Safety data sheet according to U.S.A. Federal Hazcom 2012 and Canadian Regulation SOR/88-66

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

1.1. Product identifier.

Code.	**HI93731B-0**
Product name.	**Zinc Reagent B**
Chemical name and synonym.	**CYCLOHEXANONE**

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

Intended use.	**Determination of Zinc in Water Samples.**

1.3. Details of the supplier of the safety data sheet.

Name.	**Hanna Instruments S.R.L.**
Full address.	**str. Hanna Nr 1**
District and Country.	**457260 loc. Nusfalau (Salaj)** **Romania** **Tel. (+40) 260607700** **Fax. (+40) 260607700**
e-mail address of the competent person. responsible for the Safety Data Sheet.	**sds@hannainst.com**
Product distribution by:	**Hanna Intruments, Inc - 584 Park East, Woonsochet, Rhode Island, USA 02895 - Technical Service Contact Information: +1-800-426-6287**

1.4. Emergency telephone number.

For urgent inquiries refer to.	**USA Emergency Contact Information: +1-800-424-9300 - CHEMTREC 24 hours/365 days - International Emergency Contact Information: +1-703-527-3887 - CHEMTREC 24hours/365 days**

SECTION 2. Hazards identification.

2.1. Classification of the substance or mixture.

The product is classified as hazardous pursuant to the provisions set forth in OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200). The product thus requires a safety datasheet.
Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Classification and Hazard Statement.

Flammable liquid, category 3	Flammable liquid and vapour.
Acute toxicity, category 4	Harmful if swallowed.
Acute toxicity, category 4	Harmful in contact with skin.
Acute toxicity, category 4	Harmful if inhaled.
Serious eye damage, category 1	Causes serious eye damage.
Skin irritation, category 2	Causes skin irritation.

Hazard pictograms:

Signal words: Danger

Hazard statements:

H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H332	Harmful if inhaled.
H318	Causes serious eye damage.

SECTION 2. Hazards identification. ... / >>

H315 Causes skin irritation.

Precautionary statements:
Prevention:
P210 Keep away from heat.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust, fume, gas, mist, vapours, spray.
P280 Wear protective gloves, protective clothing, eye protection and face protection.
Response:
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a POISON CENTER or doctor, if you feel unwell.
P362 Take off contaminated clothing.
P370+P378 In case of fire: use powder to extinguish.
Storage:
--
Disposal:
--

2.2. Other hazards.

Information not available.

SECTION 3. Composition/information on ingredients.

3.1. Substances.

Contains:

Identification.	**x = Conc. %.**	**Classification:**
CYCLOHEXANONE		
CAS. 108-94-1	100	Flammable liquid, category 3 H226, Acute toxicity, category 4 H302, Acute toxicity, category 4 H312, Acute toxicity, category 4 H332, Serious eye damage, category 1 H318, Skin irritation, category 2 H315
EC. 203-631-1		
INDEX. 606-010-00-7		

* There is a batch to batch variation.

The full wording of hazard (H) phrases is given in section 16 of the sheet.

3.2. Mixtures.

Information not relevant.

SECTION 4. First aid measures.

4.1. Description of first aid measures.

EYES: Remove contact lenses, if present. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids fully. If problem persists, seek medical advice.
SKIN: Remove contaminated clothing. Rinse skin with a shower immediately. Wash contaminated clothing before using it again.
INHALATION: Remove to open air. If the subject stops breathing, administer artificial respiration. Get medical advice/attention immediately.
INGESTION: Get medical advice/attention immediately. Do not induce vomiting. Do not administer anything not explicitly authorised by a doctor.

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

For symptoms and effects caused by the contained substances, see chap. 11.

CYCLOHEXANONE
Irritant effects, Dizziness, narcosis, Nausea, Vomiting, Stomach/intestinal disorders, Headache, Salivation, Coma, Risk of corneal clouding. The following applies to ketones in general: when vapours/aerosols occur, mucosal irritations, coughing, and dyspnoea after inhalation. The absorption of large quantities leads to: CNS depression (narcosis). Repeated skin contact leads to a degreasing effect, with secondary inflammation possible. Toxic effects on the liver and kidneys cannot be excluded after high doses. The inhalation of droplets may result in the formation of oedemas in the respiratory tract.

SECTION 4. First aid measures. ... / >>

4.3. Indication of any immediate medical attention and special treatment needed.
Information not available.

SECTION 5. Firefighting measures.

5.1. Extinguishing media.
SUITABLE EXTINGUISHING EQUIPMENT
Extinguishing substances are: carbon dioxide, foam, chemical powder. For product loss or leakage that has not caught fire, water spray can be used to disperse flammable vapours and protect those trying to stem the leak.
UNSUITABLE EXTINGUISHING EQUIPMENT
Do not use jets of water. Water is not effective for putting out fires but can be used to cool containers exposed to flames to prevent explosions.

5.2. Special hazards arising from the substance or mixture.
HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE
Excess pressure may form in containers exposed to fire at a risk of explosion. Do not breathe combustion products.

CYCLOHEXANONE
Combustible. Vapours are heavier than air and may spread along floors. Forms explosive mixtures with air at elevated temperatures.
Development of hazardous combustion gases or vapours possible in the event of fire. Pay attention to flashback.

5.3. Advice for firefighters.
GENERAL INFORMATION
Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS
Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures.
Block the leakage if there is no hazard.
Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions.
The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up.
Collect the leaked product into a suitable container. If the product is flammable, use explosion-proof equipment. Evaluate the compatibility of the container to be used, by checking section 10. Absorb the remainder with inert absorbent material.
Make sure the leakage site is well aired. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections.
Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage.

7.1. Precautions for safe handling.
Keep away from heat, sparks and naked flames; do not smoke or use matches or lighters. Without adequate ventilation, vapours may accumulate at ground level and, if ignited, catch fire even at a distance, with the danger of backfire. Avoid bunching of electrostatic charges. Do not eat, drink or smoke during use. Remove any contaminated clothes and personal protective equipment before entering places in which people eat. Avoid leakage of the product into the environment.

7.2. Conditions for safe storage, including any incompatibilities.
Store only in the original container. Store in a well ventilated place, keep far away from sources of heat, naked flames and sparks and other sources of ignition. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s).
Information not available.

SECTION 8. Exposure controls/personal protection.

8.1. Control parameters.

Regulatory References:

USA	NIOSH-REL	NIOSH publication No. 2005-149, 3th printing, 2007.
USA	OSHA-PEL	Occupational Exposure Limits - Limits for Air Contaminants TABLE Z-1-1910.1000.
USA	CAL/OSHA-PEL	California Division of Occupational Safety and Health (Cal-OSHA) Permissible Exposure Limits (PELs).
EU	OEL EU	Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC.
	TLV-ACGIH	ACGIH 2016

CYCLOHEXANONE

Threshold Limit Value.

Type	Country	TWA/8h		STEL/15min		
		mg/m3	ppm	mg/m3	ppm	
OEL	EU	40.8	10	81.6	20	SKIN.
TLV-ACGIH	-	80	20	201	50	
OSHA	USA	200	50			
CAL/OSHA	USA	100	25			SKIN.
NIOSH	USA	100	25			SKIN.

Legend:
(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.

CYCLOHEXANONE
Biological Values, ACGIH: 80 mg/L 1,2 Cyclohexanediol in urine (end of shift at end of workweek), 8 mg/L Cyclohexanol in urine (end of shift); GBR: 2 mmol Cyclohexanol/mol creatinine in urine (post shift) - DEU: 250 mg/L 1,2 Cyclohexanediol urin (Probenahmezeitpunkt: Expositionsende bzw. Schichtende; bei Langzeitexposition: nach mehreren vorangegangenen Schichten), 30 mg/L Cyclohexanol urin (Probenahmezeitpunkt: Expositionsende bzw. Schichtende) - ESP: 80 mg/L 1,2 Ciclohexanodiol en orina (final de la semanalaboral), 8 mg/L Ciclohexanol en orina (final de la semanalaboral).

8.2. Exposure controls.

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration. Personal protective equipment must comply with current regulations.
HAND PROTECTION
Protect hands with category III work gloves (OSHA 29 CFR 1910.138).
The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability.
The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.
SKIN PROTECTION
Wear category I professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.
EYE PROTECTION
Wear airtight protective goggles (OSHA 29 CFR 1910.133).
RESPIRATORY PROTECTION
If the threshold value (e.g. TLV-TWA) is exceeded for the substance or one of the substances present in the product, wear a mask with a NIOSH certified filter, whose class must be chosen according to the limit of use concentration (NIOSH 42 CFR 84, OSHA 29 CFR 1910.134). In the presence of gases or vapours of various kinds and/or gases or vapours containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required.
Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited.
If the substance considered is odourless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus or external air-intake breathing apparatus. For a correct choice of respiratory protection device, see standard NIOSH 42 CFR 84 and OSHA 29 CFR 1910.134.
ENVIRONMENTAL EXPOSURE CONTROLS.
The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties.

9.1. Information on basic physical and chemical properties.

Appearance	liquid	
Colour	colourless	
Odour	pungent	
Odour threshold.	Not available.	
pH.	7	
Melting point / freezing point.	-31 °C.	
Initial boiling point.	Not available.	
Boiling range.	Not available.	
Flash point.	43 T ≤ 60	(°C°F)
Evaporation rate	Not available.	
Flammability (solid, gas)	Not available.	
Lower inflammability limit.	Not available.	
Upper inflammability limit.	Not available.	
Lower explosive limit.	1.3 % (V/V).	
Upper explosive limit.	9.4 % (V/V).	
Vapour pressure.	4 mmHg	
Vapour density	Not available.	
Relative density.	0.950	
Solubility	soluble in water	
Partition coefficient: n-octanol/water	Not available.	
Auto-ignition temperature.	Not available.	
Decomposition temperature.	Not available.	
Viscosity	Not available.	
Explosive properties	Not available.	
Oxidising properties	Not available.	

9.2. Other information.

Molecular weight.	98.140

SECTION 10. Stability and reactivity.

10.1. Reactivity.

There are no particular risks of reaction with other substances in normal conditions of use.

CYCLOHEXANONE
May condense under the effect of heat to form resinous compounds. Attacks various types of plastic.

10.2. Chemical stability.

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions.

The vapours may also form explosive mixtures with the air.

CYCLOHEXANONE
Risk of explosion on contact with: hydrogen peroxide, nitric acid, heat, mineral acids. Can react violently with oxidising agents. Forms explosive mixtures with the air.

10.4. Conditions to avoid.

Avoid overheating. Avoid bunching of electrostatic charges. Avoid all sources of ignition.

CYCLOHEXANONE
Avoid exposure to sources of heat and naked flames.

10.5. Incompatible materials.
Information not available.

10.6. Hazardous decomposition products.

In the event of thermal decomposition or fire, gases and vapours that are potentially dangerous to health may be released.

SECTION 11. Toxicological information.

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.
It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on toxicological effects.

CYCLOHEXANONE
Acute oral toxicity, Symptoms: Stomach/intestinal disorders, Risk of aspiration upon vomiting, Aspiration may cause pulmonary oedema and pneumonitis - Acute inhalation toxicityabsorption, Symptoms: In high doses, Irritation symptoms in the respiratory tract - Acute dermal toxicity, absorption, Skin irritation, Repeated or prolonged exposure may cause skin irritation and dermatitis, due to degreasing properties of the product - Eye irritation, Risk of corneal clouding.

ACUTE TOXICITY.

LC50 (Inhalation - vapours) of the mixture:	11,000 mg/l
LC50 (Inhalation - mists / powders) of the mixture:	Not classified (no significant component).
LD50 (Oral) of the mixture:	1540,000 mg/kg
LD50 (Dermal) of the mixture:	1100,000 mg/kg

CYCLOHEXANONE

LD50 (Oral).	1540 mg/kg Rat
LD50 (Dermal).	948 mg/kg Rabbit
LC50 (Inhalation).	32.65 mg/l/4h Rat

Carcinogenicity Assessment:
108-94-1 CYCLOHEXANONE
IARC:3

SKIN CORROSION / IRRITATION.
Causes skin irritation.

SERIOUS EYE DAMAGE / IRRITATION.
Causes serious eye damage.

RESPIRATORY OR SKIN SENSITISATION.
Does not meet the classification criteria for this hazard class.

GERM CELL MUTAGENICITY.
Does not meet the classification criteria for this hazard class.

CARCINOGENICITY.
Does not meet the classification criteria for this hazard class.

REPRODUCTIVE TOXICITY.
Does not meet the classification criteria for this hazard class.

STOT - SINGLE EXPOSURE.
Does not meet the classification criteria for this hazard class.

STOT - REPEATED EXPOSURE.
Does not meet the classification criteria for this hazard class.

ASPIRATION HAZARD.
Does not meet the classification criteria for this hazard class.

SECTION 12. Ecological information.

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity.

SECTION 12. Ecological information. ... / >>

CYCLOHEXANONE

LC50 - for Fish.	527 mg/l/96h Pimephales promelas
EC50 - for Crustacea.	> 100 mg/l/48h Daphnia magna
Chronic NOEC for Fish.	> 100 mg/l

12.2. Persistence and degradability.

CYCLOHEXANONE

Solubility in water.	0.1 - 100 mg/l
Rapidly biodegradable.	

12.3. Bioaccumulative potential.

CYCLOHEXANONE

Partition coefficient: n-octanol/water.	0.86

12.4. Mobility in soil.

CYCLOHEXANONE

Partition coefficient: soil/water.	1.18

12.5. Results of PBT and vPvB assessment.

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

12.6. Other adverse effects.

Information not available.

SECTION 13. Disposal considerations.

13.1. Waste treatment methods.

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
Waste transportation may be subject to dangerous goods transport regulations.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information.

14.1. UN number.

ADR / RID, IMDG, IATA: 1915

14.2. UN proper shipping name.

ADR / RID:	CYCLOHEXANONE
IMDG:	CYCLOHEXANONE
IATA:	CYCLOHEXANONE

SECTION 14. Transport information. ... / >>

14.3. Transport hazard class(es).

ADR / RID:	Class: 3	Label: 3
IMDG:	Class: 3	Label: 3
IATA:	Class: 3	Label: 3

14.4. Packing group.

ADR / RID, IMDG, IATA: III

14.5. Environmental hazards.

ADR / RID:	NO
IMDG:	NO
IATA:	NO

14.6. Special precautions for user.

ADR / RID:	HIN - Kemler: 30 Special Provision: -	Limited Quantities: 5 L	Tunnel restriction code: (D/E)
IMDG:	EMS: F-E, S-D	Limited Quantities: 5 L	
IATA:	Cargo: Pass.: Special Instructions:	Maximum quantity: 220 L Maximum quantity: 60 L -	Packaging instructions: 366 Packaging instructions: 355

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code.

Information not relevant.

SECTION 15. Regulatory information.

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

U.S. Federal Regulations.

TSCA:
All components are listed on TSCA Inventory.

Clean Air Act Section 112(b):
No component(s) listed.

Clean Air Act Section 602 Class I Substances:
No component(s) listed.

Clean Air Act Section 602 Class II Substances:
No component(s) listed.

Clean Water Act – Priority Pollutants:
No component(s) listed.

Clean Water Act – Toxic Pollutants:
No component(s) listed.

DEA List I Chemicals (Precursor Chemicals):
No component(s) listed.

DEA List II Chemicals (Essential Chemicals):

SECTION 15. Regulatory information. ... / >>

No component(s) listed.

EPA List of Lists:
313 Category Code:
No component(s) listed.

EPCRA 302 EHS TPQ:
No component(s) listed.

EPCRA 304 EHS RQ:
No component(s) listed.

CERCLA RQ:
108-94-1 CYCLOHEXANONE

EPCRA 313 TRI:
No component(s) listed.

RCRA Code:
108-94-1 CYCLOHEXANONE

CAA 112 (r) RMP TQ:
No component(s) listed.

State Regulations.

Massachussetts:
108-94-1 CYCLOHEXANONE

Minnesota:
108-94-1 CYCLOHEXANONE

New Jersey:
108-94-1 CYCLOHEXANONE

New York:
108-94-1 CYCLOHEXANONE

Pennsylvania:
108-94-1 CYCLOHEXANONE

California:
108-94-1 CYCLOHEXANONE

Proposition 65:
This product does not contain any substances know to the State of California to cause cancer, reproductive harm or birth defects.

International Regulations.
Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:
None.

Substances subject to the Rotterdam Convention:
None.

Substances subject to the Stockholm Convention:
None.

Candadian WHMIS.
Information not available.

SECTION 16. Other information.

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

Flam. Liq. 3	Flammable liquid, category 3
Acute Tox. 4	Acute toxicity, category 4
Eye Dam. 1	Serious eye damage, category 1
Skin Irrit. 2	Skin irritation, category 2
H226	Flammable liquid and vapour.

SECTION 16. Other information. ... / >>

H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H332	Harmful if inhaled.
H318	Causes serious eye damage.
H315	Causes skin irritation.

LEGEND:
- 313 CATEGORY CODE: Emergency Planning and Community Right-to Know Act Section 313 Category Code
- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAA 112 ® RMP TQ: Risk Management Plan Threshold Quantity (Clean Air Act Section 112®)
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CERCLA RQ: Reportable Quantity (Comprehensive Environment Response, Compensation, and Liability Act)
- CLP: EC Regulation 1272/2008
- DEA: Drug Enforcement Administration
- EmS: Emergency Schedule
- EPA: US Environmental Protection Agency
- EPCRA: Emergency Planning and Community Right-to Know Act
- EPCRA 302 EHS TPQ: Extremely Hazardous Substance Threshold Planning Quantity (Section 302 Category Code)
- EPCRA 304 EHS RQ: Extremely Hazardous Substance Reportable Quantity (Section 304 Category Code)
- EPCRA 313 TRI: Toxics Release Inventory (Section 313 Category Code)
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PEL: Predicted exposure level
- RCRA Code: Resource Conservation and Recovery Act Code
- REL: Recommended exposure limit
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TSCA: Toxic Substances Control Act
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- WHMIS: Workplace Hazardous Materials Information System.

GENERAL BIBLIOGRAPHY:
- GHS rev. 3
- The Merck Index. 10th Edition
- Handling Chemical Safety
- Niosh - Registry of Toxic Effects of Chemical Substances
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- ECHA website

- 6 NYCRR part 597
- Cal/OSHA website
- California Safe Drinking Water and Toxic Enforcement Act
- EPA website
- Hazard Comunication Standard (HCS 2012)
- IARC website
- List Of Lists EPA: Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112® of the Clean Air Act
- Massachussetts 105 CMR Department of public health 670.000: "Right to Know"
- Minensota Chapter 5206 Departemnt Of Labor and Industry Hazardous Substances, Employee "Right to Know".
- New Jersey Worker and Community Right to know Act N.J.S.A.
- NTP. 2011. Report on Carcinogens, 12th Edition.
- OSHA website

SECTION 16. Other information. ... / >>

- Pennsylvania, Hazardous Substance List, Chapter 323

Note for users:
The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.
This document must not be regarded as a guarantee on any specific product property.
The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.
Provide appointed staff with adequate training on how to use chemical products.

Changes to previous review:
The following sections were modified:
02.