

Product name	AGM Series Battery
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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

A. Product name	AGM Series Battery
B. Recommended use of the chemical and restrictions on use	
Recommended use of the chemical	For engine start
Restrictions on use	It prohibited the use of non-designated use
C. Manufacturer/supplier/distributor information	
Manufacturer	DN Automotive Corp.
Addrres	(Shinilban Industrial Zone1) 12, Cheoyongsaneop 2-gil, Onsan-eup, Ulju-gun, Ulsan, Korea (44993)
Emergency telephone numbers	TEL : +82-52-240-7500 FAX : +82-52-240-7510

2. HAZARDS IDENTIFICATION

A. Hazard classification	<p>Substances and mixtures, which in contact with water, emit flammable gases : Categories 2</p> <p>Specific target organ toxicity repeated exposure : Category 1</p> <p>Hazardous to the aquatic environment_chronic : Category 1</p> <p>Acute toxicity (oral, dermal, inalation) : Categories 1</p> <p>Skin corrosion : Categories 1</p> <p>Serious eye damage : Category 1</p> <p>Carcinogenicity : Category 2</p> <p>Reproductive toxicity : Category 1A</p>
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B. Allocation label elements

Symbol



Signal word

Danger

Hazard statements

H372 Causes damage to organs through prolonged or repeated exposure
H261 In contact with water releases flammable gas
H370 Causes damage to organs
H314 Causes severe skin burns and eye damage
H318 Causes serious eye damage
H330 Harmful if inhaled
H350 May cause cancer (inhalation)
H360 May damage fertility or the unborn child

Precautionary statements

Prevention

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P223 Do not allow contact with water
P231 + P232 Handle under inert gas. Protect from moisture.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash ... thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area

Response	<p>P280 Wear protective gloves/protective clothing/eye protection/face protection</p> <p>P281 Use personal protective equipment as required.</p> <p>P284 [In case of inadequate ventilation] wear respiratory protection</p> <p>P301 + P330 + P331 If SWALLOWED Rinse mouth. Do NOT induce vomiting</p> <p>P303 + P361 + P353 If ON SKIN(or hair) Take off immediately all contaminated clothing. Rinse skin with water/shower</p> <p>P304 + P340 IF INHALED IF INHALED Remove person to fresh air and keep comfortable for breathing</p> <p>P305 + P351 + P338 IF IN EYES Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.</p> <p>P307 + P311 Immediately call a POISON CENTER/doctor/?</p> <p>P308+P313 IF exposed or concerned: Get medical advice/ attention.</p> <p>P310 Immediately call a POISON CENTER/doctor/</p> <p>P314 Get medical advice/attention if you feel unwell.</p> <p>P320 Specific treatment is urgent (see ?on this label).</p> <p>P321 Specific treatment (see ?on this label).</p> <p>P335 + P334 Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages.</p> <p>P363 Wash contaminated clothing before reuse.</p> <p>P370 + P378 In case of fire Use to extinguish.</p>
Storage	<p>P402 + P404 Store in a dry place. Store in a closed container.</p> <p>P403 + P233 Store in a well-ventilated place. Keep container tightly closed.</p> <p>P405 Store locked up.</p>
Disposal	<p>P501 Dispose of contents/container to ...</p>

C. Other hazards which do not result in classification (NFPA)

Lead

Health	1
Flammability	No data
Reactivity	0

Silica, Amorphous Fused

Health	1
Flammability	0
Reactivity	0

Calcium

Health	3
Flammability	1
Reactivity	2

Tin

Health	1
Flammability	No data
Reactivity	0

Sulfuric acid

Health	3
Flammability	No data
Reactivity	2

Polypropylene	
Health	1
Flammability	1
Reactivity	0

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical name / Synonym	CAS No. or ID	Content (%)
Lead	7439-92-1	64-74
Sulfuric acid	7664-93-9	13-23
Polypropylene	9003-07-0	6-16
Separator	Not Applicable	1-3

4. FIRST AID MEASURES

A. Eye contact	If a battery ruptures, do not rub or scratch exposed eye. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. GET MEDICAL ATTENTION IMMEDIATELY.
B. Skin contact	If a battery ruptures, do not rub or scratch exposed skin. If liquid get on the skin, immediately flush the contaminated skin with water for at least 15 minutes. If liquid penetrate through the clothing, immediately remove the clothing and shoes under a safety shower and continue to wash the skin for at least 15 minutes. GET MEDICAL ATTENTION IMMEDIATELY.
C. Inhalation	If a battery ruptures, move to fresh air in case of accidental inhalation of mist. If breathing has stopped, perform artificial respiration. If breathing is difficult, give oxygen. GET MEDICAL ATTENTION AS SOON AS POSSIBLE.
D. Ingestion	If solutions of a battery chemicals have been swallowed and the person is conscious, give one glass of water. Vomiting may occur spontaneously, but Do NOT induce vomiting. Never give anything by mouth to an unconscious person. GET MEDICAL ATTENTION IMMEDIATELY.
E. Most important symptoms/effects, acute or delayed	<p>EYES : Not a likely route of exposure. If a battery ruptures, direct contact with the liquid or exposure to vapors or mists may cause tearing, redness, swelling, corneal damage and irreversible eye damage. Splashes in the eyes will cause severe burns.</p> <p>SKIN : Not a likely route of exposure. Direct contact with internal components of a battery can be severely irritating to the skin and may result in redness, swelling, burns and severe skin damage. Skin contact may aggravate an existing dermatitis condition.</p> <p>INHALATION : Not a likely route of exposure. If a battery ruptures, may be harmful or fatal if inhaled in a confined area. May cause severe irritation and burns of the nose, throat and respiratory tract.</p> <p>INGESTION : Not a likely route of exposure. Causes serious burns of the mouth or perforation of the esophagus or stomach. May be fatal if swallowed.</p> <p>* Lead may causes toxic to blood, kidneys, central nervous system (CNS). Repeated or prolonged</p>
F. Indication of immediate medical attention and notes for physician	Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

A. Suitable (and unsuitable) extinguishing media	Use extinguishing media appropriate for surrounding fire. If a battery ruptures, use dry chemical, soda ash, lime, sand or carbon dioxide.
B. Specific hazards arising from the chemical	Lead, lead compounds and sulfuric acid fume may be released during a fire involving the product.
C. Special protective equipment and precautions for	Wear self-contained breathing apparatus (SCBA) and full fire-fighting protective clothing.
D. Fire and explosion hazard	Not flammable. Battery may rupture due to pressure buildup when exposed to excessive heat and may be result in the release of corrosive materials.

6. ACCIDENTAL RELEASE MEASURES

A. Necessary measures and protective gear to protect humans	If a battery ruptures, avoid contact with skin, eyes and clothing. Do not touch spilled material. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection).
B. Necessary measures to protect environment	Notify authorities and appropriate federal, state, and local agencies. Prevent the product from spreading into the environment. Avoid direct discharge into
C. Methods and materials for containment and cleaning up	SMALL SPILLS: Collect all released material in a plastic lined metal container. If necessary neutralize the residue with a dilute solution of sodium carbonate. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by building a dike. Absorb with dry earth, sand or other non-combustible material. Neutralize the residue with a dilute solution of sodium carbonate. Dispose of all contaminated materials in accordance with current local regulations.

7. HANDLING AND STORAGE

A. Precautions for safe handling	Protect from physical damage.
B. Conditions for safe storage (Including any incompatibilities)	Avoid contact with eyes. Store in a cool, dry, ventilated area away from sources of heat, moisture, incompatibilities, and direct sunlight. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Occupational exposure limit(s), biological exposure standard	
OSHA-PEL	0.05 mg/m ³ (Lead), 1 mg/m ³ (Sulfuric acid), 0.5 mg/m ³ (Antimony)
ACGIH-TLV	TWA 0.05 mg/m ³ (Lead), TWA 0.2 mg/m ³ (Sulfuric acid) TWA 0.5 mg/m ³ (Antimony)
B. Appropriate engineering controls	Use local exhaust ventilation if necessary to control airborne mist and vapor.
C. Individual protection measures	
Respiratory protection	If significant mists or aerosols are generated an approved respirator is recommended. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.
Eye protection	Wear safety glasses with side shields (or goggles).
Hand protection	Wear chemical resistant gloves. Gloves should be replaced immediately if signs of degradation are observed.
Body protection	Use good work and personal hygiene practices to avoid exposure. Consider the provision in the work area of a safety shower and eyewash. Always wash thoroughly after handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance (Physical State, Colour Etc.)	Off-white cloudy liquid with solid object.
B. Odour	Characteristics
C. Odor threshold	Not available
D. pH	pH < 1 (Sulfuric acid)
E. Melting point/freezing point	Not available

F. Initial boiling point and boiling range	Not available
G. Flash point	Non-flammable
H. Evaporation rate	Not available
I. Flammability (Solid, Gas)	Not applicable
J. Upper/Lower flammability or explosive limits	Non-flammable
K. Vapor pressure	Not available
L. Solubility	Soluble in water
M. Vapor density	Not available
N. Specific gravity	Not available
O. Partition coefficient of n-octanol/water	Not available
P. Auto-ignition temperature	Not applicable
Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	Mixture

Note: These physical properties are typical values for this product.

A. Appearance (Physical State, Colour Etc.)	Bluish white, silvery gray.
B. Odour	None
C. Odor threshold	Not available
D. pH	Not applicable
E. Melting point/freezing point	327.5°C
F. Initial boiling point and boiling range	1740°C (1013 hPa)
G. Flash point	Non-flammable
H. Evaporation rate	Not applicable
I. Flammability (Solid, Gas)	Not applicable
J. Upper/Lower flammability or explosive limits	Non-flammable
K. Vapor pressure	1.33 hPa (973°C)
L. Solubility	Insoluble in water
M. Vapor density	Not applicable
N. Specific gravity	11.34 g/cm ³
O. Partition coefficient of n-octanol/water	Not applicable
P. Auto-ignition temperature	Not applicable
Q. Decomposition temperature	Not applicable
R. Viscosity	Not applicable
S. Molecular weight	207.2

Note: These physical properties are typical values for Lead(Pb).

10. STABILITY AND REACTIVITY

A. Chemical stability	Stable at normal temperatures and storage conditions.
B. Possibility of hazardous reactions	Hazardous polymerization will not occur.
C. Conditions to avoid (static discharge, shock, vibration etc.)	Overcharging. Sources of ignition. Mechanical impact. Contact with incompatible chemicals.
D. Substances to avoid	If a battery ruptures, avoid contact with organic materials and alkaline materials.
E. Hazardous decomposition products	Lead, Lead compounds and sulfuric acid fumes may be released during a fire involving the product.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

Inhalation	Corrosive, severe irritation and burns.
Ingestion	Serious burns
Eye/Skin	Eye : Tearing, redness, swelling, corneal damage, irreversible eye damage and severe burns. Skin : Redness, swelling, burns and severe skin damage.

B. Delayed and immediate effects and also chronic effects from short and long term exposure

Acute toxicity (possible route of exposure)	Oral (LD50) : Rat, 2140 mg/kg (Sulfuric acid), 7000 mg/kg (Antimony) Skin (LD50) : Not available Inhalation (LC50) : Rat, 0.347 mg/L(4hr) (dust//mist)
Skin corrosion/irritation	cat 1
Serious eye damage/irritation	cat 1
Respiratory sensitization	Not available
Skin sensitization	Not available
Carcinogenicity	cat 1B ACGIH Group A2, IARC Group 1 (Mist containing sulfuric acid) * Note: Sulfuric acid mist is not expected under normal use of the product. ACGIH Group A3, IARC Group 2B (Lead), IARC Group 3 (Polypropylene)
Germ cell mutagenicity	cat 2
Reproductive toxicity	Not available
STOST–single exposure	cat 1 Respiratory
STOST–repeated exposure	cat 1 Hematopoietic system, kidney, central nervous system, peripheral nervous system, cardiovascular system, immune system, respiratory.
Aspiration hazard	Not available

C. Numeric measure of toxicity (such as acute toxicity estimates) – ATEmix

Oral (LD50)	Rat, > 5,000 mg/kg
Skin (LD50)	Not available
Inhalation (LC50)	Rat, 2.51 mg/L(4hr) (dust//mist)

12. ECOLOGICAL INFORMATION

A. Aquatic/terrestrial ecology toxicity

Fish (LC50)	Not available
Daphnia (EC50)	Not available
Algae (EC50)	Not available

B. Persistence and degradability

Persistence	Not available
Degradability	Not available

C. Bioaccumulative potential

Not available

D. Mobility in soil

Not available

E. Other hazardous effects

Not available

13. DISPOSAL CONSIDERATIONS

A. DISPOSAL METHODS

Dispose of in accordance with local, state, and federal regulations. Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

B. PRECAUTIONS (INCLUDING DISPOSAL OF CONTAMINATED CONTAINER OR PACKAGE)

Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION

Note: Transportation requirements do not apply once the battery pack has been installed in a vehicle as part of the vehicle's functional components.

Transportation: Sealed Lead Acid Battery is not a DOT Hazardous Material

Other: Per DOT, IATA, ICAO, and IMDG rules and regulations, these batteries are exempt from "UN2800" classification as a result of successful completion of the following tests:

- 1.) Vibration tests 2.) Pressure Differential Tests 3.) Crack test

These batteries meet the requirements contained in the following special provisions.

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|--------------------|---|
| A. Regulatory Body | Special provisions |
| B. U.S. DOT | Unregulated, meets the requirement of 49 CFR 173.159 and 173.159a |
| C. IATA / ICAO | Unregulated, meets the requirement of Special Revisions A-67 |
| D. IMO IMDG | Unregulated, meets the requirement of Special Revisions #238 |

* Proper Shipping Name : Batteries , wet, non-spillable

15. REGULATORY INFORMATION

A. Inventories

- | | |
|-------------------|---|
| EINECS/EU | Listed (EINECS No. 231-100-4(Lead), 231-639-5(Sulfuric acid)) |
| TSCA/US | Listed |
| ENCS/JAPAN | Listed (ENCS No. 1-527(Lead), 1-430(Sulfuric acid)) |
| AICS/AUSTRALIA | Listed |
| DSL/CANADA | Listed |
| IECSC/CHINA | Listed |
| PICCS/PHILIPPINES | Listed |
| KECI/S.KOREA | Listed (KE-21887(Lead), KE-32570(Sulfuric acid)) |

B. International Environmental Agreement

- | | |
|---|---------------------|
| PIC | Not listed |
| POPs | Not listed |
| Ozone depletion | Not listed |
| EU. Directive 67/548/EEC on the classification, packaging, and labelling of dangerous substances, Annex I | |
| Classification | C: R35 |
| Risk Phrases | R35 |
| Safety Phrases | S1/2, S26, S30, S45 |

C. U.S. Federal, Health and Environment) and U.S. Federal, Right-To-Know

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| CERCLA Section 103 (40 CFR 302.4) | 10lb (4.535 kg) (Lead), 1000 lb (453.599 kg) (Sulfuric acid) |
| EPCRA (SARA Title III) Section 302 (EHS -TPQ) | 1000 lb (453.599 kg) (Sulfuric acid) |
| EPCRA (SARA Title III) Section 304 (EHS - Reporting Quantities) | 1000 lb (453.599 kg) (Sulfuric acid) |
| EPCRA (SARA Title III) Section 313 - Toxic chemical release reporting (OSHA Specifically Regulated Substances (29 CFR 1910.1001-.1052) | Sulfuric acid (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any Not applicable |

D. Canada regulatory information

- | | |
|----------------------------------|-----------|
| WHMIS Ingredient Disclosure List | Regulated |
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NOTE: The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the Safety Data Sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

A. Source of data

Guideline for Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

EC-ECB, International Uniform Chemical Information Database (IUCLID)

Hazardous Substances Data Bank (HSDB)

Registry of Toxic Effects of Chemical Substances (RTECS)

National Institute of Technology and Evaluation -NITE (Japan).

NFPA 704 Standard System for the Identification of the Hazards of Materials for Emergency Response.

International Chemical Safety Cards(ICSC)(<http://www.nihs.go.jp/ICSC>)

3E Company/Ariel WebInsight DB.