

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name : Nadic Methyl Anhydride, NMA NMA-NE
 Product form : Substance
 Product code : NMA, NMA-NE
 Other means of identification : Methyl-5-norbornene-2,3-dicarboxylic anhydride; 4-7-Methanoisobenzofuran-1,3-dione

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Use in closed process, no likelihood of exposure.
 Use in closed, continuous process with occasional controlled exposure.
 Use in closed batch process (synthesis or formulation).
 Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities.
 Transfer of substance or preparation into small containers (dedicated filling line, including weighing).

1.3. Details of the supplier of the safety data sheet

Dixie Chemical Company, Inc.
 10601 Bay Area Blvd
 Pasadena TX 77507
 Phone: 281-474-3271
 Email: msds@dixiechemical.com

1.4. Emergency telephone number

Emergency number : CHEMTREC® (800) 424-9300 Domestic, (703) 527-3887 International

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Acute Tox. 4 (Oral) H302
 Acute Tox. 3 (Inhalation/aerosol) H331
 Skin Irrit. 2 H315
 Eye Dam. 1 H318
 Resp. Sens. 1 H334
 Skin Sens. 1 H317

2.2. Label elements

GHS-US labelling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H302 - Harmful if swallowed
 H315 - Causes skin irritation
 H317 - May cause an allergic skin reaction
 H318 - Causes serious eye damage
 H331 - Toxic if inhaled
 H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled

Precautionary statements (GHS-US) :

P261 - Avoid breathing mist
 P264 - Wash hands, forearms and face thoroughly after handling
 P270 - Do not eat, drink or smoke when using this product
 P271 - Use only outdoors or in a well-ventilated area
 P272 - Contaminated work clothing must not be allowed out of the workplace
 P280 - Wear eye protection, face protection, protective clothing, protective gloves
 P284 - [In case of inadequate ventilation] wear respiratory protection
 P301+P312 - If swallowed: Call a doctor, a poison center if you feel unwell
 P302+P352 - If on skin: Wash with plenty of soap and water
 P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
 P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 P310 - Immediately call a doctor, a poison center
 P311 - Call a doctor, a poison center

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P321 - Specific treatment (see first aid instructions on this label)
P330 - Rinse mouth
P332+P313 - If skin irritation occurs: Get medical advice/attention
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention
P342+P311 - If experiencing respiratory symptoms: Call a poison center, a doctor
P362 - Take off contaminated clothing and wash before reuse
P362+P364 - Take off contaminated clothing and wash it before reuse
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS-US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Name	Product identifier	%
Methyl-5-norbornene-2,3-dicarboxylic anhydride	(CAS No) 25134-21-8	90 - 100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, get medical attention/advice. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. Get medical attention. If breathing is difficult, supply oxygen. If breathing has stopped, give artificial respiration.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin with water for at least 15 minutes. Get medical attention immediately.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of water for at least 15 minutes. Remove contact lenses if present and easy to do so. Get medical attention immediately. Continue rinsing.

First-aid measures after ingestion : IF SWALLOWED: rinse mouth thoroughly. Do not induce vomiting without advice from poison control center or medical professional. Get medical attention immediately.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation : Toxic if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Symptoms/injuries after skin contact : May cause an allergic skin reaction. Causes skin irritation.

Symptoms/injuries after eye contact : Causes serious eye damage.

Symptoms/injuries after ingestion : Harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Carbon dioxide. Alcohol-resistant foam.

Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Must be preheated before ignition can occur.

Explosion hazard : Product is not explosive.

Reactivity : Carbon oxides may be emitted upon combustion of material. This material reacts with water or steam to form phthalic acids. This reaction is slightly exothermic.

5.3. Advice for firefighters

Firefighting instructions : Use cold water spray to cool fire-exposed containers to minimize risk of rupture. Do not dispose of fire-fighting water in the environment. Dispose of in accordance with relevant local regulations. Prevent human exposure to fire, fumes, smoke and products of combustion.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Evacuate area. Keep upwind. Ventilate area. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Protective equipment as described in Section 8.

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Notify authorities if product enters sewers or public waters. Prevent entry to sewers and public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for cleaning up : Eliminate ignition sources. Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Place in a suitable container for disposal in accordance with the waste regulations (see Section 13).

6.4. Reference to other sections

See Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wear personal protective equipment. Do not handle until all safety precautions have been read and understood. Ensure good ventilation of the work station. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Preferably transfer by pump or gravity. Handle small quantities under a lab hood. Prevent product vapors decomposition from contacting hot spots. Prevent product vapors decomposition from electric arc action (welding)

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Protect from sunlight. Store in a well-ventilated place. Store in original container. Keep the container tightly closed. Keep in a bonded area.

Packaging materials : Polyethylene. Steel coated (enameled).

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Methyl-5-norbornene-2,3-dicarboxylic anhydride (25134-21-8)	
Remark (ACGIH)	OELs not established
Remark (OSHA)	OELs not established

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof equipment with flammable materials. Ensure adequate ventilation, especially in confined areas.

Personal protective equipment : Gloves. Wear chemical goggles and face shield in combination. Protective clothing. Insufficient ventilation: wear respiratory protection.



Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suggested glove materials are: Neoprene, Nitrile/butadiene rubber, Polyethylene, Ethyl vinyl alcohol laminate, PVC or vinyl. Be aware that the chemical may penetrate the gloves. Frequent changes are advisable. Suitable gloves for this specific application can be recommended by the glove supplier.

Eye protection : Wear eye protection, including chemical splash goggles and a face shield when possibility exists for eye contact due to spraying liquid or airborne particles.

Skin and body protection : Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection : Use NIOSH-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Color	: Pale yellow to tan.
Odor	: Slight.
Odor Threshold	: No data available
pH	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: 132 °C (270 °F) at 2 mm Hg or ca. 140 °C (284 °F) at 10 mm Hg
Flash point	: 135 °C (275 °F) PMCC, ASTM D93
Auto-ignition temperature	: No data available
Decomposition temperature	: 200 °C (392 °F)
Flammability (solid, gas)	: No data available
Vapour pressure	: 5 mm Hg at 120 °C (248 °F)
Relative vapour density at 20 °C	: 6.1 g/L (AIR = 1)
Relative density	: 1.2 (≥ 1.25) at 20 °C (68 °F)
Solubility	: No data available
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Carbon oxides may be emitted upon combustion of material. This material reacts with water or steam to form phthalic acids. This reaction is slightly exothermic.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Heating above 200 °C may result in product decomposition and release of hazardous fumes.

10.4. Conditions to avoid

Ignition sources. Incompatibles. Water.

10.5. Incompatible materials

Acids. Oxidizing agents. Bases. Water.

10.6. Hazardous decomposition products

Carbon monoxide (CO), carbon dioxide (CO₂).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed. Inhalation:aerosol: Toxic if inhaled.

Methyl-5-norbornene-2,3-dicarboxylic anhydride (25134-21-8)	
LD50 oral rat	914 mg/kg
LD50 dermal rat	4920 mg/kg
LC50 inhalation rat	0.75 mg/L (migrated information Criteria used for interpretation: EU)

Skin corrosion/irritation : Causes skin irritation.

Serious eye damage/irritation : Causes serious eye damage.

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Respiratory or skin sensitisation	: May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction.
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified
Symptoms/injuries after inhalation	: Toxic if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Symptoms/injuries after skin contact	: May cause an allergic skin reaction. Causes skin irritation.
Symptoms/injuries after eye contact	: Causes serious eye damage.
Symptoms/injuries after ingestion	: Harmful if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No information available.

12.2. Persistence and degradability

Nadic Methyl Anhydride	
Persistence and degradability	No data available.

12.3. Bioaccumulative potential

Nadic Methyl Anhydride	
Bioaccumulative potential	No information available.

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Do not discharge to public wastewater systems without permit of pollution control authorities. No discharge to surface waters is allowed without an NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local/national regulations. Do not allow the product to be released into the environment.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No. (ADR)	: 2810
UN-No. (IMDG)	: 2810
UN-No. (IATA)	: 2810
UN-No. (ADN)	: 2810
UN-No. (RID)	: 2810

14.2. UN proper shipping name

Proper Shipping Name (ADR)	: TOXIC LIQUID, ORGANIC, N.O.S. (contains Nadic Methyl Anhydride),
Proper Shipping Name (IMDG)	: TOXIC LIQUID, ORGANIC, N.O.S. (contains Nadic Methyl Anhydride),
Proper Shipping Name (IATA)	: Toxic liquid, organic, n.o.s. (contains Nadic Methyl Anhydride),
Proper Shipping Name (ADN)	: TOXIC LIQUID, ORGANIC, N.O.S. (contains Nadic Methyl Anhydride),
Proper Shipping Name (RID)	: TOXIC LIQUID, ORGANIC, N.O.S. (contains Nadic Methyl Anhydride),
Transport document description (ADR)	: UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. (contains Nadic Methyl Anhydride), 6.1, II, (D/E)
Transport document description (IMDG)	: UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. (contains Nadic Methyl Anhydride), 6.1, II
Transport document description (IATA)	: UN 2810 Toxic liquid, organic, n.o.s. (contains Nadic Methyl Anhydride), 6.1, II
Transport document description (ADN)	: UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. (contains Nadic Methyl Anhydride), 6.1, II
Transport document description (RID)	: UN 2810 TOXIC LIQUID, ORGANIC, N.O.S. ((contains Methyl-5-norbornene-2,3-dicarboxylic anhydride), 6.1, II

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14.3. Transport hazard class(es)

ADR

Transport hazard class(es) (ADR) : 6.1

Hazard labels (ADR) : 6.1



IMDG

Transport hazard class(es) (IMDG) : 6.1

Hazard labels (IMDG) : 6.1



IATA

Transport hazard class(es) (IATA) : 6.1

Hazard labels (IATA) : 6.1



ADN

Transport hazard class(es) (ADN) : 6.1

Hazard labels (ADN) : 6.1



RID

Transport hazard class(es) (RID) : 6.1

Hazard labels (RID) : 6.1



14.4. Packing group

Packing group (ADR) : II

Packing group (IMDG) : II

Packing group (IATA) : II

Packing group (ADN) : II

Packing group (RID) : II

14.5. Environmental hazards

Dangerous for the environment : No

Marine pollutant : No

Other information : No supplementary information available

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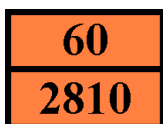
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14.6. Special precautions for user

- Overland transport

Classification code (ADR)	: T1
Special provision (ADR)	: 274, 614
Limited quantities (ADR)	: 100ml
Excepted quantities (ADR)	: E4
Packing instructions (ADR)	: P001, IBC02
Mixed packing provisions (ADR)	: MP15
Portable tank and bulk container instructions (ADR)	: T11
Portable tank and bulk container special provisions (ADR)	: TP2, TP27
Tank code (ADR)	: L4BH
Tank special provisions (ADR)	: TU15, TE19
Vehicle for tank carriage	: AT
Transport category (ADR)	: 2
Special provisions for carriage - Loading, unloading and handling (ADR)	: CV13, CV28
Special provisions for carriage - Operation (ADR)	: S9, S19
Hazard identification number (Kemler No.)	: 60
Orange plates	:



Tunnel restriction code (ADR)	: D/E
EAC	: 2X
APP	: B

- Transport by sea

Special provision (IMDG)	: 274
Limited quantities (IMDG)	: 100 ml
Excepted quantities (IMDG)	: E4
Packing instructions (IMDG)	: P001
IBC packing instructions (IMDG)	: IBC02
Tank instructions (IMDG)	: T11
Tank special provisions (IMDG)	: TP2, TP13, TP27
EmS-No. (Fire)	: F-A
EmS-No. (Spillage)	: S-A
Stowage category (IMDG)	: B
Stowage and handling (IMDG)	: SW2
Properties and observations (IMDG)	: Toxic if swallowed, by skin contact or by inhalation.

- Air transport

PCA Excepted quantities (IATA)	: E4
PCA Limited quantities (IATA)	: Y641
PCA limited quantity max net quantity (IATA)	: 1L
PCA packing instructions (IATA)	: 654
PCA max net quantity (IATA)	: 5L
CAO packing instructions (IATA)	: 662
CAO max net quantity (IATA)	: 60L
Special provision (IATA)	: A3, A4, A137
ERG code (IATA)	: 6L

- Inland waterway transport

Classification code (ADN)	: T1
Special provision (ADN)	: 274, 614, 802
Limited quantities (ADN)	: 100 ml
Excepted quantities (ADN)	: E4

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Carriage permitted (ADN) : T
Equipment required (ADN) : PP, EP, TOX, A
Ventilation (ADN) : VE02
Number of blue cones/lights (ADN) : 2

- Rail transport

Classification code (RID) : T1
Special provision (RID) : 274, 614
Limited quantities (RID) : 100ml
Excepted quantities (RID) : E4
Packing instructions (RID) : P001, IBC02
Mixed packing provisions (RID) : MP15
Portable tank and bulk container instructions (RID) : T11
Portable tank and bulk container special provisions (RID) : TP2, TP27
Tank codes for RID tanks (RID) : L4BH
Special provisions for RID tanks (RID) : TU15
Transport category (RID) : 2
Special provisions for carriage - Loading, unloading and handling (RID) : CW13, CW28, CW31
Colis express (express parcels) (RID) : CE5
Hazard identification number (RID) : 60

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

15.1. US Federal regulations

Nadic Methyl Anhydride

All chemical substances in this product are listed in the EPA (Environment Protection Agency) TSCA (Toxic Substances Control Act) Inventory

SARA Section 311/312 Hazard Classes : Immediate (acute) health hazard

15.2. International regulations

All chemical substances in this product are listed on the Australian Inventory of Chemical Substances (AICS) or are exempt
All chemical substances in this product are listed on the Canadian Domestic Substances List (DSL) or are exempt
All chemical substances in this product are listed on the Chinese Chemical Inventory of Existing Chemical Substances (IECSC) or are exempt
All chemical substances in this product are listed on the European EINECS Inventory or the ELINCS list or are exempt
All chemical substances in this product are listed on the Japanese Existing and New Chemical Substances Inventory (ENCS) or are exempt
All chemical substances in this product are listed on the Korean Existing Chemicals Inventory (KECI) or are exempt
All chemical substances in this product are listed on the New Zealand Inventory of Chemicals (NZIoC) or are exempt
All chemical substances in this product are listed on the Philippines Inventory of Chemicals and Chemical Substances (PICCS) or are exempt
All chemical substances in this product are listed on the Taiwan Chemical Substance Inventory (TSCI) or are exempt

15.3. US State regulations

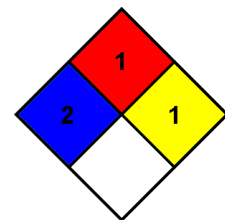
California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm

SECTION 16: Other information

Indication of changes : Revision 3.0
Revision Date : 11/1/2017
Other information : Author: SWE.

NFPA health hazard : 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.
NFPA fire hazard : 1 - Must be preheated before ignition can occur.
NFPA reactivity : 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



HMIS III Rating

Health : 2*
Flammability : 1

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Physical : 1
Personal Protection :

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product