1 Identification

· Product identifier

· Trade name: CADMIUM 1000 PPM A/S STANDARD
· Article number N9300176
· 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

  Health hazard

  Carc. 1B  H350  May cause cancer.
  Repr. 2    H361  Suspected of damaging fertility or the unborn child.

  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, GHS08
· Signal word Danger

· Hazard-determining components of labeling:
  cadmium

· Hazard statements
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
  H350 May cause cancer.
  H361 Suspected of damaging fertility or the unborn child.

· Precautionary statements
  P201  Obtain special instructions before use.
  P202  Do not handle until all safety precautions have been read and understood.
  P264  Wash thoroughly after handling.
  P280  Wear protective gloves/protective clothing/eye protection/face protection.
Trade name: CADMIUM 1000 PPM A/S STANDARD

(Contd. of page 1)

P302+P352 If on skin: Wash with plenty of water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P321 Specific treatment (see on this label).
P362+P364 Take off contaminated clothing and wash it before reuse.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

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

· HMIS-ratings (scale 0 - 4)

  HEALTH 
  Health = *2
  FIRE
  Fire = 0
  REACTIVITY
  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

· CAS No. Description
7732-18-5 Water
· Chemical characterization: Mixtures
· Description: Mixture of the substances listed below with nonhazardous additions.

· Hazardous components:

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
</tr>
<tr>
<td>7440-43-9</td>
<td>cadmium</td>
</tr>
</tbody>
</table>

(Contd. on page 3)
Trade name: CADMIUM 1000 PPM A/S STANDARD

4 First-aid measures

- Description of first aid measures
  - General information: Immediately remove any clothing soiled by the product.
  - After inhalation: In case of unconsciousness place patient stably in side position for transportation.
  - After skin contact: Immediately wash with water and soap and rinse thoroughly.
  - After eye contact:
    Rinse opened eye for several minutes under running water. 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).
  - Dispose contaminated material as waste according to item 13.
  - Ensure adequate ventilation.
- Reference to other sections
  - See Section 7 for information on safe handling.
  - See Section 8 for information on personal protection equipment.
  - See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

- PAC-1:
  - 7697-37-2 Nitric Acid
    0.16 ppm
  - 7440-43-9 cadmium
    0.10 mg/m³

- PAC-2:
  - 7697-37-2 Nitric Acid
    24 ppm
  - 7440-43-9 cadmium
    0.76 mg/m³
Trade name: CADMIUM 1000 PPM A/S STANDARD

7 Handling and storage

- Handling:
  - Precautions for safe handling
    Ensure good ventilation/exhaustion at the workplace.
    Open and handle receptacle with care.
  - Information about protection against explosions and fires: Keep respiratory protective device available.
  - 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

<table>
<thead>
<tr>
<th>Component</th>
<th>PEL</th>
<th>REL</th>
<th>TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 Nitric Acid</td>
<td>Long-term value: 5 mg/m³, 2 ppm</td>
<td>Short-term value: 10 mg/m³, 4 ppm</td>
<td>Short-term value: 10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td></td>
<td>REL Long-term value: 5 mg/m³, 2 ppm</td>
<td>REL Long-term value: 5.2 mg/m³, 2 ppm</td>
<td>REL Long-term value: 5.2 mg/m³, 2 ppm</td>
</tr>
<tr>
<td>7440-43-9 cadmium</td>
<td>PEL Long-term value: 0.005 mg/m³ as Cd; see 29 CFR 1910.1027</td>
<td>REL See Pocket Guide App. A</td>
<td>TLV Long-term value: 0.01 0.002* mg/m³ as Cd; *respirable fraction; BEI</td>
</tr>
</tbody>
</table>
Trade name: CADMIUM 1000 PPM A/S STANDARD

Ingredients with biological limit values:

- **7440-43-9 cadmium**
  - BEI: 5 µg/g creatinine
  - Medium: urine
  - Time: not critical
  - Parameter: Cadmium (background)

- **5 µg/L**
  - Medium: blood
  - Time: not critical
  - Parameter: Cadmium (background)

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.
  - Store protective clothing separately.
  - Avoid contact with the eyes and skin.

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

Protection of hands:

- Protective gloves
  - The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
  - 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

<table>
<thead>
<tr>
<th>Information on basic physical and chemical properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form: Liquid</td>
</tr>
<tr>
<td>Color: Transparent</td>
</tr>
<tr>
<td>Odor: Odorless</td>
</tr>
<tr>
<td>Odor threshold: Not determined.</td>
</tr>
<tr>
<td>pH-value: Not determined.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Change in condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/Melting range: 0 °C (32 °F)</td>
</tr>
<tr>
<td>Boiling point/Boiling range: 100 °C (212 °F)</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. Not determined. |

| Explosion limits: |
| Lower: Not determined. |
| Upper: Not determined. |

| Vapor pressure at 20 °C (68 °F): 23 hPa (17.3 mm Hg) |
| Density at 20 °C (68 °F): 1 g/cm³ (8.345 lbs/gal) |
| Relative density: Not determined. |
| Vapor density: Not determined. |
| Evaporation rate: Not determined. |

| Solubility in / Miscibility with Water: Not miscible or difficult to mix. |
| Partition coefficient (n-octanol/water): Not determined. |

| Viscosity: |
| Dynamic: Not determined. |
| Kinematic: Not determined. |

| Solvent content: |
| Water: 97.9 % |
| VOC content: 0.00 % |

| Solids content: 0.1 % |
| 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:
  - LD/LC50 values that are relevant for classification:
    
    | Substance | LD50/LC50 Value |
    |-----------|-----------------|
    | 7440-43-9 cadmium | Oral LD50 225 mg/kg (rat) |
  
- 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
  
<table>
<thead>
<tr>
<th>Agency</th>
<th>Substance</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IARC</td>
<td>7440-43-9 cadmium</td>
<td>1</td>
</tr>
<tr>
<td>NTP</td>
<td>7440-43-9 cadmium</td>
<td>K</td>
</tr>
<tr>
<td>OSHA-Ca</td>
<td>7440-43-9 cadmium</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, even in small quantities.
    Danger to drinking water if even extremely 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)
  - DOT
    - Class: 8 Corrosive substances
    - Label: 8
  - ADR
    - Class: 8 (C1) Corrosive substances
    - Label: 8
Trade name: CADMIUM 1000 PPM A/S STANDARD

(IMDG, IATA)

- Class: 8 Corrosive substances
- Label: 8

- Packing group: III
- DOT, ADR, IMDG, IATA
- Environmental hazards:
- Marine pollutant: No

- Special precautions for user: Warning: Corrosive substances
- Hazard identification number (Kemler code): 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)
    - 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
  - 7697-37-2 Nitric Acid
    - Ox. Liq. 2, H272
    - Skin Corr. 1A, H314

(Contd. on page 10)
Trade name: CADMIUM 1000 PPM A/S STANDARD

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-43-9</td>
<td>cadmium</td>
<td>0.1%</td>
</tr>
<tr>
<td>7697-37-2</td>
<td>Nitric Acid</td>
<td></td>
</tr>
<tr>
<td>7732-18-5</td>
<td>Water</td>
<td></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
    - 7440-43-9 cadmium
  - TSCA (Toxic Substances Control Act):
    - All ingredients are listed.
    - 7732-18-5 Water
    - 7697-37-2 Nitric Acid
    - 7440-43-9 cadmium
  - Hazardous Air Pollutants
    - None of the ingredients is listed.
  - Proposition 65
    - Chemicals known to cause cancer:
      - 7440-43-9 cadmium
    - Chemicals known to cause reproductive toxicity for females:
      - None of the ingredients is listed.
    - Chemicals known to cause reproductive toxicity for males:
      - 7440-43-9 cadmium
    - Chemicals known to cause developmental toxicity:
      - 7440-43-9 cadmium
  - Cancerogenity categories
    - EPA (Environmental Protection Agency)
      - 7440-43-9 cadmium B1
    - TLV (Threshold Limit Value established by ACGIH)
      - 7440-43-9 cadmium A2
    - NIOSH-Ca (National Institute for Occupational Safety and Health)
      - 7440-43-9 cadmium
  - National regulations:
    - Additional classification according to Decree on Hazardous Materials:
      - Carcinogenic hazardous material group III (dangerous).
  - 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.
    - Workers are not allowed to be exposed to the hazardous carcinogenic materials contained in this preparation. Exceptions can be made by the authorities in certain cases.

(Contd. on page 11)
Trade name: CADMIUM 1000 PPM A/S STANDARD

Water hazard class: Water hazard class 3 (Self-assessment): extremely 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)
NPFAPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Ox. Liq. 2: Oxidizing liquids – Category 2
Acute Tox. 3: Acute toxicity – Category 3
Acute Tox. 2: Acute toxicity – 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
Mut. 2: Germ cell mutagenicity – Category 2
Carc. 1B: Carcinogenicity – Category 1B
Repr. 2: Reproductive toxicity – Category 2
STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1
Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1
Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1

* Data compared to the previous version altered.