SAFETY DATA SHEET (EC Directive 91/155/EEC)

Magic Rhodium

Version dated 01.11.2016

1. MATERIAL/PREPARATION AND COMPANY NAME

Product information

Trade name	**Magic Rhodium**
Company	HOROTEC SA
	Av. Léopold-Robert 105b
	CH-2301 La Chaux-de-Fonds
Telephone	+41 (0)32 911 21 21
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Emergency phone number +41 145 Use of

electroplating means

2. COMPOSITION/INFORMATION ON COMPONENTS

Chemical characterization

Hazardous ingredients

Chemical name aqueous solution containing silver cyanide aqueous solution containing potassium cyanide

Formula	AgCN	KCN
CAS no.	506-64-9	151-50-8
INDEX no.		006-007-00-5
EC no.	208-048-6	205-792-3
Symbols	T, N	T, N
R phrases	R23/24/25, R32, R51/53	R23/24/25, R32, R51/53

3. POSSIBLE HAZARDS

Toxic on inhalation, if swallowed and in contact with skin. Forms very poisonous gases on contact with acid. Toxic to aquatic organisms; may cause long-term adverse effects in the water. Hydrocyanic acid can trigger all stages of poisoning.

4. FIRST-AID MEASURES

General information

The following first aid and therapy recommendations should be made available to all first responders and physicians who may provide the first aid service, even before starting work with cyanides/hydrocyanic acid. Observe self-protection measures. If signs of poisoning occur, seek medical help immediately.

Possible signs of poisoning: headache, dizziness, drowsiness, nausea, seizures, loss of consciousness, respiratory distress, respiratory arrest, cardiac arrest.

Take the affected person out of the danger area.

Remove contaminated or impregnated clothing immediately and dispose of safely. Do not leave the affected person unattended.

Administer oxygen in case of respiratory distress. If breathing has stopped, provide mouth-to-mouth resuscitation.

Mouth-to-nose respiration. Use anesthesia bag or respirator. Keep warm and in a quiet

place. In the case of unconsciousness, lie the patient in a stable position on the side.

Breathing in

Administer oxygen in case of respiratory distress. If breathing has stopped, provide mouth-to-mouth resuscitation.

Skin contact

After contact with skin, wash immediately with plenty of water.

Eye contact

Rinse immediately with plenty of water for at least 10 minutes with the eyelid gap open. If eye symptoms persist, consult an ophthalmologist.

Swallowing

Alert an emergency physician immediately (keyword: poisoning by cyanide/hydrocyanic acid). Do not induce vomiting. Only if the patient is fully conscious: Rinse mouth with water.

5. Continuation of FIRST AID MEASURES

Information for the doctor

Possible signs of poisoning:

Division into 2 stages appears to be useful:

1. Slight poisoning: patient is conscious.
2. Severe poisoning: patient is unconscious

The following symptoms give no safe indication of the prognosis.

Symptoms in the central nervous system:

Early stage: Headache, dizziness, somnolence (drowsiness) and nausea.

Advanced stage: Convulsions, coma.

Pulmonary symptoms:

Early stage: Dyspnoea, tachypnea.

Advanced stage: Hypoventilation, Cheyne-Stokes breathing, apnoea

Cardiovascular symptoms:

Early stage: Hypertension, sinus node arrhythmia, AV node arrhythmia, bradycardia.

Advanced stage: Tachycardia, complex arrhythmias and cardiac arrest

Skin symptoms:

Early stage: Skin colour pink.

Advanced stage: Cyanosis.

Metabolic effect:

Lactate acidosis up to pH 7.1 and lactate level of 17 mmol/l are described.

Therapy:

Prevention of absorption and preservation of vital functions with strict observance of self-protection! Rapid treatment with antidotes can be life saving and has priority over removal of poisons!

Antidote therapy:

Attention! Dosage figures apply to adults weighing 70 kg.

In case of slight poisoning or risk of post-resorption (pathway: skin, gastrointestinal tract): if necessary, administer sodium thiosulphate (12.5 g i.v.) depending on the clinical picture.

For severe poisoning, use of antidotes is required.

Follow the national treatment regimens. Information on the approval of antidotes in different countries cannot be given.

Common antidote combinations:

Dicobalt edetate/sodium thiosulphate: 300 mg (1 ampoule) dicobalt edetate i.v., combination with sodium thiosulphate i.v. possible. Antidote in the case of misdiagnosis or overdose: Sodium-calcium edetate.

Hydroxocobalamin/sodium thiosulphate: 4 g hydroxocobalamin as a slow infusion; then 8 g sodium thiosulphate as an infusion. The hydroxocobalamin dose can be increased as needed.

Amyl nitrite/sodium nitrite/sodium thiosulphate: Make the patient inhale amyl nitrite every 15 to 30 seconds, then 300-600 mg sodium nitrite i.v., then 12.5 g sodium thiosulphate as an infusion. Antidote in the case of misdiagnosis or overdose

(methaemoglobinaemia > 30%): toluidine blue, methylene blue.

4-dimethylaminophenol, 4-DMAP/sodium thiosulphate: 250 mg (1 ampoule) 4-DMAP i.v., then 12.5 g sodium thiosulphate infusion. Antidote in case of misdiagnosis or overdose

(methaemoglobinaemia > 30%): toluidine blue, methylene blue.

Symptomatic therapy:

Oxygen administration,ventilation, treatment of arrhythmias, treatment of seizures, correction of the acid-base balance. Monitoring of the patient, if post-resorption is possible (after oral administration, after skin resorption).

After skin contact, eye contact, ingestion of cyanide salt or cyanide solution: as well as poisoning, consider chemical burns!

After swallowing:

Only if the patient is fully conscious: Rinse the mouth. First

administer the antidote if necessary.

Early endoscopy for the assessment of possible mucosal lesions in the oesophagus and stomach. The use of activated carbon is controversial.

6. MEASURES FOR FIRE-FIGHTING

Extinguishing agents

Alkaline powder extinguishing agent

Unsuitable extinguishing agents - unsuitable for safety reasons

Water, acidic water,

foam

Carbon dioxide

(CO2) acidic

extinguishing

agents

Acidic powder extinguishing agent

Special hazards during fire-fighting

In the event of fire, the following can occur as hazardous flue gases: hydrogen cyanide.

On exposure to acids (including carbon dioxide!), hydrocyanic acid is released, which is flammable and can form explosive gas mixtures with air.

Special protective equipment for fire-fighting

In case of fire, wear self-contained breathing apparatus and a chemical protective suit

More information

Fire-fighting water must not be allowed to enter sewers, subsoil or water bodies. Provide sufficient fire-fighting water storage possibilities.

Contaminated fire-fighting water must be disposed of in accordance with local regulations.

Fire residues must be disposed of according to the regulations. Remove all ignition sources.

7. MEASURES IN THE CASE OF ACCIDENTAL RELEASE

Personal precautionary measures

Wear personal protective equipment. Keep people away and remain on the wind-facing side.

Environmental protection measures

Do not allow entering the soil, water bodies or sewers.

Cyanide effluents and solutions must be detoxified before being discharged into a public sewer network or water body.

In case of gas leaks or in case of penetration into water bodies, soil or sewers, inform the competent authorities.

Cleaning procedure

Absorb with liquid-binding materials (e.g. inert absorbent universal binder). Fill into tightly closed containers. Dispose of the absorbed materials in accordance with the regulations (inert = slow)

Additional information

Check ambient air for hydrocyanic acid content (gas tracer). Refer to the manufacturer/supplier for information on reuse/recycling.

8. HANDLING AND STORAGE

Handling

Instructions for safe handling

Wear personal protective equipment. Ensure suitable extraction/ventilation in the workplace or on working machines. Substances to be avoided: Acid.
The product should only be handled by trained staff. Creation of safety and operating instructions.

Information about fire and explosion protection

Observe the usual measures for fires involving chemicals. The product itself does not burn. Fire residues and contaminated fire-fighting water must be disposed of in accordance with the local regulations.

Storage
Requirements for storage rooms and containers

Keep the container tightly closed.

More information

Inventory management is required. Unauthorized persons must not have access to storage rooms.

Information on combined storage

Do not store together with acid and acidic salts. Keep away from foods, beverages and animal feeds. Store separated / away from foods / stimulants / animal feeds. Avoid contact with acids.

9. EXPOSURE LIMITATION AND PERSONAL PROTECTIVE EQUIPMENT

Components with workplace-related, monitored limit values

aqueous solution containing silver cyanide

CAS	506-64-9
EINECS no.	208-048-6
Limit value	5 mg / m3 MAK (TRGS 900) Specification for cyanide (total dust)
Short-term value	4
Exposure type	Inhalation fraction
Limit values	Skin designation (TRGS 900) can be absorbed through the skin
Limit values	The above values apply to pure silver cyanide in powder form. In the product Magic Rhodium, the exposure is ten times lower.

Aqueous solution containing potassium cyanide

CAS	151-50-8
EC no.	205-792-3
INDEX no.	006-007-00-5
Limit value	5 mg / m3 MAK (TRGS 900) Specification for cyanide (total dust)
Short-term value	4
Exposure type	Inhalation fraction
Limit values	Skin designation (TRGS 900) can be absorbed through the skin.
Limit values	The above values apply to pure potassium cyanide in powder form. In the product Magic Rhodium, the exposure is ten times lower.

Technical protective measures

Provide adequate extraction/ventilation in the workplace or on working machines.

Personal protective measures for respiratory protection

In case of the formation of hydrogen cyanide: Wear self-contained breathing apparatus. Observe the exposure time limit for respiratory protection,

In case of the formation of dust/aerosols: Respiratory protection with combination filter B-P3
Respiratory protection with combination filter ABEK-P3

Hand protection

Chemical resistant protective gloves (EN 374)

Glove material Protective gloves made of the following materials: natural latex (NR), nitrile rubber (NBR), PVC, resistant to alkalis, acid resistant

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the resultant standard EN 374.

Eye protection

Safety glasses with side protection

Skin and body protection

Chemical protection suit
In cleaning work: Rubber or plastic boots.

Hygiene measures

Do not eat, drink, smoke or take snuff while working. Wash hands during breaks and after ending work. Avoid contact with skin, eyes and clothing. On contact with skin, wash immediately with plenty of water. Preventive skin protection

After work, perform skin cleansing and skin care. Change wet and saturated clothing immediately. Store work clothes separately.

Protective measures

All indicated protective measures must be must be complied with strictly. In the case of possible contact with the skin/eyes, the specified hand/eye/body protection must be used. The personal protective equipment used must meet the requirements of Directive 89/686/EEC and its amendments (CE marking).

10. PHYSICAL CHEMICAL CHARACTERISTICS

Appearance

Form	liquid with white precipitate
Colour	transparent liquid, white precipitate
Smell	slight bitter almond

Safety-relevant data

pH value	11- 12
Melting point/range	n/a
Boiling point/range	n/a
Flash point	n/a
Flammability	n/a
Ignition temperature	n/a
Density	1.15 - 1.25 g / cm3

Further details

Miscibility with water	yes
	See also point 16, last sentence

11. STABILITY AND REACTIVITY

Personal protective measures

Substances to be avoided

On exposure to acids (including carbon dioxide/carbonic acid), hydrocyanic acid is released, which is flammable and can form explosive gas mixtures with air.

Well-known acids in the working and household area! Only examples, no claim to completeness! Avoid all contact with Magic Rhodium!

Gastric acid, uric acid, carbonic acid, acetic acid, citric acid, Coca-Cola, fruit (acids), accumulator acid, battery acid, etc.

Hazardous decomposition products : HCN Hydrogen cyanide (hydrocyanic acid).

12. TOXICOLOGY INFORMATION

Acute oral toxicology	LD50 rat: 10 mg / kg oral 2.5 mg / kg Intravenous
	method Literature
	Test substance: KCN
	Lowest published LD50 is 2.86 mg/kg body weight. There is no specific experience with humans. If Magic Rhodium behaves analogously to KCN, an oral dose of one large swallow (about 15 cm3) leads to unconsciousness or death in adults.
Skin irritation, rabbit:	strongly irritating
	Method: Literature

Eye irritation, rabbit: strongly irritating

	Method: Literature
Experience in humans	Poisoning affects the central nervous system.
	Symptoms of poisoning: Nausea, vomiting, cramping, loss of consciousness and central respiratory arrest.

13. ECOLOGY INFORMATION

Information on elimination (persistence and degradability)

Behavior in environmental compartments

Eco toxic effects

Fish toxicity	LC50 *Leuciscus idus melanotus*:	0.07 mg/l
	Method:	Literature
	Substance reference:	Cyanide
Daphnia toxicity	EC50 *Daphnia magna*:	3 mg/l
	Test substance:	Cyanide
	Method:	Literatur
Bacterial toxicity	EC50 *Escherichia coli*:	0.0004 mg/l
	Method:	Literature
	Substance reference:	Canid
More information effects	Toxic to aquatic organisms, may cause long-term adverse	
	in water bodies. Therefore, do not drain into receiving water courses.	
	Pseudomonas putida, initial inhibition of cell proliferation at 0.01 mg/l (h) (no test, projected) Assessment of water pollutants (UBA, 1979)	

14. DISPOSAL NOTES

Product

Cyanide effluents and solutions must be detoxified before being discharged into a public sewer network or water body. Residual quantities and non-recyclable solutions must be sent to a recognized disposal company.

Uncleaned packaging

Empty containers should not be reused and must be disposed of in accordance with local authorities. If any product remains in the emptied container, the handling label on the container must also be followed.

Unopened original bottles

Full, unopened original bottles from the manufacturer Drewanz are taken back by the manufacturer Drewanz against reimbursement of shipping costs (shipping only as hazardous goods). The manufacturer Drewanz decides whether a shipping company or itself will pick up the goods.

Waste code number

For this product, no waste code number can be defined according to the European waste list, since only the intended use by the consumer permits an allocation. The waste code number must be determined according to the European waste list (EU decision on waste list 2000/532/EC) in consultation with the waste disposal company/manufacturer/authority.

15. SHIPPING INFORMATION

Land transport ADR / RID / GVSE

Class	6.1
Hazard label	6.1
UN no. / Material number	1935
Packaging group	II (depending on quantities, possibly I)
Warning sign	66/1935

Description of goods Technical name CYANIDE, SOLUTION, N.A.G

Hazard inducer	contains silver cyanide, potassium cyanide

Sea transport IMDG code / GGVSee

Class	6.1
UN no. / Material number	1935
	Pack
aging group	II
Marine Pollutant	Marine Pollutant
EmS	F-A, S-A

Description of goods Technical name	Cyanide, Solution, N.O.S
Hazard inducer	.contains potassium cyanide, potassium cyanargentate

Air transport ICAO-TI / IATA-DGR

Class	6.1
UN no. / Material number	1935
Packaging group	II (depending on quantities, possibly I)
Description of goods Technical name	CYANIDE, SOLUTION, N.O.S.

Inland waterway transport ADN/ADNR GGVBinSch

Class	6.1
Haxard label	6.1
UN no. / Material number	1935
Packaging group	II (depending on quantities, possibly I)
Meeresschadstoff	Marine Pollutant
EmS	F.A, S-A
Description of goods Technical name	CYANIDE, SOLUTION, N.A.G.
Hazard inducer	contains silver cyanide,
potassium cyanide	

Loading instructions/Remarks (hazardous goods -

free text) IATA_C	ERG-Code 6L
IATA_P	ERG-Code 6
LIMDG	Do not stow in outer container rows
ADR	Listed product § 7 GGVSE
	From 1,000 kg with volume > 3,000 litres, Table 3 must be observed

Transport/Additional information (cross-regulation hazard texts)

Prohibition of loading together with acids (danger of toxic gases)
Prohibition of loading together with foods, stimulants and animal feeds

16. REGULATIONS

Labelling according to EC directives

Statutory basis/list EU. Directive 67/548/EEC 67/548/EEC / 25th

Hazard-determining components

Aqueous solution containing silver cyanide (AgCN)

Aqueous solution containing potassium cyanide (KCN)

Symbols	**Texts**
T	Toxic
N	Harmful to the environment

R phrases	**Texts**
R23/24/25	Toxic on inhalation, swallowing and contact with skin.
R32	Contact with acids releases very toxic gases.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in water bodies.

S phrases

S1/2	Store in a locked place and out of reach of children.
S7	Keep the container tightly closed.
S28.1	After contact with skin, wash immediately with plenty of water.
S29	Do not allow to get into drains.
S45/46	In case of accident or if you feel unwell or if swallowed, consult a physician immediately. (if possible, show this label).
S60	This material and its container must be disposed of as hazardous waste.
S61	Avoid releasing into the environment avoid. Refer to the special instructions. Consult the safety data sheet.

National regulations

Statutory basis EU	Directive 67/548/EEC 67/548/EEC / 25th
Water hazard class	WGK 3 - highly water endangering (possibly lower, still being tested) (classification according to VwVwS)
	Occupational health and safety regulations BGI 569:
Hydrogen cyanide/Cyanides	
	TRGS 514 “Storage of very toxic and toxic substances in packages and portable containers”
	TRGS 900 “Limit values in air in the workplace”
Restrictions on use	Observe the restrictions on use for expectant and breast-feeding mothers. Observe the use restrictions for young people.
Other regulations	Other countries: Observe the national regulations.

Other information

This version replaces all previous editions.

The information in this safety data sheet corresponds to the best of our knowledge at the time of the revision.

This information is intended to give you guidance on the safe handling of the product mentioned in this safety data sheet during storage, processing, transport and disposal.

The information is not transferable to other products.

If the product mentioned in this safety data sheet is blended, mixed or processed with other materials, or if it is processed, the data contained in this safety data sheet may not be transferred to the new material thus produced unless expressly stated otherwise.

Since the concentration of Magic Rhodium changes by mixing (dilution) with water, the efficacy of rubbing silver is no longer guaranteed.