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

- **Product identifier**
  - **Trade name:** OFN Solution 13 (100,000 ng/mL)
  - **Part number:** LECO-004-13
  - **Application of the substance / the mixture:** Laboratory chemicals

- **Details of the supplier of the safety data sheet**
  - **Manufacturer/Supplier:**
    ULTRA Scientific, Inc.
    250 Smith Street
    North Kingstown, RI 02852
    USA
  - **Information department:**
    Telephone: (401) 294-9400
    Fax: (401) 295-2300
    E-mail: regulatory@ultrasci.com
  - **Emergency telephone number:**
    US: (800) 424-9300
    Outside US: (703) 527-3887

2 Hazard(s) identification

- **Classification of the substance or mixture**
  - **GHS02 Flame**
    Flam. Liq. 2 H225 Highly flammable liquid and vapor.
  - **GHS08 Health hazard**
    Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.
  - **GHS07**
    Skin Irrit. 2 H315 Causes skin irritation.
    STOT SE 3 H336 May cause drowsiness or dizziness.

- **Label elements**
  - **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
  - **Hazard pictograms**
    - GHS02
    - GHS07
    - GHS08

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  - 2,2,4-trimethylpentane

- **Hazard statements**
  - Highly flammable liquid and vapor.
Causes skin irritation. May cause drowsiness or dizziness. May be fatal if swallowed and enters airways.

· Precautionary statements

IF SWALLOWED: Immediately call a POISON CENTER/doctor. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Specific treatment (see on this label).

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. If skin irritation occurs: Get medical advice/attention. 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 container tightly closed. Store in a well-ventilated place. Keep cool.

Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:

   · NFPA ratings (scale 0 - 4)

   Health = 1
   Fire = 3
   Reactivity = 0

   · HMIS-ratings (scale 0 - 4)

   HEALTH : Health = 1
   FIRE : Fire = 3
   REACTIVITY : Reactivity = 0

· Other hazards

· Results of PBT and vPvB assessment

   · PBT: Not applicable.
   · vPvB: Not applicable.

3 Composition/information on ingredients

· Chemical characterization: Mixtures

   · Description: Mixture of the substances listed below with nonhazardous additions.

   · Dangerous components:

   540-84-1 2,2,4-trimethylpentane 99.985%
4 First-aid measures

- **Description of first aid measures**
- **General information**: Immediately remove any clothing soiled by the product.
- **After inhalation**: In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact**: Immediately wash with water and soap and rinse thoroughly.
- **After eye contact**: Rinse opened eye for several minutes under running water.
- **After swallowing**: If symptoms persist consult doctor.
- **Information for doctor**:
  - **Most important symptoms and effects, both acute and delayed**: No further relevant information available.
  - **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.
- **For safety reasons unsuitable extinguishing agents**: Water with full jet
- **Special hazards arising from the substance or mixture**: No further relevant information available.
- **Advice for firefighters**:
  - **Protective equipment**: No special measures required.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
  
  Wear protective equipment. Keep unprotected persons away.

- **Environmental precautions**: Do not allow to enter sewers/ surface or ground water.

- **Methods and material for containment and cleaning up**:
  
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  
  Dispose contaminated material as waste according to item 13.
  
  Ensure adequate ventilation.

- **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.

- **Protective Action Criteria for Chemicals**

  | PAC-1: | 2,2,4-trimethylpentane          | 230 ppm |
  | PAC-2: | 2,2,4-trimethylpentane          | 830 ppm  |
  | PAC-3: | 2,2,4-trimethylpentane          | 5000* ppm|

7 Handling and storage

- **Handling**:
- **Precautions for safe handling**
  
  Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.

- **Information about protection against explosions and fires:**
  - Keep ignition sources away - Do not smoke.
  - Protect against electrostatic charges.

- **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 item 7.

- **Control parameters**

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>540-84-1 2,2,4-trimethylpentane</td>
<td>2350 mg/m³, 500 ppm</td>
<td>PEL, n-Octane only</td>
</tr>
<tr>
<td></td>
<td>1401 mg/m³, 300 ppm</td>
<td>TLV, n-Octane only</td>
</tr>
</tbody>
</table>

- **Additional information:** The lists that were valid during the creation were used as basis.

- **Exposure controls**

- **Personal protective equipment:**

- **General protective and hygienic measures:**
  - Keep away from foodstuffs, beverages and feed.
  - Immediately remove all soiled and contaminated clothing.
  - Wash hands before breaks and at the end of work.
  - Avoid contact with the skin.
  - Avoid contact with the eyes and skin.

- **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. Selection of the glove material on consideration of the penetration times, rates of diffusion and the 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 can not 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 found out by the manufacturer of the protective gloves and has to be observed.
## 9 Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Information</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Form</td>
<td>Fluid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Nearly odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not determined</td>
</tr>
<tr>
<td>pH-value</td>
<td>Not determined</td>
</tr>
<tr>
<td><strong>Change in condition</strong></td>
<td></td>
</tr>
<tr>
<td>Melting point/Melting range</td>
<td>-107 °C (-161 °F)</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>99 °C (210 °F)</td>
</tr>
<tr>
<td>Flash point</td>
<td>-12 °C (10 °F)</td>
</tr>
<tr>
<td>Flammability (solid, gaseous)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>410 °C (770 °F)</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not determined</td>
</tr>
<tr>
<td>Auto igniting</td>
<td>Product is not selfigniting</td>
</tr>
<tr>
<td>Danger of explosion</td>
<td>Product is not explosive. However, formation of explosive air/vapor mixtures are possible.</td>
</tr>
<tr>
<td>Explosion limits</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>1.1 Vol %</td>
</tr>
<tr>
<td>Upper</td>
<td>6 Vol %</td>
</tr>
<tr>
<td>Vapor pressure at 20 °C (68 °F):</td>
<td>41.25 hPa (31 mm Hg)</td>
</tr>
<tr>
<td>Density at 20 °C (68 °F):</td>
<td>0.692 g/cm³ (5.775 lbs/gal)</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not determined</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not determined</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not determined</td>
</tr>
<tr>
<td>Solubility in / Miscibility with Water</td>
<td>Not miscible or difficult to mix.</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
<td>Not determined</td>
</tr>
<tr>
<td>Viscosity</td>
<td></td>
</tr>
<tr>
<td>Dynamic</td>
<td>Not determined</td>
</tr>
<tr>
<td>Kinematic</td>
<td>Not determined</td>
</tr>
<tr>
<td>Solvent content</td>
<td></td>
</tr>
<tr>
<td>Organic solvents</td>
<td>100.0 %</td>
</tr>
<tr>
<td>VOC content</td>
<td>100.0 %</td>
</tr>
<tr>
<td></td>
<td>999.9 g/l / 8.34 lb/gl</td>
</tr>
</tbody>
</table>
Trade name: OFN Solution 13 (100,000 ng/mL)

10 Stability and reactivity

- **Reactivity**: No further relevant information available.
- **Chemical stability**
  - **Thermal decomposition / conditions to be avoided**: No decomposition if used according to specifications.
  - **Possibility of hazardous reactions**: No dangerous reactions known.
- **Conditions to avoid**: No further relevant information available.
- **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**:
    - 540-84-1 2,2,4-trimethylpentane
      - Oral LD50 >5000 mg/kg (rat)
      - Dermal LD50 >2000 mg/kg (rabbit)
      - Inhalative LC50/4 h >33.52 mg/l (rat)
- **Primary irritant effect**:
  - **on the skin**: Irritant to skin and mucous membranes.
  - **on the eye**: No irritating effect.
- **Sensitization**: No sensitizing effects known.
- **Additional toxicological information**:
  - The product shows the following dangers according to internally approved calculation methods for preparations: Irritant
- **Carcinogenic categories**
  - **IARC (International Agency for Research on Cancer)**: None of the ingredients is listed.
  - **NTP (National Toxicology Program)**: None of the ingredients is listed.
  - **OSHA-Ca (Occupational Safety & Health Administration)**: None of the ingredients is 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.
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.

14 Transport information

- UN-Number
  - DOT, IMDG, IATA: UN1262

- UN proper shipping name
  - DOT: Octanes mixture
  - IMDG: OCTANES mixture, MARINE POLLUTANT
  - IATA: OCTANES mixture

- Transport hazard class(es)
  - DOT
    - Class: 3 Flammable liquids
    - Label: 3
  - IMDG
    - Class: 3 Flammable liquids
    - Label: 3

(Contd. of page 6)

- Additional ecological information:
  - General notes:
    Water hazard class 2 (Self-assessment): hazardous for water
    Do not allow product to reach ground water, water course or sewage system.
    Danger to drinking water if even small quantities leak into the ground.

- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.

- Other adverse effects
  No further relevant information available.
### Trade name: OFN Solution 13 (100,000 ng/mL)

<table>
<thead>
<tr>
<th>Class</th>
<th>3 Flammable liquids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label</td>
<td>3</td>
</tr>
</tbody>
</table>

### Environmental hazards:
- Product contains environmentally hazardous substances: 2,2,4-trimethylpentane
- Symbol (fish and tree)

### Special precautions for user
- Warning: Flammable liquids
- Danger code (Kemler): 33
- EMS Number: F-E,S-E
- Stowage Category: B

### Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
- Not applicable.

### Transport/Additional information:
- DOT
  - Quantity limitations:
    - On passenger aircraft/rail: 5 L
    - On cargo aircraft only: 60 L

### IMDG
- Limited quantities (LQ): 1L
- Excepted quantities (EQ): Code: E2
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 500 ml

### UN "Model Regulation"
- UN 1262 OCTANES MIXTURE, ENVIRONMENTALLY HAZARDOUS, 3, II, ENVIRONMENTALLY HAZARDOUS

### 15 Regulatory information
- Safety, health and environmental regulations/legislation specific for the substance or mixture
- Sara
  - Section 355 (extremely hazardous substances):
    - None of the ingredients is listed.
  - Section 313 (Specific toxic chemical listings):
    - None of the ingredients is listed.
  - TSCA (Toxic Substances Control Act):
    - 540-84-1 2,2,4-trimethylpentane
  - Proposition 65
    - Chemicals known to cause cancer:
      - None of the ingredients is listed.
Trade name: OFN Solution 13 (100,000 ng/mL)

- **Chemicals known to cause reproductive toxicity for females:** None of the ingredients is listed.

- **Chemicals known to cause reproductive toxicity for males:** None of the ingredients is listed.

- **Chemicals known to cause developmental toxicity:** None of the ingredients is listed.

- **Carcinogenic categories**
  - **EPA (Environmental Protection Agency)**
    - 540-84-1 2,2,4-trimethylpentane
  - **TLV (Threshold Limit Value established by ACGIH)** None of the ingredients is listed.
  - **NIOSH-Ca (National Institute for Occupational Safety and Health)** None of the ingredients is listed.

- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
  - **Hazard pictograms**
    - GHS02  GHS07  GHS08

- **Signal word** Danger

- **Hazard-determining components of labeling:** 2,2,4-trimethylpentane

- **Hazard statements**
  - Highly flammable liquid and vapor.
  - Causes skin irritation.
  - May cause drowsiness or dizziness.
  - May be fatal if swallowed and enters airways.

- **Precautionary statements**
  - Keep away from heat/sparks/open flames/hot surfaces. No smoking.
  - Use explosion-proof electrical/ventilating/lighting/equipment.
  - Avoid breathing dust/fume/gas/mist/vapors/spray
  - Wear protective gloves/protective clothing/eye protection/face protection.
  - Ground/bond container and receiving equipment.
  - Use only non-sparking tools.
  - Take precautionary measures against static discharge.
  - Wash thoroughly after handling.
  - Use only outdoors or in a well-ventilated area.
  - IF SWALLOWED: Immediately call a POISON CENTER/doctor.
  - IF on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  - Specific treatment (see on this label).
  - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  - Call a POISON CENTER/doctor if you feel unwell.
  - IF skin irritation occurs: Get medical advice/attention.
  - 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 container tightly closed.
Store in a well-ventilated place. Keep cool.
Dispose of contents/container in accordance with local/regional/national/international regulations.

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

### 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing SDS**: Document Control / Regulatory
- **Contact**: regulatory@ultrasci.com
- **Date of preparation / last revision**: 02/15/2017 / -
- **Abbreviations and acronyms**:
  - ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  - IMDG: International Maritime Code for Dangerous Goods
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - ACGIH: American Conference of Governmental Industrial Hygienists
  - 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)
  - VOC: Volatile Organic Compounds (USA, EU)
  - LC50: Lethal concentration, 50 percent
  - LD50: Lethal dose, 50 percent
  - PBT: Persistent, Bioaccumulative and Toxic
  - vPvB: very Persistent and very Bioaccumulative
  - NIOSH: National Institute for Occupational Safety
  - OSHA: Occupational Safety & Health
  - TLV: Threshold Limit Value
  - PEL: Permissible Exposure Limit
  - REL: Recommended Exposure Limit
  - Flam. Liq. 2: Flammable liquids – Category 2
  - Skin Irrit. 2: Skin corrosion/irritation – Category 2
  - STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
  - Asp. Tox. 1: Aspiration hazard – Category 1