

Issuing Date 29-Aug-2024**Revision Date** 29-Aug-2024**Revision Number** 1**1. Identification****Product identifier****Product Name** 4,4'-METHYLENE DIANILINE**Other means of identification****Product Code** 3602806**CAS Number** 101-77-9**UN-No** UN2651**Synonyms** MDA-100; 4,4-MDA; Benzenamine, 4,4'-methylenebis-; p,p'-Diaminodiphenylmethane; 4,4'-Diaminodiphenylmethane; Di-(4-aminophenyl)methane**Recommended use of the chemical and restrictions on use****Recommended Use** Coatings**Restriction on Use** Do not use where contact with food or drinking water is possible Avoid prolonged contact with eyes, skin, and clothing**Details of the supplier of the safety data sheet****Supplier Address**ACETO US, LLC
4 Tri Harbor Court
Port Washington, NY 11050-4661
Phone: (516) 627-6000
Fax: (516) 627-6093
Email: actylis@actylis.com**Emergency telephone number****Emergency telephone number(s)** ChemTrec: 1-800-424-9300
Outside of the United States: 1-703-527-3887

2. Hazard(s) identification

Classification

Acute toxicity - Oral	Category 3
Acute toxicity - Dermal	Category 4
Skin sensitization	Category 1
Germ cell mutagenicity	Category 2
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 1
Specific target organ toxicity (repeated exposure)	Category 2
Chronic aquatic toxicity	Category 1
Acute aquatic toxicity	Category 1

Hazards not otherwise classified (HNOC)

Not applicable

Label elements



Danger

Hazard statements

Toxic if swallowed.
Harmful in contact with skin.
May cause an allergic skin reaction.
Suspected of causing genetic defects.
May cause cancer.
Causes damage to organs.
May cause damage to organs through prolonged or repeated exposure.
Very toxic to aquatic life with long lasting effects.

Precautionary Statements - Prevention

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear protective gloves/clothing and eye/face protection.
Wash face, hands and any exposed skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Contaminated work clothing must not be allowed out of the workplace.
Do not breathe dust/fume/gas/mist/vapors/spray.

Precautionary Statements - Response

Specific treatment (see supplemental first aid instructions on this label).
IF exposed: Call a POISON CENTER or doctor.
IF ON SKIN: Wash with plenty of water and soap.
Call a POISON CENTER or doctor if you feel unwell.
Take off contaminated clothing and wash it before reuse.
If skin irritation or rash occurs: Get medical advice/attention.
IF SWALLOWED: Immediately call a POISON CENTER or doctor.
Rinse mouth.

Precautionary Statements - Storage

Store locked up.

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant.

Other Information

No information available.

3. Composition/information on ingredients**Substance**

Synonyms MDA-100; 4,4'-MDA; Benzenamine, 4,4'-methylenebis-; p,p'-Diaminodiphenylmethane; 4,4'-Diaminodiphenylmethane; Di-(4-aminophenyl)methane

Formula C13H14N2

Chemical name	CAS No.	Weight-%	Trade secret
4,4'-Methylenedianiline	101-77-9	=> 99	

4. First-aid measures**Description of first aid measures**

General advice	Show this safety data sheet to the doctor in attendance. IF exposed or concerned: Get medical advice/attention.
Inhalation	Remove to fresh air. IF exposed or concerned: Get medical advice/attention.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.
Skin contact	Wash with soap and water. May cause an allergic skin reaction. Wash off immediately with plenty of water for at least 15 minutes. If symptoms persist, call a physician.
Ingestion	Do NOT induce vomiting. Rinse mouth. Never give anything by mouth to an unconscious person. Get medical attention.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Wear personal protective clothing (see section 8).

Most important symptoms and effects, both acute and delayed

Symptoms	Itching. Rashes. Hives.
Effects of Exposure	May cause cancer. Mutagenic effects. Causes damage to organs. May cause damage to organs through prolonged or repeated exposure.

Indication of any immediate medical attention and special treatment needed

Note to physicians	May cause sensitization in susceptible persons. Treat symptomatically.
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5. Fire-fighting measures

Suitable Extinguishing Media	Dry chemical. Carbon dioxide (CO ₂). Foam. Water spray or fog.
Unsuitable extinguishing media	No information available.
Specific hazards arising from the chemical	Product is or contains a sensitizer. May cause sensitization by skin contact.
Hazardous Combustion Products	Carbon oxides. Nitrogen oxides.
Explosion Data	
Sensitivity to mechanical impact	None.
Sensitivity to static discharge	None.
Special protective equipment and precautions 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	Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.
Other information	Refer to protective measures listed in Sections 7 and 8.

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. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Remove contaminated clothing and shoes.
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Conditions for safe storage, including any incompatibilities

Storage Conditions	Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Protect from sunlight.
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8. Exposure controls/personal protection**Control parameters****Exposure Limits**

Chemical name	ACGIH TLV	OSHA PEL	NIOSH
4,4'-Methylenedianiline 101-77-9	TWA: 0.1 ppm S*	-	-

Appropriate engineering controls

Engineering controls Showers
 Eyewash stations
 Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Hand protection Wear suitable gloves.

Gloves

Skin and body protection Wear suitable protective clothing. Long sleeved clothing.

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 Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Wash hands before breaks and immediately after handling the product.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Solid
Appearance	Crystal
Color	White; Or; Pale Yellow
Odor	No information available
Odor Threshold	No information available

Property	Values	Remarks • Method
pH	No data available	None known
pH (as aqueous solution)		None known
Melting point / Freezing point	88 - 94 °C / 190.4 - 201.2 °F	None known
Boiling point / boiling range	389 - 399 °C / 732.2 - 750.2 °F	None known
Flash Point	221 °C / 429.8 °F	None known
Evaporation Rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limit in Air		None known
Upper flammability limit	No data available	
Lower flammability limit	No data available	
Vapor Pressure	0.12mm Hg @ 152°C	None known
Vapor Density	6.8	None known
Relative density	1.15 @ 20°C	None known
Water solubility	1.25 g/l @ 20 °C	None known
Solubility in other solvents	No data available	None known
Partition coefficient: n-octanol/water	1.59	None known
Autoignition temperature °C	261 °C / 501.8 °F	No information available
Decomposition temperature		None known
Kinematic Viscosity	No data available	None known
Dynamic Viscosity		None known

Other information

Explosive properties	No information available
Oxidizing properties	No information available
Softening Point	No information available
Molecular Weight	198.27 g/mol
VOC content	No information available
Liquid Density	No information available
Bulk density	No information available

10. Stability and reactivity

Reactivity	No information available.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	None under normal processing.
Conditions to Avoid	Heat, flames and sparks. Excessive heat. sources of ignition.
Incompatible materials	Oxidizing agent. Acids. Acid chlorides. Acid anhydrides.
Hazardous decomposition products	Carbon oxides. Nitrogen oxides (NOx).

11. Toxicological information

Information on likely routes of exposure

Product Information

Inhalation	Avoid breathing dust, fume, gas, mist, vapors and spray.
Eye contact	Avoid contact with eyes.
Skin contact	May cause sensitization by skin contact. Specific test data for the substance or mixture is not available. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. (based on components). Toxic in contact with skin.
Ingestion	Specific test data for the substance or mixture is not available. Toxic if swallowed. (based on components).

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms	Itching. Rashes. Hives.
Acute toxicity	Toxic if swallowed. Harmful by skin contact.

Numerical measures of toxicity

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
4,4'-Methylenedianiline 101-77-9	= 264 mg/kg (Mouse)	= 1500 mg/kg (Rat)	-

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

Skin corrosion/irritation	No information available.
Serious eye damage/eye irritation	No information available.
Respiratory or skin sensitization	May cause an allergic skin reaction.
Germ cell mutagenicity	Contains a known or suspected mutagen. Classification based on data available for ingredients. Suspected of causing genetic defects.

Carcinogenicity Contains a known or suspected carcinogen. Classification based on data available for ingredients. May cause cancer.

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical name	ACGIH	IARC	NTP	OSHA
4,4'-Methylenedianiline 101-77-9	A3	Group 2B	Reasonably Anticipated	X

Legend

ACGIH (American Conference of Governmental Industrial Hygienists)

A3 - Animal Carcinogen

IARC (International Agency for Research on Cancer)

Group 2B - Possibly Carcinogenic to Humans

NTP (National Toxicology Program)

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

Occupational Safety and Health Administration of the US Department of Labor

X - Present

Reproductive toxicity No information available.

STOT - single exposure Based on the classification criteria of the Globally Harmonized System as adopted in the country or region with which this safety data sheet complies, this product has been determined to cause systemic target organ toxicity from acute exposure. (STOT SE). Causes damage to organs if swallowed. Causes damage to organs in contact with skin.

STOT - repeated exposure May cause damage to organs through prolonged or repeated exposure.

Target organ effects Liver, spleen, Eyes, Central Vascular System (CVS), Bladder.

Aspiration hazard No information available.

Other Adverse Effects No information available.

Interactive effects No information available.

12. Ecological information

Ecotoxicity Very toxic to aquatic life with long lasting effects.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
4,4'-Methylenedianiline 101-77-9	EC50: =21mg/L (72h, Desmodesmus subspicatus)	LC50: =42mg/L (96h, Brachydanio rerio)	-	-

Persistence/Degradability Slight.

Bioaccumulation Slight.

Component Information

Chemical name	Partition coefficient
4,4'-Methylenedianiline 101-77-9	1.55

Mobility in Soil Medium.

Other adverse effects No information available.

13. Disposal considerations**Waste treatment methods****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**

UN-No	UN2651
Proper Shipping Name	4,4'-Diaminodiphenyl methane
Transport hazard class(es)	6.1
Packing Group	III 4,4'-Methylenedianiline: RQ (lb)= 10.00
DOT reportable quantity kg (calculated)	4,4'-Methylenedianiline: RQ (kg)= 4.58
DOT Reportable Quantity lbs. (calculated)	4,4'-Methylenedianiline: RQ (lb)= 10.00
Special Provisions	IB8, IP3, TP1, TP33
DOT Marine Pollutant	P
Marine Pollutant name	4,4'-Methylenedianiline
Description	UN2651, 4,4'-Diaminodiphenyl methane, 6.1, III
Emergency Response Guide Number	153

TDG

UN-No	UN2651
Proper Shipping Name	4,4'-Diaminodiphenylmethane
Transport hazard class(es)	6.1
Packing Group	III
Melting point / Freezing point	4,4'-Methylenedianiline.
Description	UN2651, 4,4'-Diaminodiphenylmethane, 6.1, III

MEX

UN-No	UN2651
Proper Shipping Name	4,4'-Diaminodiphenylmethane
Transport hazard class(es)	6.1
Packing Group	III
Description	UN2651, 4,4'-Diaminodiphenylmethane, 6.1, III

ICAO

UN-No	UN2651
Proper Shipping Name	4,4'-Diaminodiphenylmethane
Transport hazard class(es)	6.1
Packing Group	III
Description	UN2651, 4,4'-Diaminodiphenylmethane, 6.1, III

IATA

UN number or ID number	UN2651
Proper Shipping Name	4,4'-Diaminodiphenylmethane
Transport hazard class(es)	6.1
Packing group	III
Description	UN2651, 4,4'-Diaminodiphenylmethane, 6.1, III
ERG Code	6L

IMDG

UN number or ID number	UN2651
Proper Shipping Name	4,4'-Diaminodiphenylmethane
Transport hazard class(es)	6.1
Packing Group	III
EmS No.	F-A, S-A
Marine pollutant	P
Description	UN2651, 4,4'-Diaminodiphenylmethane, 6.1, III, Marine pollutant

15. Regulatory information**International Inventories**

TSCA

Complies

Chemical name	CAS No.	Inventory Listing Status	Commercial Activity Designation
4,4'-Methylenedianiline	101-77-9	Present	Active

Chemical name	CAS No.	References
4,4'-Methylenedianiline	101-77-9	-

DSL/NDL	Complies
EINECS/ELINCS	Complies
Japan (ENCS)	Complies
Inventory of Existing Chemical Substances in China	Complies
Korea (KECL)	Complies
Philippines (PICCS)	Complies
AIIC	Complies
NZIoC	Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDL - 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
AIIC - Australian Inventory of Industrial Chemicals
NZIoC - New Zealand Inventory of Chemicals

Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

Chemical name	SARA 313 - Threshold Values %
4,4'-Methylenedianiline - 101-77-9	0.1

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).

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
4,4'-Methylenedianiline 101-77-9	-	-	-	-

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302).

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	Reportable Quantity (RQ)
4,4'-Methylenedianiline 101-77-9	10 lb	-	RQ 10 lb final RQ RQ 4.54 kg final RQ

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals:.

Chemical name	California Proposition 65
4,4'-Methylenedianiline - 101-77-9	Carcinogen

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
4,4'-Methylenedianiline 101-77-9	X	X	X

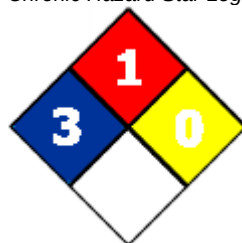
U.S. EPA Label Information**EPA Pesticide Registration Number** Not applicable

16. Other information

NFPA **Health hazards** 3 **Flammability** 1 **Instability** 0 **Special hazards** -

Chronic Hazard Star Legend

* = Chronic Health Hazard

**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	*	Skin designation
+	Sensitizers		

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)
 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)
 National Institute of Technology and Evaluation (NITE)
 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)
 U.S. 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

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Disclaimer

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End of Safety Data Sheet