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

- **Product identifier**
  - Trade name: OFN Solution 12 (50,000 ng/mL)
  - Part number: LECO-004-12
  - 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**
- 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.
- IF skin irritation occurs: Get medical advice/attention.
- Do NOT induce vomiting.
- In case of fire: Use for extinction: CO2, powder or water spray.
- 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
  - Fire = 1
  - 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 99.993%
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:
  - 540-84-1 2,2,4-trimethylpentane 230 ppm
- PAC-2:
  - 540-84-1 2,2,4-trimethylpentane 830 ppm
- PAC-3:
  - 540-84-1 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**
  - **Components with limit values that require monitoring at the workplace:**
    
<table>
<thead>
<tr>
<th>Component</th>
<th>PEL Limit values</th>
<th>TLV Limit values</th>
</tr>
</thead>
<tbody>
<tr>
<td>540-84-1 2,2,4-trimethylpentane</td>
<td>2350 mg/m³, 500 ppm</td>
<td>1401 mg/m³, 300 ppm</td>
</tr>
<tr>
<td>n-Octane only</td>
<td></td>
<td></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.

(Contd. on page 5)
9 Physical and chemical properties

- **Information on basic physical and chemical properties**
- **General Information**
  - **Appearance:**
    - Form: Fluid
    - Color: Colorless
  - **Odor:** Nearly odorless
  - **Odor threshold:** Not determined.
- **pH-value:** Not determined.

- **Change in condition**
  - **Melting point/Melting range:** -107 °C (-161 °F)
  - **Boiling point/Boiling range:** 99 °C (210 °F)

- **Flash point:** -12 °C (10 °F)

- **Flammability (solid, gaseous):** Not applicable.

- **Ignition temperature:** 410 °C (770 °F)

- **Decomposition temperature:** Not determined.

- **Danger of explosion:** Product is not selfigniting.

- **Explosion limits:**
  - Lower: 1.1 Vol %
  - Upper: 6 Vol %

- **Vapor pressure at 20 °C (68 °F):** 41.25 hPa (31 mm Hg)

- **Density at 20 °C (68 °F):** 0.692 g/cm³ (5.775 lbs/gal)

- **Relative density**
  - Not determined.

- **Vapor density**
  - Not determined.

- **Evaporation rate**
  - Not determined.

- **Solubility in / Miscibility with Water:** Not miscible or difficult to mix.

- **Partition coefficient (n-octanol/water):** Not determined.

- **Viscosity:**
  - Dynamic: Not determined.
  - Kinematic: Not determined.

- **Solvent content:**
  - Organic solvents: 100.0 %
  - VOC content: 100.0 %
    - 999.9 g/l / 8.34 lb/gl

(Contd. on page 6)
Trade name: OFN Solution 12 (50,000 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.
44.1.9 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.

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
### 14. Special Precautions for User

- **Warning:** Flammable liquids
- **Danger code (Kemler):** 33
- **EMS Number:** F-E,S-E
- **Stowage Category:** B

### 15. Regulatory Information

#### 15.1. 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-I 2,2,4-trimethylpentane
  - **Proposition 65**
  - **Chemicals known to cause cancer:** None of the ingredients is listed.
· 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
    II
  
  · 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