1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>MSDS Name:</th>
<th>1-Fluoro-2,4-dinitrobenzene</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms:</td>
<td>Sanger's reagent; FDNB; DNFB; 2,4-Dinitrofluorobenzene</td>
</tr>
<tr>
<td>Company Identification:</td>
<td>Sisco Research Laboratories Pvt. Ltd. Andheri (East), Mumbai – 400 099. Tel: +91 22 2687 2601 Fax: +91 22 2687 8241 Website: <a href="http://www.srlchem.com">www.srlchem.com</a></td>
</tr>
</tbody>
</table>

2 - COMPOSITION, INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name:</th>
<th>%</th>
<th>EINECS#</th>
</tr>
</thead>
<tbody>
<tr>
<td>70-34-8</td>
<td>2,4-Dinitrofluorobenzene</td>
<td>99%</td>
<td>200-734-3</td>
</tr>
</tbody>
</table>

3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Danger! Causes eye and skin irritation and possible burns. Vesicant (agent that induces blistering). May cause allergic respiratory and skin reaction. Causes digestive and respiratory tract irritation with possible burns. May be fatal if absorbed through the skin or swallowed.

Target Organs: Central nervous system, respiratory system, eyes, skin.

**Potential Health Effects**

- **Eye:** Causes eye irritation and possible burns.
- **Skin:** Causes severe skin irritation. May be fatal if absorbed through the skin. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. This material is a vesicant, that is, it will induce blistering.
- **Ingestion:** May be fatal if swallowed. May cause severe gastrointestinal tract irritation with nausea, vomiting and possible burns. May cause central nervous system effects. Ingestion of large amounts of fluoride may cause salivation, nausea, vomiting, abdominal pain, fever, labored breathing. Exposure to fluoride compounds can result in systemic toxic effects on the heart, liver, and kidneys. It may also deplete calcium levels in the body leading to hypocalcemia and death. Acute oral toxicity tests have shown lethality with central nervous system signs in mice.
- **Inhalation:** May cause allergic respiratory reaction. May cause severe irritation of the respiratory tract with possible burns.
- **Chronic:** Chronic inhalation and ingestion may cause chronic fluoride poisoning (fluorosis) characterized by weight loss, weakness, anemia, brittle bones, and stiff joints. Repeated
exposure may cause central nervous system damage. Chronic exposure to fluoride compounds may cause systemic toxicity.

4 - FIRST AID MEASURES

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: POISON material. In case of contact, get medical aid immediately. Immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: POISON material. If swallowed, get medical aid immediately. Only induce vomiting if directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

5 - FIRE FIGHTING MEASURES

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Violently decomposes when heated under confinement.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

6 - ACCIDENTAL RELEASE MEASURES

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Provide ventilation. Evacuate unnecessary personnel. Keep unnecessary and unprotected personnel away.

7 – HANDLING AND STORAGE

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not breathe dust, mist,
or vapor. Do not get in eyes, on skin, or on clothing. Use only with adequate ventilation.

**Storage:**
Store in a cool, dry, well-ventilated area away from incompatible substances.

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**8 – EXPOSURE CONTROLS, PERSONAL PROTECTION**

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

**Exposure Limits**
Not available

**Personal Protective Equipment**

**Eyes:** Wear chemical splash goggles.

**Skin:** Wear appropriate protective gloves to prevent skin exposure.

**Clothing:** Wear appropriate protective clothing to prevent skin exposure.

**Respirators:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

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**9 - PHYSICAL AND CHEMICAL PROPERTIES**

**Physical State:** Solid

**Color:** yellow

**Specific Gravity/Density:** 1.520-1.540

**Molecular Formula:** $C_6H_3FN_2O_4$

**Molecular Weight:** 186.10

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**10 - STABILITY AND REACTIVITY**

**Chemical Stability:** Stable under normal temperatures and pressures.

**Conditions to Avoid:** Excess heat, Solution in ether may explode when evaporated., confined spaces.

**Incompatibilities with Other Materials:** Strong oxidizing agents, strong bases.

**Hazardous Decomposition Products:** Nitrogen oxides, carbon monoxide, carbon dioxide, hydrogen fluoride gas.

**Hazardous Polymerization:** Has not been reported.

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**11 - TOXICOLOGICAL INFORMATION**

**RTECS#:** CAS# 70-34-8: CZ7800000

**LD50/LC50:** RTECS: Not available. Other: Rat LDLo Oral: 50 mg/kg (RTECS), Mouse LDLo Skin: 100 mg/kg
Carcinogenicity: 2,4-Dinitrofluorobenzene - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Other: The hazards associated with nitrobenzene may be seen in this product.

12 - ECOLOGICAL INFORMATION
Not available

13 - DISPOSAL CONSIDERATIONS
Not available

14 - TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>IATA</th>
<th>IMO</th>
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</thead>
<tbody>
<tr>
<td>Shipping Name:</td>
<td>Toxic Solids,</td>
<td>Toxic Solids,</td>
</tr>
<tr>
<td></td>
<td>Organic, N.O.S.</td>
<td>Organic, N.O.S.</td>
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<tr>
<td>Hazard Class:</td>
<td>6.1</td>
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<tr>
<td>UN Number:</td>
<td>2811</td>
<td>2811</td>
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<tr>
<td>Packing Group:</td>
<td>II</td>
<td>II</td>
</tr>
</tbody>
</table>

15 - REGULATORY INFORMATION

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols: T
Risk Phrases: R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed. R 33 Danger of cumulative effects. R 42/43 May cause sensitization by inhalation and skin contact. R 44 Risk of explosion if heated under confinement.
Safety Phrases: S 28A After contact with skin, wash immediately with plenty of water. S 37 Wear suitable gloves. S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection) CAS# 70-34-8: Not available
Canada CAS# 70-34-8 is listed on Canada's DSL List
US Federal TSCA CAS# 70-34-8 is listed on the TSCA Inventory.
Health & Safety Reporting List None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules None of the chemicals in this product are under a Chemical Test Rule.
Section 12b None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use
Rule

None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs

None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes CAS # 70-34-8: acute.

Section 313 No chemicals are reportable under Section 313.

Clean Air Act: This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.

Clean Water Act: None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA: STATE 2,4-Dinitrofluorobenzene is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65 California No Significant Risk Level: None of the chemicals in this product are listed.

SISCO RESEARCH LABORATORIES provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.