

Product identifier	99.85% Acetic acid
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1. Identification of the substance/mixture and of the company/undertaking

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| 1) Product identifier | 99.85% Acetic acid |
| 2) Relevant identified uses of the substance or mixture and uses advised against | |
| Relevant identified uses | No data |
| Uses advised against | No data |
| 3) Supplier information(For imports, emergency number on domestic suppliers) | |
| Company | LOTTE INEOS CHEMICAL CO., LTD. |
| Address | 63-15, Sanggae-ro, Cheongnyang-eup, Uiju-gun, Ulsan, Republic of Korea |
| Emergency telephone number | (052)279-1190~6 |

2. HAZARD IDENTIFICATION

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|--------------------------|--|
| 1) Hazard classification | Flammable liquid : Cat. 3
Metal corrosive substance : Cat. 1
Acute toxicity(dermal) : Cat. 4
Skin corrosive/Skin irritation : Cat. 1
Severe eye damage/Eye irritation : Cat. 1
Respiratory sensitization : Cat. 1
Specific target organ toxicity(single exposure) : Cat. 1 |
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2) Allocation label elements

Hazard pictograms



Signal word

Danger

Hazard statements

H226 Flammable liquid and vapour.
 H290 May be corrosive to metals.
 H312 Harmful in contact with skin.
 H314 Causes severe skin burns and eye damage.
 H318 Causes serious eye damage.
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 H370 Causes damage to respiratory and skin.

Precautionary statements

Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
 P233 Keep container tightly closed.
 P234 Keep only in original container.
 P240 Ground/bond container and receiving equipment.
 P241 Use explosion-proof electrical/ventilating/lighting equipment.
 P242 Use only non-sparking tools.
 P243 Take precautionary measures against static discharge.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
 P264 Wash handling area thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P284 In case of inadequate ventilation wear respiratory protection.

Response

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
 P302+P352 IF ON SKIN: Wash with plenty of soap and water.
 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 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.
 P308+P311 IF exposed or concerned: Call a POISON CENTER/doctor.
 P310 Immediately call a POISON CENTER or doctor/ physician.
 P312 Call a POISON CENTER or doctor/physician if you feel unwell.

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Storage	<p>P321 Specific treatment such as wash with water, prevent contamination.</p> <p>P342+P311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.</p> <p>P362+P364 Take off contaminated clothing and wash before reuse.</p> <p>P363 Wash contaminated clothing before reuse.</p> <p>P370+P378 In case of fire: Use carbon dioxide, or water spray for extinction.</p> <p>P390 Absorb spillage to prevent material damage.</p> <p>P403+P235 Store in a well-ventilated place. Keep cool.</p> <p>P405 Store locked up.</p>
Disposal	<p>P406 Store in corrosive resistant container with a resistant inner liner.</p> <p>P501 Dispose of contents/container in accordance with prescribed regulations.</p>
3) Other Hazard-Risk which are not included in the classification criterias(NFPA)	
Health	3
Flammability	2
Reactivity	0
3. Composition/Information on ingredients	
Chemical Name	Acetic acid
Other name	Glacial acetic acid
CAS No.	64-19-7
PCT (WT)(%)	99.85
Chemical Name	WATER
Other name	Hydrogen oxide
CAS No.	7732-18-5
PCT (WT)(%)	0.15
4. FIRST AID MEASURES	
1) Following eye contact	<p>Call 911 or emergency medical service.</p> <p>IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p>
2) Following skin contact	<p>IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. If exposed: Call a POISON CENTER or doctor/physician.</p> <p>Wash contaminated clothing before reuse.</p> <p>Remove contaminated clothing, shoes and isolate contaminated area.</p> <p>For minor skin contact, avoid spreading material on unaffected skin.</p> <p>In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.</p> <p>Wash skin with soap and water.</p>
3) Following inhalation	<p>IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.</p> <p>Immediately call a POISON CENTER or doctor/physician.</p>
4) Following ingestion	<p>IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.</p> <p>If exposed: Call a POISON CENTER or doctor/physician.</p> <p>Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.</p>
5) Advice to physician	<p>Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.</p>
5. FIRE FIGHTING MEASURES	
1) Suitable (and unsuitable) extinguishing media	<p>Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.</p> <p>Use dry sand or earth to smother fire.</p>
2) Special hazards arising from the substance or mixture	<p>Flammable liquid and vapor</p> <p>May be corrosive to metals.</p> <p>May violently polymerize and result in fire and explosion.</p> <p>Vapor can move to a source of ignition and flash back.</p> <p>Pungent and toxic gas can be formed by thermal decomposition and combustion while burning.</p> <p>Can form explosive mixtures at temperatures at or above the flashpoint.</p> <p>Containers may explode when heated.</p> <p>HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.</p>

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3) Special protective equipment for firefighters	<p>Runoff may create fire or explosion hazard.</p> <p>Vapor explosion hazard indoors, outdoors or in sewers.</p> <p>Some may burn but not ignite readily.</p> <p>Vapor may form explosive mixture with air.</p> <p>Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.</p> <p>Rescuers must use appropriate protective equipment.</p> <p>Evacuate area and fight fire from a safe distance.</p> <p>Cautions ; Most of liquids are lighter than water.</p> <p>Most vapors are heavier than air. They will spread along ground and collect in low or confined areas.</p> <p>Dike fire-control water for later disposal; do not scatter the material.</p> <p>Move containers from fire area if you can do it without risk.</p> <p>Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.</p> <p>Fire involving Tanks: Do not get water inside containers.</p> <p>Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.</p> <p>Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.</p> <p>Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.</p> <p>Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.</p>
6. ACCIDENTAL RELEASE MEASURES	
1) Health considerations and protective equipment	<p>Avoid breathing dust/fume/gas/mist/vapours/spray.</p> <p>The very fine particles can cause a fire or explosion, eliminate all ignition sources.</p> <p>Clean up spills immediately, observe precautions in Protective Equipment section.</p> <p>Isolate the contaminated area.</p> <p>Keep unnecessary and unprotected personnel from entering.</p> <p>ELIMINATE all ignition sources.</p> <p>All equipment used when handling the product must be grounded.</p> <p>Stop leak if you can do it without risk.</p> <p>Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.</p> <p>A vapor suppressing foam may be used to reduce vapors.</p> <p>Cover with plastic sheet to prevent spreading.</p> <p>Please note that materials and conditions to be avoided.</p>
2) Environmental precautions	Prevent the inflow to the canal, drain, basement, and closed-door.
3) For cleaning up	<p>Dike and collect water used to fight fire.</p> <p>Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.</p> <p>Absorb the liquid and scrub the area with detergent and water.</p> <p>Large Spill: Dike far ahead of liquid spill for later disposal.</p> <p>Use clean non-sparking tools to collect absorbed material.</p> <p>Absorb spillage to prevent material damage.</p>
7. HANDLING AND STORAGE	
1) Precautions for safe handling	<p>Use explosion-proof electrical/ventilating/lighting equipment.</p> <p>Use only non-sparking tools.</p> <p>Take precautionary measures against static discharge.</p> <p>Avoid breathing dust/fume/gas/mist/vapours/spray.</p> <p>Wash handling area thoroughly after handling.</p> <p>Do not eat, drink or smoke when using this product.</p> <p>Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition;</p> <p>Use only in a well-ventilated area.</p> <p>Follow all MSDS/Label precautions even after container is emptied because they may product residues</p> <p>Use care in handling/storage.</p> <p>Loosen closure cautiously before opening.</p> <p>Avoid prolonged or repeated contact with skin.</p> <p>Do not enter storage area unless adequately ventilated.</p> <p>All equipment used when handling the product must be grounded.</p> <p>Please note that materials and conditions to be avoided.</p>

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2) Conditions for safe storage	<p>Handling refer to engineering control/personal protection section.</p> <p>Caution: Heat</p> <p>Measure atmospheric oxygen concentration and ventilate the area during the operation since low-closed area can cause oxygen deficiency.</p> <p>Keep away from heat/sparks/open flames/hot surfaces. - No smoking.</p> <p>Keep container tightly closed.</p> <p>Store in a well-ventilated place. Keep cool.</p> <p>Store locked up.</p> <p>Store in corrosive resistant container with a resistant inner liner.</p> <p>Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.</p> <p>Keep away from food and drinking water.</p>

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1) Chemical exposure limits, Biological exposure standard	
Occupational exposure limits (Domestic)	TWA - 10ppm, 25mg/m ³ STEL - 15ppm, 37mg/m ³
Occupational exposure limits (ACGIH)	TWA - 10ppm STEL - 15ppm
Biological limit values	No data
2) Appropriate engineering controls	<p>Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.</p> <p>When dust, fume or mist generates during operation, ventilate to maintain the air pollution below exposure limit.</p> <p>Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.</p>
3) Personal protection equipment	
Respiratory protection	<p>Wear proper filtered, canister-mounted full-face, electric half-face or air supplied continuous flow/pressure required half-face respiratory protection when exposure concentration less than 500ppm.</p> <p>Wear proper filtered or canister-mounted full-face or hood/helmet type, pressure required air supplied respirator when exposure concentration less than 10000ppm.</p> <p>Wear proper filtered, canister-mounted Self-Contained Breathing Apparatus(SCBA) or pressure required SCBA respiratory protection when exposure concentration less than 100000ppm.</p> <p>Wear breathing protection, which needs a confirmation from the Korea Occupational Safety and Health Agency, for exposed material by the physio-chemical properties.</p> <p>Wear proper filtered or canister-mounted half-face respiratory protection when exposure concentration less than 100ppm.</p> <p>Wear proper filtered or canister-mounted loose-fitting electric hood/helmet respiratory protection, or continuous flow dust mask when exposure concentration less than 250ppm.</p>
Eye protection	<p>Provide emergency showers and eyewash.</p> <p>Use chemical splash goggles and face shield.</p>
Hand protection	Wear suitable protective gloves.
Body protection	Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

1) Appearance	
Physical state	Liquid
Colour	Colorless
2) Odor	Vinegar odor
3) Odor threshold	-
4) pH	2.47
5) Melting point/freezing point	17°C
6) Initial boiling point and boiling range	118°C
7) Flash point	39°C
8) Evaporation rate	0.97
9) Flammability(solid, gas)	-
10) Upper/lower flammability or explosive limits	16/5.4 %
11) Vapour pressure	15.7mmHg(25°C)
12) Solubility(ies)	100g/100ml
13) Vapour density	2.07
14) Relative density	1.0492
15) n-octanol/water partition coefficient	-0.17 log Pow
16) Auto ignition temperature	427°C
17) Decomposition temperature	-

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18) Viscosity		1.22 cP(20°C)
19) Molecular weight(mass)		60.05
10. STABILITY AND REACTIVITY		
1) Stability and hazardous reactivity		<p>Flammable liquid and vapor</p> <p>May corrode metals.</p> <p>Decomposes on high temperature and can form toxic gas.</p> <p>May violently polymerize and result in fire and explosion.</p> <p>Can form explosive mixtures at temperatures at or above the flashpoint.</p> <p>Containers may explode when heated.</p> <p>Runoff may create fire or explosion hazard.</p> <p>Vapor explosion hazard indoors, outdoors or in sewers.</p> <p>May be ignited by heat, sparks or flames.</p> <p>Flammable/combustible material.</p> <p>Vapors may travel to source of ignition and flash back.</p> <p>Contact may cause severe burns to skin and eyes.</p> <p>Vapors may cause dizziness or asphyxiation without warning.</p> <p>May cause toxic effects if inhaled or ingested/swallowed.</p>
2) Conditions to avoid		Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
3) Incompatible materials		No data
4) Hazardous decomposition products		During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
11. TOXICOLOGICAL INFORMATION		
1) Information on the likely routes of exposure		No data
2) Health hazard information		
Acute toxicity		
Oral		LD50 3310 mg/kg Rat
Dermal		LD50 1060 mg/kg Rabbit
Inhalation		LC50 16000 ppm 4 hr Rat
Skin corrosion/Irritation		Skin necrosis and burns appear in animal test
Serious eye damage/irritation		It causes severe eye damage, permanent corneal damage in rabbits. It causes paralysis or turbidity of the cornea to human in an accident.
Respiratory sensitization		Inhalation exposure may cause respiratory hypersensitivity such as bronchial asthma.
Skin sensitization		No data
Carcinogenicity		
Ministry of Employment and Labor Notice		Not applicable
IARC		No data
OSHA		No data
ACGIH		No data
NTP		No data
EU CLP		No data
Germ cell mutagenicity		No data
Reproductive toxicity		No data
Specific target organ toxicity (single exposure)		It causes intravascular clotting disorders, severe hemolysis to human. Inhalation exposure in humans causes irritation to nose, upper respiratory tract, and lungs, If human inhales the vapor, it causes airway corrosion and lung edema.
Specific target organ toxicity (repeated exposure)		No data
Aspiration hazard		No data
12. ECOLOGICAL INFORMATION		
1) Aquatic toxicity		
Fish		LC50 251 mg/l 96 hr
Crustacean		EC50 47 mg/l 24 hr
Acuatic algae		No data
2) Persistence and degradation		
Persistence		log Kow -0.17(=log Pow)
Degradation		No data
3) Bioaccumulative potential		

Product identifier	99.85% Acetic acid
Accumulation	No data
Biodegradation	74(%)
4) Mobility in soil	No data
5) Other adverse effects	
Hazardous to the ozone layer	Not applicable
13. DISPOSAL CONSIDERATIONS	
1) Disposal methods	Dispose of contents and container according to the waste control act.
2) Precautions (including disposal of contaminated container of package)	Dispose of contents and container according to the regulations.
14. TRANSPORT INFORMATION	
1) UN No.	2789
2) Proper shipping name	ACETIC ACID, GLACIAL or ACETIC ACID SOLUTION more than 80% acid, by mass
3) Class or division	CLASS 8
4) Packing group	II
5) Marine pollutant	No
6) Special safety response for transportation or transportation measure	
Emergency measure in fire	F-E
Emergency measure in spilled	S-C
15. REGULATORY INFORMATION	
1) Occupational Safety and Health Act in Korea	Harmful Factors subject to Working Environment Measurement (measurement cycle : 6 months) Harmful Materials subject to Management Materials subject to Submission of Process Safety Reports (PSM) Substance set the Standards of Exposure
2) Chemical Control Act in Korea	Not applicable
3) Safety Control of Dangerous Substances Act in Korea	4th class Second Petroleum liquids (Water soluble liquid) 2000ℓ
4) Wastes Control Act in Korea	Designated waste
5) Other regulations in KOREA and Abroad regulations	
Other regulation (Domestic)	
Persistent Organic Pollutants (POPs) Control Act	Not applicable
National regulations	
U.S.A. management information (OSHA regulation)	Not applicable
U.S.A. management information (CERCLA regulation)	2267.995 kg 5000 lb
U.S.A. management information (EPCRA 302 regulation)	Not applicable
U.S.A. management information (EPCRA 304 regulation)	Not applicable
U.S.A. management information (EPCRA 313 regulation)	Not applicable
U.S.A. management information (Rotterdam Convention on Substances)	Not applicable
U.S.A. management information (Stockholm Convention on Substances)	Not applicable
U.S.A. management information (Mont- real Protocol on Substances)	Not applicable
EU Classification (CLASSIFICATION)	R10 C; R35
EU Classification (Risk Phrases)	R10, R35
EU Classification (Safety Phrases)	S1, S2, S23, S26, S45
16. OTHER INFORMATION	
1) Reference	(1) ICSC (J)(1997) (2) Merck (13th, 2001) (3) Howard (1997) (4) Organic compound dictionary (5) Honmel (1991)

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- (6) PATTY (5th; 2001)
- (7) NLM
- (8) IUCLID (2004)
- (9) ICSC (1997)
- (10) IUCLID (2000)
- (11) Existing chemicals safety examination data
- (12) PHYSPROP Database (2005)

2) Print date

3) Revision date

Number of revised

Date of last revision

4) Other

2013. 3. 19

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2021. 03. 29

○ The Material Safety Data Sheet (MSDS) was prepared and edited with reference to the MSDS provided by the Korea Occupational Safety and Health Agency.