Safety Data Sheet

Revision date: 05.2015 *Version: 1.1*

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

1.1. Product identifier

Trade name/designation:	Ammonium hydroxide, BDH Aristar® Plus Ammonium hydroxide, BDH Aristar® Ultra
Product No.:	87003-245, 87003-246 87003-214, 87003-656
Other means of identification:	EU Index # 007-001-01-2

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

Relevant identified uses: For laboratory use only. Not for drug, food, or household use.

1.3. Details of the supplier of the safety data sheet

Manufactured for	VWR International, LLC Radnor Corporate Center 100 Matsonford Road Radnor, PA 19087-8660	VWR International Co 2360 Argentia Road Mississauga, ON L5N 5Z7 CANADA
Telephone	610.386.1700	800.932.5000

1.4. Emergency Telephone number

CHEMTREC	800.424.9300
CANUTEC	613.996.6666

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

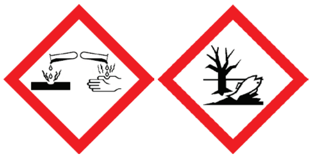
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS) and WHMIS HPR

For the full text of the H-Statement(s) and P-Statement(s) mentioned in this Section, see Section 16.

Hazard classes and hazard categories	Hazard statements
Skin corrosion, category 1A	H314
Aquatic toxicity, acute, category 1	H400

2.2. GHS Label elements, including precautionary statements

Pictograms:



Signal word: Danger

Hazard statements	
H314	Causes severe skin burns and eye damage.
H400	Very toxic to aquatic life.

Precautionary statements	
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with 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.
P310	Immediately call a POISON CENTER or doctor.
P501	Dispose of contents/containers in accordance with local, state and federal regulations.

2.4. Hazards not otherwise classified (HNOC) or not covered by GHS or WHIMS

None known.

SECTION 3: Composition / information on ingredients

3.1. Hazard components

Chemical name	Formula	Molecular weight	CAS#	Weight%
Ammonium hydroxide	NH_4OH	35.05	1336-21-6	20-22% (as NH_3)
Water	H_2O	18.02	7732-18-5	Balance

SECTION 4: First aid measures

4.1. General information

In case of inhalation: This chemical is toxic. Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment, use the buddy system). Remove source of contamination or move victim to fresh air. If breathing is difficult, trained personnel should administer emergency oxygen. DO NOT allow victim to move about unnecessarily. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure. If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) or automated external defibrillation (AED) immediately. Avoid mouth-to-mouth contact by using mouth guards or shields. Quickly transport victim to an emergency care facility.

In case of skin contact: Avoid direct contact. Wear chemical protective clothing, if necessary. As quickly as possible, remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Immediately flush with lukewarm, gently flowing water for at least 30 minutes. If irritation persists, repeat flushing. DO NOT INTERRUPT FLUSHING. If necessary and it can be done safely, continue flushing during transport to emergency care facility. Quickly transport victim to an emergency care facility. Double bag, seal, label and leave contaminated clothing, shoes and leather goods at the scene for safe disposal. NOTE: Any skin contact will also involve significant inhalation exposure.

In case of eye contact: Avoid direct contact. Wear chemical protective gloves, if necessary. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes, while holding the eyelid(s) open. If a contact lens is present, DO NOT delay irrigation or attempt to remove the lens. Neutral saline solution may be used as soon as it is available. DO NOT INTERRUPT FLUSHING. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto the face. Quickly transport victim to an emergency care facility. NOTE: Any eye contact will also involve significant inhalation exposure.

In case of ingestion: NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.

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

Brief exposure to concentrations above 1500 ppm can cause pulmonary edema, a potentially fatal accumulation of fluid in the lungs. Symptoms of pulmonary edema (tightness in the chest and shortness of breath) can develop up to 48 hours after exposure and are aggravated by physical exertion. Ingestion may cause death from shock or asphyxia and as little as one teaspoonful (5 mL) of 28% NH_4OH solution has been recorded as fatal.

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

Consult a doctor and/or the nearest Poison Control Centre for all exposures.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Ammonium hydroxide will not burn. If ammonia gas is burning, use dry chemical powder or carbon dioxide for small fires and water spray, fog or foam for large fires. Otherwise, use extinguishing media appropriate to the surrounding fire conditions.

5.2. Special hazards arising from the substance or mixture

Ammonium hydroxide solutions are not flammable at normal temperatures. However, ammonia gas may be generated from ammonium hydroxide. Ammonia gas concentrations within the flammable range (15-28%) can be ignited and pose a significant fire and explosion hazard, especially in a confined space. In a fire, ammonium hydroxide will give off very toxic, flammable ammonia gas. Ammonia gas decomposes to flammable hydrogen gas and nitrogen at about 450-500 °C. The main products of combustion in air are nitrogen, with small amounts of toxic and irritating nitrogen dioxide, and ammonium nitrate. Containers may rupture violently due to over-pressurization, if exposed to fire or excessive heat for a sufficient period of time, releasing flammable and toxic gases.

5.3. Special protective equipment for firefighters

Ammonium hydroxide and ammonia gas are corrosive to skin, eyes and respiratory tract. Do not enter without wearing specialized protective equipment suitable for the situation. Firefighter's normal protective clothing (Bunker Gear) will not provide adequate protection. Chemical protective clothing (e.g. chemical splash suit) and positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) may be necessary.

5.4. Hazardous combustion products

Nitrogen gas, nitrogen dioxide, ammonium nitrate.

5.5. Advice for firefighters

Evacuate area and fight fire from a safe distance or a protected explosion-resistant location or maximum possible distance. Approach fire from upwind to avoid hazardous gases and flammable and toxic decomposition products (e.g. ammonia and hydrogen).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Evacuate downwind locations. Ensure cleanup is conducted by trained personnel only. Wear adequate personal protective equipment. Do not touch damaged containers or spilled product unless wearing appropriate protective equipment. Increase ventilation to area or move leaking container to a well-ventilated and secure area. Remove or isolate incompatible materials as well as other hazardous materials. Review handling section before proceeding with cleanup.

Vapor or gas may accumulate in hazardous amounts in low-lying areas especially inside confined spaces, if ventilation is not sufficient. Before entry, especially into confined areas, check atmosphere with an appropriate monitor.

6.2. Environmental precautions

Notify government environmental agencies if there is a release of ammonium hydroxide into the environment.

6.3. Methods and material for containment and cleaning up

Do not allow into any sewer, on the ground or into any waterway. If the spill is inside a building, prevent product from entering drains, ventilation systems and confined areas.

SMALL SPILLS: Stop or reduce leak if safe to do so. Ventilate the area. Contain and soak up spill with absorbent that does not react with spilled product. Flush area with water. Place used absorbent into suitable, covered, labeled containers for disposal. Contaminated absorbent poses the same hazard as the spilled product.

LARGE SPILLS: Contact supplier, local fire and emergency services for help. Dike spilled product to prevent runoff. Cover the spill surface with the appropriate type of foam to reduce the release of vapor/ammonia gas. Ventilate the area to prevent the gas from accumulating, especially in confined spaces. Knock down gas with fog or fine water spray. Remove or recover liquid using pumps or vacuum equipment. Flush spill area. Dike and recover contaminated water for appropriate disposal. Store recovered product in suitable containers that are: tightly-covered, corrosion-resistant.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

This material is a TOXIC, CORROSIVE liquid. Ammonium hydroxide readily gives off ammonia gas which is also an EXPLOSION HAZARD, especially in confined spaces. Before handling, it is extremely important that engineering controls are operating and that protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use. Maintenance and emergency personnel should be advised of potential hazards.

If ammonium hydroxide is released, immediately put on a suitable respirator and leave the area until the severity of the release is determined. In case of leaks, escape-type respiratory protective equipment should be available in the immediate work area. Immediately report leaks, spills or failures of the engineering controls. Unprotected persons should avoid all contact with this chemical including contaminated equipment.

Consider using a closed handling system for large-scale use of this material. If a closed handling system is not possible, use the smallest possible amounts in a well-ventilated area separate from the storage area. Avoid generating vapors or mists. Prevent the release of vapors, mists or ammonia gas into the workplace air. For large-scale operations consider the installation of an ammonia gas leak detection system with an alarm. For large-scale handling operations use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas of use.

Do not use with incompatible materials such as oxidizing agents (e.g. nitrogen oxide), halogens (e.g. chlorine, fluorine) and heavy metals (e.g. mercury, silver). See Section 10 for more information. Inspect containers for damage or leaks before handling. Cautiously, dispense into sturdy containers made of compatible materials. Pour carefully from the container to avoid splashing and spurting. Stand upwind of all opening, pouring and mixing operations. Use corrosion-resistant transfer equipment. Regularly check storage tanks and transfer equipment for evidence of corrosion or leakage. Have suitable emergency equipment for fires, spills and leaks readily available. Practice good housekeeping. Maintain handling equipment. Comply with applicable regulations.

7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, well-ventilated area, out of direct sunlight and away from heat sources. Do not store below ground level or in confined spaces. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Keep storage area separate from work areas. Post warning signs. Inspect periodically for damage or leaks.

Keep quantities stored as small as possible. For large-scale storage of this material consider the installation of an ammonia leak detection system with an alarm. Store away from incompatible materials, such as chlorine or copper. See Section 10 for more information.

Inspect all incoming containers to make sure they are properly labeled and not damaged. Always store in original labeled container. Protect the label and keep it visible. Keep containers tightly closed when not in use and when empty. Protect from damage. Store empty containers separately. Empty containers may contain hazardous residues. Keep closed.

Walls, floors, shelving, fittings, lighting and ventilation systems in storage area should be made from carbon steel or stainless steel which do not react with ammonium hydroxide. Storage facilities should be made of fire-resistant materials. Store this material according to applicable occupational health and safety regulations and fire and building codes. Have appropriate fire extinguishers and spill clean-up equipment in storage area.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Chemical Name	Limit Value Type	Exposure Limit Value	Source
Ammonium hydroxide	TLV-TWA, REL-TWA PEL-T-TWA	25 ppm (ammonia) 50 ppm (35 mg/m^3) (ammonia)	USA ACGIH, USA NIOSH USA OSHA
	TLV-STEL, REL-STEL	35 ppm (ammonia)	USA ACGIH, USA NIOSH
Water	None listed.	Not applicable	Not applicable

8.2. Exposure controls

Appropriate engineering controls: Engineering control methods to reduce hazardous exposures are preferred. Methods include mechanical ventilation (dilution and local exhaust), process or personnel enclosure, control of process conditions, and process modification (e.g. substitution of a less hazardous material). Administrative controls and personal protective equipment may also be required.

Because of the high potential hazard associated with ammonium hydroxide, stringent control measures such as enclosure or isolation may be necessary for large-scale handling operations. For large-scale handling operations, use non-sparking, corrosion-resistant ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas of use. Consider the installation of an ammonia leak detection system with an alarm. Supply sufficient replacement air to make up for air removed by exhaust systems.

Walls, floors, shelving, fittings, lighting and ventilation systems should be made from carbon steel or stainless steel which do not react with ammonia or ammonium hydroxide. Have a safety shower and eye-wash fountain readily available in the immediate work area.

Personal protective equipment:

Eye/face protection: Chemical safety goggles. A face shield may also be necessary.

Skin protection: Chemical protective gloves, coveralls, boots, and/or other chemical protective clothing. An impervious full-body encapsulating suit and respiratory protection may be required in some operations. Have a safety shower and eye-wash fountain readily available in the immediate work area.

Respiratory protection: NIOSH RECOMMENDATIONS FOR AMMONIA CONCENTRATIONS IN AIR:

EMERGENCY OR PLANNED ENTRY INTO UNKNOWN CONCENTRATIONS OR IDLH CONDITIONS: Any self-contained breathing apparatus that has a full face piece and is operated in a pressure-demand or other positive-pressure mode; or any supplied-air respirator that has a full face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

ESCAPE: Any air-purifying, full face piece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against ammonia. Any appropriate escape-type, self-contained breathing apparatus

Hygiene measures: Remove contaminated clothing immediately. Keep contaminated clothing in closed containers. Discard or launder before re-wearing. Inform laundry personnel of contaminant's hazards. Do not eat, drink, or smoke in work areas.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

a)	Appearance:	
	Physical state	Liquid
	Color	Clear, colorless
b)	Odor	Strong odor – ammonia-like
c)	Odor threshold	Geometric mean: 17 ppm (detection) (ammonia gas)
d)	pH	10.6 (0.01 N); 11.1 (0.1 N); 11.6 (1 N)
e)	Melting point/freezing point	20% (w/w): -34.9 °C (-30.8 °F); 24% (w/w): -44.5 °C (-48.1 °F)
f)	Boiling point/boiling range	25% (w/w): 38 °C (100.4 °F); 29.4% (w/w): 27.2 °C (81 °F)
g)	Flash point	Not flammable under normal conditions.
h)	Evaporation rate	Not available (ammonium hydroxide); the evaporation of ammonia gas from solutions increases with the concentration of the solution.
i)	Flammability (solid, gas)	Not applicable
j)	Upper/lower flammability/explosive limits	Lower: Not available (ammonium hydroxide); 15-16% (ammonia gas) Upper: Not available (ammonium hydroxide); 25-28% (ammonia gas)
k)	Vapor pressure (Partial pressure at 21.1 °C)	19.1% (w/w): 29.5 kPa (221.32 mm Hg); 23.9% (w/w): 47.4 kPa (355.2 mm Hg)
l)	Vapor density (at 21.1 °C)	0.588 (ammonia gas) (air=1)
m)	Relative density (at 20 °C)	20% (w/w): 0.92 g/cm^3; 24% w/w: 0.91 g/cm^3
n)	Solubilities	Soluble in all proportions in water with mild liberation of heat.
o)	Partition coefficient (n-Octanol/Water)	Log P(oct) = -2.66 (estimated)
p)	Auto-ignition temperature	Not available (ammonium hydroxide); 651 °C (1204 °F); 850 °C (1562 °F) (ammonia gas)
q)	Decomposition temperature	Not available (ammonium hydroxide); 448.9-498.9 °C (840-930 °F) (ammonia gas)
r)	Viscosity	No information available.
s)	Explosive properties	No information available.
t)	Oxidizing properties	No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Ammonium hydroxide dissolves in water with mild release of heat.

10.2. Chemical stability

Normally stable. Ammonia gas may be given off under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous polymerization does not occur. See Section 10.5 for incompatible materials.

10.4. Conditions to avoid

High temperatures, open flames, electric sparks, welding.

10.5. Incompatible materials

OXIDIZING AGENTS (e.g. perchlorates, chlorates, hydrogen peroxide, chromic trioxide, nitrogen oxides, calcium or sodium hypochlorite) - can react with generation of heat. Reaction may become violent or explosive.

HEAVY METALS AND THEIR SALTS (e.g. silver, gold, lead, mercury or zinc, especially halide salts) - may form shock-sensitive compounds that may explode when dry.

HALOGENS (e.g. chlorine, bromine, fluorine or iodine) or INTERHALOGENS (e.g. bromine pentafluoride, chlorine trifluoride) - can react violently or form explosive chemicals.

NITROMETHANE - Increases the sensitivity of nitromethane to detonation. Form salts which are explosive when dry.

STRONG MINERAL ACIDS (e.g. sulfuric acid, hydrochloric acid, hydrofluoric acid or nitric acid) - reaction is exothermic (gives off heat); mixture becomes boiling hot and reaction may become violent.

DIMETHYL SULFATE - reacts violently.

ACROLEIN, ACRYLIC ACID, CHLOROSULFURIC ACID, PROPIOLACTONE or PROPYLENE OXIDE - mixing with 28% ammonium hydroxide in a closed container caused the temperature and pressure to rise.

10.6. Hazardous decomposition products

Ammonium hydroxide releases ammonia gas, which decomposes to flammable hydrogen gas and nitrogen at about 450-500 °C. The main products of combustion in air are nitrogen with small amounts of toxic and irritating nitrogen dioxide and ammonium nitrate.

SECTION 11: Toxicology

11.1. Information on toxicological effects

Acute toxicity

Oral LD50: 350 mg/kg (rat); 91 mg/kg (mouse)

Inhalation LC50: No information available.

Dermal LD50: No information available.

Other information on acute toxicity: RTECS# BQ9625000

Skin corrosion/irritation: Ammonium hydroxide is corrosive. Corrosive materials are capable of producing severe burns, blisters, ulcers and permanent scarring, depending on the concentration of the solution and the duration of contact.

Serious eye damage/eye irritation: Ammonium hydroxide is corrosive. Corrosive materials are capable of producing severe eye burns, and permanent injury, including blindness, depending on the concentration of the solutions and duration of contact.

Respiratory or skin sensitization: Ammonia gas is readily released from ammonium hydroxide solutions, depending on the concentration of the solution and the temperature. Ammonia gas is a severe respiratory tract irritant. People repeatedly exposed to ammonia may develop a tolerance (or acclimatization) to the irritating effects after a few weeks.

Germ cell mutagenicity: No information available.

Carcinogenicity: Ammonium hydroxide is not known to be a carcinogen.

Reproductive toxicity: No information available.

Specific target organ toxicity-single exposure: No information available.

Specific target organ toxicity-repeated exposure: No information available.

Aspiration hazard: No information available.

Additional information: May cause dermatitis, liver and kidney damage, chronic bronchitis and olfactory fatigue (the odor and irritation effects are detected at higher concentrations). Prolonged or repeated exposure may cause corneal damage and the development of cataracts and glaucoma. To the best of our knowledge, the chronic toxicity of this substance has not been fully investigated.

SECTION 12: Ecological information

12.1. Ecotoxicity: Bluegill (*Lepomis macrochirus*): LC50 = 0.024-0.093 mg/L/48H; *Daphnia magna*: LC50 = 0.66 mg/L/48H at 22 °C

12.2. Persistence and degradability: Persistent.

12.3. Bioaccumulative potential: Bioaccumulation is not anticipated for inorganic compounds that are miscible with water.

12.4. Mobility in soil: No information available.

12.5. Results of PBT and vPvB assessment: Not applicable for inorganic substances.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Review federal, provincial, and local government requirements prior to disposal. Neutralization by trained hazardous waste workers should be considered.

SECTION 14: Transport information

Land Transport DOT (U.S.)

UN Number	UN2672
Proper Shipping Name	AMMONIA SOLUTION, 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
Class(es)	8
Hazard Label(s)	Corrosive
Packing Group	III
Environmental Hazard(s)	--

Sea Transport IMDG

UN Number	UN2672
Proper Shipping Name	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
Class(es)	8
Hazard Label(s)	Corrosive
EMS- No.	F-A, S-B
Packing Group	III
Environmental Hazard(s)	--
Segregation Group	Category A

Air Transport IATA

UN Number	UN2672
Proper Shipping Name	**Ammonia solution** relative density (specific gravity) between 0.880 and 0.957 at 15 °C in water, with more than 10% but not more than 35% ammonia
Class(es)	8
Hazard Label(s)	Corrosive
Packing Group	III

SECTION 15: Regulatory information

OSHA Hazards: CAS #1336-21-6 meets criteria for hazardous material, as defined by 29 CFR 1910.1200.

SARA 302 Extremely Hazardous Substances: This material contains Ammonium hydroxide (CAS# 1336-21-6), which is subject to the reporting requirement of 500 lbs RQ (Ammonia, CAS# 7664-41-7).

SARA 313 (TRI reporting): This material contains Ammonium hydroxide (CAS# 1336-21-6), which is subject to the reporting requirements of Section 313 of SARA Title III.

SARA 311/312 Hazardous Chemicals: This material contains Ammonium hydroxide (CAS# 1336-21-6).

Massachusetts Right-To-Know Substance List: CAS# 1336-21-6 is listed, 50 lbs RQ.

Pennsylvania Right-To-Know Hazardous Substances: CAS# 1336-21-6 is listed, E (environmental hazard).

New Jersey Worker and Community Right-To-Know Components: CAS# 1336-21-6 is listed, RTK# 0103.

California Proposition 65: CAS# 1336-21-6 is not subject to this act. CAS# 7732-18-5 is not subject to this act.

Inventory Status:

Canada DSL/NDSL Inventory List: CAS# 1336-21-6 is listed. CAS# 7732-18-5 is listed.

US TSCA Inventory List: CAS# 1336-21-6 is listed. CAS# 7732-18-5 is listed.

EINECS, ELINCS or NLP: CAS# 1336-21-6 is listed, EC# 215-647-6. CAS# 7732-18-5 is listed, EC# 231-791-2.

SECTION 16: Other information

Full text of H-Statement(s) and P-Statement(s)

H314	Causes severe skin burns and eye damage.
H400	Very toxic to aquatic life.
P260	Do not breathe fumes/gas/mist/vapours/spray.
P264	Wash thoroughly after handling.

P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
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.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position 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 or doctor.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/containers in accordance with local, state and federal regulations.

Canadian Carcinogenicity hazard class: Not applicable.
PHNOC hazard class: Not applicable.
HHNOC hazard class: Not applicable.
Biohazardous Infectious Materials hazard class: Not applicable.

NFPA Rating:

Health: 3
Flammability: 1
Reactivity: 0
Special Hazard: Not applicable

DISCLAIMER

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. VWR International and its Affiliates shall not be held liable for any damage resulting from handling.