



Scientific Documentation

ZI105, Zinc Chloride, Granular, USP

Not appropriate for regulatory submission.
Please visit www.spectrumchemical.com or
contact Tech Services for the most up-to-date
information contained in this information
package.

Spectrum Chemical Mfg Corp

769 Jersey Avenue
New Brunswick, NJ 08901
Phone 732.214.1300

Ver4.04 9.August.2018



Dear Customer,

Thank you for your interest in Spectrum's quality products and services.

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To accomplish our mission, Spectrum utilizes our sourcing leverage and supplier qualification expertise in offering one of the industry's most comprehensive line of fine chemical products under one brand, in packaging configurations designed to meet your research and production requirements. Our product grades include: USP, NF, BP, EP, JP, FCC, ACS, KSA, Reagent grade, as well as DEA controlled substances. We operate facilities in the United States on the East Coast, West Coast, as well as in Shanghai, China in order to provide the best logistical support for our customers.

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In the following pages, we have designed and prepared documented scientific information to aid you in your initial qualification or your continual use of our products. Please do not hesitate to contact us if further information or the most up-to-date documentation is desired from any of the covered areas.

We appreciate your business and we look forward to hearing from you.

Sincerely,

A handwritten signature in blue ink, appearing to read "Michael Dang", with a stylized flourish at the end.

Michael Dang
Director, Quality Systems & GMP Compliance
mdang@spectrumchemical.com

9.August.2018

ZI105, Zinc Chloride, Granular, USP

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Specification for Zinc Chloride, Granular, USP (ZI105)

Item Number	ZI105
Item	Zinc Chloride, Granular, USP
CAS Number	7646-85-7
Molecular Formula	ZnCl ₂
Molecular Weight	136.29
MDL Number	
Synonyms	

Test	Specification	
	Min	Max
ASSAY	97.0	100.5 %
OXYCHLORIDE	TO PASS TEST	
SULFATES (SO ₄)		0.03 %
ALKALIES AND ALKALINE EARTHS		1.0 %
AMMONIUM SALTS	TO PASS TEST	
LEAD (Pb)		0.005 %
ELEMENTAL IMPURITIES	AS REPORTED	
IDENTIFICATION A	TO PASS TEST	
IDENTIFICATION B	TO PASS TEST	
CERTIFIED HALAL		
RETEST DATE		
DATE OF MANUFACTURE		
APPEARANCE		
RESIDUAL SOLVENTS	TO PASS TEST	

Spectrum Chemical Mfg Corp

Corporate Headquarters:

769 Jersey Ave.
New Brunswick, NJ 08901
732.214.1300

West Coast Facility:

14422 S. San Pedro St.
Gardena, CA 90248
310.516.8000



SAFETY DATA SHEET

Preparation Date: 05/08/2015

Revision Date: 6/14/2018

Revision Number: G3

1. IDENTIFICATION

Product identifier

Product code: ZI105
Product Name: ZINC CHLORIDE, GRANULAR, USP, JP

Other means of identification

Synonyms: No information available
CAS #: 7646-85-7
RTECS # ZH1400000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: No information available.
Uses advised against No information available

Supplier: Spectrum Chemical Mfg. Corp
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: <https://www.spectrumchemical.com>
Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous according to the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3

Label elements

Danger

Hazard statements

Harmful if swallowed
Causes severe skin burns and eye damage
May cause respiratory irritation

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**Hazards not otherwise classified (HNOC)**

Not Applicable

Other hazards

Not available

Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area

Precautionary Statements - Response

Immediately call a POISON CENTER or doctor/physician

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 doctor/physician.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

Wash contaminated clothing before reuse

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor/physician. Call a POISON CENTER or doctor/physician if you feel unwell.

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell

Rinse mouth

Do NOT induce vomiting

Precautionary Statements - Storage

Store locked up

Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
Zinc Chloride	7646-85-7	100

4. FIRST AID MEASURES

First aid measures**General Advice:**

National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

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Skin Contact:	Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.
Eye Contact:	Flush eyes with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.
Inhalation:	Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention.
Ingestion:	Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. If victim is conscious, give water or milk. Immediate medical attention is required.

Most important symptoms and effects, both acute and delayed

Symptoms	Severe skin and eye irritation or burns Causes eye damage Irritating to respiratory system Coughing Dyspnea (Difficulty breathing and shortness of breath) May cause cyanosis Causes digestive (gastrointestinal) tract irritation May cause gastrointestinal (digestive) tract burns May cause abdominal pain, nausea, vomiting, diarrhea Central nervous system effects May affect the cardiovascular system It may affect the kidneys May affect the liver
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Indication of any immediate medical attention and special treatment needed

Notes to Physician:	Treat symptomatically.
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Protection of first-aiders

First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media:	The product is not flammable. If it is involved in a fire, extinguish the fire using an agent suitable for the type of surrounding fire.
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Unsuitable Extinguishing Media:	No information available.
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Specific hazards arising from the chemical

Hazardous Combustion Products:	No information available.
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Specific hazards:	A mixture of potassium and zinc chloride produces a strong explosion on impact.
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Special Protective Actions for Firefighters

Specific Methods:

No information available.

Special Protective Equipment for Firefighters:

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

6. ACCIDENTAL RELEASE MEASURES**Personal precautions, protective equipment and emergency procedures****Personal Precautions:**

Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up**Methods for containment**

Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading.

Methods for cleaning up

Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE**Precautions for safe handling****Technical Measures/Precautions:**

Provide sufficient air exchange and/or exhaust in work rooms. Keep away from incompatible materials.

Safe Handling Advice

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not ingest. Do not breathe vapors/dust. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities**Technical Measures/Storage Conditions:**

Deliquescent. Protect from moisture. Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials.

Incompatible Materials:

Metals

Oxidizing agents

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Control parameters****National occupational exposure limits****United States**

Components	CAS-No.	OSHA	NIOSH	ACGIH	AIHA WEEL
Zinc Chloride	7646-85-7	1 mg/m ³ TWA	1 mg/m ³ TWA 2 mg/m ³ STEL	2 mg/m ³ STEL fume 1 mg/m ³ TWA fume	None

Canada

Components	CAS-No.	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
Zinc Chloride	7646-85-7	1 mg/m ³ TWA fume 2 mg/m ³ STEL fume	1 mg/m ³ TWA fume 2 mg/m ³ STEL fume	2 mg/m ³ STEL	None

Australia and Mexico

Components	CAS-No.	Australia	Mexico
Zinc Chloride	7646-85-7	2 mg/m ³ STEL 1 mg/m ³ TWA	1 mg/m ³ TWA 2 mg/m ³ STEL

Appropriate engineering controls

Engineering measures to reduce exposure:

Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection:

Goggles

Skin and body protection:

Chemical resistant apron
Gloves
Long sleeved clothing

Respiratory protection:

Effective dust mask. Wear respirator with dust filter.

Hygiene measures:

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:

Solid

Appearance:

Deliquescent. Granular.

Color:

White.

Odor:

Odorless.

Taste

No information available.

Formula:

ZnCl₂

Molecular/Formula weight:

136.29

Flammability:

No information available

Flashpoint (°C/°F):

No information available.

Flash Point Tested according to:

Not available

Autoignition Temperature (°C/°F):

No information available

Lower Explosion Limit (%):

No information available

Upper Explosion Limit (%):

No information available

Melting point/range(°C/°F):

290°C/554°F

Decomposition temperature(°C/°F):

No information available

Boiling point/range(°C/°F):

732°C/1349.6°F

Bulk density:

No information available

Density (g/cm³):

No information available

Specific gravity:

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2.907

pH:
No information available

Vapor pressure @ 20°C (kPa):
No information available

Evaporation rate:
No information available

Vapor density:
4.7

VOC content (g/L):
No information available

Odor threshold (ppm):
No information available

**Partition coefficient
(n-octanol/water):**
No information available

Viscosity:
No information available

Miscibility:
No information available

Solubility:
Easily soluble in cold water, hot water.
Soluble in acetone
Solubility in Water: 432 g/100 water at 25°C; 614 g/100 g water at 100°C.
One gram of Zinc Chloride is soluble in 0.25 ml of 2% Hydrochloric acid.
One gram of Zinc Chloride is soluble in 1.3 ml of alcohol.
One gram of Zinc Chloride is soluble in 2 ml of Glycerol

10. STABILITY AND REACTIVITY

Reactivity

Reactive with metals
Reactive with oxidizing agents
A mixture of potassium and zinc chloride produces a strong explosion on impact

Chemical stability

Stability: Deliquescent. Stable at normal conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Ignition sources. Incompatible materials.

Incompatible Materials: Metals
Oxidizing agents

Hazardous decomposition products: No information available.

Other Information

Corrosivity: Extremely corrosive in presence of aluminum
Highly corrosive in presence of copper
Slightly corrosive in presence of stainless steel (304)
Slightly corrosive in presence of stainless steel (316)
Non-corrosive in the presence of glass
Minor corrosive effect on bronze
Severe corrosive effect on Brass

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Ingestion. Inhalation. Skin. Eyes.

Acute Toxicity

Component Information

Zinc Chloride	
CAS-No.	7646-85-7

LD50/oral/rat = 1100 mg/kg Oral LD50 Rat(LOLI); 350 mg/kg (RTECS)

LD50/oral/mouse = 329 mg/kg Oral LD50 Mouse

LD50/dermal/rabbit = No information available

LD50/dermal/rat = No information available

LC50/inhalation/rat = <= 1975 mg/m³ 10 min Inhalation LC50

LC50/inhalation/mouse = No information available

Other LD50 or LC50 information = No information available

Product Information

LD50/oral/rat =

VALUE- Acute Tox Oral = 350 mg/kg

LD50/oral/mouse =

Value - Acute Tox Oral = 329 mg/kg

LD50/dermal/rabbit

VALUE-Acute Tox Dermal = No information available

LD50/dermal/rat

VALUE -Acute Tox Dermal = No information available

LC50/inhalation/rat

VALUE-Vapor = No information available

VALUE-Gas = No information available

VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse

VALUE-Vapor = No information available

VALUE - Gas = No information available

VALUE - Dust/Mist = No information available

Symptoms

Skin Contact:

Causes severe irritation and burns.

Eye Contact:

Causes severe eye irritation and possible burns. May cause reversible eye damage. May cause corneal opacity. May cause corneal ulceration. May cause glaucoma.

Inhalation

May cause severe respiratory tract irritation, and pneumonitis. It may affect behavior/central nervous system. Symptoms may include sore throat, coughing, shortness of breath, dyspnea, chest tightness, headache, excitement, cyanosis (bluish discoloration of skin due to deficient oxygenation of the blood), delayed lung edema, bronchial asthma . Inhalation of fumes may cause metal fume fever. It is characterized by flu-like symptoms (fever, chills, cough, muscle pain, weakness), chest pain.

Ingestion

Harmful if swallowed. Causes digestive (gastrointestinal) tract irritation. May cause

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abdominal pain, nausea, vomiting, diarrhea. May cause anorexia. May cause digestive (gastrointestinal) tract burns. May cause perforation of the digestive tract. May cause permanent damage to the digestive tract. It may also affect behavior/Central nervous system (excitement, central nervous system depression, lethargy, confusion), the urinary system (kidney damage - hematuria, oliguria, renal failure), cardiovascular system, respiration (dyspnea), metabolism (acidosis, hypercalcemia, pancreas (elevated amylase, and glucose levels), liver (hepatic enzymes increased), and blood (changes in white and red blood cell count, anemia, leukocytosis, changes in serum composition). Zinc chloride is irritating or caustic depending on the concentration ingested.

Aspiration hazard No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity Prolonged or repeated skin contact may cause defatting and dermatitis.

Sensitization: No information available.

Mutagenic Effects: Mutations in microorganisms
Experiments with bacteria and/or yeast have shown mutagenic effects

Carcinogenic effects: Equivocal tumorigenic agent by Registry of Toxic Effects of Chemical Substances (RTECS) criteria.

Components	CAS-No.	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
Zinc Chloride	7646-85-7	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

ACGIH (American Conference of Governmental Industrial Hygienists)

IARC (International Agency for Research on Cancer)

NTP (National Toxicology Program)

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

Reproductive toxicity No data is available

Reproductive Effects: May cause adverse reproductive effects based on animal data
Developmental Effects: May cause adverse developmental effects based on animal data
Teratogenic Effects: May cause birth defects (teratogenic effects) based on animal test data

Specific Target Organ Toxicity

STOT - single exposure STOT - single exposure. Respiratory system.
STOT - repeated exposure No information available.
Target Organs: Respiratory system. Lungs. Skin.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: No information available.

Mobility: No information available.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:

Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:

Empty containers should be taken for local recycling, recovery or waste disposal

Components	CAS-No.	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Zinc Chloride	7646-85-7	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No: Not Regulated
Proper Shipping Name: Zinc chloride, anhydrous
Hazard Class: 8
Subsidiary Class No information available
Packing group: No information available
Emergency Response Guide Number No information available
Marine Pollutant No data available
DOT RQ (lbs): No information available
Special Provisions No Information available
Symbol(s): [DOT]: (R4) - Identifies a material that is a hazardous substance that has a reportable quantity (RQ) of 1000 pounds (454 Kilograms).
Description: UN2331,Zinc chloride, anhydrous ,8,PG III,Marine Pollutant

TDG (Canada)

UN-No: UN2331
Proper Shipping Name: Zinc chloride, anhydrous
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: III
Marine Pollutant No Information available
Description: UN2331,ZINC CHLORIDE, ANHYDROUS,8,PG III,Marine Pollutant

ADR

UN-No: UN2331
Proper Shipping Name: Zinc chloride, anhydrous
Hazard Class: 8
Packing Group: III
Subsidiary Risk: No information available
Description: UN2331 Zinc chloride, anhydrous,8,III

IMO / IMDG

UN-No: UN2331
Proper Shipping Name: Zinc chloride, anhydrous
Hazard Class: 8

Subsidiary Risk: P
Packing Group: III
Marine Pollutant No information available
EMS: F-A

RID

UN-No: UN2331
Proper Shipping Name: Zinc chloride, anhydrous
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: III
Description: UN2331 Zinc chloride, anhydrous,8,III

ICAO

UN-No: UN2331
Proper Shipping Name: Zinc chloride, anhydrous
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: III
Description: UN2331,Zinc chloride, anhydrous,8,PG III

IATA

UN-No: UN2331
Proper Shipping Name: Zinc chloride, anhydrous
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: III
ERG Code: 8L
Special Provisions No information available
Description: UN2331,Zinc chloride, anhydrous,8,PG III

15. REGULATORY INFORMATION

International Inventories

Components	CAS-No.	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Zinc Chloride	7646-85-7	PresentACTIVE	Present KE-35535	Present	Present (1)-264	Present	Present	Present 231-592-0

U.S. Regulations

Zinc Chloride

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: 2030
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Pennsylvania RTK: Environmental hazard
Pennsylvania RTK - Environmental Hazard List Present
Minnesota - Hazardous Substance List: Present
New York Release Reporting - List of Hazardous Substances:
 5000 lb RQ
 100 lb RQ
Louisiana Reportable Quantity List for Pollutants: Listed
California Directors List of Hazardous Substances: Present
FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 182.70,21 CFR 182.8985
FDA - 21 CFR - Total Food Additives 182.70, 182.8985, 582.80

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

Chemicals Known to the State of California to Cause Cancer:

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This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:

This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Components	CAS-No.	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Zinc Chloride	7646-85-7	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CAS-No.	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting de minimis
Zinc Chloride	7646-85-7	1000 lb final RQ 454 kg final RQ	None	None	Zinc compounds	1% de minimus concentration

U.S. TSCA

Components	CAS-No.	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Zinc Chloride	7646-85-7	Not Applicable	Not Applicable

Canada

WHMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information:

The WHMIS 2015 classification of this product has not been validated or reviewed yet.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

WHMIS 1988 Hazard Class

E Corrosive material

Components

Zinc Chloride

WHMIS 1988

E

Canada Controlled Products Regulation:

This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Components	WHMIS Ingredient Disclosure List -
Zinc Chloride	1 %

Inventory

Components	CAS-No.	Canada (DSL)	Canada (NDSL)
Zinc Chloride	7646-85-7	Present	Not Listed

Components	CAS-No.	CEPA Schedule I - Toxic Substances
Zinc Chloride	7646-85-7	Not listed
Components	CAS-No.	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Zinc Chloride	7646-85-7	Not listed

EU Classification

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Components	CAS-No.	EU GHS - SV - CLP (1272/2008)
Zinc Chloride	7646-85-7	Acute toxicity - Oral - Acute Tox. 4: H302 Harmful if swallowed. (Minimum classification); Skin corrosion/irritation - Skin Corr. 1B: H314 Causes severe skin burns and eye damage.; Hazardous to aquatic environment - acute hazard - Aquatic Acute 1: H400 Very toxic to aquatic life.; Hazardous to aquatic environment - chronic hazard - Aquatic Chronic 1: H410 Very toxic to aquatic life with long lasting effects.030-003-00-2 Specific target organ toxicity - Single exposure - STOT SE 3: H335 May cause respiratory irritation. (C >= 5 %)030-003-00-2

EU - CLP (1272/2008)

R-phrases(s)

R22 - Harmful if swallowed.

R34 - Causes burns.

R50/53 - Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S -phrase(s)

S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S60 - This material and its container must be disposed of as hazardous waste.

S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.

S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.

Components	CAS-No.	Classification	Concentration Limits:	Safety Phrases
Zinc Chloride	7646-85-7	Xn; R22 C; R34 N; R50-53	10%<=C C; R34 5%<=C<10% Xi; R36/37/38	S: (1/2)-26-36/37-/39-45- 60-61

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:

C - Corrosive.

C

**16. OTHER INFORMATION**

Preparation Date: 05/08/2015
Revision Date: 6/14/2018
Prepared by: Sonia Owen

Disclaimer:

All chemicals may pose unknown hazards and should be used with caution. This

Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet



Manufacturer

Product Covered: ZI105, Zinc Chloride, Granular, USP

Spectrum takes ownership as the manufacturer for the Spectrum product listed above and provides full quality assurance, customer service, and technical product support.

While information concerning the raw material manufacturer of our starting materials is considered proprietary, such information can be made available upon request contingent on demonstration of business volume justification and successful execution of confidential disclosure agreement (CDA).

Requests for disclosure of proprietary raw material manufacturer information may be submitted to the assigned account representative for consideration.

Sincerely,

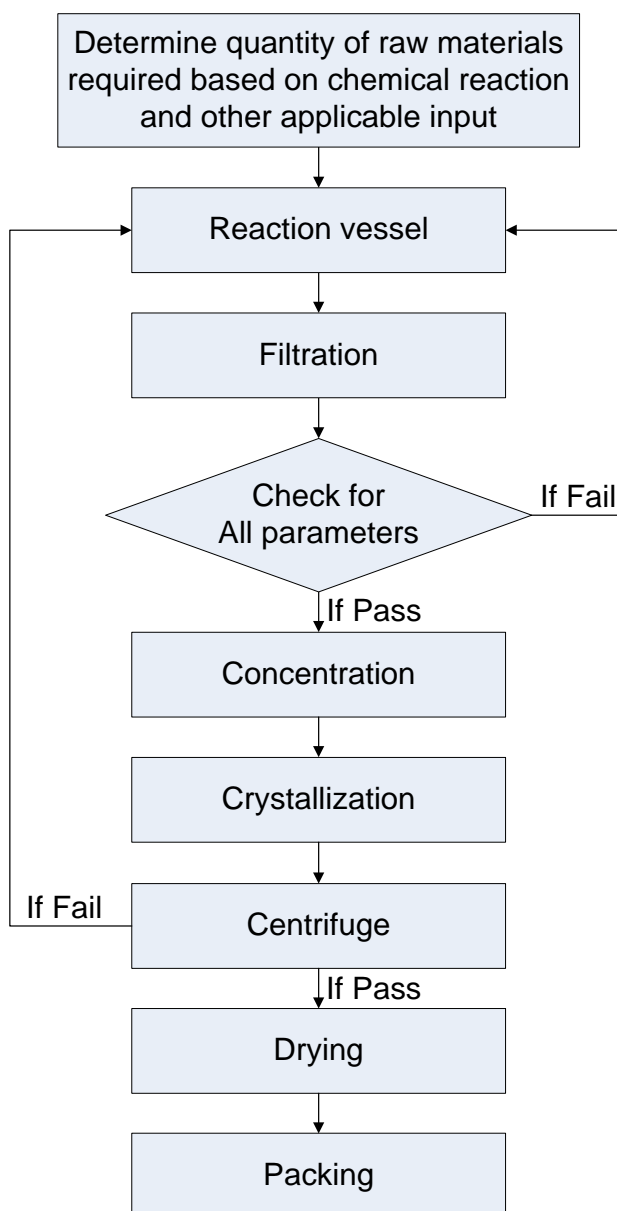
A handwritten signature in blue ink, appearing to read "Michael Dang", with a long horizontal flourish extending to the right.

Michael Dang
Director, Quality Systems & GMP
Compliance
mdang@spectrumchemical.com

9.August.2018

Manufacturing Process Flowchart

Zinc Chloride, Granular, USP - ZI105



Spectrum Chemical Mfg Corp

Corporate Headquarters:

769 Jersey Ave.
New Brunswick, NJ 08901
732.214.1300

West Coast Facility:

14422 S. San Pedro St.
Gardena, CA 90248
310.516.8000

CERTIFICATE OF REGISTRATION

This is to certify that the quality management system of:

Spectrum Chemicals and Laboratory Products, Inc.

Main Site: 14422 South San Pedro Street, Gardena, California, 90248, USA,

Additional sites: 13915 South Main Street, Los Angeles, California, 90061, USA

769 Jersey Avenue, New Brunswick, New Jersey, 08901, USA

755 Jersey Avenue, New Brunswick, New Jersey, 08901, USA

777 Jersey Avenue, New Brunswick, New Jersey, 08901, USA

400 N. Oracle, Suite 221, Tucson, Arizona, 85704, USA, USA

has been assessed and registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The quality management system is applicable to:

Main Site: The manufacture and distribution of specialty fine chemicals, solutions, equipment, supplies and products for the laboratory, pharmaceutical, food, healthcare, cosmetic, fragrance, biotechnology, environmental and process industries.

Certificate Number:

94-316m-03

Initial Certification Date:

27 December 1994

Certificate Issue Date:

31 July 2017

Certificate Expiry Date:

28 January 2019



A handwritten signature in black ink, appearing to read 'Calin Moldovean', written over a horizontal line.

Authorized Signature

Calin Moldovean

President Business Assurance

Intertek Testing Services NA, Inc. dba Intertek
900 Chelmsford Street, Lowell, MA, USA



APPENDIX TO CERTIFICATE OF REGISTRATION

This appendix identifies the locations by the management system of

Spectrum Chemicals and Laboratory Products, Inc.

755 and 769 Jersey Avenue: The manufacture and distribution of specialty fine chemicals, solutions, equipment, supplies and products for the laboratory, pharmaceutical, food, healthcare, cosmetic, fragrance, biotechnology, environmental and process industries.

777 Jersey Avenue: The manufacture and distribution of specialty fine chemicals, solutions, equipment, supplies and products for Compounding Pharmacies.

7400 N. Oracle: The manufacture and distribution of specialty fine chemicals, solutions, equipment, supplies and products for the laboratory, pharmaceutical, food, healthcare, cosmetic, fragrance, biotechnology, environmental and process industries.



管理体系认证 注册证书

兹证明，以下组织：

斯百全化学（上海） 有限公司

上海市松江区申港路3802弄A20

的管理体系，符合以下标准要求并予以注册：

ISO 9001:2015

此管理体系适用于：

药用辅料销售，化学品销售

统一社会信用代码：

91310000777627048K

证书编号：

111310001

首次认证日期：

2015年11月17日

认证决定日期：

2017年12月26日

签发日期：

2017年12月26日

有效期至：

2018年11月10日



014

Calin Moldovean

President, Business Assurance

Intertek Certification Limited, 10A Victory
Park, Victory Road, Derby DE24 8ZF, United
Kingdom

Intertek Certification Limited
是 UKAS 认可的认证机构，
注册号为 014



CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Spectrum China Ltd.

Building A20, No. 3802, Shengang Road, Songjiang District, Shanghai, China

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Sales for Pharmaceutical Excipients, Sales for Chemicals

Unified Social Credit Identifier:

91310000777627048K

Certificate Number:

111310001

Initial Certification Date:

17 November 2015

Date of Certification Decision:

26 December 2017

Issuing Date:

26 December 2017

Valid Until:

10 November 2018



014

Calin Moldovean

President, Business Assurance

Intertek Certification Limited, 10A Victory
Park, Victory Road, Derby DE24 8ZF, United
Kingdom

Intertek Certification Limited is a
UKAS accredited body under
schedule of accreditation no. 014.



July 13, 2017

Certification of Compliance with current Good Manufacturing Practices

Dear Valued Customer:

Spectrum Chemical Mfg Corp certifies that our USP, NF, FCC, EP, BP, JP and food grade products are produced, processed, packaged and held in compliance with current Good Manufacturing Practices (cGMP) in accordance with the applicable parts of 21 CFR, parts 210 and 211 of the Code of Federal Regulations.

Spectrum is an FDA registered and inspected Drug Establishment. Our United States Food and Drug Administration (USFDA) Registration numbers are as follows:

Spectrum-Gardena, CA:	<u>2020632</u>
Spectrum-New Brunswick, NJ:	<u>2246824</u>
Spectrum-Shanghai, China:	<u>3006174778</u>

Thank you for your interest in Spectrum products. If we may be of further assistance, please feel free to contact the Quality Assurance department at 310-516-8000 or via email at qualityassurance@spectrumchemical.com

Sincerely,



Oralia Chavez
Quality Assurance Specialist



August 9, 2018

Certification of Compliance with current Good Manufacturing Practices

Dear Valued Customer:

Spectrum Chemical Mfg Corp certifies that the following product(s) is produced, processed, packaged and held in compliance with current Good Manufacturing Practices (cGMP) in accordance with the applicable parts of 21 CFR, parts 210 and 211 of the Code of Federal Regulations.

Catalog Number	Product Name
ZI105	Zinc Chloride, Granular, USP

Spectrum is an FDA registered and inspected Drug Establishment. Our United States Food and Drug Administration (USFDA) Registration numbers are as follows:

Spectrum-Gardena, CA: 2020632
Spectrum-New Brunswick, NJ: 2246824
Spectrum-Shanghai, China: 03006174778

Thank you for your interest in Spectrum products. If we may be of further assistance, please feel free to contact the Quality Assurance department at 310-516-8000 or via email at qualityassurance@spectrumchemical.com

Sincerely,

A handwritten signature in black ink, appearing to read "Oralia Chavez".

Oralia Chavez
Quality Assurance Specialist



April 11, 2016

Re: Zinc Chloride, Granular, USP- ZI105

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfr. Corp. understand the concern regarding Bovine Spongiform Encephalopathy (BSE). Please be assured that the chemical

Zinc Chloride, Granular, USP- ZI105

is BSE/TSE free.

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at techservices@spectrumchemical.com.

Sincerely,

Darlene Dagdag- Lyudmirskiy
Technical Services
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature



March 31, 2016

Re: Zinc Chloride, Granular, USP- ZI105

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfr. Corp. understand the concern regarding the presence of allergens in raw materials. Please be assured that the following chemical does not contain (Cereals containing gluten (i.e. wheat, rye, barley, oats, spelt, kamut or their hybridised strains) and products thereof, Crustaceans and products thereof, Eggs and products thereof, Fish, Shellfish, and products thereof, Peanuts and products thereof, Soybeans and products thereof, Milk and products thereof (including lactose), Nuts (i.e. almond, hazelnut, walnut, cashew, pecan nut, Brazil nut, pistachio nut, Macadamia nut and Queensland nut), and products thereof, Celery and products thereof, Mustard and products thereof, Sesame seeds and products thereof, Sulphur dioxide and sulphites at concentration > 10mg/kg or 10mg/L (expressed as SO₂), Lupin and products thereof, Molluscs and products thereof and Wheat).

Zinc Chloride, Granular, USP- ZI105

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at techservices@spectrumchemical.com.

Sincerely,

Darlene Dagdag- Lyudmirskiy
Technical Services
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature



April 20, 2016

Re: Zinc Chloride, Granular, USP-ZI105

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

We at Spectrum Chemical Mfg. Corp. understand the concern regarding Aflatoxins in raw materials. To the best of our knowledge, the product listed below is not contaminated with Aflatoxins. Aflatoxins are not used in production. The following product does not come in contact with Aflatoxins at any stage of production.

Zinc Chloride, Granular, USP-ZI105

If you have any further questions, please contact Tech Services at (310) 516-8000 Extension 5471, or by email at techservices@spectrumchemical.com.

Sincerely,

Darlene Dagdag-Lyudmirskiy
Technical Services
Spectrum Chemical Mfr. Corp.

This document has been produced electronically and is valid without a signature

Label Information

The Spectrum label presents technical and safety information in an easily understood format. Our technical specialists stay abreast of the latest requirements of the Globally Harmonized System for Classification and Labelling of Chemicals (GHS), as well as the Occupational Safety and Health Administration (OSHA), the Food and Drug Administration (FDA) and other government regulatory agencies in order to ensure compliance, accuracy and concise hazard communication.

A **DANGER**

B

C *** Causes severe skin burns and eye damage • Harmful if swallowed • May cause respiratory irritation.**

D **ZI105**

E **Zinc Chloride**

F **2.5 KG**

G **Granular**

H **U.S.P.**

I **CAS 7646-85-7**

J **CAUTION: For manufacturing or laboratory use only. Read and understand the label and Safety Data Sheet (SDS) prior to use.**

K **DOT: UN2331, Zinc chloride, anhydrous, 8, PG III**

L **Exp. Date: 03-31-2025**

M **Chemical Emergency: (800)424-9300**

N **www.SpectrumChemical.com**

O **KEEP FROM CHILDREN**

SPECTRUM[®]

ZnCl₂

F.W. 136.29

Assay 97.0-100.5%

MAXIMUM LIMITS

Oxychloride To pass test

Sulfate (SO₄) 0.03%

Alkalies and Alkaline Earths 1.0%

Ammonium Salts To pass test

Lead (Pb) 0.005%

Residual Solvents To pass test

WARNING: This product contains a chemical known to the State of California to cause cancer.

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

DELIQUESCENT: Keep tightly closed.

W 9/E3GHS **Lot No. 062233**

SPECTRUM CHEMICAL MFG. CORP.

Gardena, CA 90248 • New Brunswick, NJ 08901

- | | | |
|---|--|---|
| A Bar Code | F Size/Quantity | K Empirical Formula, Formula Weight and Technical Specifications Panel |
| B GHS Hazard Pictograms | G Chemical Abstracts Service (CAS) Registry Number | L Expiration Information |
| C Warning, Safety Data and Precautionary Information | H Caution Information | M Lot Number |
| D Product Catalog Number | I DOT Shipping Information | N Kosher Certified by Kosher Supervision of America (KSA). |
| E Item Name, Form, Grade | J Toll-Free 24-Hour Chemical Emergency Telephone Number | |
| O Storage Color Band | | |

This color-coded band indicates the hazard most likely to be posed by that material under storage conditions. The criteria used to assign band colors have been established by the Storage Code working group of the Society for Chemical Hazard Communication (SCHC). It is recommended that like colors be stored together, unless otherwise stated, based on the color codes indicated to the right. However, it is the responsibility of the customer to check with their local fire department for possible conflicts with our recommendations when storing hazardous chemicals.

- YELLOW:** Oxidizer
- RED:** Flammable
- GREEN:** General Storage
- BLUE:** Health Hazard
- WHITE:** Corrosive

Spectrum Chemical Mfg Corp

Corporate Headquarters:

769 Jersey Ave.
New Brunswick, NJ 08901

732.214.1300

West Coast Facility:

14422 S. San Pedro St.
Gardena, CA 90248

310.516.8000

Item Number	ZI105	Lot Number	IHC1115
Item	Zinc Chloride, Granular, USP		
CAS Number	7646-85-7		
Molecular Formula	ZnCl ₂	Molecular Weight	136.29

Test	Specification		Result
	min	max	
ASSAY	97.0	100.5 %	97.91 %
OXYCHLORIDE	TO PASS TEST		PASSES TEST
SULFATES (SO ₄)		0.03 %	<0.03 %
ALKALIES AND ALKALINE EARTHS		1.0 %	0.17 %
AMMONIUM SALTS	TO PASS TEST		PASSES TEST
LEAD (Pb)		0.005 %	<0.005 %
ELEMENTAL IMPURITIES	AS REPORTED		COMPLIES WITH STANDARD
IDENTIFICATION A	TO PASS TEST		PASSES TEST
IDENTIFICATION B	TO PASS TEST		PASSES TEST
CERTIFIED HALAL			CERTIFIED HALAL
RETEST DATE			31-DEC-2020
DATE OF MANUFACTURE			01-JAN-2018
APPEARANCE			WHITE CRYSTALLINE GRANULES
RESIDUAL SOLVENTS	TO PASS TEST		NO RESIDUAL SOLVENTS USED

Spectrum Chemical Mfg Corp
14422 South San Pedro Street
Gardena 90248 CA



Certificate of Analysis Results Certified By:



Adan Hernandez
Quality Control Manager
Spectrum Chemicals & Laboratory Products

All pharmaceutical ingredients are tested using current edition of applicable pharmacopeia.

Read and understand label and SDS before handling any chemicals. All Spectrum's chemicals are for manufacturing, processing, repacking or research purposes by experienced personnel only. It is the customer's responsibility to provide adequate hazardous material training and ensure that appropriate Personal Protective Equipment (PPE) is used before handling any chemical.

Item Number	ZI105	Lot Number	2HC0334
Item	Zinc Chloride, Granular, USP		
CAS Number	7646-85-7		
Molecular Formula	ZnCl ₂	Molecular Weight	136.29

Test	Specification		Result
	min	max	
ASSAY	97.0	100.5 %	97.91 %
OXYCHLORIDE	TO PASS TEST		PASSES TEST
SULFATES (SO ₄)		0.03 %	<0.03 %
ALKALIES AND ALKALINE EARTHS		1.0 %	0.17 %
AMMONIUM SALTS	TO PASS TEST		PASSES TEST
LEAD (Pb)		0.005 %	<0.005 %
ELEMENTAL IMPURITIES	AS REPORTED		COMPLIES WITH STANDARD
IDENTIFICATION A	TO PASS TEST		PASSES TEST
IDENTIFICATION B	TO PASS TEST		PASSES TEST
CERTIFIED HALAL			CERTIFIED HALAL
RETEST DATE			31-DEC-2020
DATE OF MANUFACTURE			01-JAN-2018
APPEARANCE			WHITE CRYSTALLINE GRANULAR
RESIDUAL SOLVENTS	TO PASS TEST		NO RESIDUAL SOLVENTS USED

Spectrum Chemical Mfg Corp
755 Jersey Avenue
New Brunswick 08901 NJ



Certificate Of Analysis Results Certified by



Ibad Tirmizi
Director of Quality
Spectrum Chemical Mfg. Corp.

All pharmaceutical ingredients are tested using current edition of applicable pharmacopeia.

Read and understand label and SDS before handling any chemicals. All Spectrum's chemicals are for manufacturing, processing, repacking or research purposes by experienced personnel only. It is the customer's responsibility to provide adequate hazardous material training and ensure that appropriate Personal Protective Equipment (PPE) is used before handling any chemical.

June 15, 2018

RE: Lot Numbering System

Dear Valued Customer:

This letter is to inform you of Spectrum Chemicals and Laboratory Products' Lot Numbering System. The system is based on an alpha-numerical sequence which provides the month, year and location of production.

The lot numbering system utilized until 2010 is a sequence of **six characters**, two letters followed by four numbers. The first letter represents the year, for example, Y denotes 2009 and Z denotes 2010. The second letter represents the month and site, for example, A-L denotes January through December at Spectrum's Gardena, CA facility, while M-X denotes January through December at the New Brunswick, NJ facility. The following four numbers are sequentially assigned.

Example: ZI0928 = The 928th material produced in California in September 2010

The lot numbering system utilized for 2011 and forward, is a sequence of **seven characters**. The first character, a number, represents the production facility:

- 1 = Gardena, CA Facility
- 2 = New Brunswick, NJ Facility
- 3 = China Facility

The second character, a letter, represents the year. For example, A denotes 2011 and B denotes 2012. The third character, a letter, represents the month, with A denoting January and L denoting December. The following four numbers are sequentially assigned.

Example: 2AA0706 = The 706th material produced in New Jersey in January 2011

Thank you for your interest with Spectrum products. Please feel free to contact us at 310-516-8000 or via email at qualityassurance@spectrumchemical.com if we may be of further assistance.

Sincerely,



Michael Dang
Director, Quality Systems & GMP Compliance
mdang@spectrumchemical.com



Stability – Shelf Life Guidance

Product Covered: ZI105, Zinc Chloride, Granular, USP

Spectrum Chemical's manufacturing partner has assigned the following shelf life guidance for the product listed above.

The product, ZI105, Zinc Chloride, Granular, USP, is assigned a 24 months shelf life from date of manufacturing. The quality and integrity of the chemical depends on the handling and storage conditions. Please refer to the Safety Data Sheet for proper storage and handling procedures.

Adan R. Hernandez
Quality Control Manager

A handwritten signature in blue ink, appearing to read "Adan R. Hernandez".

Corporate Headquarters
769 Jersey Avenue
New Brunswick, NJ 08901-3605



المجلس الإسلامي الأمريكي للغذاء و التغذية

THE ISLAMIC FOOD AND NUTRITION COUNCIL OF AMERICA

IFANCA HALAL PRODUCT CERTIFICATE شهادة حلال

This is to certify that the following product(s) have been produced under the supervision of the Islamic Food and Nutrition Council of America (IFANCA®). The production facility as well as component ingredients have been reviewed and approved. The product(s) are in compliance with the halal requirements under Islamic laws.

Date: September 05, 2017

Document #: 11205.11206.II170801

Company Name & Address: Spectrum Laboratory Products, Inc. 769- Jersey Avenue New Brunswick, New Jersey 08901 USA

Plant Name & Address: Spectrum Laboratory Products, Inc. 769-Jersey Ave New Brunswick, New Jersey 08901 USA

Product Name	Product Code	Halal-ID	Product Certificate #
Zinc Chloride, Granular, USP	ZI105	B94083	HC-17SPJ281

Muhammad Munir Chaudry
Muhammad Munir Chaudry, Ph.D.
President



This certificate is valid until **August 31, 2018** and subject to renewal at that time.

Page 1 of 1

