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

1.1. Product identifier

Product form : Substance
Substance name : Ammonium Hydroxide, 28-30% w/w
CAS No : 1336-21-6
Product code : LC11050
Formula : NH4OH
Synonyms : ammonia hydrate, 28%-30% / Ammonia solution, relative density between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia / ammonia,aqua 25%<=conc<35% / ammonia,liquor,25%<=conc<35% / ammonia, solutions, 28%-30% / ammoniawater, 28%-30% / aqua ammonia, solution, 28%-30% / spirit of hartshorn, 28%-30%
BIG no : 26353

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Chemical raw material
Food industry: additive
Solvent

1.3. Details of the supplier of the safety data sheet

LabChem Inc
Jackson's Pointe Commerce Park Building 1000, 1010 Jackson's Pointe Court
16063 Zelienople, PA - USA
T 412-826-5230 - F 724-473-0647
info@labchem.com - www.labchem.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 or 011-703-527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification
Acute Tox. 4 (Oral) H302
Skin Corr. 1A H314
Aqueous Acute 1 H400

2.2. Label elements

GHS-US labelling

GHS05
GHS07
GHS09

Signal word (GHS-US) : Danger
Hazard statements (GHS-US) : H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H400 - Very toxic to aquatic life
Precautionary statements (GHS-US) : P260 - Do not breathe mist, spray, vapours
P264 - Wash exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P273 - Avoid release to the environment
P280 - Wear eye protection, face protection, protective clothing, protective gloves
P301+P312 - IF SWALLOWED: call a POISON CENTER or doctor/physician if you feel unwell
P301+P330+P311 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER/doctor/…
P330 - If swallowed, rinse mouth
P363 - Wash contaminated clothing before reuse
P391 - Collect spillage
P405 - Store locked up
P501 - Dispose of contents/container to comply with local, state and federal regulations
2.3. Other hazards
Other hazards not contributing to the classification: None.

2.4. Unknown acute toxicity (GHS US)
No data available

SECTION 3: Composition/information on ingredients

3.1. Substances
Substance type: Multi-constituent

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water (CAS No) 7732-18-5</td>
<td></td>
<td>70 - 72</td>
<td>Not classified</td>
</tr>
<tr>
<td>Ammonium Hydroxide, 28-30% w/w (CAS No) 1336-21-6</td>
<td></td>
<td>28 - 30</td>
<td>Acute Tox. 4 (Oral), H302 Skin Corr. 1A, H314 Aquatic Acute 1, H400</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

3.2. Mixture
Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures


First-aid measures after inhalation: Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact: Wash immediately with lots of water (15 minutes)/shower. Do not apply (chemical) neutralizing agents. Remove clothing while washing. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%; take victim to hospital.

First-aid measures after eye contact: Rinse immediately with plenty of water for 15 minutes. Cover eyes aseptically. Do not apply neutralizing agents. Take victim to an ophthalmologist.


4.2. Most important symptoms and effects, both acute and delayed


Symptoms/injuries after skin contact: Caustic burns/corrosion of the skin.

Symptoms/injuries after eye contact: Irritation of the eye tissue. Permanent eye damage.


4.3. Indication of any immediate medical attention and special treatment needed
Obtain medical assistance.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media: EXTINGUISHING MEDIA FOR SURROUNDING FIRES: All extinguishing media allowed.

Unsuitable extinguishing media: No unsuitable extinguishing media known.

5.2. Special hazards arising from the substance or mixture
Fire hazard: DIRECT FIRE HAZARD. Non combustible.

Explosion hazard: INDIRECT EXPLOSION HAZARD. Reactions with explosion hazards: see "Reactivity Hazard".
### Reactivity
- **On heating**: release of toxic/corrosive/combustible gases/vapours (ammonia). On burning: release of toxic and corrosive gases/vapours (nitrous vapours). Concentrated solution violent to explosive reaction with many compounds e.g.: with (some) halogens compounds, with (strong) oxidizers and with (some) acids.

### 5.3. Advice for firefighters
- **Firefighting instructions**: Cool tanks/drums with water spray/remove them into safety. Do not move the load if exposed to heat. Dilute toxic gases with water spray. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it.
- **Protection during firefighting**: Do not enter fire area without proper protective equipment, including respiratory protection.

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

**6.1.1. For non-emergency personnel**

**6.1.2. For emergency responders**
- **Protective equipment**: Equip cleanup crew with proper protection.
- **Emergency procedures**: Stop leak if safe to do so. Ventilate area.

#### 6.2. Environmental precautions
- Prevent soil and water pollution. Prevent spreading in sewers.

#### 6.3. Methods and material for containment and cleaning up
- **For containment**: Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Dam up the liquid spill. Try to reduce evaporation. Dilute toxic gases/vapours with water spray. Take account of toxic/corrosive precipitation water.
- **Methods for cleaning up**: Damaged/cooled tanks must be emptied. Take up liquid spill into absorbent material, e.g.: sand/earth or powdered limestone. Scoop absorbed substance into closing containers. See "Material-handling" for suitable container materials. Carefully collect the spill/leftovers. Take collected spill to manufacturer/competent authority. Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.

#### 6.4. Reference to other sections
- No additional information available

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling
- **Precautions for safe handling**: Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Use corrosionproof equipment. Thoroughly clean/dry the installation before use. Do not discharge the waste into the drain. Keep away from naked flames/heat. Observe strict hygiene. Keep container tightly closed. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection. Exhaust gas must be neutralised.
- **Hygiene measures**: Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse.

#### 7.2. Conditions for safe storage, including any incompatibilities
- **Storage conditions**: Keep container closed when not in use.
- **Incompatible products**: Strong acids. silver nitrate.
- **Maximum storage period**: 365 days
- **Storage temperature**: < 38 °C
- **Heat and ignition sources**: KEEP SUBSTANCE AWAY FROM: heat sources.
- **Prohibitions on mixed storage**: KEEP SUBSTANCE AWAY FROM: oxidizing agents. (strong) acids. halogens.
- **Storage area**: Store at ambient temperature. Keep out of direct sunlight. Store in a dark area. Keep container in a well-ventilated place. Keep locked up. Provide for a tub to collect spills. Meet the legal requirements.
- **Special rules on packaging**: SPECIAL REQUIREMENTS: closing. clean. opaque. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.
- **Packaging materials**: SUITABLE MATERIAL: synthetic material. glass. MATERIAL TO AVOID: aluminium. copper. tin. zinc. nickel. bronze.

#### 7.3. Specific end use(s)
- No additional information available
Ammonium Hydroxide, 28-30% w/w Safety Data Sheet  
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Ammonium Hydroxide, 28-30% w/w (1336-21-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA ACGIH ACGIH TWA (mg/m³)</td>
</tr>
<tr>
<td>USA ACGIH ACGIH TWA (ppm)</td>
</tr>
<tr>
<td>USA ACGIH ACGIH STEL (mg/m³)</td>
</tr>
<tr>
<td>USA ACGIH ACGIH STEL (ppm)</td>
</tr>
<tr>
<td>USA OSHA OSHA PEL (TWA) (mg/m3)</td>
</tr>
<tr>
<td>USA OSHA OSHA PEL (TWA) (ppm)</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Appropriate engineering controls: Provide adequate general and local exhaust ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Materials for protective clothing: GIVE EXCELLENT RESISTANCE: butyl rubber. GIVE GOOD RESISTANCE: neoprene, nitrile rubber, viton, tetrafluoroethylene. GIVE LESS RESISTANCE: PVC. GIVE POOR RESISTANCE: natural rubber, polyethylene, PVA.

Hand protection: Gloves.

Eye protection: Protective goggles.

Skin and body protection: Head/neck protection. Corrosion-proof clothing.


Thermal hazard protection: None necessary.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Liquid

Appearance: Liquid.

Molecular mass: 35.05 g/mol

Colour: Colourless.

Odour: Irritating/pungent odour.

Odour threshold: 5 - 50 ppm

pH: 11.7 (3.5 %)

pH solution: 3.5 %

Relative evaporation rate (butylacetate=1): No data available

Melting point: No data available

Freezing point: No data available

Boiling point: 27 °C

Flash point: Not applicable

Self ignition temperature: Not applicable

Decomposition temperature: No data available

Flammability (solid, gas): No data available

Vapour pressure: No data available

Relative vapour density at 20 °C: No data available

Relative density: 0.88 - 0.91

Density: 0.89

Solubility: Water: Complete

Log Pow: -1.3

Log Kow: No data available

Viscosity, kinematic: No data available

Viscosity, dynamic: No data available

Explosive properties: No data available

Oxidising properties: No data available

Explosive limits: Not applicable

9.2. Other information

Minimum ignition energy: Not applicable

VOC content: Not applicable

Other properties: Clear. Physical properties depending on the concentration. Volatile. Substance has basic reaction.
Ammonium Hydroxide, 28-30% w/w
Safety Data Sheet
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SECTION 10: Stability and reactivity

10.1. Reactivity
On heating: release of toxic/corrosive/combustible gases/vapours (ammonia). On burning: release of toxic and corrosive gases/vapours (nitrous vapours). Concentrated solution violent to explosive reaction with many compounds e.g.: with (some) halogens compounds, with (strong) oxidizers and with (some) acids.

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
Reacts vigorously with strong oxidizers and acids.

10.4. Conditions to avoid
High temperature. Incompatible materials.

10.5. Incompatible materials
May react violently with acids.

10.6. Hazardous decomposition products
Gaseous ammonia.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity : Harmful if swallowed.

**Ammonium Hydroxide, 28-30% w/w (1336-21-6)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>LD50 oral rat</td>
<td>350 mg/kg</td>
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**Water (7732-18-5)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>≥ 90000 mg/kg</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation : Causes severe skin burns and eye damage.

pH: 11.7 (3.5 %)

Serious eye damage/irritation : Not classified

pH: 11.7 (3.5 %)

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified


Symptoms/injuries after skin contact : Caustic burns/corrosion of the skin.

Symptoms/injuries after eye contact : Irritation of the eye tissue. Permanent eye damage.


SECTION 12: Ecological information

12.1. Toxicity
Ecology - general : Dangerous for the environment.

## Ammonium Hydroxide, 28-30% w/w

### Safety Data Sheet

**Ammonium Hydroxide, 28-30% w/w (1336-21-6)**

### 12. Persistence and degradability

**Persistence and degradability**

- Readily biodegradable in water. Ozonation in water. Biodegradable in the soil. No (test)data on mobility of the components of the mixture available. Ozonation in the air.

### 12.3. Bioaccumulative potential

**Bioaccumulative potential**

- Bioaccumulation: not applicable.

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

No additional information available

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

- **Waste disposal recommendations**: Recycle/reuse. Remove for physico-chemical/biological treatment. Remove to an authorized incinerator equipped with an afterburner and a flue gas scrubber with energy recovery. Use appropriate containment to avoid environmental contamination.

- **Additional information**: LWCA (the Netherlands): KGA category 02. Hazardous waste according to Directive 2008/98/EC.

- **Ecology - waste materials**: Avoid release to the environment.

### SECTION 14: Transport information

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

#### 14.1. UN number

- **UN-No.(DOT)**: 2672
- **DOT NA no.**: UN2672

#### 14.2. UN proper shipping name

- **DOT Proper Shipping Name**: Ammonia solutions
- **relative density between 0.880 and 0.957 at 15 degrees C in water, with more than 10 percent but not more than 35 percent ammonia**
- **Department of Transportation (DOT) Hazard Classes**: 8 - Class 8 - Corrosive material 49 CFR 173.136
- **Hazard labels (DOT)**: 8 - Corrosive substances

- **Packing group (DOT)**: III - Minor Danger

- **DOT Special Provisions (49 CFR 172.102)**: IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirements: Only liquids with a vapor pressure less than or equal to 110 kPa at 55 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672).

- **IP8**: Ammonia solutions may be transported in rigid or composite plastic IBCs (31H1, 31H2 and 31HZ1) that have successfully passed, without leakage or permanent deformation, the hydrostatic test specified in 178.814 of this subchapter at a test pressure that is not less than 1.5 times the vapor pressure of the contents at 55 C (131 F). T7 - 4 178.274(d)(2) Normal............. 178.275(d)(3)

- **TP1**: The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.

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DOT Packaging Exceptions (49 CFR 173.xxx) : 154
DOT Packaging Non Bulk (49 CFR 173.xxx) : 203
DOT Packaging Bulk (49 CFR 173.xxx) : 241
Marine pollutant : P

14.3. Additional information

Other information : No supplementary information available.
State during transport (ADR-RID) : as liquid.

Overland transport
Packing group (ADR) : III
Class (ADR) : 8 - Corrosive substances
Hazard identification number (Kepler No.) : 80
Classification code (ADR) : C5
Danger labels (ADR) : 8 - Corrosive substances

Orange plates :

Tunnel restriction code : E

Transport by sea
DOT Vessel Stowage Location : A - The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.
DOT Vessel Stowage Other : 40 - Stow “clear of living quarters”,52 - Stow “separated from” acids,85 - Under deck stowage must be in mechanically ventilated space
EmS-No. (1) : F-A
EmS-No. (2) : S-B

Air transport
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 60 L

SECTION 15: Regulatory information

15.1. US Federal regulations

Ammonium Hydroxide, 28-30% w/w (1336-21-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
RQ (Reportable quantity, section 304 of EPA's List of Lists) : 1000 lb

Ammonium Hydroxide, 28-30% w/w (1336-21-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
RQ (Reportable quantity, section 304 of EPA's List of Lists) : 1000 lb

15.2. International regulations

CANADA

Ammonium Hydroxide, 28-30% w/w (1336-21-6)
Listed on the Canadian DSL (Domestic Substances List) inventory.
WHMIS Classification Class E - Corrosive Material
Ammonium Hydroxide, 28-30% w/w
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

<table>
<thead>
<tr>
<th>Ammonium Hydroxide, 28-30% w/w (1336-21-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the Canadian DSL (Domestic Substances List) inventory.</td>
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</table>

**WHMIS Classification**

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td>Class E - Corrosive Material</td>
</tr>
</tbody>
</table>

**EU-Regulations**

No additional information available

**Classification according to Regulation (EC) No. 1272/2008 [CLP]**

Skin Corr. 1B  H314
Aquatic Acute 1  H400
Full text of H-phrases: see section 16

**Classification according to Directive 67/548/EEC or 1999/45/EC**

C: R34
N: R50
Full text of R-phrases: see section 16

**15.2.2. National regulations**

<table>
<thead>
<tr>
<th>Ammonium Hydroxide, 28-30% w/w (1336-21-6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listed on the Canadian Ingredient Disclosure List</td>
</tr>
</tbody>
</table>

**15.3. US State regulations**

No additional information available

**SECTION 16: Other information**

Training advice: Users of breathing apparatus must be trained.

Full text of H-phrases: see section 16:

- **Acute Tox. 4 (Oral)**: Acute toxicity (oral), Category 4
- **Aquatic Acute 1**: Hazardous to the aquatic environment — Acute Hazard, Category 1
- **Skin Corr. 1A**: Skin corrosion/irritation, Category 1A
- **H302**: Harmful if swallowed
- **H314**: Causes severe skin burns and eye damage
- **H400**: Very toxic to aquatic life

**NFPA health hazard**: 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

**NFPA fire hazard**: 0 - Materials that will not burn.

**NFPA reactivity**: 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.

**HMIS III Rating**

<p>| | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 Minimal Hazard</td>
</tr>
<tr>
<td>Physical</td>
<td>1 Slight Hazard</td>
</tr>
<tr>
<td>Personal Protection</td>
<td>H</td>
</tr>
</tbody>
</table>

**SDS US (GHS HazCom 2012)**

Information in this SDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc assumes no liability resulting from the use of this SDS. The user must determine suitability of this information for his application.

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