

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

1 Identification

- **Product identifier**
- **Trade name:** Ferrous Sulfate Solution
Prepared to AM-S 300.10
- **Article number:** ERL093
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Aqua Solutions, Inc.
6913 Highway 225
DEER PARK, TX 77536
USA
800-256-2586
- **Information department:**
Technical Coordinator
Sherman Nelson shermann@aquasolutions.org
Technical Coordinator
Sherman Nelson shermann@aquasolutions.org
- **Emergency telephone number:**
Chemtrec: 800-424-9300
Canutec: 613-996-6666



2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS02 Flame

Flammable Liquids 3

H226 Flammable liquid and vapor.



GHS06 Skull and crossbones

Acute Toxicity - Oral 3

H301 Toxic if swallowed.

Acute Toxicity - Dermal 3

H311 Toxic in contact with skin.

Acute Toxicity - Inhalation 3

H331 Toxic if inhaled.



GHS08 Health hazard

Specific Target Organ Toxicity - Single Exposure 1 H370 Causes damage to the central nervous system and the visual organs.

- **Label elements**
- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**



GHS02



GHS06



GHS08

- **Signal word** Danger

(Contd. on page 2)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
Prepared to AM-S 300.10

(Contd. of page 1)

· **Hazard-determining components of labeling:**

Methanol

Ferrous Sulfate Heptahydrate

· **Hazard statements**

Flammable liquid and vapor.

Toxic if swallowed, in contact with skin or if inhaled.

Causes damage to the central nervous system and the visual organs.

· **Precautionary statements**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dust/fume/gas/mist/vapors/spray.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

If swallowed: Immediately call a poison center/doctor.

Specific treatment (see on this label).

Rinse mouth.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF exposed: Call a POISON CENTER or doctor/physician.

Call a poison center/doctor if you feel unwell.

Take off immediately all contaminated clothing and wash it before reuse.

In case of fire: Use CO₂, powder or water spray to extinguish.

Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 2

Fire = 3

Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2

Fire = 3

Reactivity = 0

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

US

(Contd. on page 3)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
Prepared to AM-S 300.10

(Contd. of page 2)

3 Composition/information on ingredients

- **Chemical characterization: Mixtures**
- **Description:** Mixture of the substances listed below with nonhazardous additions.

- **Dangerous components:**

| | | |
|----------------|------------------------------|---------|
| CAS: 67-56-1 | Methanol | 43.428% |
| CAS: 7782-63-0 | Ferrous Sulfate Heptahydrate | 2.524% |
| CAS: 7664-93-9 | Sulfuric Acid 96 - 98% | 1.01% |

- **Table of Nonhazardous Ingredients**

| | | |
|----------------|------------|---------|
| CAS: 7732-18-5 | Water | 52.983% |
| CAS: 7439-89-6 | Iron Metal | 0.055% |

4 First-aid measures

- **Description of first aid measures**
- **General information:**
 Immediately remove any clothing soiled by the product.
 Remove breathing apparatus only after contaminated clothing have been completely removed.
 In case of irregular breathing or respiratory arrest provide artificial respiration.
- **After inhalation:**
 Supply fresh air or oxygen; call for doctor.
 In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing:** Do not induce vomiting; immediately call for medical help.
- **Information for doctor:**
 · **Most important symptoms and effects, both acute and delayed** No further relevant information available.
 · **Indication of any immediate medical attention and special treatment needed**
 No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
 CO₂, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards arising from the substance or mixture**
 During heating or in case of fire poisonous gases are produced.
- **Advice for firefighters**
- **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
 Mount respiratory protective device.
 Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.

(Contd. on page 4)

US

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
Prepared to AM-S 300.10

(Contd. of page 3)

- **Methods and material for containment and cleaning up:**
 Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
 Dispose contaminated material as waste according to item 13.
 Ensure adequate ventilation.
- **Reference to other sections**
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**

· **PAC-1:**

| | | |
|----------------|------------------------------|------------------------|
| CAS: 67-56-1 | Methanol | 530 ppm |
| CAS: 7782-63-0 | Ferrous Sulfate Heptahydrate | 15 mg/m ³ |
| CAS: 7664-93-9 | Sulfuric Acid 96 - 98% | 0.20 mg/m ³ |
| CAS: 7439-89-6 | Iron Metal | 3.2 mg/m ³ |

· **PAC-2:**

| | | |
|----------------|------------------------------|-----------------------|
| CAS: 67-56-1 | Methanol | 2,100 ppm |
| CAS: 7782-63-0 | Ferrous Sulfate Heptahydrate | 170 mg/m ³ |
| CAS: 7664-93-9 | Sulfuric Acid 96 - 98% | 8.7 mg/m ³ |
| CAS: 7439-89-6 | Iron Metal | 35 mg/m ³ |

· **PAC-3:**

| | | |
|----------------|------------------------------|-----------------------|
| CAS: 67-56-1 | Methanol | 7200* ppm |
| CAS: 7782-63-0 | Ferrous Sulfate Heptahydrate | 990 mg/m ³ |
| CAS: 7664-93-9 | Sulfuric Acid 96 - 98% | 160 mg/m ³ |
| CAS: 7439-89-6 | Iron Metal | 150 mg/m ³ |

7 Handling and storage

- **Handling:**
- **Precautions for safe handling**
 Ensure good ventilation/exhaustion at the workplace.
 Open and handle receptacle with care.
 Prevent formation of aerosols.
- **Information about protection against explosions and fires:**
 Keep ignition sources away - Do not smoke.
 Protect against electrostatic charges.
 Keep respiratory protective device available.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep receptacle tightly sealed.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

(Contd. on page 5)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
Prepared to AM-S 300.10

(Contd. of page 4)

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

CAS: 67-56-1 Methanol

PEL Long-term value: 260 mg/m³, 200 ppm

REL Short-term value: 325 mg/m³, 250 ppm
 Long-term value: 260 mg/m³, 200 ppm
 Skin

TLV Short-term value: 250 ppm
 Long-term value: 200 ppm
 Skin; BEI

CAS: 7782-63-0 Ferrous Sulfate Heptahydrate

REL Long-term value: 1 mg/m³
 as Fe

TLV Long-term value: 1 mg/m³
 as Fe

CAS: 7664-93-9 Sulfuric Acid 96 - 98%

PEL Long-term value: 1 mg/m³

REL Long-term value: 1 mg/m³

TLV Long-term value: 0.2* mg/m³
 *as thoracic fraction, A2

· **Ingredients with biological limit values:**

CAS: 67-56-1 Methanol

BEI 15 mg/L
 LD50 Intraperitoneal: urine
 Time: end of shift
 LD50: Methanol (background, nonspecific)

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**

· **Personal protective equipment:**

· **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.
 Immediately remove all soiled and contaminated clothing.
 Wash hands before breaks and at the end of work.
 Store protective clothing separately.
 Avoid contact with the eyes and skin.

· **Breathing equipment:**

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

(Contd. on page 6)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
Prepared to AM-S 300.10

(Contd. of page 5)

- **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

- **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:**



Tightly sealed goggles

- **Body protection: Protective work clothing**

9 Physical and chemical properties

- **Information on basic physical and chemical properties**

- **General Information**

- **Appearance:**

| | |
|------------------------|-----------------|
| Form: | Liquid |
| Color: | Colorless |
| Odor: | Methanol |
| Odor threshold: | Not determined. |

- **pH-value:** Not determined.

- **Change in condition**

| | |
|-------------------------------------|-----------------|
| Melting point/Melting range: | Undetermined. |
| Boiling point/Boiling range: | 100 °C (212 °F) |

- **Flash point:** 25 °C (77 °F)

- **Flammability (solid, gaseous):** Flammable.

- **Ignition temperature:** 455 °C (851 °F)

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Product is not selfigniting.

- **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

- **Explosion limits:**

| | |
|---------------|-----------|
| Lower: | 5.5 Vol % |
| Upper: | 44 Vol % |

- **Vapor pressure at 20 °C (68 °F):** 128 hPa (96 mm Hg)

- **Density at 20 °C (68 °F):** 1 g/cm³ (8.345 lbs/gal)

- **Relative density** Not determined.

- **Vapor density** Not determined.

- **Evaporation rate** Not determined.

- **Solubility in / Miscibility with**

Water: Not miscible or difficult to mix.

(Contd. on page 7)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
Prepared to AM-S 300.10

(Contd. of page 6)

· **Partition coefficient (n-octanol/water):** Not determined.

· **Viscosity:**

Dynamic: Not determined.

Kinematic: Not determined.

· **Solvent content:**

Organic solvents: 43.4 %

Water: 53.0 %

VOC content: 43.43 %

434.3 g/l / 3.62 lb/gal

Solids content: 0.0 %

· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.

· **Chemical stability**

· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

· **Possibility of hazardous reactions** No dangerous reactions known.

· **Conditions to avoid** No further relevant information available.

· **Incompatible materials:** No further relevant information available.

· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)

| | | |
|------------|---------|-----------|
| Oral | LD50 | 228 mg/kg |
| Dermal | LD50 | 691 mg/kg |
| Inhalative | LC50/4h | 6.91 mg/l |

· **Primary irritant effect:**

· **on the skin:** No irritant effect.

· **on the eye:** No irritating effect.

· **Sensitization:** No sensitizing effects known.

· **Additional toxicological information:**

The product shows the following dangers according to internally approved calculation methods for preparations:
 Toxic

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

| | | |
|----------------|------------------------|---|
| CAS: 7664-93-9 | Sulfuric Acid 96 - 98% | I |
|----------------|------------------------|---|

· **NTP (National Toxicology Program)**

| | | |
|----------------|------------------------|---|
| CAS: 7664-93-9 | Sulfuric Acid 96 - 98% | K |
|----------------|------------------------|---|

(Contd. on page 8)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
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(Contd. of page 7)

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.


12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
 Water hazard class 1 (Self-assessment): slightly hazardous for water
 Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
 Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- **UN-Number**
- **DOT, IMDG, IATA** UN1993
- **UN proper shipping name**
- **DOT** Flammable liquids, n.o.s. (Methanol)
- **IMDG, IATA** FLAMMABLE LIQUID, N.O.S. (Methanol)
- **Transport hazard class(es)**
- **DOT**
- 
- **Class** 3 Flammable liquids

(Contd. on page 9)

Safety Data Sheet


acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
Prepared to AM-S 300.10

(Contd. of page 8)

| | |
|---|--|
| · Label | 3 |
| · IMDG, IATA | |
|  | |
| · Class | 3 Flammable liquids |
| · Label | 3 |
| · Packing group | II |
| · DOT, IMDG, IATA | II |
| · Environmental hazards: | |
| · Marine pollutant: | No |
| · Special precautions for user | Warning: Flammable liquids |
| · Hazard identification number (Kemler code): | 336 |
| · EMS Number: | F-A,S-B |
| · Segregation groups | (SGGI) Acids |
| · Stowage Category | B |
| · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
| · Transport/Additional information: | |
| · DOT | |
| · Quantity limitations | On passenger aircraft/rail: 1 L On cargo aircraft only: 30 L |
| · IMDG | |
| · Limited quantities (LQ) | 100 ml |
| · Excepted quantities (EQ) | Code: E4 Maximum net quantity per inner packaging: 1 ml Maximum net quantity per outer packaging: 500 ml |
| · UN "Model Regulation": | UN 1993 FLAMMABLE LIQUID, N.O.S. (METHANOL), 3, II |

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

No further relevant information available.

· **Sara**

· **Section 355 (extremely hazardous substances):**

| | |
|----------------|------------------------|
| CAS: 7664-93-9 | Sulfuric Acid 96 - 98% |
|----------------|------------------------|

· **Section 313 (Specific toxic chemical listings):**

| | |
|--------------|----------|
| CAS: 67-56-1 | Methanol |
|--------------|----------|

| | |
|----------------|------------------------|
| CAS: 7664-93-9 | Sulfuric Acid 96 - 98% |
|----------------|------------------------|

· **TSCA (Toxic Substances Control Act):**

| | |
|-------|--------|
| Water | ACTIVE |
|-------|--------|

| | |
|----------|--------|
| Methanol | ACTIVE |
|----------|--------|

| | |
|------------------------|--------|
| Sulfuric Acid 96 - 98% | ACTIVE |
|------------------------|--------|

(Contd. on page 10)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
Prepared to AM-S 300.10

(Contd. of page 9)

Iron Metal

ACTIVE

· **Hazardous Air Pollutants**

CAS: 67-56-1 | Methanol

· **Proposition 65**

· **Chemicals known to cause cancer:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

CAS: 67-56-1 | Methanol

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

None of the ingredients is listed.

· **TLV (Threshold Limit Value)**

CAS: 7664-93-9 | Sulfuric Acid 96 - 98%

A2

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS02

GHS06

GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**

Methanol

Ferrous Sulfate Heptahydrate

· **Hazard statements**

Flammable liquid and vapor.

Toxic if swallowed, in contact with skin or if inhaled.

Causes damage to the central nervous system and the visual organs.

· **Precautionary statements**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting/equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dust/fume/gas/mist/vapors/spray.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

If swallowed: Immediately call a poison center/doctor.

(Contd. on page 11)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/04/2023

Reviewed on 04/04/2023

Trade name: Ferrous Sulfate Solution
Prepared to AM-S 300.10

(Contd. of page 10)

Specific treatment (see on this label).

Rinse mouth.

If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF exposed: Call a POISON CENTER or doctor/physician.

Call a poison center/doctor if you feel unwell.

Take off immediately all contaminated clothing and wash it before reuse.

In case of fire: Use CO2, powder or water spray to extinguish.

Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

Store locked up.

Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** Environment protection department.

· **Contact:**

· **Date of preparation / last revision**

Revision 1.0 03/31/2023 Reviewed SDS for accuracy. STN
04/04/2023

· **Abbreviations and acronyms:**

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

VOC: Volatile Organic Compounds (USA, EU)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

BEI: Biological Exposure Limit

Flammable Liquids 3: Flammable liquids – Category 3

Acute Toxicity - Oral 3: Acute toxicity – Category 3

Specific Target Organ Toxicity - Single Exposure 1: Specific target organ toxicity (single exposure) – Category 1

· *** Data compared to the previous version altered.**