Compiled on: 9.12.2010.
Revised on: 4.2.2016.
Replaces the previous version of the safety data sheet starting from: 4.2.2016.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE /MIXTURE AND OF THE COMPANY/UNDERTAKING

Subsection 1.1. Product identifier:	**AMMONIA SOLUTION 25%; 27% 007-001-01-2**
Registration number:	01-2119488876-14-0125
Subsection 1.2. Relevant identified uses of the substance or mixture, and uses advised against:	Ammonium hydroxide is mostly used in the chemical industry as raw material for the production of ammonium salts. In the fertilizers industry it is used both as raw material and fertilizer. It is also used in textile industry, food industry, pulp and paper industry and pharmaceutical industry.
Uses advised against:	None
Subsection 1.3. Details of the Supplier:	
a) Manufacturer/Supplier:	"HIP-AZOTARA" d.o.o. Pančevo
b) Status:	Manufacturer/Producer
c) Street address and telephone number:	Spoljnostarčevačka 80, 26000 Pančevo, The Republic of Serbia +381 13 308067; 7-15 h(Environmental Protection Department) +381 13 308052, 308057; 7-15 h (Sales Department)
d) e-mail address of competent person responsible for the SDS:	gordana.vasojevic@hip-azotara.rs ekologija.info@hip-azotara.rs
e)Only Representative in EU:	BENS consulting d.o.o. Address: Bakovniška 7, 1241 Kamnik, Slovenia Tel.: +386 1 562 19 20; e-mail: info@kemikalije.com Contact person in EU: Mark Stanojević
Subsection 1.4. Single European emergency call number:	112
Supplier:	+386 1 562 19 20

SECTION 2. HAZARDS IDENTIFICATION

Subsection 2.1. Classification of the substance or mixture:

Classification according to Reg. 1272/2008:

Hazard class and category	*Hazard statements*
Skin Corr. 1B	H314
–STOT SE 3	H335
Aquatic Acute 1	H400

**see Section 16 for full text of risk phrases and hazard statements.*

Subsection 2.2. Label elements:

Signal word: Danger

H314: Causes severe skin burns and eye damage.
H335: May cause respiratory irritation.
H400: Very toxic to aquatic life.

P260: Do not breathe vapours.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P304+P340: IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing.
P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P310: Immediately call a POISON CENTER/doctor.

Subsection 2.3. Other hazards:

a) Persistent-bioaccumulative-toxic/very persistent-very bioaccumulative

The substance is not classified as PBT, or as vPvB.

b) Other information

Aqueous solution of ammonia is not flammable. However, ammonia vapours in the presence of air, at concentrations 16-27%, may cause explosion if caught by fire.

SECTION 3. INFORMATION ON INGREDIENTS

Subsection 3.1. Information on the ingredients of the substance:

Chemical name	**Ammonia**	**Water**
Chemical formula	NH_3	H_2O
Index number	007-001-01-2	/
EC number	215-647-6	/
CAS number	1336-21-6	7732-18-5
Concentration	25 %	75 %
	27 %	73 %

*EU inventory: *the component is listed on the European Inventory of Existing Chemical Substances – EINECS*

SECTION 4. FIRST AID MEASURES

Subsection 4.1. Description of first aid measures:	
- following inhalation:	Move the injured person to fresh air at once. Keep the patient warm and at rest. Apply artificial respiration if breathing has stopped or shows signs of failing. If the patient is unconscious, place them on their side in a stable position. If the patient suffers cardiac arrest (absence of heartbeats or pulse) commence cardio-pulmonary resuscitation immediately. Obtain immediate medical attention.
- following skin contact:	Rinse with large quantities of water. In case of chemical burns (frostbite) clothing may adhere to the skin. After some time, remove the adhering clothing carefully using lukewarm water. Remove clothing and rinse the affected areas with water. Do not apply any creams or ointments at least 24h after the accident. Immediately obtain medical attention.
- following eye contact:	Immediately flush eyes with eyewash solution or water for at least 15 minutes. Hold eyelids open during flushing, protecting the eye that is not affected. Continue flushing until medical attention is obtained.
- following ingestion:	If the injured person is conscious, wash out mouth with water and give 2 or 3 glasses of water to drink. Do not induce vomiting, but if it occurs, put the patient in the face-down position in order to prevent lung damage. Obtain immediate medical attention.
- advice:	In case of exposure to ammonia solution vapours, it is essential to remove the affected person immediately from the contaminated area. The rescuer must be adequately equipped with a facemask and filters approved for ammonia (green, marked K) or SCBA with a full facemask. Give immediate first aid, obtain medical attention and fully inform the physician about the details of the accident. In addition to the facemask and self-contained breathing apparatus, the rescuer must wear chemical-resistant protective gloves (rubber gloves), protective clothing, suitable boots and safety goggles.
Subsection 4.2. Most important symptoms and effects, both acute and delayed:	Ammonia vapours from ammonia solutions may cause the following effects if present in the air in certain concentrations: • 400 ppm (278 mg/m³) = immediate irritation of the throat, • 700 ppm (487 mg/m³) = eye irritation, • 1700 ppm (1182 mg/m³) = cough, • 2500-6500 ppm (1738-4519 mg/m³) = life-threatening after 30 minutes, • 5000-10000 ppm and above (3476-6953 mg/m³) = death. The most important symptoms <u>following inhalation</u> are**:** nose and throat irritation, cough, breathing difficulty, nausea, vomiting, inflammation of the respiratory tract, possible symptoms as in asthma; following a more intensive exposure –

	reflex respiratory arrest/cardiac arrest, pulmonary edema, pneumonia. Following ingestion, ammonia causes painful corrosion of the mouth, throat, esophagus, stomach and internal organs. Perforations, peritonitis and cardiovascular reactions (shock, collapse) are possible. After the contact of liquid ammonia with skin damage resulting from freezing is possible. In contact with eyes causes: burns/pain, lacrimation, conjunctivitis; at high concentrations delayed effects such as edema/corneal turbidity, epithelial loss, cataract, glaucoma; liquid ammonia splashes cause irreversible damage to the eyes.
Subsection 4.3. Indication of any immediate medical attention and special treatment needed:	Obtain medical attention if any of the above symptoms occur.

SECTION 5. FIREFIGHTING MEASURES

Subsection 5.1. Extinguishing media:	Use foam, dry powder or CO_2.
Subsection 5.2. Special hazards arising from the substance or mixture:	***Do not spray water into ammonia solution*** (significantly accelerates evaporation). Aqueous solution of ammonia is not flammable. However, ammonia vapours in the presence of air, at concentrations 16-27%, may cause explosion if caught by fire. It is highly unlikely for such a concentration to occur, except in a confined space or in the vicinity of large spills. The presence of lubricant oils or some other ignitable material increases the fire hazard. Tanks or cylinders may rupture or explode if exposed to heat. Ammonia in contact with mercury, chlorine, iodine, bromine, calcium, silver oxide or hypochlorite may produce explosive compounds. Fire may be caused by: non-compliance with the maintenance instructions (working without the permit obtained from the responsible person), not following the instructions from the work permit (negligence, carelessness, lack of knowledge). Explosion can occur in all containers and pipelines if blowing with air is performed causing leaks at safety valves.
Subsection 5.3. Advice for firefighters:	Firefighters must be protected against possible exposure to ammonia gas by wearing suitable protective clothing and self-contained breathing apparatus. They must also be trained for carrying and properly using the equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Subsection 6.1. Personal precautions, protective equipment and emergency procedures:	Use personal protective equipment. For information on protective equipment see *Subsection 8.2. Exposure controls and personal protection.* Those dealing with major releases should wear full protective clothing and respiratory protection.
Subsection 6.2. Environmental precautions:	Stop leak of ammonia solution as, due to its high basicity and solubility in water, it could increase the pH of surface waters and soil. Ammonia is toxic to aquatic flora and fauna. In case of ammonia gas spreading, as a consequence of evaporation from ammonia solutions, clean up the location as quickly as possible and notify emergency response personnel.
Subsection 6.3. Methods and material for containment and cleaning up:	Evacuate the area downwind of the release, if it is safe to do so. If not, close all windows and switch off any extraction fans or electrical appliances. Trained personnel should isolate the source of leak as soon as possible. Ventilate area of spill or leak to disperse vapours. Remove ignition sources. Cover with foam to reduce evaporation. Contain spillages, if possible. Use water sprays to combat gas clouds. Do not apply water directly into large ammonia solution spills. Take care to avoid contamination of watercourses. Inform appropriate authorities in case of accidental contamination of watercourses or drains.
Subsection 6.4. Reference to other sections:	See *Subsection 8.2. Exposure controls and personal protection* for information on protective equipment. For information on waste treatment see *Section 13. Disposal considerations*.

SECTION 7. HANDLING AND STORAGE

Subsection 7.1. Precautions for safe handling:	<u>Information on safe handling of the chemical substance</u>: - follow the operating instructions; - wear full protective equipment; - avoid skin and eye contact and inhalation of vapours; - provide adequate ventilation. <u>Handling of incompatible chemical substances or mixtures:</u> Do not use oxidising agents, acids, halogens, heavy and non-ferrous metals and aluminium. Ammonia solution reacts with a number of organic and inorganic acids, forming salts. Do not store together with the following substances: pharmaceutical products, foodstuffs and animal feed including additives, radioactive and explosive materials and flammable substances. <u>Information on handling in case of release of the chemical substance to the environment</u>: - control atmospheric levels for compliance with occupational exposure limits; - personal protective equipment and firefighting equipment should always be at hand;

	- clean up the location as quickly as possible and notify emergency response personnel. General occupational hygiene: -do not eat, drink or smoke in work areas; -wash hands after use; -remove contaminated clothing and protective equipment before exiting the work areas;
Subsection 7.2. Conditions for safe storage, including any incompatibilities:	Technical measures: ammonia solutions evaporate at regular temperatures and at regular pressures and therefore must be kept in pressurized, tightly closed containers. Storage conditions: storage containers should be kept in a cool, well-ventilated area. Keep away from heat, ignitable sources and incompatible substances. Do not permit smoking in the storage area. Reactions of ammonia with construction materials: Non-ferrous metals such as bronze and copper are incompatible materials for the storage of ammonia as their use produces a chemical reaction. Materials that can be used are aluminium, steel (carbon and stainless) and plastic materials (polytetrafluoroethylene and polychlorotrifluoroethylene). Electrical equipment: electrical installation resistant to ammonia vapours is required.
Subsection 7.3. Specific end use(s):	Professional use only, in accordance with the prescribed operating instructions.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Subsection 8.1. Control parameters:

Occupational Exposure limit values according to Commission Directive 2000/39/EC:

Occupational exposure limit values	
mg/m^3	**ppm**
14	20

Exposure limit value – short term	
mg/m^3	**ppm**
36	50

Information on monitoring procedures:
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.

Derived no-effect level (DNEL), data refer to ammonia:
DNEL (short term exposure, skin - workers): 6.8 mg/kg
DNEL (long term exposure, inhalation - workers): 36 mg/m^3

	Predicted no-effect concentration (PNEC), data refer to ammonia:PNEC (water): 0.0011 mg/l
Subsection 8.2. Exposure controls and personal protection:	Appropriate engineering controls: • provide ventilation in work area, • eyewash stations with fresh water are required (these places must be clearly marked), • avoid contact with skin: frostbite hazard, • avoid inhalation of gas, • change and ventilate clothing which was in contact with gas. Personal protection: *Eye/face protection:* Safety glasses/face-shield(EN 166) *Skin protection:* Wear overalls (EN ISO 13688) and suitable boots (EN ISO 20345). In case of accident wear special chemical-resistant overall (EN 943). Protective ammonia-resistant gloves (rubber gloves) (EN 374). *Respiratory protection:* Use facemask (EN 136) and filter approved for ammonia (green, marked K) (EN 149).Use self-contained breathing apparatus with a full facemask (EN 145) if ammonia concentration in the air exceeds maximum allowable concentrations. Environmental Exposure Controls: Environment exposure control should be performed in accordance with the applicable regulations.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Subsection 9.1. Information on basic physical and chemical properties:	
a) appearance-physical state and colour:	Colourless liquid
b) odour:	Pungent ammonia odour
c) odour treshold:	Data not available
d) pH:	Strong base, 11.7 (1%)
e) melting point/freezing point:	-58 °C (25%)
f) initial boiling point and boiling range:	38 °C at 101.3 kPa
g) flash point:	Data not available
h) evaporation rate:	Highly volatile
i) flammability:	Not flammable
j) upper/lower flammability or explosive limits:	16-27% (NH_3 in the air at 0°C)

k) vapour pressure:	48 kPa, 20 °C (25%)
l) vapour density:	Data not available
m) relative density:	Liquid NH_3 0.6386 kg/m^3 at 0°C, 101.3kPa Gaseous NH_3 0.7714 kg/m^3 at 0°C, 101.3kPa
n) solubility:	Easily soluble in water, forms alkaline solution. Soluble in organic solvents: alcohol, acetone, chloroform and ether
o) partition coefficient: n-octanol/water:	Data not available
p) auto-ignition temperature:	651 °C (NH_3 vapours)
q) decomposition temperature:	Data not available
r) viscosity:	Data not available
s) explosive properties:	Not explosive
t) oxidising properties:	Not oxidising
Subsection 9.2. Other information:	Not available

SECTION 10. REACTIVITY AND STABILITY

Subsection 10.1. Reactivity	May react violently with acids, fluorine, acetaldehyde, boron halogenides, chlorine mixtures, carbon dioxide, platinum catalysts, phosphorus oxides, sulphur dioxide, hydrogen sulfide
Subsection 10.2. Chemical stability	Chemically stable at temperatures up to 150-200°C. Ammonia released from the liquid at temperatures above 454 °C decomposes forming hydrogen (in the presence of metals, e.g. nickel, this occurs even at lower temperatures). In case of high temperatures (690 °C) and in case of high energy sources of ignition, it decomposes into nitrogen and hydrogen, the latter forming flammable mixtures with air.
Subsection 10.3. Possibility of hazardous reactions	The substance is a strong base, reacts violently with acids and produces corrosive effects. Reacts violently in contact with strong oxidizing agents, hydrogen peroxide, calcium, halogens (except bromine), hydrocarbons, in mixture with air.
Subsection 10.4. Conditions to avoid	Stable within the limits of designed conditions of use and storage. Heat input can cause liquid to vaporize. Avoid physical damage and heating of containers.
Subsection 10.5. Incompatible materials	As it may have a violent reaction with acids, fluorine, acetaldehyde, boron halogenides, chlorine mixtures, carbondioxide, platinum catalysts, phosphorus oxides, sulphur dioxide, hydrogen sulfide, keep it away from incompatible substances.
Subsection 10.6. Hazardous decomposition products	Thermal decomposition (combustion) produces NOx gases and ammonia vapours.

SECTION 11. TOXICOLOGICAL INFORMATION

Subsection 11.1. Information on toxicological effects:	
a) acute toxicity:	*-oral (LD $_{50}$):* 350 mg/kg (rat) *-inhalation (LC_{50}):* 11590 mg/m³ air, 60 min /data refer to anhydrous ammonia/ *-skin (LD $_{50}$):* Data not available Data refer to inhalation of ammonia vapours from ammonia solution, for humans: - 400 ppm (=278 mg/m³; in the air)= Immediate throat irritation - 1700 ppm (= 1182 mg/m³; in the air)=Cough - 2500 - 6500 ppm (= 1738-4519 mg/m³; in the air) = Life-threatening after 30 minutes 12% solution of NH_3 - corrosive (rabbit) 10% solution of NH_3 - causes irritation (rabbit)
b) skin corrosion/irritation:	Study scientifically unjustified (Corrosive)
c) serious eye damage/irritation:	Study scientifically unjustified (Corrosive)
d) respiratory or skin sensitization:	Available data insufficient for classification
e) germ cell mutagenicity:	The substance is not classified as mutagenic
f) carcinogenicity:	The substance is not classified as carcinogenic
e) reproductive toxicity:	The substance is not classified as toxic to reproduction
g) STOT – single exposure:	Available data insufficient for classification
h) STOT – repeated exposure:	Available data insufficient for classification
i) aspiration hazard:	Available data insufficient for classification
Subsection 11.2. Information on likely routes of exposure:	- skin exposure: skin burns - eye exposure: lacrimation - peroral: nose and throat irritation - inhalation: lung damage
Subsection 11.3. Symptoms related to the physical, chemical and toxicological characteristics:	See Subsection *4.2. Most important symptoms and effects, both acute and delayed*
Subsection 11.4. Delayed and immediate effects, as well as chronic effects from short and long term exposure:	See Subsection *4.2. Most important symptoms and effects, both acute and delayed*
Subsection 11.5. Interactive effects:	Data not available
Subsection 11.6. Absence of specific data:	All the available and relevant data are shown
Subsection 11.7. Other information:	All the available and relevant data are shown

SECTION 12. ECOLOGICAL INFORMATION

Subsection 12.1. Toxicity:	
-aquatic organisms:	fish: * LC_{50} =0.5 mg/l, 96h - causes death (Lepomis cyanellus - Green sunfish); *LC_{50} =11-48 mg/l, 96h - causes death (Oncorhynchus mykiss - Rainbow trout) daphnia: * LC_{50}=101 mg/l, 48h - causes death (Daphnia magna) /data refer to anhydrous ammonia/
-soil organisms:	Data not available
-plants and terrestrial organisms:	Data not available
Subsection 12.2. Persistence and degradability:	
-biodegradation:	In fresh water it is nitrified by microorganisms or adsorbed on sediment particles and colloids. In soil, ammonia is oxidized by bacteria to nitrate.
- other processes of degradation:	In the atmosphere, it may be degraded by photolysis or neutralized by acid pollutants of the air.
- degradation in wastewaters:	Substantially biodegradable in water.
Subsection 12.3. Bioaccumulative potential:	The substance has no potential for bioaccumulation.
Subsection 12.4. Mobility in soil:	The substance has low mobility in soil.
Subsection 12.5. Results of PBT and vPvB assessment:	The substance is not classified as PBT, or as vPvB.
Subsection 12.6. Other adverse effects:	May cause changes in pH in the aquatic system. Depending on the local conditions and existing concentration, degradation activity may be inhibited by activated sludge. Do not allow to enter watercourses, wastewaters or soil!

SECTION 13. DISPOSAL CONSIDERATIONS

Subsection 13.1. Waste treatment methods:	Waste generation should be prevented or reduced to minimum wherever possible. Disposal of this product and any by-products must always be performed in accordance with the laws on environmental protection, laws on waste management and all the local requirements.

SECTION 14. TRANSPORT INFORMATION

Subsection 14.1. UN number ADR / RID / ADN / IMDG/ ICAO:	2672
Subsection 14.2. UN proper shipping name ADR / RID / ADN / IMDG/ ICAO:	AMMONIA SOLUTION
Subsection 14.3. Transport hazard class(es):	ADR / RID / ADN / IMDG/ ICAO: 8
Subsection 14.4. Packing group:	ADR / RID / ADN / IMDG/ ICAO: III
Subsection 14.5. Environmental hazards:	Environmentally hazardous
Subsection 14.6. Special precautions for user:	

	ADR	**RID**	**ADN**
Hazard Identification Number (Kemler Code)	80		/
Classification code:	C5		
Hazard warning label:	8		8 + N1
Special provisions:	543		34
Tank code:	L4BN		N
Tank-vessel carriage:	AT	/	/
Transport category (Tunnel restriction code):	3 (E)	3	/
Required equipment:	/	/	PP, EP

Subsection 14.7. Transport in bulk:	Not applicable

SECTION 15. REGULATORY INFORMATION

Subsection 15.1. Safety, health and environmental regulations:	- Regulation EC 1272/2008 (CLP) - Regulation EC 1907/2006 (REACH)
Subsection 15.2. Chemical safety assessment:	Chemical safety assessment performed for ammonia and the relevant Chemical Safety Report (CSR) has been prepared. The relevant information is contained in the sections of the present safety data sheet as well.

SECTION 16. OTHER INFORMATION

Subsection 16.1. Indication of changes:	This safety data sheet has been significantly changed and amended in terms of form and contents in accordance with regulations.
Subsection 16.2. List of abbreviations and acronyms:	**ADNR** European Agreement concerning the International Carriage of Dangerous Goods by inland Waterways **ADR** European Agreement concerning the International Carriage of Dangerous Goods by Road **CAS** Chemical Abstract Service **DNEL** Derived No Effect Levels **EC number** European Commission number **ECHA** European Chemicals Agency **EC_{50}** half maximal effective concentration **IUCLID** International Uniform Chemical Information Database **IMDG** International Maritime Dangerous Goods **LC_{50}** Lethal concentration 50% **LD_{50}** Lethal Dose 50% **MAC** Maximum allowable concentration **OSHA** Occupational Safety and Health Administration **PBT** Persistence Bioaccumulation potential and Toxicity **PNEC** Predicted No Effect Concentration **ppm** parts per million **RID** International Rule for Transport of Dangerous Substances by Railway **STEL** Short-Term Exposure Limit **TWA** Time Weighted Averages **vPvB** Very persistent and very bioaccumulative
Subsection 16.3. Literature references and sources of data:	/ ECHA-European Chemicals Agency/ /„IUCLID Dataset“ European Chemicals Bureau/ /OECD Existing Chemicals Database / /Regulation on preventive measures for safe and healthy work when exposed to chemicals (The Off. Gaz.of the RS 106/2009)/ /Transport regulations according to ADR, RID,IMDG and ADN including the amendments/ /Occupational Medicine, prof.dr.Mirjana Aranđelović and prof.dr.Jovica Jovanović, Faculty of medicine, University of Niš, 2009/
Subsection 16.4. List of relevant hazard statements, safety phrases and precautionary statements:	Hazard statements: H314: Causes severe skin burns and eye damage. H335: May cause respiratory irritation. H400: Very toxic to aquatic life. Precautionary statements P260: Do not breathe vapours. P273: Avoid release to the environment. P280: Wear protective gloves/protective clothing/eye protection/face protection. P304+P340: IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P303 + P361 + P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. P310: Immediately call a POISON CENTER/doctor.

Subsection 16.5. Advice on appropriate training for employees:	Act in accordance with the applicable regulations regarding the occupational safety and health.

The information indicated is based on the knowledge and experience up to the date of the compilation of the Safety Data Sheet. The purpose of this Safety Data Sheet is to highlight the precautionary and safety measures regarding this product.
"HIP-AZOTARA" does not assume any responsibility for the information out of the scope of what is written here. The Safety Data Sheet shall not by any means be considered a guarantee for the marketability and the use of the product for certain purposes.
It is the responsibility of the user to inspect and examine the product in order to verify personally whether the product is suitable for a particular purpose. Furthermore, the user is responsible for handling, storage and use of this product in accordance with the applicable laws and regulations ensuring the occupational safety and health and environmental protection.

The information in this Safety Data Sheet refers exclusively to our products, and on condition that the products are not used together with the third parties' materials.