SAFETY DATA SHEET

Preparation Date: 09/23/2016 **Revision date** 10/04/2019 **Revision Number:** G2

1. IDENTIFICATION

Product identifier

Product code: P2385
Product Name: M-PHENYLENEDIAMINE

Other means of identification
Synonyms: m-Aminoaline
AminoanilineBenzenediamine
,3-Benzenediamine (9CI)Diaminobenzene
,3-Diaminobenzene
Metaphenylenediamine
,3-Phenylenediamine
CAS #: 108-45-2
RTECS # SS7700000
CI#: 76025

Recommended use of the chemical and restrictions on use
Recommended use: For manufacturing or laboratory use only.
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: Tom Tyner (USA - West Coast)
Contact Person: Ibad Tirmiz (USA - East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by 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 3
Acute toxicity - Dermal	Category 4
Acute toxicity - Inhalation (Dusts/Mists)	Category 4
Serious eye damage/eye irritation	Category 2A
Skin sensitization	Category 1
Germ cell mutagenicity	Category 2
Specific target organ toxicity (repeated exposure)	Category 2

Label elements

Danger

Hazard statements
Harmful in contact with skin or if inhaled
Toxic if swallowed
Causes serious eye irritation
May cause an allergic skin reaction
Suspected of causing genetic defects
May cause damage to organs through prolonged or repeated exposure

Hazards not otherwise classified (HNOC)
Not Applicable

Other hazards
Very toxic to aquatic life with long lasting effects
Very toxic to aquatic life

Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Use only outdoors or in a well-ventilated area
Contaminated work clothing must not be allowed out of the workplace
Wear protective gloves
Do not breathe dust

Precautionary Statements - Response
IF exposed or concerned: Get medical attention
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 attention.
IF ON SKIN: Wash with plenty of water
Call a POISON CENTER or physician if you feel unwell
Wash contaminated clothing before reuse
If skin irritation or rash occurs: Get medical attention
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF SWALLOWED: Immediately call a POISON CENTER or physician
Rinse mouth

Precautionary Statements - Storage
Store locked up

Precautionary Statements - Disposal
Dispose of contents and container to an approved waste disposal plant in accordance with local, regional, national and international regulations as applicable

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS No	Weight-%
m-Phenylenediamine	108-45-2	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. First aider needs to protect himself. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

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. 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. Immediate medical attention is required.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center immediately. Toxic if swallowed.

Most important symptoms and effects, both acute and delayed

Symptoms

Causes serious eye irritation
Causes digestive (gastrointestinal) tract irritation
May cause gastrointestinal (digestive) tract burns
May cause sensitization by skin contact
May cause an allergic skin reaction
Suspected of causing genetic defects
May cause heritable genetic damage in humans
Nausea
Dizziness
Headache
It may cause dermatitis
May cause pulmonary edema
Lightheadedness

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 (CO2). Nitrogen oxides (NOx).

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

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not let product enter 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. Avoid dust formation. Keep away from incompatible materials. Remove all sources of ignition.

Safe Handling Advice:
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not breathe dust. Do not ingest. Keep away from heat and sources of ignition. Use only in well-ventilated areas. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions:
Air sensitive. Sensitive to light. Store in light-resistant containers. 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:
Acids
Strong oxidizing agents
Acid anhydrides
Acid chlorides
Chloroformates

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

Component	CAS No	OSHA	NIOSH	ACGIH	AIHA WEEL
m-Phenylenediamine	108-45-2	None	None	0.1 mg/m³ TWA	None

Canada

Component	CAS No	Canada - Alberta	Canada - British Columbia	Canada - Ontario	Canada - Quebec
m-Phenylenediamine	108-45-2	0.1 mg/m³ TWA	0.1 mg/m³ TWA	None	None

Australia and Mexico

Component	CAS No	Australia	Mexico
m-Phenylenediamine	108-45-2	0.1 mg/m³ TWA	0.1 mg/m³ TWA

Appropriate engineering controls

Engineering measures to reduce exposure: Ensure adequate ventilation, especially in confined areas. 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 or Safety glasses with side-shields.

Skin and body protection: Gloves
Long sleeved clothing
Chemical resistant apron

Respiratory protection: Effective dust mask. or. Wear respirator with dust filter. Use a dust respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentration of dust (dust clouds) , inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent.

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:
Powder.

Color:
White. Reddish.

Odor:
No information available.

Taste
No information available.

Formula
C6H8N2

Molecular/Formula weight (g/mole):
108.14

Flammability (solid, gas)
no data available

Flashpoint (°C/°F):
110°C (230°F)

Flash Point Tested according to:
Closed cup

Autoignition Temperature (°C/°F):
560°C (1040°F)

Lower Explosion Limit (%):
No information available

Upper Explosion Limit (%):
No information available

Melting point/range(°C/°F):
62-66°C/143.6-150.8°F

Decomposition temperature(°C/°F):
No information available

Boiling point/range(°C/°F):
282-284°C/539.6-543.2°F

Bulk density:
No information available

Density (g/cm3):
1.139

Specific gravity:
No information available

pH
No information available

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

Evaporation rate:
No information available

Vapor density:
3.7 at 20 °C
(Air = 1.0)

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:
Soluble in Methanol
Soluble in Acetone
Soluble in DMF and MEK
Soluble in dioxane
Soluble in Alcohol
Soluble in Ether
Chloroform

10. STABILITY AND REACTIVITY

Reactivity
No information available

Chemical stability

Stability: Sensitive to light. Sensitive to air. Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Exposure to light. Exposure to air. Incompatible materials. Ignition sources.

Incompatible Materials:
Acids
Strong oxidizing agents
Acid anhydrides
Acid chlorides
Chloroformates

Hazardous decomposition products: Carbon monoxide. Carbon dioxide. Nitrogen oxides (NOx).

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:
Skin. Eyes. Ingestion. Inhalation.

Acute Toxicity

The following values are calculated based on chapter 3.1 of the GHS document
Component Information

m-Phenylenediamine	
CAS No	108-45-2

LD50/oral/rat = 204 mg/kg Oral LD50 Rat (LOLI) = 280 mg/kg Oral LD50 (RTECS)
LD50/oral/mouse = 67.7 mg/kg Oral LD50 Mouse
LD50/dermal/rabbit = No information available
LD50/dermal/rat = 1100 mg/kg Dermal LD50 Rat
LC50/inhalation/rat = 3.2 mg/l 4h Inhalation LC50 Rat
LC50/inhalation/mouse = No information available
Other LD50 or LC50information = 450 mg/kg Oral LD50 Guinea Pig, 437 mg/kg Oral LD50 Rabbit

Product Information

LD50/oral/rat =
Value - Acute Toxicity = 280 mg/kg

LD50/oral/mouse =
Value - Acute Tox = 67.7 mg/kg

LD50/dermal/rabbit
Value - Acute Toxicity = No information available

LD50/dermal/rat
VALUE - Acute Tox = 1100 mg/kg

LC50/inhalation/rat
VALUE-Vapor = No information available
VALUE-Gas = No information available
VALUE-Dust/Mist = 3.2 mg/l

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. May cause allergic skin reaction.

Eye Contact: Causes serious eye irritation.

Inhalation May cause irritation of respiratory tract. May cause dizziness and headache. It may cause pulmonary edema. May cause lightheadedness.

Ingestion Causes severe gastrointestinal tract irritation and burns. Causes severe pain, nausea, vomiting, diarrhea, and shock. May cause severe and permanent damage to the digestive tract. May cause perforation of the digestive tract. May cause corrosion and permanent destruction of the esophagus.

Aspiration hazard No information available.

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

Chronic Toxicity Repeated absorption may cause disorder of central nervous system, liver, kidneys and blood. Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated inhalation may affect the urinary system.

Sensitization: May cause sensitization by skin contact.

Mutagenic Effects: Suspected of causing genetic defects

Carcinogenic effects: Not considered carcinogenic.

Component	CAS No	IARC	ACGIH - Carcinogens	NTP	OSHA HCS - Carcinogens	Australia - Notifiable Carcinogenic Substances	Australia - Prohibited Carcinogenic Substances
m-Phenylenediamine	108-45-2	Supplement 7 [1987] Monograph 16 [1978]	A4 Not Classifiable as a Human Carcinogen	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: No information available
Developmental Effects: No information available
Teratogenic Effects: No information available

Specific Target Organ Toxicity

STOT - single exposure No information available.
STOT - repeated exposure May cause damage to organs through prolonged or repeated exposure.
Target Organs: Liver. Kidneys. Blood. Central nervous system.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: Aquatic environment.

m-Phenylenediamine - 108-45-2

Algae/aquatic plants	EC50: =2.4mg/L (96h, Pseudokirchneriella subcapitata)
Fish	LC50: =1600mg/L (96h, Pimephales promelas)
Crustacea	EC50: =5.9mg/L (48h, Daphnia magna)

Persistence and degradability: No information available

Bioaccumulative potential: No information available.

Mobility in soil No information available
Other adverse effects 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

Component	CAS No	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
m-Phenylenediamine	108-45-2	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No:	UN1673
Proper Shipping Name:	Phenylenediamines
Hazard Class	6.1
Subsidiary Class	No information available
Packing group:	III
Emergency Response Guide Number	153
Marine Pollutant	No data available
DOT RQ (lbs):	No information available
Special Provisions	IB8, IP3, T1, TP33
Symbol(s):	[DOT]: (+) - Fixes the proper shipping name, hazard class and packing group for that entry without regard to whether the material meets the definition of that class, packing group or any other hazard class.
Description:	UN1673, Phenylenediamines, 6.1, III

TDG (Canada)

UN-No:	UN1673
Proper Shipping Name:	Phenylenediamines
Hazard Class	6.1
Subsidiary Risk:	No information available
Packing Group:	III
Marine Pollutant	No Information available

Description: UN1673, Phenylenediamines, 6.1, III

ADR

UN Number	UN1673
Proper Shipping Name:	Phenylenediamines (o-, m-, p-)
Transport hazard class(es)	6.1
Packing group	III
Subsidiary Risk:	No information available
Special Provisions	279
Description:	UN1673, Phenylenediamines (o-, m-, p-), 6.1, III, ENVIRONMENTALLY HAZARDOUS

IMDG

UN-No:	UN1673
Proper Shipping Name:	Phenylenediamines
Hazard Class:	6.1
Subsidiary Risk:	No information available
Packing Group:	III
Marine Pollutant	No information available
EMS:	F-A
Special Provisions	279
Description	UN1673, Phenylenediamines, 6.1, III, Marine pollutant

RID

UN Number	UN1673
Proper Shipping Name:	Phenylenediamines
Transport hazard class(es)	6.1
Subsidiary Risk:	No information available
Packing group	III
Special Provisions	279
Description:	UN1673, Phenylenediamines, 6.1, III, ENVIRONMENTALLY HAZARDOUS

ICAO (air)

UN-No:	UN1673
Proper Shipping Name:	Phenylenediamines
Hazard Class	6.1
Subsidiary Risk:	No information available
Packing Group:	III
Description:	UN1673, Phenylenediamines, 6.1, III
Special Provisions	A113

IATA

UN Number	UN1673
Proper Shipping Name:	Phenylenediamines
Transport hazard class(es)	6.1
Subsidiary Risk:	No information available
Packing group	III
Precautionary Statements - Response	6L
Special Provisions	No information available
Description:	UN1673, Phenylenediamines, 6.1, III

15. REGULATORY INFORMATION

International Inventories

Component	CAS No	U.S. TSCA	KOREA KECL	Philippines	Japan ENCS	China IECSC	Australia	EINECS-No.

				(PICCS)			(AICS)	
m-Phenylenediamine	108-45-2	PresentACTIVE	Present KE-02175	Present	Present (3)-185	Present	Present	Present 203-584-7

U.S. Regulations

m-Phenylenediamine

Massachusetts RTK: Present
New Jersey RTK Hazardous Substance List: 1316
New Jersey (EHS) List: 1316 500 lb TPQ
New Jersey - Discharge Prevention - List of Hazardous Substances: Present
Minnesota - Hazardous Substance List: Present

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)

Component	CAS No	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
m-Phenylenediamine	108-45-2	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Component	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
m-Phenylenediamine	108-45-2	None	None	None	None	1.0 % de minimis concentration

U.S. TSCA

Component	CAS No	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
m-Phenylenediamine	108-45-2	Not Applicable	Not Applicable

Canada

WHIMIS 2015 - GHS Classifications

WHMIS 2015 Hazard Classification Information: .

Component
m-Phenylenediamine
108-45-2 (100)

WHMIS 2015 Hazard Classification
Acute toxicity - Oral - Category 4: H302 Harmful if swallowed.; Acute toxicity - Inhalation - Category 4: H332 Harmful if inhaled.; Serious Eye Damage/Eye Irritation - Category 2: H319 Causes serious eye irritation.; Skin sensitizers - Category 1A: H317 May cause allergic skin reaction.; Combustible Dust - Category 1: May form combustible dust concentrations in air (factors such as combustibility and explosiveness of dusts including composition and shape and size of particles could cause substance to belong to 'Combustible dust' hazard class)

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

DSL/NDSL

Component	CAS No	Canada (DSL)	Canada (NDSL)
m-Phenylenediamine	108-45-2	Present	Not Listed

Component	CAS No	CEPA Schedule I - Toxic Substances
m-Phenylenediamine	108-45-2	Not listed
Component	CAS No	CEPA - 2010 Greenhouse Gases Subject to Mandatory Reporting
m-Phenylenediamine	108-45-2	Not listed

EU Classification

EU GHS - SV - CLP 1272/2008

Component	CAS No	EU GHS - SV - CLP (1272/2008)
m-Phenylenediamine	108-45-2	Acute toxicity - Oral - Acute Tox. 3: H301 Toxic if swallowed. (Minimum classification); Acute toxicity - Dermal - Acute Tox. 3: H311 Toxic in contact with skin. (Minimum classification); Acute toxicity - Inhalation - Acute Tox. 3: H331 Toxic if inhaled. (Minimum classification); Serious Eye Damage/Eye Irritation - Eye Irrit. 2: H319 Causes serious eye irritation.; Skin sensitizers - Skin Sens. 1: H317 May cause allergic skin reaction.; Germ cell mutagenicity - Muta. 2: H341 Suspected of causing genetic defects.; 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.612-147-00-3

EU - CLP (1272/2008)

R-phrase(s)

R25 - Toxic if swallowed
R36 - Irritating to eyes
R43 - May cause sensitization by skin contact
R68 - Possible risk of irreversible effects
R50 - Very toxic to aquatic organisms
R53 - May cause long-term adverse effects in the aquatic environment
R20/21 - Harmful by inhalation and in contact with skin

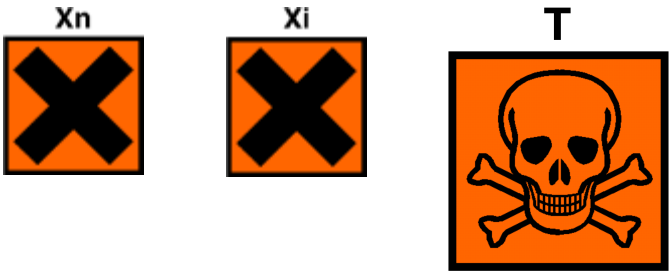
S -phrase(s)

S 7 - Keep container tightly closed.
S36 - Wear suitable protective clothing
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S61 - Avoid release to the environment. Refer to special instructions/safety data sheets.
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection

Component	CAS No	Classification	Concentration Limits:	Safety Phrases
m-Phenylenediamine	108-45-2	T; R23/24/25 Xi; R36 R43 N; R50-53 Muta.Cat.3; R68	No information	

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

Indication of danger:
Xn - Harmful
Xi - Irritant
T - Toxic



16. OTHER INFORMATION

Preparation Date: 09/23/2016
Revision date 10/04/2019
Prepared by: Roumann Pangilinan

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