

Scientific Documentation

Riboflavin 5'-Phosphate Sodium, USP, bioCERTIFIED (TM)

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





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Specification for Riboflavin 5'-Phosphate Sodium, USP, bioCERTIFIED (TM) (RI914)

Item Number	RI914
Item	Riboflavin 5'-Phosphate Sodium, USP, bioCERTIFIED (TM)
CAS Number	6184-17-4
Molecular Formula	C ₁₇ H ₂₀ N ₄ NaO ₉ P•2H ₂ O
Molecular Weight	514.36
MDL Number	
Synonyms	

Test	Specification		
	Min	Max	
APPEARANCE			
ASSAY (DRIED BASIS)	73.0	79.0 %	
SPECIFIC ROTATION, [a]D25	+37.0° to +42.0°		
pH OF A 1% SOLUTION	5.0	6.5	
LOSS ON DRYING		7.5 %	
RESIDUE ON IGNITION		25.0 %	
FREE PHOSPHATE (as PO ₄)		1 %	
LUMIFLAVIN		0.025	
RIBOFLAVIN DIPHOSPHATES, AS RIBOFLAVIN:		6.0% on the dried basis	
FREE RIBOFLAVIN:		6.0% on the dried basis	
ELEMENTAL IMPURITIES	AS REPORTED		
MICROBIAL LIMITS:			
TAMC		1000 CFU/g	
TYMC		100 CFU/g	
ENDOTOXINS		10 IU/g	
IDENTIFICATION A	PALE GREENISH-YELLOW WITH YELLOWISH GREEN FLUORESCENCE		
IDENTIFICATION B	POSITIVE FOR SODIUM AND PHOSPHATE		

Test	Specification	
	Min	Max
EXPIRATION DATE		
DATE OF MANUFACTURE		
MONOGRAPH EDITION		
RESIDUAL SOLVENTS	AS REPORTED	

Spectrum Chemical Mfg Corp

Corporate Headquarters:West Coast Facility:769 Jersey Ave.14422 S. San Pedro St.New Brunswick, NJ 08901Gardena, CA 90248732.214.1300310.516.8000



Certificate Of Analysis

Item Number	RI914	Lot Number	4MH0034
Item	Riboflavin 5'-Phosphate Sodium, USP, bioCERTIFIED (TM)	Manufacturer Lot	UEB2206066
CAS Number	6184-17-4	Manufacturer Code	2335
Molecular Formula	C ₁₇ H ₂₀ N ₄ NaO ₉ P•2H ₂ O	Molecular Weight	514.36

TECT	SPECIFICATION		DECLU T
TEST	MIN	MAX	RESULT
APPEARANCE			ORANGE POWDER
ASSAY (DRIED BASIS)	73.0	79.0 %	76.5 % (M)
SPECIFIC ROTATION, [a]D25	+37.0° to +42.0°		+40.0°
pH OF A 1% SOLUTION	5.0	6.5	6.2
LOSS ON DRYING		7.5 %	3.2 %
RESIDUE ON IGNITION		25.0 %	< 25.0 %
FREE PHOSPHATE (as PO ₄)		1 %	< 1.0 %
LUMIFLAVIN		0.025	< 0.025
RIBOFLAVIN DIPHOSPHATES, AS RIBOFLAVIN:		6.0% on the dried basis	4.2 % (M)
FREE RIBOFLAVIN:		6.0% on the dried basis	3.0 % (M)
ELEMENTAL IMPURITIES	AS REPORTED		COMPLIES WITH STANDARD
MICROBIAL LIMITS:			
TAMC		1000 CFU/g	<100 CFU/g
ТҮМС		100 CFU/g	<50 CFU/g
ENDOTOXINS		10 IU/g	<9.6 UI/g
IDENTIFICATION A	PALE GREENISH- YELLOW WITH YELLOWISH GREEN FLUORESCENCE		PALE GREENISH YELLOW WITH YELLOWISH GREEN FLUORESCENCE

TECT	SPECIFICATION		DECLUIT.
TEST	MIN	MAX	RESULT
IDENTIFICATION B	POSITIVE FOR SODIUM AND PHOSPHATE		POSITIVE FOR SODIUM AND PHOSPHATE
EXPIRATION DATE			02-MAR-2025
DATE OF MANUFACTURE			03-JUN-2022
MONOGRAPH EDITION			USP 2023
RESIDUAL SOLVENTS	AS REPORTED		
CLASS 2 (solvent) / ACETONITRILE			< 410 ppm
CLASS 2 (SOLVENT) / METHANOL			< 3000 ppm
CLASS 2 (solvent) / PYRIDINE			< 200 ppm
NOTE:All results reported with (M) are from manufacturer certificate of			
analysis			

Certificate of Analysis Results Entered By:

MCAMACHO Matheu Camacho 05-JAN-24 12:36:45

Spectrum Chemical Mfg Corp 777 Jersey Avenue New Brunswick 08901 NJ



Certificate of Analysis Results Approved By:

GHERRERA Genaro Herrera 05-JAN-24 12:50:54

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.

Spectrum Chemical Mfg. Corp. repackages Active Pharmaceutical Ingredient chemicals provided by other manufacturers and suppliers. For traceability purposes, Spectrum's Certificate of Analysis contains an identifier code unique to each manufacturer or supplier, as well as the chemical's lot number provided on the original manufacturer Certificate of Analysis. This material is manufactured by DSM Nutritional Products France SAS at 1 Boulevard D Alsace, Village Neuf, Alsace 68305, France (FRA). Copies of the original Certificate of Analysis are available upon request from your Spectrum Sales Representative or by calling Spectrum's Quality Department at 1-800-772-8786.





Revision date 20-December-2022 Revision Number 4

1. Identification

Product identifier

Product Name RIBOFLAVIN 5'-PHOSPHATE SODIUM, USP, bioCERTIFIED™

Other means of identification

Product Code(s) RI914

Synonyms None

Other information Riboflavin 5'-Phosphate Sodium, Dihydrate, CAS # 6184-17-4. Anhydrous CAS #

130-40-5

Recommended use of the chemical and restrictions on use

Recommended use No information available

Restrictions on use No information available

Details of the supplier of the safety data sheet

Supplier Address

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

Emergency telephone number

Emergency Telephone Chemtrec 1-800-424-9300

2. Hazard(s) identification

Classification

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Hazards not otherwise classified (HNOC)

Not applicable

Label elements

Hazard statements

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

The product contains no substances which at their given concentration, are considered to be hazardous to health.

Other information

No information available.

3. Composition/information on ingredients

Substance

Chemical name	CAS No	Weight-%
Riboflavin 5'-Phosphate Sodium, dihydrate	6184-17-4	100

4. First-aid measures

Description of first aid measures

Inhalation Remove to fresh air.

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids.

Consult a physician.

Skin contact Wash skin with soap and water.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects, both acute and delayed

Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

5. Fire-fighting measures

surrounding environment.

Large Fire CAUTION: Use of water spray when fighting fire may be inefficient.

Unsuitable extinguishing media Do not scatter spilled material with high pressure water streams.

Specific hazards arising from the

chemical

No information available.

Hazardous combustion products Carbon Monoxide, Carbon Dioxide. Sodium oxides. Phosphorus oxides. Nitrogen oxides

(NOx).

Explosion data

Sensitivity to mechanical impact none.

Sensitivity to static discharge none.

Special protective equipment for

fire-fighters

Firefighters should wear self-contained breathing apparatus and full firefighting turnout

gear. Use personal protection equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

7. Handling and storage

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions Sensitive to light. Store in light-resistant containers. Keep container tightly closed in a dry

and well-ventilated place. Flushed with nitrogen.

8. Exposure controls/personal protection

Control parameters

Exposure Limits The following ingredients are the only ingredients of the product above the cut-off level (or

level that contributes to the hazard classification of the mixture) which have an exposure limit applicable in the region for which this safety data sheet is intended or other

recommended limit. At this time, the other relevant constituents have no known exposure

limits from the sources listed here.

Appropriate engineering controls

Engineering controls Showers

Eyewash stations Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection No special protective equipment required.

Skin and body protectionNo special protective equipment required.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are

exceeded or irritation is experienced, ventilation and evacuation may be required.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state Solid

Appearance Crystalline powder
Color Yellow-orange
Odor Odorless

Odor threshold No information available

Property Values Remarks • Method

5.0-6.5 (for a 1% solution) None known рH Melting point / freezing point no data available None known Boiling point / boiling range no data available None known Flash point no data available None known no data available None known **Evaporation rate** Flammability (solid, gas) no data available None known Flammability Limit in Air None known

Upper flammability or explosive No data available

limits

Lower flammability or explosive No data available

limits

Vapor pressure No data available None known Vapor density no data available None known Relative density no data available None known Water solubility Soluble in water None known Solubility(ies) no data available None known **Partition coefficient** No data available None known no data available Autoignition temperature None known **Decomposition temperature** None known

Kinematic viscosityno data availableNone knownDynamic viscosityNo data availableNone known

Other information

Explosive propertiesNo information availableOxidizing propertiesNo information availableSoftening pointNo information available

Molecular weight 514.36 g/mol

VOC Content (%)
Liquid Density
No information available
No information available
No information available

10. Stability and reactivity

Reactivity No information available.

Chemical stability Stable under recommended storage conditions.

Possibility of hazardous reactions None under normal processing.

Conditions to avoid

None known based on information supplied.

Incompatible materials

None known based on information supplied.

Hazardous decomposition products None known based on information supplied.

11. Toxicological information

Information on likely routes of exposure

Inhalation Specific test data for the substance or mixture is not available.

Eye contact Specific test data for the substance or mixture is not available.

Skin contact Specific test data for the substance or mixture is not available.

Ingestion Specific test data for the substance or mixture is not available.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms No information available.

Acute toxicity

Numerical measures of toxicity

No information available

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

Skin corrosion/irritation Serious eye damage/eye irritation Respiratory or skin sensitization Germ cell mutagenicity

No information available. No information available. No information available. No information available.

Reproductive toxicity No information available.

STOT - single exposure STOT - repeated exposure **Aspiration hazard**

No information available. No information available. No information available.

No information available. Other adverse effects

Interactive effects No information available.

12. Ecological information

Ecotoxicity The environmental impact of this product has not been fully investigated.

Persistence and degradability **Bioaccumulation**

No information available. Inherently biodegradable.

No information available. Other adverse effects

13. Disposal considerations

Waste treatment methods

ICAO (air)

Waste from residues/unused products

Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. Transport information

DOT not regulated TDG not regulated not regulated MEX not regulated **IATA** not regulated

IMDG not regulated

RID not regulated

ADR not regulated

ADN not regulated

15. Regulatory information

International Inventories

TSCA Not listed

Note *Contact supplier for details. One or more substances in this product are either not listed

on the US TSCA inventory, listed on the confidential US TSCA inventory or are otherwise

exempted from inventory listing requirements

DSL/NDSL Does not Comply EINECS/ELINCS Does not Comply

ENCS This product complies with ENCS: **IECSC** This product complies with China:

KECL Does not Comply **PICCS** Does not Comply

AICS This product does not comply with AICS

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

This product does not contain any substances regulated under applicable state right-to-know regulations

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. Other information

NFPA

Health hazards 0 Flammability 0 Instability 0

Physical and chemical properties -

HMIS

Health hazards 0 Flammability 0 Physical hazards 0 Personal protection X

Key or legend to abbreviations and acronyms used in the safety data sheet Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA TWA (time-weighted average) STEL STEL (Short Term Exposure Limit)

Ceiling Maximum limit value

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR) U.S. Environmental Protection Agency ChemView Database

European Food Safety Authority (EFSA) EPA (Environmental Protection Agency) Acute Exposure Guideline Level(s) (AEGL(s))

U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act

U.S. Environmental Protection Agency High Production Volume Chemicals

Food Research Journal

Hazardous Substance Database

International Uniform Chemical Information Database (IUCLID)

Japan GHS Classification

Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)

NIOSH (National Institute for Occupational Safety and Health)

National Library of Medicine's ChemID Plus (NLM CIP)

National Library of Medicine's PubMed database (NLM PUBMED)

National Toxicology Program (NTP)

New Zealand's Chemical Classification and Information Database (CCID)

Organization for Economic Co-operation and Development Environment, Health, and Safety Publications Organization for Economic Co-operation and Development High Production Volume Chemicals Program

Organization for Economic Co-operation and Development Screening Information Data Set

World Health Organization

Revision date 20-December-2022
Revision Note 20-December-2022
No information available.

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet



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
RI914	Riboflavin 5'-Phosphate Sodium, USP, bioCERTIFIED ™

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

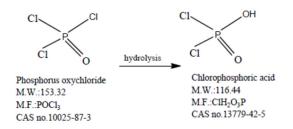
Thank you for your interest in Spectrum products. If we may be of further assistance, please feel free to contact the Quality Assurance department at 310-516-8000 or via email at qualityassurance@spectrumchemical.com

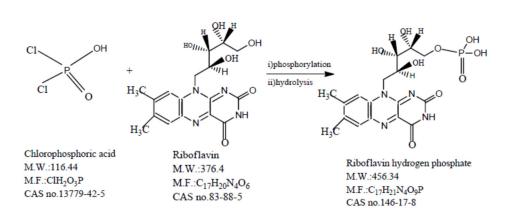
Sincerely,
Quality Assurance
Spectrum Chemical Mfg. Corp.

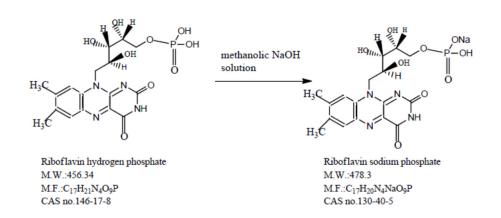
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Manufacturing Process Flowchart - Riboflavin 5'-Phosphate Sodium, USP, bioCertified [™] (Catalog No. RI914)









RI914, Riboflavin 5'-Phosphate Sodium, USP, bioCERTIFIED

Source Statement

The above-mentioned catalog item is manufactured by chemical synthesis. No animal or plant derived products are used in the manufacturing process.

BSE/TSE Statement

The above-mentioned catalog item does not contain nor is manufactured using any animal derived products and is therefore BSE/TSE free.

Allergen Statement

The above-mentioned catalog item does not contain any of the following:

- Milk
- Egg
- Fish
- Shellfish
- Tree Nuts
- Wheat
- Peanuts
- Soy

- Cereals containing Gluten
- Celery
- Mustard
- Sesame Seed
- Corn
- Latex
- Sulfites > 10 ppm

EU Fragrance Allergen Statement

The above-mentioned catalog item does not contain any of the 26 EU fragrance allergens listed in Annex III lines 67-92. These substances are not intentionally added to the following chemical and therefore, are not expected to be present.

GMO Statement

The above-mentioned catalog item is manufactured without the use of genetically modified organisms and is therefore GMO free.

Melamine Statement

The above-mentioned catalog does not use or add melamine to the manufacturing process and is considered melamine-free.

Nitrosamine Statement

Based on knowledge of the manufacturing process, nitrosamine impurities are not known or suspected to be present in the above-mentioned material.

Animal Testing Statement

The above-mentioned catalog item has not been tested on animals.



Organic Compliance Statement

The above-mentioned catalog item has not been produced using GMOs, irradiation, ethylene oxide (EtO) or sewage sludge.

Shelf Life Statement

The above-mentioned catalog item is typically assigned a shelf life of 24 months from the date of manufacture. The actual assigned shelf life for any specific lot should be referenced on the Certificate of Analysis.

Other Chemicals Statement

Spectrum does not have any reason to suspect the above-mentioned catalog item contains any of the following chemicals. This product does not come into contact with these chemicals during packaging or storage:

- Aflatoxins
- Antibiotics
- Bisphenol A (BPA)
- CMR Substances

- Parabens
- Pesticides
- Phthalates
- Preservatives



Elemental Impurities - Riboflavin 5'-Phosphate Sodium, USP, bioCERTIFIED TM (Catalog No. RI914)

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

The above material complies with the USP<232>, <233> Elemental Impurities and the ICH Q3D Elemental Impurities Guideline. The following elemental impurities are likely to be present:

Elemental Impurity		Class	Expected Concentration
Nickel	Ni	2A	< 0.5 ppm
Copper	Cu	3	< 7.5 ppm

Other elemental impurities considered by USP <232>, <233> and ICH Q3D which are not addressed in the above-mentioned table are not likely to be present. These substances are not used in the production process, are not intentionally added, or known to be present in the above-mentioned material.

This information is subject to change and is intended for risk assessment only. It is the responsibility of the end user to evaluate suitability of any chemical for the intended use as well as to assess compound-specific limits of daily intake of metal impurities. For lot specific information, please refer to the respective Certificate of Analysis.

If you have any further questions, please contact us by telephone at 1(800)772-8786 Option 2, or by email at TechServices@spectrumchemical.com.

Sincerely, Technical Services Spectrum Chemical Mfg. Corp.

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Residual Solvents - Riboflavin 5'-Phosphate Sodium, USP, bioCERTIFIED TM (Catalog No. RI914)

To Whom It May Concern:

Thank you for your interest in Spectrum high quality chemicals.

The above-mentioned catalog item complies with the requirements of USP <467> Residual Solvents and ICH Q3C Residual Solvents Guideline. The following solvents are likely to be present:

Residual Solvent	Class	Expected Concentration
Acetonitrile	2	< 410 ppm
Pyridine	2	< 200 ppm
Methanol	2	< 3000 ppm

No Class 1, Class 3, or other solvents are used or produced in the manufacturing process of this material.

For lot-specific information, please refer to the respective Certificate of Analysis.

If you have any further questions, please contact us by telephone at 1(800)772-8786 Option 2, or by email at TechServices@spectrumchemical.com.

Sincerely, Technical Services Spectrum Chemical Mfg. Corp.

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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. Below you will find a typical label example for this catalog item.

USE CARE: This material has been evaluated per GHS/OSHA criteria and is not classified as hazardous. All chemicals may pose unknown hazards and must be used with caution. Use personal protection and safe handling methods consistent with proper workplace safety practices. Consult SDS for additional properties and precautions. If adverse reaction occurs seek medical attention.

KEEP FROM CHILDREN WARNING:

Cancer and Reproductive Harmwww.P65Warnings.ca.gov

Riboflavin 5'-Phosphate Sodium

USP, bioCERTIFIEDTM
CAS 6184-17-4
CAS 130-40-5



CAUTION: For manufacturing, processing or repacking. Rx only. Further processing and testing required for use in parenteral applications.

Read and understand the label and Safety Data Sheet (SDS) prior to use.

Chemical Emergency: (800)424-9300

www.SpectrumChemical.com

C₁₇H₂₀N₄NaO₉P•2H₂O F.W. 514.36

Manufacturer/Supplier Code Manufacturer Lot Number	? ?
Assay (Dried Basis)	+37.0° to +42.0°
Loss on Drying	

LIGHT SENSITIVE: Keep tightly closed in light-resistant containers

FLUSHED WITH NITROGEN, VACUUM SEALED

Repackaged by Spectrum as:

G 1/J10GHS-A

Lot No. XQ####

Spectrum Chemical Mfg Corp

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