



Scientific Documentation

B1196, Butylated Hydroxytoluene,
Granular, NF

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

Ver4.03 29.January.2018



Dear Customer,

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

Spectrum has been proudly serving our scientific community for over 45 years. It is our mission to manufacture and distribute fine chemicals and laboratory products with Quality and delivery you can count on every time.

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.

At Spectrum, Quality is priority number one. Suppliers with the best qualifications are preferred and we employ full-functioning in-house analytical laboratories at each of our facilities. Our facilities and systems are USFDA registered and ISO certified. We frequently host customer audits and cherish opportunities for improvements. Quality is engrained into our culture. Quality is priority number one.

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 "Alan Wang", with a large, sweeping loop at the end.

Alan Wang, MSQA, ASQ CQA
Director of Technical Services
techservices@spectrumchemical.com

B1196, Butylated Hydroxytoluene, Granular, NF

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Specification for Butylated Hydroxytoluene, Granular, NF (B1196)

Item Number	B1196
Item	Butylated Hydroxytoluene, Granular, NF
CAS Number	128-37-0
Molecular Formula	C ₁₅ H ₂₄ O
Molecular Weight	220.36
MDL Number	
Synonyms	BHT ; Butylated Hydroxytoluene ; 2,6-Di-tert-butyl-p-cresol

Test	Specification	
	Min	Max
ASSAY	99.0	101.5 %
RESIDUE ON IGNITION		0.002 %
ELEMENTAL IMPURITIES	AS REPORTED	
ORGANIC IMPURITIES	TO PASS TEST	
IDENTIFICATION	TO PASS TEST	
CERTIFIED HALAL		
CERTIFIED KOSHER		
RETEST DATE		
MANUFACTURE DATE		
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: 4/24/2014

Revision Date: 6/20/2016

Revision Number: G3

1. IDENTIFICATION

Product identifier

Product code: B1196
Product Name: BUTYLATED HYDROXYTOLUENE, GRANULAR, NF

Other means of identification

Synonyms: BHT
 Butylhydroxytoluene
 p-Cresol, 2,6-di-tert-butyl-
 Butylated Hydroxytoluene
 Ionol
 2,6-Di-tert-butyl-p-cresol
 2,6-Bis(1,1-dimethylethyl)-4-methylphenol
 2,6-Di-tert-butyl-1-hydroxy-4-methylbenzene
 2,6-Di-tert-butyl-p-methylphenol
 3,5-Di-tert-butyl-4-hydroxytoluene
 4-Methyl-2,6-di-tert-butylphenol
CAS #: 128-37-0
RTECS # GO7875000
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: FOOD ADDITIVE; ANTIOXIDANT FOR SYNTHETIC RUBBERS, PLASTICS, SOAPS, ANIMAL & VEGETABLE OILS; ANTISKINNING AGENT IN PAINTS & INKS; IN CHEWING GUM BASE, PACKAGING MATERIALS, BUTTER, CANDY, PARAFFIN & MINERAL OILS; EMPLOYED TO RETARD OXIDATIVE DEGRADATION OF OILS & FATS IN VARIOUS COSMETICS & PHARMACEUTICALS.
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 2
Serious eye damage/eye irritation	Category 2A

Label elements

Warning

Hazard statements

Harmful if swallowed

Causes skin irritation

Causes serious eye irritation



Hazards not otherwise classified (HNOC)

Not Applicable

Other hazards

Toxic to aquatic life with long lasting effects

Toxic to aquatic life

Precautionary Statements - Prevention

Wash face, hands and any exposed skin thoroughly after handling

Do not eat, drink or smoke when using this product

Wear protective gloves/protective clothing/eye protection/face protection

Precautionary Statements - Response

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

IF ON SKIN: Wash with plenty of water

If skin irritation occurs: Get medical advice/attention

Take off contaminated clothing and wash it before reuse

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

Rinse mouth

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
Butylated Hydroxytoluene 128-37-0	128-37-0	100

4. FIRST AID MEASURES

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.

Skin Contact:

Wash off immediately with soap and plenty of water removing all contaminated clothing and shoes. Get medical attention. If skin irritation persists, call a physician.

Eye Contact:

Flush eyes with water for 15 minutes. Get medical attention.

Inhalation:

Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms

Irritating to eyes and skin. Vomiting. Nausea. May cause diarrhea. Respiratory depression. Central nervous system effects. Tremors.

Indication of any immediate medical attention and special treatment needed

Notes to Physician:

Treat symptomatically

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:

Dry chemical. Carbon dioxide (CO₂). Water spray mist or foam.

Unsuitable Extinguishing Media:

No information available.

Specific hazards arising from the chemical

Hazardous Combustion Products:

Carbon monoxide; Carbon dioxide

Specific hazards:

May be combustible at high temperatures

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:	Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Use personal protective equipment. Avoid dust formation. Remove all sources of ignition.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Prevent entry into waterways, sewers.

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. Avoid dust formation. Keep away from incompatible materials.

Safe Handling Advice

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

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:

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:

Oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
Butylated Hydroxytoluene 128-37-0	None	10 mg/m ³ TWA	2 mg/m ³ TWA inhalable fraction and vapor	None

Canada

Components	Alberta	British Columbia	Ontario	Quebec
Butylated Hydroxytoluene 128-37-0	10 mg/m ³ TWA	2 mg/m ³ TWA aerosol, inhalable, and vapour	2 mg/m ³ TWA inhalable fraction and vapor	10 mg/m ³ STEV

Australia and Mexico

Components	Australia	Mexico
Butylated Hydroxytoluene 128-37-0	10 mg/m ³ TWA	10 mg/m ³ TWA 20 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: Long sleeved clothing. Chemical resistant apron. Gloves.

Respiratory protection: 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

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Solid	Appearance: Granular. Crystalline.	Color: White. Yellowish.
Odor: Slight. Phenolic.	Taste Tasteless.	Formula: C15-H24-O
Molecular/Formula weight: 220.36	Flammability: No information available	Flash point (°C): 127
Flashpoint (°C/°F): 127 °C/260 °F	Flash Point Tested according to: Closed cup	Autoignition Temperature (°C/°F): 470 °C/878°F
Lower Explosion Limit (%): No information available	Upper Explosion Limit (%): No information available	Melting point/range(°C/°F): 70 °C/158 °F
Decomposition temperature(°C/°F): No information available	Boiling point/range(°C/°F): 265 °C/509 °F	Bulk density: No information available
Density (g/cm3): No information available	Specific gravity: 1.03-1.048 @ 2- °C	pH: No information available
Vapor pressure @ 20°C (kPa): No information available	Evaporation rate: No information available	Vapor density: 7.6
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: Insoluble in water Freely soluble in Toluene Soluble in Isopropanol Soluble in Methanol Soluble in Methyl Ethyl Ketone Soluble in Acetone Soluble in Benzene Soluble in Petroleum Ether Soluble in Ethanol

10. STABILITY AND REACTIVITY

Reactivity

Reactive with oxidizing agents

Chemical stability

Stability:

Stable under recommended storage conditions

Possibility of Hazardous Reactions:

Hazardous polymerization does not occur

Conditions to avoid:

Heat. Avoid dust formation. Incompatible materials.

Incompatible Materials:

Oxidizing agents.

Hazardous decomposition products:

Carbon monoxide. Carbon dioxide.

Other Information

Corrosivity:

No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:

Ingestion. Inhalation.

Acute Toxicity

Component Information

Butylated Hydroxytoluene - 128-37-0

LD50/oral/rat = 890 mg/kg Oral LD50 Rat

LD50/oral/mouse = 650-1040 mg/kg

LD50/dermal/rabbit = No information available

LD50/dermal/rat = >2000 mg/kg

LC50/inhalation/rat = No information available

LC50/inhalation/mouse = No information available

Other LD50 or LC50 information = 10700mg/kg oral LD50 Guinea pig

2100 mg/kg oral LD50 Rabbit

Product Information

LD50/oral/rat =

VALUE- Acute Tox Oral = 890mg/kg

LD50/oral/mouse =

Value - Acute Tox Oral = 650-1040mg/kg

LD50/dermal/rabbit

VALUE-Acute Tox Dermal = No information available

LD50/dermal/rat

VALUE -Acute Tox Dermal = .>2000mg/kg

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 skin irritation. Moderately irritating to the skin.

Eye Contact: Causes eye irritation. Moderately irritating to the eyes.

Inhalation May cause irritation of respiratory tract.

Ingestion Harmful if swallowed. May cause gastritis. Ingestion may cause nausea, vomiting. May cause hypermotility, diarrhea. May affect behavior/central nervous system (tremors). May affect respiration (respiratory depression).

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 ingestion may affect the liver. Prolonged or repeated ingestion may affect the kidneys. Prolonged or repeated ingestion may affect the thyroid and result in thyroid hyperfunction.. Prolonged or repeated ingestion may affect the adrenal gland. Prolonged or repeated ingestion may affect the blood (changes in red blood cell count). Prolonged or repeated ingestion may affect the blood (changes in serum composition). Prolonged or repeated ingestion may cause weight loss. Prolonged or repeated ingestion may affect the blood (changes in clotting factors). BHT is a rare skin sensitizer and may cause allergic contact dermatitis (contact urticaria) in very sensitive individuals.

Sensitization: No information available

Mutagenic Effects: May affect genetic material
Mutations in microorganisms
Mutagenic effects in mammalian somatic cells
Experiments with animal lymphocytes have shown mutagenic effects

Carcinogenic effects: Not considered carcinogenic

Components	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
Butylated Hydroxytoluene	Group 3 - Supplement 7 [1987] Monograph 40 [1986]	A4 Not Classifiable as a Human Carcinogen	Not listed	Not listed	Not listed	Not listed

Reproductive toxicity No data is available

Reproductive Effects: No information available
Developmental Effects: May cause adverse developmental effects based on animal data
Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure No information available
STOT - repeated exposure No information available
Target Organs: Liver. Skin. Eyes.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: Aquatic environment.

Butylated Hydroxytoluene - 128-37-0

Freshwater Algae Data: 6 mg/L EC50 Pseudokirchneriella subcapitata 72 h
0.42 mg/L EC50 Desmodesmus subspicatus 72 h

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	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Butylated Hydroxytoluene	None	None	None	None

14. TRANSPORT INFORMATION

DOT	
UN-No:	Not regulated. Not Regulated for Transportation unless all or part of the transportation is by vessel (applies to bulk and non-bulk shipments). For bulk shipments by ground only, it may be transported as a marine pollutant (regulated as UN3077, Class 9 "Environmentally Hazardous Substances, solid, n.o.s. (butylated hydroxytoluene)" PGIII because it meets the requirement of Chapter 2.9 of the IMDG code, but it is not mandatory by DOT because it is not on the DOT Marine Pollutant list in 49CFR Appendix B to 172.10
Proper Shipping Name:	No information available
Hazard Class:	No information available
Subsidiary Risk:	No information available
Packing Group:	None
ERG No:	No information available
Marine Pollutant	No data available
DOT RQ (lbs):	No information available
Special Provisions	No Information available
Symbol(s):	No information available
TDG (Canada)	
UN-No:	UN3077
Proper Shipping Name:	Environmentally hazardous substance, solid, n.o.s.(butylated hydroxytoluene)
Hazard Class:	9
Subsidiary Risk:	No information available
Packing Group:	III
Marine Pollutant	Marine Pollutant

14. TRANSPORT INFORMATION

ADR

UN-No: UN3077
(exception <5 liters for liquids and < 5 kilogram for solids - per single packagings or combination packagings per inner packaging)
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s.(butylated hydroxytoluene)
Hazard Class: 9
Packing Group: III
Subsidiary Risk: No information available

IMO / IMDG

UN-No: UN3077
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s. (butylated hydroxytoluene)
Hazard Class: 9
Subsidiary Risk: No information available
Packing Group: III
Marine Pollutant: Marine Pollutant
EMS: F-A

RID

UN-No: UN3077
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s. (butylated hydroxytoluene)
Hazard Class: 9
Subsidiary Risk: No information available
Packing Group: III

ICAO

UN-No: UN3077
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s.(butylated hydroxytoluene)
Hazard Class: 9
Subsidiary Risk: No information available
Packing Group: III

IATA

UN-No: UN3077
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s.(butylated hydroxytoluene)
Hazard Class: 9
Subsidiary Risk: No information available
Packing Group: III
ERG Code: 9L
Special Provisions: No information available

15. REGULATORY INFORMATION

International Inventories

Components	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Butylated Hydroxytoluene	Present	Present KE-03079	Present	Present (9)-1805 (5)-6372 (3)-540	Present	Present	Present 204-881-4

U.S. Regulations

Butylated Hydroxytoluene

Massachusetts RTK: Present

New Jersey RTK Hazardous Substance List: 0814

Butylated Hydroxytoluene

Pennsylvania RTK: Present

Minnesota - Hazardous Substance List: Present

California Directors List of Hazardous Substances: Present

FDA - Food Additives Generally Recognized as Safe (GRAS): 21 CFR 182.3173

FDA - Direct Food Additives 21 CFR 172.115 21 CFR 172.615 21 CFR 173.340

FDA - 21 CFR - Total Food Additives 137.350 166.110 172.110 172.115 172.185 172.615 173.340 175.105 175.125 175.300
175.380 175.390 176.170 176.210 177.1010 177.1210 177.1350 177.2260 177.2600
178.2010 178.3570 179.45 181.24 182.3173

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

Chemicals Known to the State of California to Cause Cancer:

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	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Butylated Hydroxytoluene	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	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
Butylated Hydroxytoluene	None	None	None	None	None

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Butylated Hydroxytoluene	Not Applicable	Not Applicable

Canada

WHMIS hazard class:

D2B Toxic materials

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 -
Butylated Hydroxytoluene	1 %

Inventory

Components	Canada (DSL)	Canada (NDSL)
Butylated Hydroxytoluene	Present	Not Listed

Components	CEPA Schedule I - Toxic Substances
Butylated Hydroxytoluene	Not listed

Components	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
Butylated Hydroxytoluene	Not listed

EU Classification

R-phrase(s)

R22 - Harmful if swallowed.

R36/38 - Irritating to eyes and skin.

S -phrase(s)

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

S46 - If swallowed, seek medical advice immediately and show this container or label.

S37/39 - Wear suitable gloves and eye/face protection.

Components	Classification	Concentration Limits:	Safety Phrases
Butylated Hydroxytoluene		No information	

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

Indication of danger:

Xn - Harmful.

Xi - Irritant.

Xn



Xi



16. OTHER INFORMATION

16. OTHER INFORMATION

Preparation Date: 4/24/2014
Revision Date: 6/20/2016
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: B1196, Butylated Hydroxytoluene, Granular, NF

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,

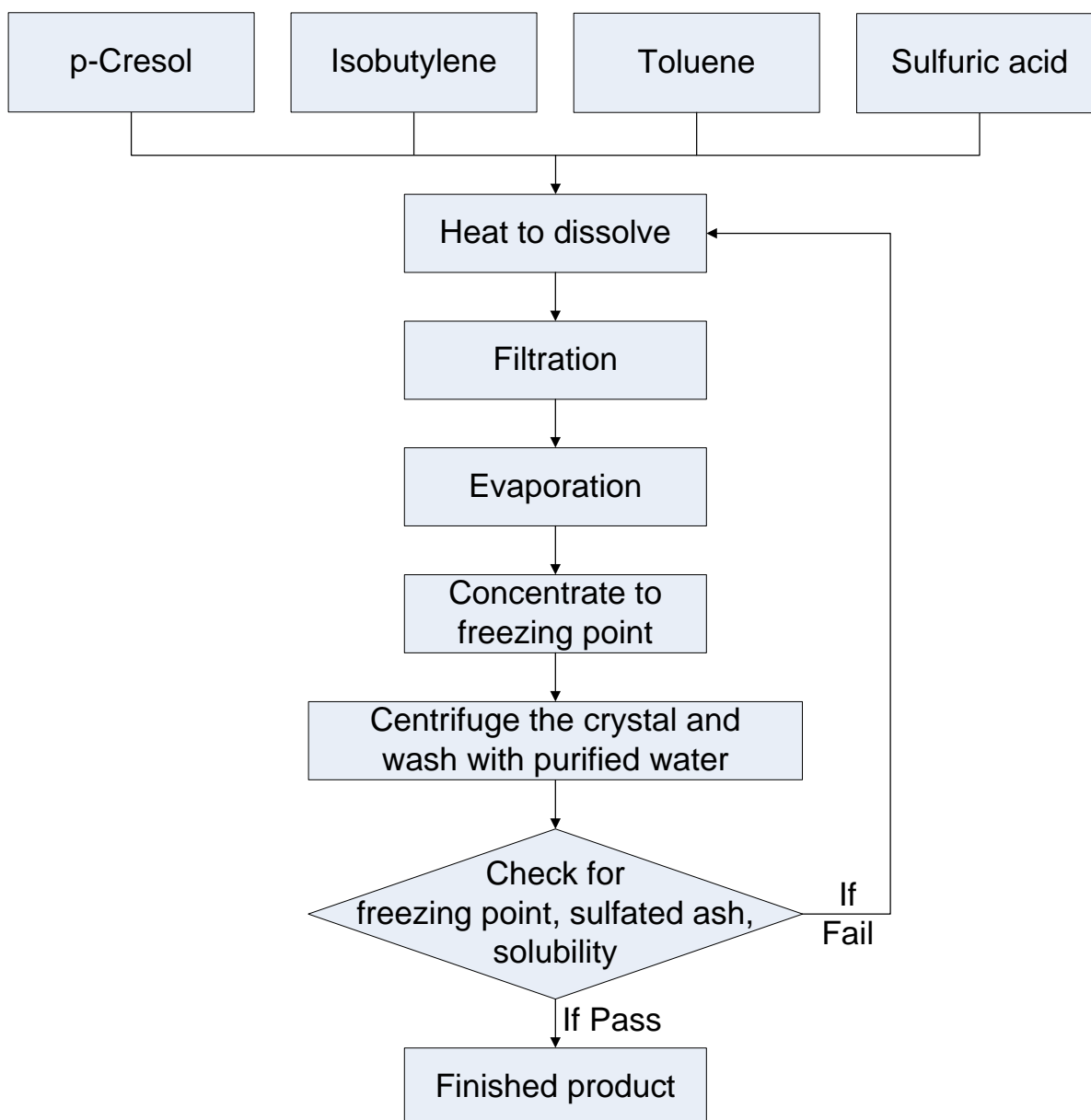
A handwritten signature in black ink, appearing to read "Alan Wang", with a large, stylized loop at the end.

Alan Wang, MSQA, ASQ CQA
Director of Technical Services
techservices@spectrumchemical.com

29.January.2018

Manufacturing Process Flowchart

Butylated Hydroxytoluene, Granular, NF - B1196



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.



Certificate of Registration

Intertek

This is to certify that the quality management system of

Spectrum China Ltd.

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

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

ISO 9001: 2008

The quality management system is applicable to:

Provision of service of purchase, testing and sales for chemical products, repacking of non-hazardous chemical products.

Organization Code: 77762704-8
Certificate Number: 111310001-01
Certificate Issue Date: 17 November 2015
Certificate Expiry Date: 14 September 2018



014

Authorised Signature: 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.

In the issuance of this certificate, Intertek assumes no liability to any party other than to the client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organization maintaining their system in accordance with Intertek's requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone.

The annual validity of the certificate can also be checked through the website <http://www.cnca.gov.cn> of CNCA in China.



The certificate remains the property of Intertek, to whom it must be returned upon request.

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

January 29, 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
B1196	Butylated Hydroxytoluene, Granular, NF

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,



Oralia Chavez
Quality Assurance Specialist



April 27, 2016

Re: Butylated Hydroxytoluene, Granular, NF-B1196

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

Butylated Hydroxytoluene, Granular, NF-B1196

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



April 27, 2016

Re: Butylated Hydroxytoluene, Granular, NF-B1196

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 (Milk; Egg; Fish; Shellfish; Tree nuts; Wheat; Peanuts; Soy; Cereals containing Gluten; Mustard; Sesame Seed).

Butylated Hydroxytoluene, Granular, NF-B1196

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 27, 2016

Re: Butylated Hydroxytoluene, Granular, NF-B1196

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.

Butylated Hydroxytoluene, Granular, NF-B1196

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

Item Number	B1196	Lot Number	2GG0061
Item	Butylated Hydroxytoluene, Granular, NF		
CAS Number	128-37-0		
Molecular Formula	C ₁₅ H ₂₄ O	Molecular Weight	220.36

Test	Specification		Result
	min	max	
ASSAY	99.0	101.5 %	99.3 %
RESIDUE ON IGNITION		0.002 %	0.0008 %
ELEMENTAL IMPURITIES	AS REPORTED		NO ELEMENTAL IMPURITIES PRESENT
ORGANIC IMPURITIES	TO PASS TEST		PASSES TEST
IDENTIFICATION	TO PASS TEST		PASSES TEST
CERTIFIED HALAL			CERTIFIED HALAL
CERTIFIED KOSHER			CERTIFIED KOSHER
RETEST DATE			08-FEB-2019
MANUFACTURE DATE			08-FEB-2017
APPEARANCE			WHITE GRANULAR
RESIDUAL SOLVENTS	TO PASS TEST		PASSES TEST
CLASS 3 (solvent) / 2-PROPANOL			<5000 ppm
OTHER RESIDUAL SOLVENTS: 2-METHYL-2-PROPANOL			<1000 ppm
OTHER RESIDUAL SOLVENTS: DIISOBUTYLENE			<50 ppm

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 MSDS/SDS before handling any chemicals. All Spectrum's chemicals are for manufacturing, processing, repacking or research purposes by experienced personal only. The customer must ensure to provide its users adequate hazardous material training and appropriate protective gears before handling our chemicals.

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 **WARNING**

• Causes serious eye irritation • Causes skin irritation • Harmful if swallowed.

• Do not eat, drink or smoke when using this product • Wear protective gloves, eye protection, face protection • Wash face, hands and any exposed skin thoroughly after handling.

FIRST AID: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF ON SKIN: Wash with plenty of water. Take off contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical attention. IF SWALLOWED: Call a POISON CENTER or physician if you feel unwell. Rinse mouth.

KEEP FROM CHILDREN

SPECTRUM[®]

B1196 **D** **F** **12 KG**

E **Butylated Hydroxytoluene**

(BHT; 2,6-Di-*tert*-butyl-*p*-cresol)

Granular, N.F.

G CAS 128-37-0

H **CAUTION:** For manufacturing, processing or repacking.
Read and understand the label and Safety Data Sheet (SDS) prior to use.

Chemical Emergency: (800)424-9300

www.SpectrumChemical.com

K **F.W. 220.36**

Assay 99.0-101.5%
MAXIMUM LIMITS

Residue on Ignition 0.002%
Heavy Metals (as Pb) 0.001%
Organic Impurities To pass test
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.

M Lot No. 062233

L Retest Date: 03-25-2025

J **KEEP FROM CHILDREN**

G 12/E11GHS **A** **O**

SPECTRUM CHEMICAL MFG. CORP. Gardena, CA 90248 • New Brunswick, NJ 08901

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

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

January 26, 2016

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
Manager, GMP Compliance



Stability – Shelf Life Guidance

Product Covered: B1196, Butylated Hydroxytoluene, Granular, NF

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

The product, B1196, Butylated Hydroxytoluene, Granular, NF, 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



KOSHER SUPERVISION OF AMERICA

בס"ד
Mar 01, 2017

The following product(s) prepared by the named company are certified kosher with the stated requirements:

Spectrum Laboratory Products, Inc.

S-0032

14422 S. San Pedro Street
Gardena CA 90248
USA

Product Name	BHT, Granular, NF - B1196
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Brand	Spectrum
--------------	-----------------

UKD-ID	KSAV3-K8J4A64
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D/P/M	P
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Symbol Required	KSA
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Special Conditions	
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This certificate expires on
Feb 01, 2018

Rabbi Binyomin Lisbon
Kashrus Administrator

Placing the KSA logo on products not listed above constitutes an un-authorized use of the KSA symbol, which is a federally registered trademark.

1 of 1



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.II170504

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 #
BHT, Granular, NF	B1196	B93984	HC-17SP1U66

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

