazard.
Toxicokinetics, metabolism and distribution	<p>Like hydrogen cyanide (HCN), acetonitrile (ACN) is easily absorbed from the lungs and gastrointestinal tract, and is distributed throughout the body in both humans and laboratory animals.</p> <p>Distribution kinetics were studied in mice after intravenous administration. After 5 minutes, the highest levels of radioactivity were found in the liver and kidney, and the levels decreased over time. At 24 and 48 hours, radioactivity was highest in the digestive tract, thymus, liver, and testes. Covalent binding studies showed approximately half of the radioactivity in the liver bound to macromolecular fractions. The radioactivity in other organs was mainly in the lipid fractions. Acetonitrile was shown to be converted to cyanide by rat nasal and liver tissues, the maximum rate being ten times higher per gram of protein in nasal tissue than in any other tissue monitored.</p>

SECTION 12: ECOLOGICAL INFORMATION**Environmental effects, behavior, and fate of the product**

Ecotoxicity	<p>The product is not expected to be harmful to aquatic organisms.</p> <p><u>Acetonitrile:</u></p> <p>LC₅₀ (<i>Fathead minnow</i>, 96h): 1,640 mg / L.</p> <p>NOEC (<i>Oryzias latipes</i>, 21 days): 102 mg / L.</p> <p>LC₅₀ (<i>Daphnia magna</i> 48h): 3,600 mg / L.</p>
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	NOEC (<i>Daphnia magna</i> 48h): 160 mg / L. NOEC (<i>Selenastrum capricornutum</i> , 72h):> 1,000 mg / L.
Persistence and degradability	The product is not expected to show persistence and is considered to degrade rapidly. <u>Acetonitrile:</u> Biodegradability: 70% in 21 days.
Bioaccumulative potential	The product has a low potential for bioaccumulation in aquatic organisms. <u>Acetonitrile:</u> BCF: 0.3. Log kow: - 0.34.
Mobility in soil	High soil mobility is expected. <u>Acetonitrile:</u> Koc: 8.04 L / kg.
Other adverse effects	No other effects of the product are known.

SECTION 13: DISPOSAL CONSIDERATIONS

Methods of disposal to the chemical product, product waste and/or contaminated container and/or packaging	Must be disposed of as hazardous waste in compliance with local regulations. The treatment and disposal should be evaluated for each specific product. Keep the product remains in its original and properly closed. Disposal should be performed as established for the product. Do not reuse empty containers. These may contain product residues and should be kept closed and sent for proper disposal as established for the product.
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SECTION 14: TRANSPORT INFORMATION**International regulations**

Land	UN – “United Nations” Recommendations on the TRANSPORT OF DANGEROUS GOODS.
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	Model Regulations
UN number	1648
UN proper shipping name	ACETONITRILE
Transport hazard class(es)	3
Subsidiary risk	N.A.
Packing group	II
Sea	IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)
UN number	1648
UN proper shipping name	ACETONITRILE
Transport hazard class(es)	3
Subsidiary risk	N.A.
Packing group	II
Environmental hazards	The product is not considered a marine pollutant.
EmS	F-E, S-D.
Air	IATA – International Air Transport Association Dangerous Goods Regulation (DGR)
UN number	1648
UN proper shipping name	ACETONITRILE
Transport hazard class(es)	3
Packing group	II
Transport in bulk according to MARPOL 73/78, Annex II, and the IBC Code	Consult regulations: - International Maritime Organization. MARPOL: Articles, protocols, annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006; - International Maritime Organization. IBC code: International code for

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the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.

Special precautions

There is no need of special precautions.

SECTION 15: REGULATORY INFORMATION

Convention concerning Safety in the use of Chemicals at Work (Convention 170) - International Labour Organization, 1990.

International Organization for Standardization - ISO 11014:2009.

SECTION 16: OTHER INFORMATION

This SDS was prepared based on current knowledge about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other materials, and use various forms of those indicated, are the responsibility of the user. Warns that the handling of any chemical substance requires the prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

SDS elaborated May 2021.

Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists

AIHA – American Industrial Hygiene Association

BCF – Bioconcentration Factor

BEI – Biological Exposure Index

CAS – Chemical Abstracts Service

C – Ceiling

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LC₅₀ – Lethal Concentration 50%**LD₅₀** – Lethal Dose 50%**ERPG** - Emergency Response Planning Guidelines**LEL** – Lower Explosive Limit**UEL** – Upper Explosive Limit**NIOSH** – National Institute of Occupational Safety and Health**OSHA** – Occupational Safety & Health Administration**PEL** – Permissible Exposure Limit**REL** – Recommended Exposure Limit**STEL** – Short Term Exposure Limit**TLV** – Threshold Limit Value**TWA** – Time Weighted Average**Bibliographic references:**

ACGIH. AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIALS HYGIENISTS. TLVs® and BEIs®: Based on the Documentation of the Threshold Limit Values (TLVs®) for Chemical Substances and Physical Agents & Biological Exposure Indices (BEIs®). Cincinnati-USA, 2021.

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