

Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 05/10/2015

Reviewed on 05/10/2015

1 Identification

- **Product identifier**
- **Trade name: 20% Piperidine in DMF**
- **Product number: ngt-20P-dmf**
- **Relevant identified uses of the substance or mixture and uses advised against**
- **Product description** PC19 Intermediate
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
 NuGeneration Technologies, LLC (dba NuGenTec)
 1155 Park Avenue, Emeryville, CA 94608
 salesteam@nugentec.com www.nugentec.com
 888-996-8436 or 707-820-4080 for product information
- **Emergency telephone number:**
 PERS Emergency Response: Domestic and Canada - 1-800-633-8253, International 1-801-629-0667

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.



GHS08 Health hazard

Repr. 1B H360 May damage fertility or the unborn child.



GHS05 Corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.

Eye Dam. 1 H318 Causes serious eye damage.



GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Acute Tox. 4 H312 Harmful in contact with skin.

Acute Tox. 4 H332 Harmful if inhaled.

- **Label elements**

- **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

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· **Hazard pictograms**



GHS02 GHS05 GHS07 GHS08

· **Signal word** *Danger*

· **Hazard-determining components of labeling:**

N,N-dimethylformamide
piperidine

· **Hazard statements**

Highly flammable liquid and vapor.
Harmful if swallowed, in contact with skin or if inhaled.
Causes severe skin burns and eye damage.
May damage fertility or the unborn child.

· **Precautionary statements**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Use explosion-proof electrical/ventilating/lighting/equipment.
Do not breathe dusts or mists.
Use only outdoors or in a well-ventilated area.
Wear protective gloves / eye protection / face protection.
Wear protective gloves / protective clothing.
Wear eye protection / face protection.
Ground/bond container and receiving equipment.
Keep container tightly closed.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a poison center/doctor.
If swallowed: Call a poison center/doctor if you feel unwell.
Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Wash contaminated clothing before reuse.
IF exposed or concerned: Get medical advice/attention.
If swallowed: Rinse mouth. Do NOT induce vomiting.
In case of fire: Use for extinction: CO₂, powder or water spray.
Take off contaminated clothing and wash it before reuse.
Store locked up.
Store in a well-ventilated place. Keep cool.
Dispose of contents/container in accordance with local/regional/national/international regulations.

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- **Classification system:**
- **NFPA ratings (scale 0 - 4)**



Health = 3
Fire = 3
Reactivity = 0

- **HMIS-ratings (scale 0 - 4)**



Health = *3
Fire = 3
Reactivity = 0

- **Hazard(s) not otherwise classified (HNOC):** None known

3 Composition/information on ingredients

- **Chemical characterization: Mixtures**
- **Description:** Mixture of substances listed below with nonhazardous additions.

- **Dangerous Components:**

CAS: 68-12-2 RTECS: LQ 2100000	N,N-dimethylformamide ⚠ Flam. Liq. 3, H226; ⚠ Repr. 1B, H360; ⚠ Acute Tox. 4, H312; Acute Tox. 4, H332; Eye Irrit. 2A, H319	80%
CAS: 110-89-4 RTECS: TM 3500000	piperidine ⚠ Flam. Liq. 2, H225; ⚠ Acute Tox. 3, H311; Acute Tox. 3, H331; ⚠ Skin Corr. 1B, H314	20%

4 First-aid measures

- **Description of first aid measures**
- **General information:**
Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing have been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
- **After inhalation:**
Supply fresh air or oxygen; call for doctor.
In case of unconsciousness, place patient securely on side position for transportation.
- **After skin contact:**
Immediately wash with water and soap and rinse thoroughly.
If skin irritation occurs, consult a doctor.
- **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing:** Drink copious amounts of water and provide fresh air. Immediately call a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:**
No further relevant information available.

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- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **Special hazards arising from the substance or mixture** No further relevant information available.
- **Advice for firefighters**
- **Protective equipment:**
Mouth respiratory protective device.
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:**
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (ie. sand, diatomite, acid binders, universal binders, sawdust).
Use neutralizing agent.
Dispose contaminated material as waste according to section 13.
Ensure adequate ventilation.
Dispose of the collected material according to regulations.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **Handling:**
- **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
Prevent formation of aerosols.
- **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
Keep protective respiratory device available.

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- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
 Keep receptacle tightly sealed.
 Store in cool, dry conditions in well sealed receptacles.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see section 7.
- **Control parameters**

· **Components with occupational exposure limits:**

68-12-2 N,N-dimethylformamide

PEL	Long-term value: 30 mg/m ³ , 10 ppm Skin
REL	Long-term value: 30 mg/m ³ , 10 ppm Skin
TLV	Long-term value: 30 mg/m ³ , 10 ppm Skin; BEI

110-89-4 piperidine

WEEL	Long-term value: 1 ppm Skin
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· **Ingredients with biological limit values:**

68-12-2 N,N-dimethylformamide

BEI	15 mg/L urine end of shift N-Methylformamide
	40 mg/L urine prior to last shift of workweek N-Acetyl-S-(N-methylcarbamoyl) cysteine (semi-quantitative)

- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
 The usual precautionary measures for handling chemicals should be followed.
 Keep away from foodstuffs, beverages and feed.
 Immediately remove all soiled and contaminated clothing and wash before reuse.
 Wash hands before breaks and at the end of work.
 Store protective clothing separately.
 Avoid contact with the eyes and skin.

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- **Breathing equipment:**

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure, use respiratory protective device that is independent of circulating air.

- **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Select glove material based on penetration times, rates of diffusion and degradation.

- **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application.

- **Penetration time of glove material**

The exact break-through time has to be determined and observed by the manufacturer of the protective gloves.

- **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

- **Information on basic physical and chemical properties**

- **General Information**

- **Appearance:**

Form:

Gel

Color:

See product specification

- **Odor:**

Mild

- **Odor threshold:**

Not determined.

- **pH-value:**

Not determined.

- **Change in condition**

Melting point/Melting range:

Not determined.

Boiling point/Boiling range:

106 °C (223 °F)

- **Flash point:**

4 °C (39 °F)

- **Flammability (solid, gaseous):**

Not applicable.

- **Ignition temperature:**

320 °C (608 °F)

- **Decomposition temperature:**

Not determined.

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- **Auto igniting:** Product is not self-igniting.
- **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
- **Explosion limits:**
 - Lower:** 1.3 Vol %
 - Upper:** 16.0 Vol %
- **Vapor pressure @ 20 °C (68 °F):** 33 hPa (25 mm Hg)
- **Density @ 20 °C (68 °F):** 0.932 g/cm³ (7.778 lbs/gal)
- **Relative density** Not determined.
- **Vapor density** Not determined.
- **Evaporation rate** Not determined.
- **Solubility in / Miscibility with Water:** Fully miscible.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
 - Dynamic:** Not determined.
 - Kinematic:** Not determined.
- **Solvent content:**
 - Organic solvents:** 0.0 %
- **Other information** No further relevant information available.

10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** Heat, flame and ignition sources.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
- **LD/LC50 values that are relevant for classification:**

68-12-2 N,N-dimethylformamide		
Oral	LD50	2800 mg/kg (rat)
Dermal	LD50	4720 mg/kg (rabbit)
Inhalative	LC50/4 h	9400 mg/l (mouse)

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Trade name: 20% Piperidine in DMF

110-89-4 piperidine

Oral	LD50	400 mg/kg (rat)
Dermal	LD50	320 mg/kg (rabbit)

• **Primary irritant effect:**

• **on the skin:**

Caustic effect on skin and mucous membranes.
Corrosive effect on skin and mucous membranes.
Corrosive to skin and mucous membranes.

• **on the eye:**

Strong caustic effect.
Corrosive effect.
Causes serious eye irritation.

• **Additional toxicological information:**

Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.
The product shows the following dangers according to internally approved calculation methods for preparations:
Toxic
Corrosive
Swallowing will lead to a corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.

• **Carcinogenic categories**

• **IARC (International Agency for Research on Cancer)**

68-12-2	N,N-dimethylformamide	3
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• **NTP (National Toxicology Program)**

None of the ingredients are listed.

• **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients are listed.

12 Ecological information

• **Toxicity**

• **Aquatic toxicity:** No further relevant information available.
• **Persistence and degradability:** No further relevant information available.

• **Behavior in environmental systems:**

• **Bioaccumulative potential:** No further relevant information available.
• **Mobility in soil:** No further relevant information available.

• **Additional ecological information:**

• **General notes:**

Do not allow product to reach ground water, water course or sewage system.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
Danger to drinking water if even small quantities leak into the ground.

• **Results of PBT and vPvB assessment**

• **PBT:** Not applicable.
• **vPvB:** Not applicable.

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- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

- **UN-Number**
- **DOT, ADR, IMDG, IATA** UN2920
- **UN proper shipping name**
- **DOT** Corrosive liquids, flammable, n.o.s. (Piperidine, N,N-Dimethylformamide)
- **ADR** UN2920 Corrosive liquids, flammable, n.o.s. (Piperidine, N,N-Dimethylformamide)
- **IMDG, IATA** CORROSIVE LIQUID, FLAMMABLE, N.O.S. (PIPERIDINE, N,N-DIMETHYLFORMAMIDE)
- **Transport hazard class(es)**
- **DOT**



- **Class** 8 Corrosive substances
- **Label** 8, 3

- **ADR**



- **Class** 8 (CF1) Corrosive substances
- **Label** 8+3

- **IMDG**



- **Class** 8 Corrosive substances

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· Label		8/3
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· IATA		
		
· Class		8 Corrosive substances
· Label		8 (3)
· Packing group		
· DOT, ADR, IMDG, IATA		I
· Environmental hazards:		Not applicable.
· Special precautions for user		Warning: Corrosive substances
· Danger code (Kemler):		883
· EMS Number:		F-E,S-C
· Segregation groups		Alkalis
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code		Not applicable.
· Transport/Additional information:		
· DOT		
· Quantity limitations		On passenger aircraft/rail: 0.5 L On cargo aircraft only: 2.5 L
<hr style="border-top: 1px dashed #000;"/>		
· ADR		
· Excepted quantities (EQ)		Code: E0 Not permitted as Excepted Quantity
<hr style="border-top: 1px dashed #000;"/>		
· IMDG		
· Limited quantities (LQ)		0
· Excepted quantities (EQ)		Code: E0 Not permitted as Excepted Quantity
· UN "Model Regulation":		UN2920, Corrosive liquids, flammable, n.o.s. (Piperidine, N,N-Dimethylformamide), 8 (3), I

15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture**
- Sara**

· Section 355 (extremely hazardous substances):

110-89-4	piperidine
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· Section 313 (Specific toxic chemical listings):

68-12-2	N,N-dimethylformamide
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· TSCA (Toxic Substances Control Act):

All ingredients are listed.

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· **California Proposition 65**

· **Chemicals known to cause cancer:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients are listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients are listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients are listed.

· **TLV (Threshold Limit Value established by ACGIH)**

68-12-2 N,N-dimethylformamide

A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients are listed.

· **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS02 GHS05 GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**

N,N-dimethylformamide
piperidine

· **Hazard statements**

Highly flammable liquid and vapor.
Harmful if swallowed, in contact with skin or if inhaled.
Causes severe skin burns and eye damage.
May damage fertility or the unborn child.

· **Precautionary statements**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Use explosion-proof electrical/ventilating/lighting/equipment.
Do not breathe dusts or mists.
Use only outdoors or in a well-ventilated area.
Wear protective gloves / eye protection / face protection.
Wear protective gloves / protective clothing.
Wear eye protection / face protection.
Ground/bond container and receiving equipment.
Keep container tightly closed.
Use only non-sparking tools.

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Take precautionary measures against static discharge.
 Wash thoroughly after handling.
 Do not eat, drink or smoke when using this product.
 Obtain special instructions before use.
 Do not handle until all safety precautions have been read and understood.
 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 Immediately call a poison center/doctor.
 If swallowed: Call a poison center/doctor if you feel unwell.
 Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 Wash contaminated clothing before reuse.
 IF exposed or concerned: Get medical advice/attention.
 If swallowed: Rinse mouth. Do NOT induce vomiting.
 In case of fire: Use for extinction: CO₂, powder or water spray.
 Take off contaminated clothing and wash it before reuse.
 Store locked up.
 Store in a well-ventilated place. Keep cool.
 Dispose of contents/container in accordance with local/regional/national/international regulations.

• **National regulations:**

The product is subject to be classified according with the latest version of the regulations on hazardous substances.

• **State Right to Know**

CAS: 68-12-2 RTECS: LQ 2100000	N,N-dimethylformamide ⚠ Flam. Liq. 3, H226; ⚠ Repr. 1B, H360; ⚠ Acute Tox. 4, H312; Acute Tox. 4, H332; Eye Irrit. 2A, H319	80%
CAS: 110-89-4 RTECS: TM 3500000	piperidine ⚠ Flam. Liq. 2, H225; ⚠ Acute Tox. 3, H311; Acute Tox. 3, H331; ⚠ Skin Corr. 1B, H314	20%
All ingredients are listed.		

• **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

• **Date of preparation / last revision** 05/10/2015 / 3

• **Abbreviations and acronyms:**

ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
 ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
 IMDG: International Maritime Code for Dangerous Goods
 DOT: US Department of Transportation
 IATA: International Air Transport Association
 ACGIH: American Conference of Governmental Industrial Hygienists

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EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
Flam. Liq. 2: Flammable liquids, Hazard Category 2
Flam. Liq. 3: Flammable liquids, Hazard Category 3
Acute Tox. 3: Acute toxicity, Hazard Category 3
Acute Tox. 4: Acute toxicity, Hazard Category 4
Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
Repr. 1B: Reproductive toxicity, Hazard Category 1B

• *** Data compared to the previous version altered.**

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