<table>
<thead>
<tr>
<th>Product code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N8140504</td>
<td><strong>Nexion Sloution Kit</strong></td>
</tr>
</tbody>
</table>

Components:

<table>
<thead>
<tr>
<th>Product code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N8145051</td>
<td>NexION Setup Solution</td>
</tr>
<tr>
<td>N8145050</td>
<td>NexION Rinse Solution</td>
</tr>
<tr>
<td>N8145055</td>
<td>NexION STD/DRC Mode Detection Limit Blank Solution</td>
</tr>
<tr>
<td>N8145056</td>
<td>NexION STD/DRC Mode Detection Limit Standard Solution</td>
</tr>
<tr>
<td>N8145059</td>
<td>NexION Dual Detector Calibration Solution</td>
</tr>
<tr>
<td>N8145054</td>
<td>NexION Cell Stability Solution</td>
</tr>
<tr>
<td>N8145057</td>
<td>NEXION KED MODE DETECTION LIMIT BLANK SOLUTION</td>
</tr>
<tr>
<td>N8145058</td>
<td>NexION KED Mode Detection Limit Standard Solution</td>
</tr>
<tr>
<td>N8145052</td>
<td>NexION KED Mode Setup Solution</td>
</tr>
</tbody>
</table>
1 Identification

· Product identifier

· Trade name: NexION Setup Solution
· Article number N8145051
· Application of the substance / the mixture Laboratory chemicals

· Details of the supplier of the safety data sheet
· Manufacturer/Supplier:
  PerkinElmer, Inc.
  710 Bridgeport Avenue
  Shelton, Connecticut 06484 USA
  CustomerCareUS@perkinelmer.com
  203-925-4600

· Emergency telephone number:
  CHEMTREC (within US)  800-424-9300
  CHEMTREC (from outside US) +1 703-527-3887 (call collect)
  CHEMTREC (within AU) +(61)-290372994

2 Hazard(s) identification

· Classification of the substance or mixture

Skin Irrit. 2  H315  Causes skin irritation.
Eye Irrit. 2A H319  Causes serious eye irritation.

· Label elements
· GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
· Hazard pictograms GHS07
· Signal word Warning
· Hazard statements
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
· Precautionary statements
  P264  Wash thoroughly after handling.
  P280  Wear protective gloves / eye protection / face protection.
  P302+P352  If on skin: Wash with plenty of water.
  P321  Specific treatment (see on this label).
  P305+P351+P338  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P332+P313  If skin irritation occurs: Get medical advice/attention.
  P362+P364  Take off contaminated clothing and wash it before reuse.
  P337+P313  If eye irritation persists: Get medical advice/attention.

· Classification system:
· NFPA ratings (scale 0 - 4)
  Health = 2
  Fire = 0
  Reactivity = 0

(Contd. on page 2)
Trade name: NexION Setup Solution

· **HMIS-ratings (scale 0 - 4)**

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Health = 2
Fire = 0
Reactivity = 0

· **Other hazards**
The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.

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

· **Composition/information on ingredients**

**3 Composition/information on ingredients**

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

**Hazardous components:**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Description</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
<td>1.0%</td>
</tr>
<tr>
<td>7439-93-2</td>
<td>lithium</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Water-react. 1, H260</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skin Corr. 1B, H314</td>
<td></td>
</tr>
<tr>
<td>7440-41-7</td>
<td>beryllium</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Acute Tox. 3, H301; Acute Tox. 2, H330</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carc. 1B, H350; STOT RE 1, H372</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skin Irrit. 2, H315; Eye Irrit. 2A, H319; Skin Sens. 1, H317; STOT SE 3, H335</td>
<td></td>
</tr>
<tr>
<td>7439-95-4</td>
<td>magnesium</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Pyr. Sol. 1, H250; Water-react. 1, H260</td>
<td></td>
</tr>
<tr>
<td>7439-89-6</td>
<td>iron</td>
<td>0.0001%</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>Indium</td>
<td>0.0001%</td>
</tr>
<tr>
<td>7440-45-1</td>
<td>cerium</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Water-react. 2, H261</td>
<td></td>
</tr>
<tr>
<td>7439-92-1</td>
<td>lead</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Acute Tox. 3, H301</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carc. 2, H351; Repr. 1A, H360-H362</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acute Tox. 4, H332</td>
<td></td>
</tr>
<tr>
<td>7440-61-1</td>
<td>uranium</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Acute Tox. 2, H300; Acute Tox. 2, H330</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STOT RE 2, H373</td>
<td></td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>98.9992%</td>
</tr>
</tbody>
</table>

(Contd. on page 3)
4 First-aid measures

- Description of first aid measures
  - 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. If symptoms persist, consult a doctor.
  - After swallowing: If symptoms persist consult 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: Use fire fighting measures that suit the environment.
- 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: Not required.
- Environmental precautions: Inform respective authorities in case of seepage into water course or sewage system.
- Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
- 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:
  - 7697-37-2 Nitric Acid 0.16 ppm
  - 7439-93-2 lithium 3.3 mg/m³
  - 7440-41-7 beryllium 0.0023 mg/m³
  - 7439-95-4 magnesium 18 mg/m³
  - 7439-89-6 iron 3.2 mg/m³
  - 7440-74-6 Indium 0.3 mg/m³
  - 7440-45-1 cerium 30 mg/m³
  - 7439-92-1 lead 0.15 mg/m³
  - 7440-61-1 uranium 0.6 mg/m³

  PAC-2:
  - 7697-37-2 Nitric Acid 24 ppm
  - 7439-93-2 lithium 36 mg/m³
Trade name: NexION Setup Solution

<table>
<thead>
<tr>
<th>Substance</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>beryllium</td>
<td>0.025 mg/m³</td>
</tr>
<tr>
<td>magnesium</td>
<td>200 mg/m³</td>
</tr>
<tr>
<td>iron</td>
<td>35 mg/m³</td>
</tr>
<tr>
<td>Indium</td>
<td>3.3 mg/m³</td>
</tr>
<tr>
<td>cerium</td>
<td>330 mg/m³</td>
</tr>
<tr>
<td>lead</td>
<td>120 mg/m³</td>
</tr>
<tr>
<td>uranium</td>
<td>5 mg/m³</td>
</tr>
</tbody>
</table>

**PAC-3:**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric Acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>lithium</td>
<td>220 mg/m³</td>
</tr>
<tr>
<td>beryllium</td>
<td>0.1 mg/m³</td>
</tr>
<tr>
<td>magnesium</td>
<td>1,200 mg/m³</td>
</tr>
<tr>
<td>iron</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td>Indium</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>cerium</td>
<td>2,000 mg/m³</td>
</tr>
<tr>
<td>lead</td>
<td>700 mg/m³</td>
</tr>
<tr>
<td>uranium</td>
<td>30 mg/m³</td>
</tr>
</tbody>
</table>

**Handling and storage**

- **Handling:**
  - Precautions for safe handling: No special precautions are necessary if used correctly.
  - Information about protection against explosions and fires: No special measures required.

- **Conditions for safe storage, including any incompatibilities**
  - **Storage:**
    - Requirements to be met by storerooms and receptacles: No special requirements.
    - Information about storage in one common storage facility: Not required.

- **Specific end use(s)**: No further relevant information available.

**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:
    | Substance    | Limit Value |
    |--------------|-------------|
    | Nitric Acid  |             |
    | PEL          | Long-term value: 5 mg/m³, 2 ppm |
    | REL          | Short-term value: 10 mg/m³, 4 ppm |
    |              | Long-term value: 5 mg/m³, 2 ppm |
    | TLV          | Short-term value: 10 mg/m³, 4 ppm |
    |              | Long-term value: 5.2 mg/m³, 2 ppm |
Trade name: NexION Setup Solution

- 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 eyes and skin.
  - Breathing equipment: Not required.
  - Protection of hands:
    
    Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
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 trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

- Eye protection:
  
  Tightly sealed goggles or safety glasses

- 9 Physical and chemical properties

  - Information on basic physical and chemical properties
    - General Information
      
      - Appearance:
        | Form: | Liquid |
        | Color: | Not determined. |
        | Odor: | Characteristic |
        | Odor threshold: | Not determined. |

      - pH-value: Not determined.

    - Change in condition
      | Melting point/Melting range: | 0 °C (32 °F) |
      | Boiling point/Boiling range: | 100 °C (212 °F) |

    - Flash point: Not applicable.

    - Flammability (solid, gaseous): Not applicable.
**Trade name: NexION Setup Solution**

- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not selfigniting.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - **Lower:** Not determined.
  - **Upper:** Not determined.
- **Vapor pressure at 20 °C (68 °F):** 23 hPa (17.3 mm Hg)
- **Density:** Not determined.
- **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:**
  - **Water:** 99.0 %
  - **VOC content:** 0.00 %
- **Other information** No further relevant information available.

**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:**
    - **Primary irritant effect:**
      - **on the skin:** Irritant to skin and mucous membranes.
      - **on the eye:** Irritating effect.
    - **Sensitization:** No sensitizing effects known.
  - **Additional toxicological information:**
    The product shows the following dangers according to internally approved calculation methods for preparations: (Contd. on page 7)
Trade name: NexION Setup Solution

Irritant

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.
    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:
  Dispose of container and materials in accordance with local, regional and national regulations.
- Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
  - DOT, ADR, IMDG, IATA UN3264
- UN proper shipping name
  - DOT Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)
  - ADR 3264 Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)
Trade name: NexION Setup Solution

<table>
<thead>
<tr>
<th>IMDG, IATA</th>
<th>CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric Acid)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transport hazard class(es)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>DOT</strong></td>
<td></td>
</tr>
<tr>
<td>· Class</td>
<td>8</td>
</tr>
<tr>
<td>· Label</td>
<td>8</td>
</tr>
<tr>
<td><strong>ADR</strong></td>
<td></td>
</tr>
<tr>
<td>· Class</td>
<td>8 (C1) Corrosive substances</td>
</tr>
<tr>
<td>· Label</td>
<td>8</td>
</tr>
<tr>
<td><strong>IMDG, IATA</strong></td>
<td></td>
</tr>
<tr>
<td>· Class</td>
<td>8</td>
</tr>
<tr>
<td>· Label</td>
<td>8</td>
</tr>
<tr>
<td><strong>Packing group</strong></td>
<td>III</td>
</tr>
<tr>
<td><strong>DOT, ADR, IMDG, IATA</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Environmental hazards:</strong></td>
<td></td>
</tr>
<tr>
<td>· Marine pollutant:</td>
<td>No</td>
</tr>
<tr>
<td><strong>Special precautions for user</strong></td>
<td>Warning: Corrosive substances</td>
</tr>
<tr>
<td>· Danger code (Kemler):</td>
<td>80</td>
</tr>
<tr>
<td>· EMS Number:</td>
<td>F-A,S-B</td>
</tr>
<tr>
<td><strong>Segregation groups</strong></td>
<td>Acids</td>
</tr>
<tr>
<td><strong>Stowage Category</strong></td>
<td>A</td>
</tr>
<tr>
<td><strong>Stowage Code</strong></td>
<td>SW2 Clear of living quarters.</td>
</tr>
<tr>
<td><strong>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</strong></td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>

**Transport/Additional information:**

| DOT |  |
| **Quantity limitations** |  |
| · On passenger aircraft/rail: 5 L  |
| · On cargo aircraft only: 60 L  |
## ADR
- **Exception quantities (EQ)**
  - Code: E1
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 1000 ml

## IMDG
- **Limited quantities (LQ)**: 5L
- **Exception quantities (EQ)**
  - Code: E1
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 1000 ml

## UN "Model Regulation":
- UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, III

### 15 Regulatory information

#### Safety, health and environmental regulations/legislation specific for the substance or mixture

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Percent</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>98.9992%</td>
<td></td>
</tr>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
<td>1.0%</td>
<td>Ox. Liq. 2, H272; Skin Corr. 1A, H314</td>
</tr>
<tr>
<td>7440-41-7</td>
<td>beryllium</td>
<td>0.0001%</td>
<td>Acute Tox. 3, H301; Acute Tox. 2, H330; Carc. 1B, H350; STOT RE 1, H372; Skin Irrit. 2, H315; Eye Irrit. 2A, H319; Skin Sens. 1, H317; STOT SE 3, H335</td>
</tr>
</tbody>
</table>

#### Sara
- **Section 355 (extremely hazardous substances):**
  - 7697-37-2 Nitric Acid

- **Section 313 (Specific toxic chemical listings):**
  - 7697-37-2 Nitric Acid
  - 7440-41-7 beryllium
  - 7439-92-1 lead

#### TSCA (Toxic Substances Control Act):
- All ingredients are listed.
  - 7697-37-2 Nitric Acid
  - 7439-93-2 lithium
  - 7440-41-7 beryllium
  - 7439-95-4 magnesium
  - 7439-89-6 iron
  - 7440-74-6 Indium
  - 7440-45-1 cerium
  - 7439-92-1 lead
  - 7440-61-1 uranium
Trade name: NexION Setup Solution

7732-18-5 Water

- Proposition 65
  - Chemicals known to cause cancer:
    - 7440-41-7 beryllium
    - 7439-92-1 lead
  - Chemicals known to cause reproductive toxicity for females:
    - 7439-92-1 lead
  - Chemicals known to cause reproductive toxicity for males:
    - 7439-92-1 lead
  - Chemicals known to cause developmental toxicity:
    - 7439-92-1 lead

- Cancerogenity categories
  - EPA (Environmental Protection Agency)
    - 7440-41-7 beryllium B1, K/L(inh), CBD(oral)
    - 7439-92-1 lead B2
  - TLV (Threshold Limit Value established by ACGIH)
    - 7440-41-7 beryllium A1
    - 7439-92-1 lead A3
    - 7440-61-1 uranium A1
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    - 7440-41-7 beryllium
    - 7440-61-1 uranium

- National regulations:
  - Information about limitation of use:
    - Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
  - Water hazard class: Water hazard class 2 (Self-assessment): hazardous for water.
  - Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

* 16 Other information

Disclaimer
The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer shall not be held liable for any damage resulting from handling or from contact with the product.

- Department issuing SDS: Environmental, Health and Safety
Trade name: NexION Setup Solution

- Contact:
  Within the USA: 1-(800)-762-4000
  Outside the USA: 1-(203)-712-8488

- Abbreviations and acronyms:
  RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
  ICAO: International Civil Aviation Organisation
  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)
  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
  Ox. Liq. 2: Oxidizing liquids – Category 2
  Skin Corr. 1A: Skin corrosion/irritation – Category 1A
  Skin Irrit. 2: Skin corrosion/irritation – Category 2
  Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A

* Data compared to the previous version altered.
1 Identification

- Product identifier
  - Trade name: NexION Rinse Solution
  - Article number N8145050
  - Application of the substance / the mixture Laboratory chemicals
- Details of the supplier of the safety data sheet
  - Manufacturer/Supplier:
    PerkinElmer, Inc.
    710 Bridgeport Avenue
    Shelton, Connecticut 06484 USA
    CustomerCareUS@perkinelmer.com
    203-925-4600
- Emergency telephone number:
  CHEMTREC (within US)  800-424-9300
  CHEMTREC (from outside US) +1 703-527-3887 (call collect)
  CHEMTREC (within AU) +(61)-290372994

2 Hazard(s) identification

- Classification of the substance or mixture
  - Skin Irrit. 2  H315  Causes skin irritation.
  - Eye Irrit. 2A  H319  Causes serious eye irritation.
- Label elements
  - GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
  - Hazard pictograms GHS07
  - Signal word Warning
- Hazard statements
  - H315 Causes skin irritation.
  - H319 Causes serious eye irritation.
- Precautionary statements
  - P264 Wash thoroughly after handling.
  - P280 Wear protective gloves / eye protection / face protection.
  - P302+P352 If on skin: Wash with plenty of water.
  - P321 Specific treatment (see on this label).
  - P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  - P332+P313 If skin irritation occurs: Get medical advice/attention.
  - P362+P364 Take off contaminated clothing and wash it before reuse.
  - P337+P313 If eye irritation persists: Get medical advice/attention.
- Classification system:
  - NFPA ratings (scale 0 - 4)
    - Health = 2
    - Fire = 0
    - Reactivity = 0

(Contd. on page 2)
Trade name: NexION Rinse Solution

- HMIS-ratings (scale 0 - 4)
  
<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FIRE</th>
<th>REACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

  Health = 2  
  Fire = 0  
  Reactivity = 0

- Other hazards
  The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.

- 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.

- Hazardous components
  7697-37-2 Nitric Acid Ox. Liq. 2, H272 Skin Corr. 1A, H314
  1.0%

- Additional Components
  7732-18-5 Water
  99.0%

4 First-aid measures

- Description of first aid measures
- 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. If symptoms persist, consult a doctor.
- After swallowing: If symptoms persist consult 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: Use fire fighting measures that suit the environment.
- 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: Not required.
Trade name: NexION Rinse Solution

(Contd. of page 2)

· Environmental precautions: Inform respective authorities in case of seepage into water course or sewage system.

· Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

· 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: | 7697-37-2 Nitric Acid | 0.16 ppm |
| PAC-2: | 7697-37-2 Nitric Acid | 24 ppm |
| PAC-3: | 7697-37-2 Nitric Acid | 92 ppm |

* 7 Handling and storage

· Handling:
  · Precautions for safe handling: No special precautions are necessary if used correctly.
  · Information about protection against explosions and fires: No special measures required.

· Conditions for safe storage, including any incompatibilities

· Storage:
  · Requirements to be met by storerooms and receptacles: No special requirements.
  · Information about storage in one common storage facility: Not required.
  · Further information about storage conditions: Keep receptacle tightly sealed.

· 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>7697-37-2 Nitric Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL: Long-term value: 5 mg/m³, 2 ppm</td>
</tr>
<tr>
<td>REL: Short-term value: 10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td>Long-term value: 5 mg/m³, 2 ppm</td>
</tr>
<tr>
<td>TLV: Short-term value: 10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td>Long-term value: 5.2 mg/m³, 2 ppm</td>
</tr>
</tbody>
</table>

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

· Exposure controls

· Personal protective equipment:
  Keep away from foodstuffs, beverages and feed.
  Immediately remove all soiled and contaminated clothing.
Trade name: NexION Rinse Solution

Wash hands before breaks and at the end of work. Avoid contact with the eyes and skin.

- **Breathing equipment:** Not required.
- **Protection of hands:**

  ![Protective gloves]

  The glove material has to be impermeable and resistant to the product/substance/preparation. 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 trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:**

  ![Tightly sealed goggles or safety glasses]

  Tightly sealed goggles or safety glasses

---

### 9 Physical and chemical properties

- **Information on basic physical and chemical properties**
  **General Information**
  **Appearance:**
  - **Form:** Liquid
  - **Color:** According to product specification
  - **Odor:** Characteristic
  - **Odor threshold:** Not determined.
  - **pH-value:** Not determined.

- **Change in condition**
  - **Melting point/Melting range:** 0 °C (32 °F)
  - **Boiling point/Boiling range:** 100 °C (212 °F)

- **Flash point:** Not applicable.

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

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Product is not selfigniting.

- **Danger of explosion:** Product does not present an explosion hazard.

- **Explosion limits:**
  - **Lower:** Not determined.
Trade name: NexION Rinse Solution

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>· Vapor pressure at 20 °C (68 °F):</td>
<td>23 hPa (17.3 mm Hg)</td>
</tr>
<tr>
<td>· Density:</td>
<td>Not determined.</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>99.0 %</td>
</tr>
<tr>
<td>Water:</td>
<td></td>
</tr>
<tr>
<td>VOC content:</td>
<td>0.00 %</td>
</tr>
<tr>
<td>· Other information</td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>

*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:
  - Primary irritant effect:
    - on the skin: Irritant to skin and mucous membranes.
    - on the eye: 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.
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.
      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:
  Dispose of container and materials in accordance with local, regional and national regulations.
- Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
- DOT, ADR, IMDG, IATA: UN3264
- UN proper shipping name
  - DOT: Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)
  - ADR: 3264 Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)
  - IMDG, IATA: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric Acid)
### Transport hazard class(es)

<table>
<thead>
<tr>
<th>DOT</th>
<th>ADR</th>
<th>IMDG, IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>8 Corrosive substances</td>
<td>Class 8 Corrosive substances</td>
</tr>
<tr>
<td>Label</td>
<td>8</td>
<td>Label 8</td>
</tr>
</tbody>
</table>

### Packing group
- DOT, ADR, IMDG, IATA: III

### Environmental hazards:
- Marine pollutant: No

### Special precautions for user
- Warning: Corrosive substances
- Danger code (Kemler): 80
- EMS Number: F-A.S-B
- Segregation groups: Acids
- Stowage Category: A
- Stowage Code: SW2 Clear of living quarters.

### 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

- ADR
  - Excepted quantities (EQ)
    - Code: E1
    - Maximum net quantity per inner packaging: 30 ml
    - Maximum net quantity per outer packaging: 1000 ml
Trade name: NexION Rinse Solution

- IMDG
  - Limited quantities (LQ) 5L
  - Excepted quantities (EQ) Code: E1
    Maximum net quantity per inner packaging: 30 ml
    Maximum net quantity per outer packaging: 1000 ml

- UN "Model Regulation": UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, III

15 Regulatory information

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

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
<th>%</th>
<th>Regulation</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>99.0%</td>
<td>Ox. Liq. 2, H272</td>
<td>Ox. Liq. 2, H272</td>
</tr>
<tr>
<td>Nitric Acid</td>
<td>7697-37-2</td>
<td>1.0%</td>
<td>Skin Corr. 1A, H314</td>
<td>Skin Corr. 1A, H314</td>
</tr>
</tbody>
</table>

- Sara

  - Section 355 (extremely hazardous substances):
    7697-37-2 Nitric Acid

  - Section 313 (Specific toxic chemical listings):
    7697-37-2 Nitric Acid

- TSCA (Toxic Substances Control Act):
  All ingredients are listed.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric Acid</td>
<td>7697-37-2</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
</tr>
</tbody>
</table>

- 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.

- Cancerogenity categories

  - EPA (Environmental Protection Agency)
    None of the ingredients is listed.

  - 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.
Trade name: NexION Rinse Solution

- National regulations:
- Information about limitation of use:
  Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
- Water hazard class: Water hazard class 2 (Self-assessment): hazardous for water.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

* 16 Other information

Disclaimer
The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer shall not be held liable for any damage resulting from handling or from contact with the product.

- Department issuing SDS: Environmental, Health and Safety
- Contact:
  Within the USA: 1-(800)-762-4000
  Outside the USA: 1-(203)-712-8488
- Abbreviations and acronyms:
  RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
  ICAO: International Civil Aviation Organisation
  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)
  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
  Ox. Liq. 2: Oxidizing liquids – Category 2
  Skin Corr. 1A: Skin corrosion/irritation – Category 1A
  Skin Irrit. 2: Skin corrosion/irritation – Category 2
  Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A

* Data compared to the previous version altered.
1 Identification

- Product identifier
  - Trade name: NexION STD/DRC Mode Detection Limit Blank Solution
  - Article number N8145055
  - Application of the substance / the mixture Laboratory chemicals

- Details of the supplier of the safety data sheet
  - Manufacturer/Supplier: PerkinElmer, Inc.
    710 Bridgeport Avenue
    Shelton, Connecticut 06484 USA
    CustomerCareUS@perkinelmer.com
    203-925-4600

- Emergency telephone number:
  CHEMTREC (within US)  800-424-9300
  CHEMTREC (from outside US) +1 703-527-3887 (call collect)
  CHEMTREC (within AU) +(61)-290372994

2 Hazard(s) identification

- Classification of the substance or mixture
  The product is not classified, according to the Globally Harmonized System (GHS).

- Label elements
  - GHS label elements Void
  - Hazard pictograms Void
  - Signal word Void
  - Hazard statements Void
  - Classification system:
    - NFPA ratings (scale 0 - 4)
      Health = 0
      Fire = 0
      Reactivity = 0
    - HMIS-ratings (scale 0 - 4)
      HEALTH 0
      FIRE 0
      REACTIVITY 0

- Other hazards
  The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.

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

(Contd. on page 2)
**3 Composition/information on ingredients**

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

### Additional Components

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Ox. Liq.</th>
<th>Skin Corr.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
<td>2, H272</td>
<td>1A, H314</td>
<td>0.5%</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td></td>
<td></td>
<td>99.5%</td>
</tr>
</tbody>
</table>

**4 First-aid measures**

- **Description of first aid measures**
- **General information:** No special measures required.
- **After inhalation:** Supply fresh air; consult doctor in case of complaints.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If symptoms persist consult 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:** Use fire fighting measures that suit the environment. Water
- **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:** Not required.
- **Environmental precautions:** Inform respective authorities in case of seepage into water course or sewage system. 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).
- **Reference to other sections**
  - No dangerous substances are released.
  - See Section 7 for information on safe handling.
  - See Section 8 for information on personal protection equipment.
  - See Section 13 for disposal information.
Trade name: NexION STD/DRC Mode Detection Limit Blank Solution

Protective Action Criteria for Chemicals

- PAC-1:
  7697-37-2 Nitric Acid 0.16 ppm

- PAC-2:
  7697-37-2 Nitric Acid 24 ppm

- PAC-3:
  7697-37-2 Nitric Acid 92 ppm

Handling and storage

- Handling:
  - Precautions for safe handling: No special measures required.
  - Information about protection against explosions and fires: No special measures required.

- Conditions for safe storage, including any incompatibilities
  - Storage:
    - Requirements to be met by storerooms and receptacles: No special requirements.
    - Information about storage in one common storage facility: Not required.
    - Further information about storage conditions: None.

- Specific end use(s): No further relevant information available.

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:
    The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

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

- Exposure controls
  - Personal protective equipment:
    - General protective and hygienic measures:
      The usual precautionary measures for handling chemicals should be followed.
    - Breathing equipment: Not required.
  
- Protection of hands:
  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
  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 trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
### 9 Physical and chemical properties

- **Appearance:**
  - **Form:** Liquid
  - **Color:** According to product specification
  - **Odor:** Characteristic
  - **Odor threshold:** Not determined.
  - **pH-value:** Not determined.

- **Change in condition**
  - **Melting point/Melting range:** 0 °C (32 °F)
  - **Boiling point/Boiling range:** Undetermined.

- **Flash point:** Not applicable.

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

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Product is not selfigniting.

- **Danger of explosion:** Product does not present an explosion hazard.

- **Explosion limits:**
  - **Lower:** Not determined.
  - **Upper:** Not determined.

- **Vapor pressure at 20 °C (68 °F):** 23 hPa (17.3 mm Hg)

- **Density:**
  - **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:**
  - **Water:** 99.5 %
  - **VOC content:** 0.00 %
  - **Other information:** No further relevant information available.
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:
  - Primary irritant effect:
    - on the skin: No irritant effect.
    - on the eye: No irritating effect.
  - Sensitization: No sensitizing effects known.
- Additional toxicological information:
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
- 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.
- Additional ecological information:
  - General notes: Generally not hazardous for water
  - Results of PBT and vPvB assessment
    - PBT: Not applicable.
    - vPvB: Not applicable.
### Safety Data Sheet acc. to OSHA HCS

**Trade name:** NexION STD/DRC Mode Detection Limit Blank Solution

(Contd. of page 5)

#### 13 Disposal considerations

- **Waste treatment methods**
  - **Recommendation:** Smaller quantities can be disposed of with household waste.

- **Uncleaned packagings:**
  - **Recommendation:** Disposal must be made according to official regulations.

#### 14 Transport information

<table>
<thead>
<tr>
<th><strong>UN-Number</strong></th>
<th><strong>DOT, ADR, ADN, IMDG, IATA</strong></th>
<th><strong>Void</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UN proper shipping name</strong></td>
<td><strong>DOT, ADR, ADN, IMDG, IATA</strong></td>
<td><strong>Void</strong></td>
</tr>
<tr>
<td><strong>Transport hazard class(es)</strong></td>
<td><strong>DOT, ADR, ADN, IMDG, IATA</strong></td>
<td><strong>Class</strong></td>
</tr>
<tr>
<td><strong>Packing group</strong></td>
<td><strong>DOT, ADR, IMDG, IATA</strong></td>
<td><strong>Void</strong></td>
</tr>
<tr>
<td><strong>Environmental hazards:</strong></td>
<td><strong>Marine pollutant:</strong></td>
<td><strong>No</strong></td>
</tr>
<tr>
<td><strong>Special precautions for user</strong></td>
<td><strong>Not applicable.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</strong></td>
<td><strong>Not applicable.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>UN &quot;Model Regulation&quot;:</strong></td>
<td><strong>Non regulated according to above specifications.</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### 15 Regulatory information

<table>
<thead>
<tr>
<th>Safety, health and environmental regulations/legislation specific for the substance or mixture</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7732-18-5 Water</td>
<td>99.5%</td>
</tr>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>Ox. Liq. 2, H272, Skin Corr. 1A, H314 0.5%</td>
</tr>
</tbody>
</table>

- **Sara**
  - **Section 355 (extremely hazardous substances):**
    - 7697-37-2 Nitric Acid
  - **Section 313 (Specific toxic chemical listings):**
    - 7697-37-2 Nitric Acid

(Contd. on page 7)
Trade name: NexION STD/DRC Mode Detection Limit Blank Solution

<table>
<thead>
<tr>
<th>· TSCA (Toxic Substances Control Act):</th>
<th>All ingredients are listed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td></td>
</tr>
<tr>
<td>7732-18-5 Water</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>· Proposition 65</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· Chemicals known to cause cancer:</th>
<th>None of the ingredients is listed.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· Chemicals known to cause reproductive toxicity for females:</th>
<th>None of the ingredients is listed.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· Chemicals known to cause reproductive toxicity for males:</th>
<th>None of the ingredients is listed.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· Chemicals known to cause developmental toxicity:</th>
<th>None of the ingredients is listed.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· Cancerogenity categories</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· EPA (Environmental Protection Agency)</th>
<th>None of the ingredients is listed.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· TLV (Threshold Limit Value established by ACGIH)</th>
<th>None of the ingredients is listed.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· NIOSH-Ca (National Institute for Occupational Safety and Health)</th>
<th>None of the ingredients is listed.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· National regulations:</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· Information about limitation of use:</th>
<th>Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· Water hazard class:</th>
<th>Generally not hazardous for water.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>· Chemical safety assessment:</th>
<th>A Chemical Safety Assessment has not been carried out.</th>
</tr>
</thead>
</table>

16 Other information

Disclaimer
The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer shall not be held liable for any damage resulting from handling or from contact with the product.

<table>
<thead>
<tr>
<th>· Department issuing SDS: Environmental, Health and Safety</th>
<th></th>
</tr>
</thead>
</table>

Contact:
Within the USA: 1-(800)-762-4000
Outside the USA: 1-(203)-712-8488
Abbreviations and acronyms:

- RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
- ICAO: International Civil Aviation Organisation
- 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)
- 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

* Data compared to the previous version altered.
* 1 Identification

- Product identifier
  - Trade name: NexION STD/DRC Mode Detection Limit Standard Solution
  - Article number N8145056
  - Application of the substance / the mixture Laboratory chemicals

- Details of the supplier of the safety data sheet
  - Manufacturer/Supplier: PerkinElmer, Inc.
    710 Bridgeport Avenue
    Shelton, Connecticut 06484 USA
    CustomerCareUS@perkinelmer.com
    203-925-4600

- Emergency telephone number:
  CHEMTREC (within US) 800-424-9300
  CHEMTREC (from outside US) +1 703-527-3887 (call collect)
  CHEMTREC (within AU) +(61)-290372994

* 2 Hazard(s) identification

- Classification of the substance or mixture
  The product is not classified, according to the Globally Harmonized System (GHS).

- Label elements
  - GHS label elements Void
  - Hazard pictograms Void
  - Signal word Void
  - Hazard statements Void

- Classification system:
  - NFPA ratings (scale 0 - 4)
    
    Health = 0
    Fire = 0
    Reactivity = 0

  - HMIS-ratings (scale 0 - 4)

- Other hazards
  - The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.

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

USA

(Contd. on page 2)
3 Composition/information on ingredients

- Chemical characterization: Mixtures
- Description: Mixture of the substances listed below with nonhazardous additions.
- Hazardous components: Void

<table>
<thead>
<tr>
<th>Additional Components</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>0.5%</td>
</tr>
<tr>
<td></td>
<td>Ox. Liq. 2, H272</td>
</tr>
<tr>
<td></td>
<td>Skin Corr. 1A, H314</td>
</tr>
<tr>
<td>7440-41-7 beryllium</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Acute Tox. 3, H301; Acute Tox. 2, H330</td>
</tr>
<tr>
<td></td>
<td>Carc. 1B, H350; STOT RE 1, H372</td>
</tr>
<tr>
<td></td>
<td>Skin Irrit. 2, H315; Eye Irrit. 2A, H319; Skin Sens. 1, H317; STOT SE 3, H335</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Resp. Sens. 1, H334; Carc. 2, H351</td>
</tr>
<tr>
<td></td>
<td>Skin Sens. 1, H317</td>
</tr>
<tr>
<td>7440-74-6 Indium</td>
<td>0.0001%</td>
</tr>
<tr>
<td>7439-89-6 iron</td>
<td>0.0001%</td>
</tr>
<tr>
<td>7440-61-1 uranium</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Acute Tox. 2, H300; Acute Tox. 2, H330</td>
</tr>
<tr>
<td></td>
<td>STOT RE 2, H373</td>
</tr>
<tr>
<td>7440-70-2 calcium</td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td>Water-react. 2, H261</td>
</tr>
<tr>
<td>7732-18-5 Water</td>
<td>99.4994%</td>
</tr>
</tbody>
</table>

4 First-aid measures

- Description of first aid measures
- General information: No special measures required.
- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- After eye contact: Rinse opened eye for several minutes under running water.
- After swallowing: If symptoms persist consult 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:
  Use fire fighting measures that suit the environment.
  Water
- Special hazards arising from the substance or mixture No further relevant information available.
Trade name: NexION STD/DRC Mode Detection Limit Standard Solution

6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures: Not required.
- Environmental precautions:
  Inform respective authorities in case of seepage into water course or sewage system.
  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).
- Reference to other sections
  No dangerous substances are released.
  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

<table>
<thead>
<tr>
<th>PAC-1:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>0.16 ppm</td>
</tr>
<tr>
<td>7440-41-7 beryllium</td>
<td>0.0025 mg/m³</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>0.18 mg/m³</td>
</tr>
<tr>
<td>7440-74-6 Indium</td>
<td>0.3 mg/m³</td>
</tr>
<tr>
<td>7439-89-6 iron</td>
<td>3.2 mg/m³</td>
</tr>
<tr>
<td>7440-61-1 uranium</td>
<td>0.6 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-2:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>24 ppm</td>
</tr>
<tr>
<td>7440-41-7 beryllium</td>
<td>0.025 mg/m³</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>7440-74-6 Indium</td>
<td>3.3 mg/m³</td>
</tr>
<tr>
<td>7439-89-6 iron</td>
<td>35 mg/m³</td>
</tr>
<tr>
<td>7440-61-1 uranium</td>
<td>5 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-3:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>7440-41-7 beryllium</td>
<td>0.1 mg/m³</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>7440-74-6 Indium</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>7439-89-6 iron</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td>7440-61-1 uranium</td>
<td>30 mg/m³</td>
</tr>
</tbody>
</table>

7 Handling and storage

- Handling:
- Precautions for safe handling: No special measures required.
### 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:**
  The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Personal protective equipment:**
  - **General protective and hygienic measures:**
    The usual precautionary measures for handling chemicals should be followed.
  - **Breathing equipment:** Not required.
  - **Protection of hands:**
    The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. 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 trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:** Goggles recommended during refilling.

### 9 Physical and chemical properties

- **Information on basic physical and chemical properties**
  - **General Information**
  - **Appearance:**
    - **Form:** Liquid
    - **Color:** According to product specification
  - **Odor:** Characteristic
  - **Odor threshold:** Not determined.
  - **pH-value:** Not determined.
  - **Change in condition**
    - **Melting point/Melting range:** 0 °C (32 °F)
Boiling point/Boiling range: Undetermined.

- Flash point: Not applicable.
- Flammability (solid, gaseous): Not applicable.
- Decomposition temperature: Not determined.
- Auto igniting: Product is not selfigniting.
- Danger of explosion: Product does not present an explosion hazard.

- Explosion limits:
  Lower: Not determined.
  Upper: Not determined.
- Vapor pressure at 20 °C (68 °F): 23 hPa (17.3 mm Hg)
- Density: Not determined.
- 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:
  Water: 99.5 %
  VOC content: 0.00 %
- Other information No further relevant information available.

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:
- Primary irritant effect:
  on the skin: No irritant effect.
47.0.4

∙ on the eye: No irritating effect.
∙ Sensitization: No sensitizing effects known.
∙ Additional toxicological information:
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
∙ Carcinogenic categories
  ∙ IARC (International Agency for Research on Cancer)
    7440-41-7 beryllium 1
    7440-48-4 cobalt 2B
  ∙ NTP (National Toxicology Program)
    7440-41-7 beryllium K
    7440-48-4 cobalt R
  ∙ 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.
  ∙ Additional ecological information:
  ∙ General notes: Generally not hazardous for water
  ∙ 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: Smaller quantities can be disposed of with household waste.
∙ Uncleaned packagings:
  ∙ Recommendation: Disposal must be made according to official regulations.

14 Transport information

∙ UN-Number
  ∙ DOT, ADR, ADN, IMDG, IATA Void

(Contd. on page 7)
Trade name: NexION STD/DRC Mode Detection Limit Standard Solution

<table>
<thead>
<tr>
<th>15 Regulatory information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety, health and environmental regulations/legislation specific for the substance or mixture</strong></td>
</tr>
<tr>
<td>7732-18-5 Water</td>
</tr>
<tr>
<td>7697-37-2 Nitric Acid</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
</tr>
</tbody>
</table>

**Sara**

**Section 355 (extremely hazardous substances):**

| 7697-37-2 Nitric Acid |

**Section 313 (Specific toxic chemical listings):**

| 7697-37-2 Nitric Acid |
| 7440-41-7 beryllium |
| 7440-48-4 cobalt |

**TSCA (Toxic Substances Control Act):**

All ingredients are listed.

| 7697-37-2 Nitric Acid |
| 7440-41-7 beryllium |
| 7440-48-4 cobalt |
| 7440-74-6 Indium |
| 7439-89-6 iron |
| 7440-61-1 uranium |
| 7440-70-2 calcium |
| 7732-18-5 Water |

(Contd. of page 6)
Trade name: NexION STD/DRC Mode Detection Limit Standard Solution

- Proposition 65
  - Chemicals known to cause cancer:
    - 7440-41-7 beryllium
    - 7440-48-4 cobalt

- 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.

- Cancerogenity categories
  - EPA (Environmental Protection Agency)
    - 7440-41-7 beryllium B1, K/L(inh), CBD(oral)
  - TLV (Threshold Limit Value established by ACGIH)
    - 7440-41-7 beryllium A1
    - 7440-48-4 cobalt A3
    - 7440-61-1 uranium A1
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    - 7440-41-7 beryllium
    - 7440-61-1 uranium

- National regulations:

- Information about limitation of use:
  Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.

- Water hazard class: Generally not hazardous for water.

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

16 Other information

Disclaimer
The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer shall not be held liable for any damage resulting from handling or from contact with the product.

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- Contact:
  Within the USA: 1-(800)-762-4000
  Outside the USA: 1-(203)-712-8488
### Abbreviations and acronyms:

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- **IATA:** International Air Transport Association
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- **ELINCS:** European List of Notified Chemical Substances
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- **HMIS:** Hazardous Materials Identification System (USA)
- **VOC:** Volatile Organic Compounds (USA, EU)
- **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

*Data compared to the previous version altered.*
1 Identification

· Product identifier
  · Trade name: NexION Dual Detector Calibration Solution
  · Article number N8145059
  · Application of the substance / the mixture Laboratory chemicals

· Details of the supplier of the safety data sheet
  · Manufacturer/Supplier:

    PerkinElmer, Inc.
    710 Bridgeport Avenue
    Shelton, Connecticut 06484 USA
    CustomerCareUS@perkinelmer.com
    203-925-4600

· Emergency telephone number:
  CHEMTREC (within US) 800-424-9300
  CHEMTREC (from outside US) +1 703-527-3887 (call collect)
  CHEMTREC (within AU) +(61)-290372994

2 Hazard(s) identification

· Classification of the substance or mixture

  Skin Irrit. 2  H315  Causes skin irritation.
  Eye Irrit. 2A  H319  Causes serious eye irritation.

· Label elements
  · GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
  · Hazard pictograms GHS07
  · Signal word Warning

· Hazard statements
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.

· Precautionary statements

  P264  Wash thoroughly after handling.
  P280  Wear protective gloves / eye protection / face protection.
  P302+P352  If on skin: Wash with plenty of water.
  P321  Specific treatment (see on this label).
  P305+P351+P338  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P332+P313  If skin irritation occurs: Get medical advice/attention.
  P362+P364  Take off contaminated clothing and wash it before reuse.
  P337+313  If eye irritation persists: Get medical advice/attention.

· Classification system:

  · NFPA ratings (scale 0 - 4)

    Health = 2
    Fire = 0
    Reactivity = 0

(Contd. on page 2)
Trade name: NexION Dual Detector Calibration Solution

- HMIS-ratings (scale 0 - 4)
  - Health = 2
  - Fire = 0
  - Reactivity = 0

- Other hazards
  The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.

- 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.

<table>
<thead>
<tr>
<th>Hazardous components</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>Ox. Liq. 2, H272</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional Components</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7439-93-2 lithium</td>
<td>Water-react. 1, H260</td>
</tr>
<tr>
<td>7439-95-4 magnesium</td>
<td>Pyr. Sol. 1, H250; Water-react. 1, H260</td>
</tr>
<tr>
<td>7429-90-5 aluminium</td>
<td></td>
</tr>
<tr>
<td>7439-96-5 manganese</td>
<td></td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>Resp. Sens. 1, H334; Carc. 2, H351</td>
</tr>
<tr>
<td>7440-02-0 nickel</td>
<td>Carc. 2, H351; STOT RE 1, H372</td>
</tr>
<tr>
<td>7440-50-8 copper</td>
<td></td>
</tr>
<tr>
<td>7440-66-6 zinc</td>
<td>Water-react. 2, H261</td>
</tr>
<tr>
<td>7440-74-6 Indium</td>
<td></td>
</tr>
<tr>
<td>7440-39-3 barium</td>
<td>Water-react. 2, H261</td>
</tr>
<tr>
<td>7440-45-1 cerium</td>
<td>Water-react. 2, H261</td>
</tr>
<tr>
<td>7440-27-9 terbium</td>
<td></td>
</tr>
<tr>
<td>7439-92-1 lead</td>
<td>Acute Tox. 3, H301</td>
</tr>
<tr>
<td>7440-61-1 uranium</td>
<td>Acute Tox. 2, H300; Acute Tox. 2, H330</td>
</tr>
<tr>
<td>7732-18-5 Water</td>
<td></td>
</tr>
</tbody>
</table>
4 First-aid measures

- **Description of first aid measures**
  - **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. If symptoms persist, consult a doctor.
  - **After swallowing:** If symptoms persist consult 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:** Use fire fighting measures that suit the environment.
  - **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** Not required.
- **Environmental precautions:**
  Inform respective authorities in case of seepage into water course or sewage system.
  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).
- **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**

<table>
<thead>
<tr>
<th>PAC-J</th>
<th>Compound</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
<td>0.16 ppm</td>
</tr>
<tr>
<td>7439-93-2</td>
<td>lithium</td>
<td>3.3 mg/m³</td>
</tr>
<tr>
<td>7439-95-4</td>
<td>magnesium</td>
<td>18 mg/m³</td>
</tr>
<tr>
<td>7439-96-5</td>
<td>manganese</td>
<td>3 mg/m³</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
<td>0.18 mg/m³</td>
</tr>
<tr>
<td>7440-02-0</td>
<td>nickel</td>
<td>4.5 mg/m³</td>
</tr>
<tr>
<td>7440-50-8</td>
<td>copper</td>
<td>3 mg/m³</td>
</tr>
<tr>
<td>7440-66-6</td>
<td>zinc</td>
<td>6 mg/m³</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>Indium</td>
<td>0.3 mg/m³</td>
</tr>
<tr>
<td>7440-39-3</td>
<td>barium</td>
<td>1.5 mg/m³</td>
</tr>
</tbody>
</table>
### Handling and storage

- **Handling:** No special precautions are necessary if used correctly.
- **Precautions for safe handling:** No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:** No special measures required.

---

**Trade name:** NexION Dual Detector Calibration Solution

**PAC-2:**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>24 ppm</td>
</tr>
<tr>
<td>7439-93-2 lithium</td>
<td>36 mg/m³</td>
</tr>
<tr>
<td>7439-95-4 magnesium</td>
<td>200 mg/m³</td>
</tr>
<tr>
<td>7439-96-5 manganese</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>7440-02-0 nickel</td>
<td>50 mg/m³</td>
</tr>
<tr>
<td>7440-50-8 copper</td>
<td>33 mg/m³</td>
</tr>
<tr>
<td>7440-66-6 zinc</td>
<td>21 mg/m³</td>
</tr>
<tr>
<td>7440-74-6 Indium</td>
<td>3.3 mg/m³</td>
</tr>
<tr>
<td>7440-39-3 barium</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td>7440-45-1 cerium</td>
<td>330 mg/m³</td>
</tr>
<tr>
<td>7440-27-9 terbium</td>
<td>13 mg/m³</td>
</tr>
<tr>
<td>7439-92-1 lead</td>
<td>120 mg/m³</td>
</tr>
<tr>
<td>7440-61-1 uranium</td>
<td>5 mg/m³</td>
</tr>
</tbody>
</table>

**PAC-3:**

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>7439-93-2 lithium</td>
<td>220 mg/m³</td>
</tr>
<tr>
<td>7439-95-4 magnesium</td>
<td>1,200 mg/m³</td>
</tr>
<tr>
<td>7439-96-5 manganese</td>
<td>1,800 mg/m³</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>7440-02-0 nickel</td>
<td>99 mg/m³</td>
</tr>
<tr>
<td>7440-50-8 copper</td>
<td>200 mg/m³</td>
</tr>
<tr>
<td>7440-66-6 zinc</td>
<td>120 mg/m³</td>
</tr>
<tr>
<td>7440-74-6 Indium</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>7440-39-3 barium</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>7440-45-1 cerium</td>
<td>2,000 mg/m³</td>
</tr>
<tr>
<td>7440-27-9 terbium</td>
<td>79 mg/m³</td>
</tr>
<tr>
<td>7439-92-1 lead</td>
<td>700 mg/m³</td>
</tr>
<tr>
<td>7440-61-1 uranium</td>
<td>30 mg/m³</td>
</tr>
</tbody>
</table>
Conditions for safe storage, including any incompatibilities

Storage:
- Requirements to be met by storerooms and receptacles: No special requirements.
- Information about storage in one common storage facility: Not required.
- Further information about storage conditions: Keep receptacle tightly sealed.
- 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>7697-37-2 Nitric Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<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 eyes and skin.
- Breathing equipment: Not required.
- Protection of hands:

  Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. 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 trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
Trade name: NexION Dual Detector Calibration Solution

· Eye protection:
  Tightly sealed goggles or safety glasses

### 9 Physical and chemical properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
  - Form: Liquid
  - Color: According to product specification

- **Odor:** Characteristic
- **Odor threshold:** Not determined.

- **pH-value:** Not determined.

- **Change in condition**
  - Melting point/Melting range: 0 °C (32 °F)
  - Boiling point/Boiling range: Undetermined.

- **Flash point:** Not applicable.

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

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Product is not selfigniting.

- **Danger of explosion:** Product does not present an explosion hazard.

- **Explosion limits:**
  - Lower: Not determined.
  - Upper: Not determined.

- **Vapor pressure at 20 °C (68 °F):** 23 hPa (17.3 mm Hg)

- **Density:** Not determined.
- **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:**
  - Water: 98.0 %
  - VOC content: 0.00 %
Trade name: NexION Dual Detector Calibration Solution

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:
    - Primary irritant effect:
      - on the skin: Irritant to skin and mucous membranes.
      - on the eye: 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)
    - 7440-48-4 cobalt 2B
    - 7440-02-0 nickel 2B
    - 7439-92-1 lead 2B
  - NTP (National Toxicology Program)
    - 7440-48-4 cobalt R
    - 7440-02-0 nickel R
    - 7439-92-1 lead R
  - 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.
Trade name: NexION Dual Detector Calibration Solution

- Additional ecological information:
  - General notes: Generally not hazardous for water
  - 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: Dispose of container and materials in accordance with local, regional and national regulations.

- Uncleaned packagings:
  - Recommendation: Disposal must be made according to official regulations.

### 14 Transport information

- UN-Number
  - DOT, ADR, IMDG, IATA: UN3264

- UN proper shipping name
  - DOT: Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)
  - ADR: 3264 Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)
  - IMDG, IATA: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric Acid)

- Transport hazard class(es)
  - DOT
    - Class: 8 Corrosive substances
    - Label: 8
  - ADR
    - Class: 8 (C1) Corrosive substances
    - Label: 8

(Contd. on page 9)
### IMDG, IATA

- **Class**: 8 Corrosive substances  
- **Label**: 8  
- **Packing group**: DOT, ADR, IMDG, IATA III  
- **Environmental hazards**: No  
- **Special precautions for user**: Warning: Corrosive substances  
- **Danger code (Kemler)**: 80  
- **EMS Number**: F-A.S-B  
- **Segregation groups**: Acids  
- **Stowage Category**: A  
- **Stowage Code**: SW2 Clear of living quarters.  

#### 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  

- **ADR**
  - **Excepted quantities (EQ)**: Code: E1  
    Maximum net quantity per inner packaging: 30 ml  
    Maximum net quantity per outer packaging: 1000 ml  

- **IMDG**
  - **Limited quantities (LQ)**: 5L  
  - **Excepted quantities (EQ)**: Code: E1  
    Maximum net quantity per inner packaging: 30 ml  
    Maximum net quantity per outer packaging: 1000 ml  

- **UN "Model Regulation"**: UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, III

### 15 Regulatory information

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

|----------|-----------------|----------|------------|--------------|-------|  
| 7732-18-5 Water                     |  |  |  |  | 97.9885%  
| 7697-37-2 Nitric Acid               | Yes | Yes | No | Yes | 97.9885%  
| 7439-95-4 magnesium                 | Yes | Yes | No | Yes | 97.9885%  

* (Contd. on page 10)
Trade name: NexION Dual Detector Calibration Solution

- **Sara**

- **Section 355 (extremely hazardous substances):**
  - 7697-37-2 Nitric Acid

- **Section 313 (Specific toxic chemical listings):**
  - 7697-37-2 Nitric Acid
  - 7429-90-5 aluminium
  - 7439-96-5 manganese
  - 7440-48-4 cobalt
  - 7440-02-0 nickel
  - 7440-50-8 copper
  - 7440-66-6 zinc
  - 7440-39-3 barium
  - 7439-92-1 lead

- **TSCA (Toxic Substances Control Act):**
  All ingredients are listed.
  - 7697-37-2 Nitric Acid
  - 7439-93-2 lithium
  - 7439-95-4 magnesium
  - 7429-90-5 aluminium
  - 7439-96-5 manganese
  - 7440-48-4 cobalt
  - 7440-02-0 nickel
  - 7440-50-8 copper
  - 7440-66-6 zinc
  - 7440-39-3 barium
  - 7440-45-1 cerium
  - 7440-74-6 Indium
  - 7440-39-3 barium
  - 7440-45-1 cerium
  - 7440-27-9 terbium
  - 7439-92-1 lead
  - 7440-61-1 uranium
  - 7732-18-5 Water

- **Proposition 65**

- **Chemicals known to cause cancer:**
  - 7440-48-4 cobalt
  - 7440-02-0 nickel
  - 7439-92-1 lead

- **Chemicals known to cause reproductive toxicity for females:**
  - 7439-92-1 lead

- **Chemicals known to cause reproductive toxicity for males:**
  - 7439-92-1 lead
Trade name: NexION Dual Detector Calibration Solution

- **Chemicals known to cause developmental toxicity:**
  - 7439-92-1 lead

- **Cancerogenity categories**

  - **EPA (Environmental Protection Agency)**
    - 7439-96-5 manganese: D
    - 7440-50-8 copper: D
    - 7440-66-6 zinc: D, I, II
    - 7440-39-3 barium: D, CBD(inh), NL(oral)
    - 7439-92-1 lead: B2

  - **TLV (Threshold Limit Value established by ACGIH)**
    - 7429-90-5 aluminium: A4
    - 7440-48-4 cobalt: A3
    - 7440-02-0 nickel: A5
    - 7440-39-3 barium: A4
    - 7439-92-1 lead: A3
    - 7440-61-1 uranium: A1

  - **NIOSH-Ca (National Institute for Occupational Safety and Health)**
    - 7440-02-0 nickel
    - 7440-61-1 uranium

- **National regulations:**

- **Information about limitation of use:**
  Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.

- **Water hazard class:** Generally not hazardous for water.

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

*16 Other information*

**Disclaimer**

The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer shall not be held liable for any damage resulting from handling or from contact with the product.

- **Department issuing SDS:** Environmental, Health and Safety
- **Contact:**
  - Within the USA: 1-(800)-762-4000
  - Outside the USA: 1-(203)-712-8488
- **Abbreviations and acronyms:**
  - RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
Trade name: NexION Dual Detector Calibration Solution

<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICAO</td>
<td>International Civil Aviation Organisation</td>
</tr>
<tr>
<td>ADR</td>
<td>Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Code for Dangerous Goods</td>
</tr>
<tr>
<td>DOT</td>
<td>US Department of Transportation</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>ACGIH</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Commercial Chemical Substances</td>
</tr>
<tr>
<td>ELINCS</td>
<td>European List of Notified Chemical Substances</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstracts Service (division of the American Chemical Society)</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Association (USA)</td>
</tr>
<tr>
<td>HMIS</td>
<td>Hazardous Materials Identification System (USA)</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile Organic Compounds (USA, EU)</td>
</tr>
<tr>
<td>PBT</td>
<td>Persistent, Bioaccumulative and Toxic</td>
</tr>
<tr>
<td>vPvB</td>
<td>very Persistent and very Bioaccumulative</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>REL</td>
<td>Recommended Exposure Limit</td>
</tr>
<tr>
<td>Ox. Liq. 2</td>
<td>Oxidizing liquids – Category 2</td>
</tr>
<tr>
<td>Skin Corr. 1A</td>
<td>Skin corrosion/irritation – Category 1A</td>
</tr>
<tr>
<td>Skin Irrit. 2</td>
<td>Skin corrosion/irritation – Category 2</td>
</tr>
<tr>
<td>Eye Irrit. 2A</td>
<td>Serious eye damage/eye irritation – Category 2A</td>
</tr>
</tbody>
</table>

* Data compared to the previous version altered.
1 Identification

- Product identifier
  - Trade name: NexION Cell Stability Solution
  - Article number N8145054
  - Application of the substance / the mixture Laboratory chemicals
- Details of the supplier of the safety data sheet
  - Manufacturer/Supplier:
    PerkinElmer, Inc.
    710 Bridgeport Avenue
    Shelton, Connecticut 06484 USA
    CustomerCareUS@perkinelmer.com
    203-925-4600
- Emergency telephone number:
  CHEMTREC (within US)  800-424-9300
  CHEMTREC (from outside US) +1 703-527-3887 (call collect)
  CHEMTREC (within AU) +(61)-290372994

2 Hazard(s) identification

- Classification of the substance or mixture
  - Skin Irrit. 2  H315  Causes skin irritation.
  - Eye Irrit. 2A H319  Causes serious eye irritation.
- Label elements
  - GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
  - Hazard pictograms GHS07
  - Signal word Warning
  - Hazard statements
    H315 Causes skin irritation.
    H319 Causes serious eye irritation.
  - Precautionary statements
    - P264 Wash thoroughly after handling.
    - P280 Wear protective gloves / eye protection / face protection.
    - P302+P352 If on skin: Wash with plenty of water.
    - P321 Specific treatment (see on this label).
    - P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
    - P332+P313 If skin irritation occurs: Get medical advice/attention.
    - P362+P364 Take off contaminated clothing and wash it before reuse.
    - P337+P313 If eye irritation persists: Get medical advice/attention.
  - Classification system:
    - NFPA ratings (scale 0 - 4)
      - Health = 2
      - Fire = 0
      - Reactivity = 0
(Contd. on page 2)
Trade name: NexION Cell Stability Solution

- HMIS-ratings (scale 0 - 4)

  Health = 2  Fire = 0  Reactivity = 0

- Other hazards
  The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.

- 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.

### Hazardous components:

<table>
<thead>
<tr>
<th>Substance Code</th>
<th>Substance Name</th>
<th>Description</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
<td>Ox. Liq. 2, H272, Skin Corr. 1A, H314</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

### Additional Components

<table>
<thead>
<tr>
<th>Substance Code</th>
<th>Substance Name</th>
<th>Description</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7439-95-4</td>
<td>magnesium</td>
<td>Pyr. Sol. 1, H250; Water-react. 1, H260</td>
<td>0.0001%</td>
</tr>
<tr>
<td>7440-47-3</td>
<td>chromium</td>
<td></td>
<td>0.0001%</td>
</tr>
<tr>
<td>7439-89-6</td>
<td>iron</td>
<td></td>
<td>0.0001%</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
<td>Resp. Sens. 1, H334; Carc. 2, H351; Skin Sens. 1, H317</td>
<td>0.0001%</td>
</tr>
<tr>
<td>7440-50-8</td>
<td>copper</td>
<td></td>
<td>0.0001%</td>
</tr>
<tr>
<td>7782-49-2</td>
<td>selenium</td>
<td>Acute Tox. 3, H301; Acute Tox. 3, H331; STOT RE 2, H373</td>
<td>0.0001%</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>Indium</td>
<td></td>
<td>0.0001%</td>
</tr>
<tr>
<td>7440-43-9</td>
<td>cadmium (non-pyrophoric)</td>
<td>Acute Tox. 2, H330; Muta. 2, H341; Carc. 1B, H350; Repr. 2, H361; STOT RE 1, H372</td>
<td>0.0001%</td>
</tr>
<tr>
<td>7439-92-1</td>
<td>lead</td>
<td>Acute Tox. 3, H301; Carc. 2, H351; Repr. 1A, H360-H362; Acute Tox. 4, H332</td>
<td>0.0001%</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td></td>
<td>98.9991%</td>
</tr>
</tbody>
</table>

(Contd. on page 3)
# Safety Data Sheet

**acc. to OSHA HCS**

**Trade name:** NexION Cell Stability Solution

---

## 4 First-aid measures

- **Description of first aid measures**
  - 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. If symptoms persist, consult a doctor.
  - After swallowing: If symptoms persist consult 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:** Use fire fighting measures that suit the environment.
  - **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** Not required.
- **Environmental precautions:** Inform respective authorities in case of seepage into water course or sewage system.
- **Methods and material for containment and cleaning up:** Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
- **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:

- 7697-37-2 Nitric Acid 0.16 ppm
- 7439-95-4 magnesium 18 mg/m³
- 7440-47-3 chromium 1.5 mg/m³
- 7439-89-6 iron 3.2 mg/m³
- 7440-48-4 cobalt 0.18 mg/m³
- 7440-50-8 copper 3 mg/m³
- 7782-49-2 selenium 0.6 mg/m³
- 7440-74-6 Indium 0.3 mg/m³
- 7440-43-9 cadmium (non-pyrophoric) 0.10 mg/m³
- 7439-92-1 lead 0.15 mg/m³

### PAC-2:

- 7697-37-2 Nitric Acid 24 ppm
Trade name: NexION Cell Stability Solution

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7439-95-4</td>
<td>magnesium</td>
<td>200 mg/m³</td>
</tr>
<tr>
<td>7440-47-3</td>
<td>chromium</td>
<td>17 mg/m³</td>
</tr>
<tr>
<td>7439-89-6</td>
<td>iron</td>
<td>35 mg/m³</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>7440-50-8</td>
<td>copper</td>
<td>33 mg/m³</td>
</tr>
<tr>
<td>7782-49-2</td>
<td>selenium</td>
<td>6.6 mg/m³</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>Indium</td>
<td>3.3 mg/m³</td>
</tr>
<tr>
<td>7440-43-9</td>
<td>cadmium (non-pyrophoric)</td>
<td>0.76 mg/m³</td>
</tr>
<tr>
<td>7439-92-1</td>
<td>lead</td>
<td>120 mg/m³</td>
</tr>
</tbody>
</table>

· PAC-3:
<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>7439-95-4</td>
<td>magnesium</td>
<td>1,200 mg/m³</td>
</tr>
<tr>
<td>7440-47-3</td>
<td>chromium</td>
<td>99 mg/m³</td>
</tr>
<tr>
<td>7439-89-6</td>
<td>iron</td>
<td>150 mg/m³</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>7440-50-8</td>
<td>copper</td>
<td>200 mg/m³</td>
</tr>
<tr>
<td>7782-49-2</td>
<td>selenium</td>
<td>40 mg/m³</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>Indium</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>7440-43-9</td>
<td>cadmium (non-pyrophoric)</td>
<td>4.7 mg/m³</td>
</tr>
<tr>
<td>7439-92-1</td>
<td>lead</td>
<td>700 mg/m³</td>
</tr>
</tbody>
</table>

*7 Handling and storage*

· Handling:
  · Precautions for safe handling: No special precautions are necessary if used correctly.
  · Information about protection against explosions and fires: No special measures required.

· Conditions for safe storage, including any incompatibilities

· Storage:
  · Requirements to be met by storerooms and receptacles: No special requirements.
  · Information about storage in one common storage facility: Not required.
  · Further information about storage conditions: Keep receptacle tightly sealed.
  · 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>CAS Number</th>
<th>Substance</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
<td>PEL Long-term value: 5 mg/m³, 2 ppm</td>
</tr>
</tbody>
</table>

(Contd. on page 5)
Trade name: NexION Cell Stability Solution

REL Short-term value: 10 mg/m³, 4 ppm
Long-term value: 5 mg/m³, 2 ppm

TLV Short-term value: 10 mg/m³, 4 ppm
Long-term value: 5.2 mg/m³, 2 ppm

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

- Exposure controls
- 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 eyes and skin.
- Breathing equipment: Not required.
- Protection of hands:

  Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
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 trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

- Eye protection:

  Tightly sealed goggles or safety glasses

9 Physical and chemical properties

- Information on basic physical and chemical properties
- General Information
- Appearances:
  - Form: Liquid
  - Color: According to product specification
  - Odor: Characteristic
  - Odor threshold: Not determined.
  - pH-value: Not determined.

- Change in condition
  - Melting point/Melting range: 0 °C (32 °F)
**Trade name: NexION Cell Stability Solution**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boiling point/Boiling range:</strong></td>
<td>100 °C (212 °F)</td>
</tr>
<tr>
<td>· Flash point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>· Flammability (solid, gaseous):</td>
<td>Not applicable.</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 does not present an explosion hazard.</td>
</tr>
<tr>
<td>· Explosion limits:</td>
<td></td>
</tr>
<tr>
<td>Lower:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Upper:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>· Vapor pressure at 20 °C (68 °F):</td>
<td>23 hPa (17.3 mm Hg)</td>
</tr>
<tr>
<td>· Density:</td>
<td>Not determined.</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>Water:</td>
<td>99.0 %</td>
</tr>
<tr>
<td>VOC content:</td>
<td>0.00 %</td>
</tr>
<tr>
<td>· Other information</td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>

* **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:
      · Primary irritant effect:
        · on the skin: Irritant to skin and mucous membranes.
Trade name: NexION Cell Stability Solution

47.0.4
∙ on the eye: 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)
<table>
<thead>
<tr>
<th>Compound</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-47-3 chromium</td>
<td>3</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>2B</td>
</tr>
<tr>
<td>7782-49-2 selenium</td>
<td>3</td>
</tr>
<tr>
<td>7440-43-9 cadmium (non-pyrophoric)</td>
<td>1</td>
</tr>
<tr>
<td>7439-92-1 lead</td>
<td>2B</td>
</tr>
</tbody>
</table>

  NTP (National Toxicology Program)
<table>
<thead>
<tr>
<th>Compound</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-48-4 cobalt</td>
<td>R</td>
</tr>
<tr>
<td>7440-43-9 cadmium (non-pyrophoric)</td>
<td>K</td>
</tr>
<tr>
<td>7439-92-1 lead</td>
<td>R</td>
</tr>
</tbody>
</table>

  OSHA-Ca (Occupational Safety & Health Administration)
<table>
<thead>
<tr>
<th>Compound</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-43-9 cadmium (non-pyrophoric)</td>
<td></td>
</tr>
</tbody>
</table>

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.
    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:
    Dispose of container and materials in accordance with local, regional and national regulations.
**14 Transport information**

<table>
<thead>
<tr>
<th>· UN-Number</th>
<th>DOT, ADR, IMDG, IATA</th>
<th>UN3264</th>
</tr>
</thead>
<tbody>
<tr>
<td>· UN proper shipping name</td>
<td>DOT</td>
<td>Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)</td>
</tr>
<tr>
<td>· UN proper shipping name</td>
<td>ADR</td>
<td>3264 Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid)</td>
</tr>
<tr>
<td>· UN proper shipping name</td>
<td>IMDG, IATA</td>
<td>CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric Acid)</td>
</tr>
<tr>
<td>· Transport hazard class(es)</td>
<td>DOT</td>
<td>Class 8 Corrosive substances</td>
</tr>
<tr>
<td>· Transport hazard class(es)</td>
<td>Label</td>
<td>8</td>
</tr>
<tr>
<td>· Transport hazard class(es)</td>
<td>ADR</td>
<td>Class 8 (C1) Corrosive substances</td>
</tr>
<tr>
<td>· Transport hazard class(es)</td>
<td>Label</td>
<td>8</td>
</tr>
<tr>
<td>· Transport hazard class(es)</td>
<td>IMDG, IATA</td>
<td>Class 8 Corrosive substances</td>
</tr>
<tr>
<td>· Transport hazard class(es)</td>
<td>IMDG, IATA</td>
<td>Label 8</td>
</tr>
<tr>
<td>· Packing group</td>
<td>DOT, ADR, IMDG, IATA</td>
<td>III</td>
</tr>
<tr>
<td>· Environmental hazards:</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>· Special precautions for user</td>
<td>Warning: Corrosive substances</td>
<td></td>
</tr>
<tr>
<td>· Danger code (Kemler):</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>· EMS Number:</td>
<td></td>
<td>F-A,S-B</td>
</tr>
<tr>
<td>· Segregation groups</td>
<td></td>
<td>Acids</td>
</tr>
<tr>
<td>· Stowage Category</td>
<td></td>
<td>A</td>
</tr>
</tbody>
</table>

(Contd. on page 9)
Trade name: NexION Cell Stability Solution

<table>
<thead>
<tr>
<th>Stowage Code</th>
<th>SW2 Clear of living quarters.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Transport/Additional information:</td>
<td></td>
</tr>
<tr>
<td>DOT Quantity limitations</td>
<td>On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L</td>
</tr>
<tr>
<td>ADR Excepted quantities (EQ) Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml</td>
<td></td>
</tr>
<tr>
<td>IMDG Limited quantities (LQ)</td>
<td>5 L Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml</td>
</tr>
<tr>
<td>UN &quot;Model Regulation&quot;: UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, III</td>
<td></td>
</tr>
</tbody>
</table>

15 Regulatory information

| Safety, health and environmental regulations/legislation specific for the substance or mixture |
|-----------------------------------------------|----------------------|----------------------|
| 7732-18-5 Water                               | 98.9991%             |
| 7697-37-2 Nitric Acid                         | 1.0%                 |
| 7440-47-3 chromium                            | 0.0001%              |
| Sara Section 355 (extremely hazardous substances): |
| 7697-37-2 Nitric Acid                         |                      |
| Section 313 (Specific toxic chemical listings): |
| 7697-37-2 Nitric Acid                         |                      |
| 7440-47-3 chromium                            |                      |
| 7440-48-4 cobalt                              |                      |
| 7440-50-8 copper                              |                      |
| 7782-49-2 selenium                            |                      |
| 7440-43-9 cadmium (non-pyrophoric)            |                      |
| 7439-92-1 lead                                |                      |
| TSCA (Toxic Substances Control Act):          |
| All ingredients are listed.                   |
| 7697-37-2 Nitric Acid                         |                      |
| 7439-95-4 magnesium                           |                      |
## Safety Data Sheet acc. to OSHA HCS

**Trade name: NexION Cell Stability Solution**

<table>
<thead>
<tr>
<th>Chemical ID</th>
<th>Chemical Name</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-47-3</td>
<td>chromium</td>
<td>D</td>
</tr>
<tr>
<td>7439-89-6</td>
<td>iron</td>
<td>D</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
<td></td>
</tr>
<tr>
<td>7440-50-8</td>
<td>copper</td>
<td></td>
</tr>
<tr>
<td>7782-49-2</td>
<td>selenium</td>
<td>D</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>Indium</td>
<td></td>
</tr>
<tr>
<td>7440-43-9</td>
<td>cadmium (non-pyrophoric)</td>
<td>B1</td>
</tr>
<tr>
<td>7439-92-1</td>
<td>lead</td>
<td>B2</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td></td>
</tr>
</tbody>
</table>

**Proposition 65**

- **Chemicals known to cause cancer:**
  - 7440-48-4 cobalt
  - 7440-43-9 cadmium (non-pyrophoric)
  - 7439-92-1 lead

- **Chemicals known to cause reproductive toxicity for females:**
  - 7439-92-1 lead

- **Chemicals known to cause reproductive toxicity for males:**
  - 7440-43-9 cadmium (non-pyrophoric)
  - 7439-92-1 lead

- **Chemicals known to cause developmental toxicity:**
  - 7440-43-9 cadmium (non-pyrophoric)
  - 7439-92-1 lead

**Cancerogenity categories**

- **EPA (Environmental Protection Agency)**
  - 7440-47-3 chromium: D
  - 7440-50-8 copper: D
  - 7782-49-2 selenium: D
  - 7440-43-9 cadmium (non-pyrophoric): B1
  - 7439-92-1 lead: B2

- **TLV (Threshold Limit Value established by ACGIH)**
  - 7440-47-3 chromium: A4
  - 7440-48-4 cobalt: A3
  - 7440-43-9 cadmium (non-pyrophoric): A2
  - 7439-92-1 lead: A3

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**
  - 7440-43-9 cadmium (non-pyrophoric)

(Contd. on page 11)
Trade name: NexION Cell Stability Solution

- National regulations:
- Information about limitation of use:
  Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
- Water hazard class: Water hazard class 2 (Self-assessment): hazardous for water.
- Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

*16 Other information

Disclaimer
The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer shall not be held liable for any damage resulting from handling or from contact with the product.

- Department issuing SDS: Environmental, Health and Safety
- Contact:
  Within the USA: 1-(800)-762-4000
  Outside the USA: 1-(203)-712-8488
- Abbreviations and acronyms:
  RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
  ICAO: International Civil Aviation Organisation
  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)
  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
  Ox. Liq. 2: Oxidizing liquids – Category 2
  Skin Corr. 1A: Skin corrosion/irritation – Category 1A
  Skin Irrit. 2: Skin corrosion/irritation – Category 2
  Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A

* Data compared to the previous version altered.
1 Identification

· Product identifier
  · Trade name: NEXION KED MODE DETECTION LIMIT BLANK SOLUTION
  · Article number: N8145057
  · Application of the substance / the mixture: Laboratory chemicals

· Details of the supplier of the safety data sheet
  · Manufacturer/Supplier:

  PerkinElmer, Inc.
  710 Bridgeport Avenue
  Shelton, Connecticut 06484 USA
  CustomerCareUS@perkinelmer.com
  203-925-4600

· Emergency telephone number:
  CHEMTREC (within US): 800-424-9300
  CHEMTREC (from outside US): +1 703-527-3887 (call collect)
  CHEMTREC (within AU): +(61)-290372994

2 Hazard(s) identification

· Classification of the substance or mixture
  The product is not classified, according to the Globally Harmonized System (GHS).

· Label elements
  · GHS label elements: Void
  · Hazard pictograms: Void
  · Signal word: Void
  · Hazard statements: Void
  · Classification system:

· NFPA ratings (scale 0 - 4)

  Health = 0
  Fire = 0
  Reactivity = 0

· HMIS-ratings (scale 0 - 4)

  HEALTH 0
  FIRE 0
  REACTIVITY 0

· Other hazards
  The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.

· 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.

<table>
<thead>
<tr>
<th>Hazardous components:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0 Hydrochloric Acid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>7732-18-5 Water</td>
</tr>
</tbody>
</table>

4 First-aid measures

- Description of first aid measures
- General information: No special measures required.
- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- After eye contact: Rinse opened eye for several minutes under running water.
- After swallowing: If symptoms persist consult 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:
  Use fire fighting measures that suit the environment.
  Water
- 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: Not required.
- Environmental precautions:
  Inform respective authorities in case of seepage into water course or sewage system.
  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).
- Reference to other sections
  No dangerous substances are released.
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

(Contd. on page 3)
7 Handling and storage

- Handling:
  - Precautions for safe handling: No special measures required.
  - Information about protection against explosions and fires: No special measures required.

- Conditions for safe storage, including any incompatibilities
  - Storage:
    - Requirements to be met by storerooms and receptacles: No special requirements.
    - Information about storage in one common storage facility: Not required.
    - Further information about storage conditions: None.

- 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:
    - 7647-01-0 Hydrochloric Acid
      - PEL Ceiling limit value: 7 mg/m³, 5 ppm
      - REL Ceiling limit value: 7 mg/m³, 5 ppm
      - TLV Ceiling limit value: 2.98 mg/m³, 2 ppm

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

- Exposure controls
  - General protective and hygienic measures:
    - The usual precautionary measures for handling chemicals should be followed.

- Breathing equipment: Not required.

- Protection of hands:
  - The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
  - 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.
**9 Physical and chemical properties**

- **Penetration time of glove material**
  The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:** Goggles recommended during refilling.

<table>
<thead>
<tr>
<th>Information on basic physical and chemical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Information</strong></td>
</tr>
<tr>
<td><strong>Form:</strong> Liquid</td>
</tr>
<tr>
<td><strong>Color:</strong> According to product specification</td>
</tr>
<tr>
<td><strong>Odor:</strong> Characteristic</td>
</tr>
<tr>
<td><strong>Odor threshold:</strong> Not determined.</td>
</tr>
<tr>
<td><strong>pH-value:</strong> Not determined.</td>
</tr>
</tbody>
</table>

- **Change in condition**
  - **Melting point/Melting range:** 0 °C (32 °F)
  - **Boiling point/Boiling range:** Undetermined.

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

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Product is not selfigniting.

- **Explosion hazard:** Not determined.
  - **Lower:** Not determined.
  - **Upper:** Not determined.

- **Vapor pressure at 20 ºC (68 ºF):** 23 hPa (17.3 mm Hg)

- **Density:** Not determined.
  - **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**
  - **Water:** 99.0 %
  - **VOC content:** 0.00 %
Trade name: NEXION KED MODE DETECTION LIMIT BLANK SOLUTION

Other information
No further relevant information available.

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:

Primary irritant effect:

on the skin: No irritant effect.

on the eye: No irritating effect.

Sensitization: No sensitizing effects known.

Additional toxicological information:
The product is not subject to classification according to internally approved calculation methods for preparations:

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

Carcinogenic categories

IARC (International Agency for Research on Cancer)
7647-01-0 Hydrochloric Acid 3

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.

Additional ecological information:

General notes: Generally not hazardous for water

(Contd. on page 6)
Trade name: NEXION KED MODE DETECTION LIMIT BLANK SOLUTION

- 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: Smaller quantities can be disposed of with household waste.
- Uncleaned packagings:
  - Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
  - DOT, ADR, IMDG, IATA UN1789
- UN proper shipping name
  - DOT Hydrochloric acid solution
  - ADR 1789 Hydrochloric acid solution
  - IMDG, IATA HYDROCHLORIC ACID solution
- Transport hazard class(es)
  - DOT
    - Class 8 Corrosive substances
    - Label 8
  - ADR
    - Class 8 (C1) Corrosive substances
    - Label 8
  - IMDG, IATA
    - Class 8 Corrosive substances
    - Label 8
Trade name: NEXION KED MODE DETECTION LIMIT BLANK SOLUTION

| Packing group | DOT, ADR, IMDG, IATA | III |
| Environmental hazards: | Marine pollutant: | No |
| Special precautions for user | Danger code (Kemler): | 80 |
| EMS Number: | Segregation groups | Acids |
| Stowage Category | | E |

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

**ADR**
- Excepted quantities (EQ)
  - Code: E1
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 1000 ml

**IMDG**
- Limited quantities (LQ): 5 L
- Excepted quantities (EQ)
  - Code: E1
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 1000 ml

UN "Model Regulation": UN 1789 HYDROCHLORIC ACID SOLUTION, 8, III

15 Regulatory information

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Substance</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td>99.0%</td>
</tr>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric Acid</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

**Sara**

Section 355 (extremely hazardous substances):

<table>
<thead>
<tr>
<th>Code</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric Acid</td>
</tr>
</tbody>
</table>

Section 313 (Specific toxic chemical listings):

<table>
<thead>
<tr>
<th>Code</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric Acid</td>
</tr>
</tbody>
</table>

TSCA (Toxic Substances Control Act):

All ingredients are listed.

<table>
<thead>
<tr>
<th>Code</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric Acid</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
</tr>
</tbody>
</table>
Trade name: NEXION KED MODE DETECTION LIMIT BLANK SOLUTION

- **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.

- **Cancerogenity categories**
  - **EPA (Environmental Protection Agency)** None of the ingredients is listed.
  - **TLV (Threshold Limit Value established by ACGIH)** 7647-01-0 Hydrochloric Acid A4
  - **NIOSH-Ca (National Institute for Occupational Safety and Health)** None of the ingredients is listed.

- **National regulations:**
  - **Information about limitation of use:** Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
  - **Water hazard class:** Generally not hazardous for water.
  - **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

**16 Other information**

*Disclaimer*
The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer shall not be held liable for any damage resulting from handling or from contact with the product.

- **Department issuing SDS:** Environmental, Health and Safety
- **Contact:**
  - Within the USA: 1-(800)-762-4000
  - Outside the USA: 1-(203)-712-8488
- **Abbreviations and acronyms:**
  - RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
  - ICAO: International Civil Aviation Organisation
  - 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
Trade name: NEXION KED MODE DETECTION LIMIT BLANK SOLUTION

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)
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
Skin Corr. 1B: Skin corrosion/irritation – Category 1B
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
* Data compared to the previous version altered.
# 1 Identification

- **Product identifier**
  - **Trade name:** NexION KED Mode Detection Limit Standard Solution
  - **Article number:** N8145058

- **Application of the substance / the mixture** Laboratory chemicals

- **Details of the supplier of the safety data sheet**

  PerkinElmer, Inc.
  710 Bridgeport Avenue
  Shelton, Connecticut 06484 USA
  CustomerCareUS@perkinelmer.com
  203-925-4600

- **Emergency telephone number:**
  - CHEMTREC (within US)  800-424-9300
  - CHEMTREC (from outside US) +1 703-527-3887 (call collect)
  - CHEMTREC (within AU) +(61)-290372994

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# 2 Hazard(s) identification

- **Classification of the substance or mixture**
  The product is not classified, according to the Globally Harmonized System (GHS).

- **Label elements**
  - **GHS label elements** Void
  - **Hazard pictograms** Void
  - **Signal word** Void
  - **Hazard statements** Void

- **Classification system:**
  - **NFPA ratings (scale 0 - 4)**
    
    ![NFPA ratings](image)
    
    Health = 0
    Fire = 0
    Reactivity = 0

  - **HMIS-ratings (scale 0 - 4)**
    
    ![HMIS-ratings](image)
    
    Health = 0
    Fire = 0
    Reactivity = 0

- **Other hazards**
  The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.

- **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.

### Hazardous components:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
<th>Description</th>
<th>Hazard Class</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric Acid</td>
<td>7647-01-0</td>
<td>Skin Corr. 1B, H314; STOT SE 3, H335</td>
<td>1.0%</td>
<td></td>
</tr>
<tr>
<td>Nitric Acid</td>
<td>7697-37-2</td>
<td>Ox. Liq. 2, H272; Skin Corr. 1A, H314</td>
<td>0.1%</td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td>7440-38-2</td>
<td>Acute Tox. 3, H301; Acute Tox. 3, H331; Carc. 1A, H350</td>
<td>0.001%</td>
<td></td>
</tr>
<tr>
<td>Selenium</td>
<td>7782-49-2</td>
<td>Acute Tox. 3, H301; Acute Tox. 3, H331; STOT RE 2, H373</td>
<td>0.001%</td>
<td></td>
</tr>
<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td></td>
<td>98.897%</td>
<td></td>
</tr>
</tbody>
</table>

**4 First-aid measures**

- **Description of first aid measures**
  - **General information:** No special measures required.
  - **After inhalation:** Supply fresh air; consult doctor in case of complaints.
  - **After skin contact:** Generally the product does not irritate the skin.
  - **After eye contact:** Rinse opened eye for several minutes under running water.
  - **After swallowing:** If symptoms persist consult doctor.
  - **Most important symptoms and effects, both acute and delayed:** No further relevant information available.

**5 Fire-fighting measures**

- **Extinguishing media**
  - **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
  - **Water**

- **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:** Not required.

- **Environmental precautions:** Inform respective authorities in case of seepage into water course or sewage system. Do not allow to enter sewers/ surface or ground water.
### Trade name: NexION KED Mode Detection Limit Standard Solution

**Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

**Reference to other sections**
No dangerous substances are released.
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:**
- 7647-01-0 Hydrochloric Acid: 1.8 ppm
- 7697-37-2 Nitric Acid: 0.16 ppm
- 7440-38-2 Arsenic: 1.5 mg/m³
- 7782-49-2 selenium: 0.6 mg/m³
- 7440-62-2 vanadium: 3 mg/m³

**PAC-2:**
- 7647-01-0 Hydrochloric Acid: 22 ppm
- 7697-37-2 Nitric Acid: 24 ppm
- 7440-38-2 Arsenic: 17 mg/m³
- 7782-49-2 selenium: 6.6 mg/m³
- 7440-62-2 vanadium: 5.8 mg/m³

**PAC-3:**
- 7647-01-0 Hydrochloric Acid: 100 ppm
- 7697-37-2 Nitric Acid: 92 ppm
- 7440-38-2 Arsenic: 100 mg/m³
- 7782-49-2 selenium: 40 mg/m³
- 7440-62-2 vanadium: 35 mg/m³

### 7 Handling and storage

#### Handling:
- **Precautions for safe handling:** No special measures required.
- **Information about protection against explosions and fires:** No special measures required.

#### Conditions for safe storage, including any incompatibilities

#### Storage:
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **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>7647-01-0 Hydrochloric Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PEL</strong> Ceiling limit value: 7 mg/m³, 5 ppm</td>
</tr>
<tr>
<td><strong>REL</strong> Ceiling limit value: 7 mg/m³, 5 ppm</td>
</tr>
<tr>
<td><strong>TLV</strong> Ceiling limit value: 2.98 mg/m³, 2 ppm</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:
The usual precautionary measures for handling chemicals should be followed.

Breathing equipment: Not required.

Protection of hands:
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
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 breakthrough time has to be found out by the manufacturer of the protective gloves and has to be observed.

Eye protection: Goggles recommended during refilling.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance:

<table>
<thead>
<tr>
<th>Form:</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>According to product specification</td>
</tr>
<tr>
<td>Odor:</td>
<td>Characteristic</td>
</tr>
<tr>
<td>Odor threshold:</td>
<td>Not determined.</td>
</tr>
</tbody>
</table>

pH-value: Not determined.

Change in condition

<table>
<thead>
<tr>
<th>Melting point/Melting range:</th>
<th>0 °C (32 °F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling point/Boiling range:</td>
<td>Undetermined.</td>
</tr>
</tbody>
</table>

Flash point: Not applicable.

Flammability (solid, gaseous): Not applicable.

Decomposition temperature: Not determined.

Auto igniting: Product is not selfigniting.

Danger of explosion: Product does not present an explosion hazard.
### 47.0.4

- **Explosion limits:**
  - Lower: Not determined.
  - Upper: Not determined.
- **Vapor pressure at 20 °C (68 °F):**
  - 23 hPa (17.3 mm Hg)
- **Density:**
  - Not determined.
- **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:**
  - Water: 98.9%
  - VOC content: 0.00%
- **Other information:** No further relevant information available.

### 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:**
- **Primary irritant effect:**
  - on the skin: No irritant effect.
  - on the eye: No irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**
  The product is not subject to classification according to internally approved calculation methods for preparations. When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.
Trade name: NexION KED Mode Detection Limit Standard Solution

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: Generally not hazardous for water
  - 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: Smaller quantities can be disposed of with household waste.

- **Uncleaned packagings:**
- Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
- DOT, ADR, IMDG, IATA: UN3264

- UN proper shipping name: Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, Nitric Acid)
**Trade name: NexION KED Mode Detection Limit Standard Solution**

<table>
<thead>
<tr>
<th><strong>ADR</strong></th>
<th>3264 Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, Nitric Acid)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IMDG, IATA</strong></td>
<td>3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (HYDROCHLORIC ACID)</td>
</tr>
<tr>
<td></td>
<td>CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (HYDROCHLORIC ACID, Nitric Acid)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Transport hazard class(es)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DOT</strong></td>
</tr>
<tr>
<td>Class</td>
</tr>
<tr>
<td>Label</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>ADR</strong></th>
<th>8 (C1) Corrosive substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>8</td>
</tr>
<tr>
<td>Label</td>
<td>8</td>
</tr>
</tbody>
</table>

| **IMDG, IATA**   |
| Class            | 8 Corrosive substances         |
| Label            | 8                             |

| **Packing group** |
| Class            | 8                             |
| Label            | 8                             |

| **DOT, ADR, IMDG, IATA** |
| Class                  | III                           |
| Label                  |                               |

| **Environmental hazards:** |
| Special precautions for user | Warning: Corrosive substances |
| Danger code (Kemler):   | 80                            |
| EMS Number:             | F-A,S-B                       |
| Segregation groups:    | Acids                         |
| Stowage Category:      | A                             |
| Stowage Code:          | SW2 Clear of living quarters. |

| **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: 5 L
  - On cargo aircraft only: 60 L

- ADR
- Excepted quantities (EQ)
  - Code: E1
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 1000 ml

- IMDG
- Limited quantities (LQ)
  - 5 L
- Excepted quantities (EQ)
  - Code: E1
  - Maximum net quantity per inner packaging: 30 ml
  - Maximum net quantity per outer packaging: 1000 ml

UN "Model Regulation":
- UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
  (HYDROCHLORIC ACID, NITRIC ACID), 8, III

15 Regulatory information

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

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Safety, health and environmental regulations/legislation specific for the substance or mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td></td>
</tr>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric Acid</td>
<td>Skin Corr. 1B, H314</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STOT SE 3, H335</td>
</tr>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
<td>Ox. Liq. 2, H272</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin Corr. 1A, H314</td>
</tr>
</tbody>
</table>

- Sara

  - Section 355 (extremely hazardous substances):
    - 7647-01-0 Hydrochloric Acid
    - 7697-37-2 Nitric Acid

  - Section 313 (Specific toxic chemical listings):
    - 7647-01-0 Hydrochloric Acid
    - 7697-37-2 Nitric Acid
    - 7440-38-2 Arsenic
    - 7782-49-2 selenium
    - 7440-62-2 vanadium

- TSCA (Toxic Substances Control Act):
  All ingredients are listed.
  - 7647-01-0 Hydrochloric Acid
  - 7697-37-2 Nitric Acid
  - 7440-38-2 Arsenic
  - 7782-49-2 selenium
  - 7440-62-2 vanadium
Trade name: NexION KED Mode Detection Limit Standard Solution

7732-18-5 Water

- Proposition 65
  - Chemicals known to cause cancer:
    - 7440-38-2 Arsenic

- 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.

- Cancerogenity categories
  - EPA (Environmental Protection Agency)
    - 7440-38-2 Arsenic A
    - 7782-49-2 selenium D
  - TLV (Threshold Limit Value established by ACGIH)
    - 7647-01-0 Hydrochloric Acid A4
    - 7440-38-2 Arsenic A1
  - NIOSH-Ca (National Institute for Occupational Safety and Health)
    - 7440-38-2 Arsenic

- National regulations:
  - Information about limitation of use:
    Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.
  - Water hazard class: Generally not hazardous for water.
  - Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

*16 Other information*

Disclaimer
The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer shall not be held liable for any damage resulting from handling or from contact with the product.

- Department issuing SDS: Environmental, Health and Safety
- Contact:
  - Within the USA: 1-(800)-762-4000
  - Outside the USA: 1-(203)-712-8488
- Abbreviations and acronyms:
  - RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
Trade name: NexION KED Mode Detection Limit Standard Solution

ICAO: International Civil Aviation Organisation
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)
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
Skin Corr. 1B: Skin corrosion/irritation – Category 1B
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

* Data compared to the previous version altered.
## 1 Identification

- **Product identifier**
  - **Trade name:** NexION KED Mode Setup Solution
  - **Article number:** N8145052
  - **Application of the substance / the mixture:** Laboratory chemicals
  - **Details of the supplier of the safety data sheet**
    - **Manufacturer/Supplier:** PerkinElmer, Inc.
      - 710 Bridgeport Avenue
      - Shelton, Connecticut 06484 USA
      - CustomerCareUS@perkinelmer.com
      - 203-925-4600
  - **Emergency telephone number:**
    - CHEMTREC (within US) 800-424-9300
    - CHEMTREC (from outside US) +1 703-527-3887 (call collect)
    - CHEMTREC (within AU) +(61)-290372994

## 2 Hazard(s) identification

- **Classification of the substance or mixture**
  The product is not classified, according to the Globally Harmonized System (GHS).

<table>
<thead>
<tr>
<th>NFPA ratings (scale 0 - 4)</th>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health = 0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fire = 0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Reactivity = 0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FIRE</th>
<th>REACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health = 0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Other hazards**
  The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.

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

---

(Contd. on page 2)
Acc. to OSHA HCS

Trade name: NexION KED Mode Setup Solution

3 Composition/information on ingredients

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

<table>
<thead>
<tr>
<th>Hazardous components:</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0 Hydrochloric Acid</td>
<td>☀ Skin Corr. 1B, H314</td>
<td>☀ STOT SE 3, H335</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.0%</td>
</tr>
<tr>
<td>Additional Components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>☀ Ox. Liq. 2, H272</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☀ Skin Corr. 1A, H314</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ox. Liq. 2, H272</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>☀ Resp. Sens. 1, H334; Carc. 2, H351</td>
<td></td>
</tr>
<tr>
<td></td>
<td>☀ Skin Sens. 1, H317</td>
<td></td>
</tr>
<tr>
<td>7440-45-1 cerium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7732-18-5 Water</td>
<td>☀ Water-react. 2, H261</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.0001%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>98.9996%</td>
</tr>
</tbody>
</table>

4 First-aid measures

- Description of first aid measures
- General information: No special measures required.
- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- After eye contact: Rinse opened eye for several minutes under running water.
- After swallowing: If symptoms persist consult 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:
  Use fire fighting measures that suit the environment.
  Water
- 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: Not required.
- Environmental precautions:
  Inform respective authorities in case of seepage into water course or sewage system.
  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).
Trade name: NexION KED Mode Setup Solution

· Reference to other sections
  No dangerous substances are released.
  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

<table>
<thead>
<tr>
<th>PAC-1:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric Acid</td>
</tr>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
</tr>
<tr>
<td>7440-45-1</td>
<td>cerium</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-2:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric Acid</td>
</tr>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
</tr>
<tr>
<td>7440-45-1</td>
<td>cerium</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-3:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-01-0</td>
<td>Hydrochloric Acid</td>
</tr>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
</tr>
<tr>
<td>7440-45-1</td>
<td>cerium</td>
</tr>
</tbody>
</table>

7 Handling and storage

· Handling:
  · Precautions for safe handling: No special measures required.
  · Information about protection against explosions and fires: No special measures required.

· Conditions for safe storage, including any incompatibilities
  · Storage:
    · Requirements to be met by storerooms and receptacles: No special requirements.
    · Information about storage in one common storage facility: Not required.
    · Further information about storage conditions: None.
  · 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>7647-01-0 Hydrochloric Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL Ceiling limit value: 7 mg/m³, 5 ppm</td>
</tr>
<tr>
<td>REL Ceiling limit value: 7 mg/m³, 5 ppm</td>
</tr>
</tbody>
</table>
## 9 Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Form</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>According to product specification</td>
</tr>
<tr>
<td>Odor</td>
<td>Characteristic</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>pH-value</strong></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>0 °C (32 °F)</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>Undetermined.</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Flammability (solid, gaseous)</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Auto igniting</strong></td>
<td>Product is not selfigniting.</td>
</tr>
<tr>
<td><strong>Danger of explosion</strong></td>
<td>Product does not present an explosion hazard.</td>
</tr>
<tr>
<td><strong>Explosion limits</strong></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Upper</td>
<td>Not determined.</td>
</tr>
<tr>
<td><strong>Vapor pressure at 20 °C (68 °F)</strong></td>
<td>23 hPa (17.3 mm Hg)</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>Not determined.</td>
</tr>
</tbody>
</table>
### 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**:
    - Primary irritant effect:
      - on the skin: No irritant effect.
      - on the eye: No irritating effect.
    - Sensitization: No sensitizing effects known.
  - **Additional toxicological information**:
    The product is not subject to classification according to internally approved calculation methods for preparations:
    When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

- **Carcinogenic categories**
  - **IARC (International Agency for Research on Cancer)**
    - 7647-01-0 Hydrochloric Acid 3
    - 7440-48-4 cobalt 2B
  - **NTP (National Toxicology Program)**
    - 7440-48-4 cobalt R

* (Contd. on page 6)
Trade name: NexION KED Mode Setup Solution

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: Generally not hazardous for water
- **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: Smaller quantities can be disposed of with household waste.
- **Uncleaned packagings**
  - Recommendation: Disposal must be made according to official regulations.

14 Transport information

- **UN-Number**
  - DOT, ADR, IMDG, IATA: UN3264
- **UN proper shipping name**
  - DOT: Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, Nitric Acid)
  - ADR: 3264 Corrosive liquid, acidic, inorganic, n.o.s. (Hydrochloric acid, Nitric Acid)
  - IMDG, IATA: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (HYDROCHLORIC ACID, Nitric Acid)
- **Transport hazard class(es)**
  - DOT: 8 Corrosive substances
## Trade name: NexION KED Mode Setup Solution

<table>
<thead>
<tr>
<th>Section</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Label</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>ADR</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Class</strong></td>
<td>8 (C1) Corrosive substances</td>
</tr>
<tr>
<td><strong>Label</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>IMDG, IATA</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Class</strong></td>
<td>8 Corrosive substances</td>
</tr>
<tr>
<td><strong>Label</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Packing group</strong></td>
<td></td>
</tr>
<tr>
<td><strong>DOT, ADR, IMDG, IATA</strong></td>
<td>III</td>
</tr>
<tr>
<td><strong>Environmental hazards:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Marine pollutant:</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Special precautions for user</strong></td>
<td>Warning: Corrosive substances 80</td>
</tr>
<tr>
<td><strong>EMS Number:</strong></td>
<td>F-A-S-B</td>
</tr>
<tr>
<td><strong>Segregation groups</strong></td>
<td>Acids</td>
</tr>
<tr>
<td><strong>Stowage Category</strong></td>
<td>A</td>
</tr>
<tr>
<td><strong>Stowage Code</strong></td>
<td>SW2 Clear of living quarters.</td>
</tr>
<tr>
<td><strong>Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code</strong></td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Transport/Additional information:</strong></td>
<td></td>
</tr>
<tr>
<td><strong>DOT</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **Quantity limitations** | On passenger aircraft/rail: 5 L  
On cargo aircraft only: 60 L |
| **ADR** |  |
| **Excepted quantities (EQ)** | Code: E1  
Maximum net quantity per inner packaging: 30 ml  
Maximum net quantity per outer packaging: 1000 ml |
| **IMDG** |  |
| **Limited quantities (LQ)** | 5L  
Code: E1  
Maximum net quantity per inner packaging: 30 ml  
Maximum net quantity per outer packaging: 1000 ml |
| **Excepted quantities (EQ)** |  |
**Trade name: NexION KED Mode Setup Solution**

**UN "Model Regulation":**

UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (HYDROCHLORIC ACID, NITRIC ACID), 8, III

---

**15 Regulatory information**

<table>
<thead>
<tr>
<th>Safety, health and environmental regulations/legislation specific for the substance or mixture</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7732-18-5 Water</td>
<td>98.9996%</td>
</tr>
<tr>
<td>7647-01-0 Hydrochloric Acid</td>
<td>Skin Corr. 1B, H314; Resp. Sens. 1, H317; STOT SE 3, H335; Carc. 2, H351 1.0%</td>
</tr>
<tr>
<td>7440-48-4 cobalt</td>
<td>Resp. Sens. 1, H334; Carc. 2, H351 0.0001%</td>
</tr>
</tbody>
</table>

---

**Sara**

- **Section 355 (extremely hazardous substances):**
  - 7647-01-0 Hydrochloric Acid
  - 7697-37-2 Nitric Acid

- **Section 313 (Specific toxic chemical listings):**
  - 7647-01-0 Hydrochloric Acid
  - 7697-37-2 Nitric Acid
  - 7440-48-4 cobalt

- **TSCA (Toxic Substances Control Act):**
  All ingredients are listed.
  - 7647-01-0 Hydrochloric Acid
  - 7697-37-2 Nitric Acid
  - 7440-48-4 cobalt
  - 7440-45-1 cerium
  - 7732-18-5 Water

- **Proposition 65**

  - **Chemicals known to cause cancer:**
    - 7440-48-4 cobalt

  - **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.

---

**Cancerogenity categories**

- **EPA (Environmental Protection Agency)**
  None of the ingredients is listed.
Trade name: NexION KED Mode Setup Solution

- **TLV (Threshold Limit Value established by ACGIH)**
  - 7647-01-0 Hydrochloric Acid
  - 7440-48-4 cobalt

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**
  None of the ingredients is listed.

- **National regulations:**
  
  - **Information about limitation of use:**
    Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.

  - **Water hazard class:** Generally not hazardous for water.

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

---

**16 Other information**

**Disclaimer**

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  - Outside the USA: 1-(203)-712-8488
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  - ICAO: International Civil Aviation Organisation
  - 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)
  - 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
  - Skin Corr. 1B: Skin corrosion/irritation – Category 1B
  - STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

* * Data compared to the previous version altered.*