

Madison Industries, Inc.

Zinc Sulfate Solution (ZnSO₄•H₂O)

Zinc Sulfate Solution is an odorless, water white liquid. Madison Industries, Inc. offers zinc sulfate in a 37 to 39 percent ZnSO₄•H₂O concentration. However, less concentrated solutions are available upon request. Zinc sulfate is a readily available and economical source of zinc.

ADVANTAGES OF ZINC SULFATE SOLUTION

Zinc Sulfate Solution from Madison Industries, Inc. has numerous advantages over the granulated material.

1. With Zinc Sulfate Solution there is no labor requirement to transport, open, empty or discard bags.
2. Less waste with solution.
3. No dust as with granular zinc sulfate.
4. Pieces of package or dirt particles do not end up in the finished product.
5. Lower warehousing and industry cost. A storage tank takes up only 80 square feet outside.
6. Delivery is made by tank wagons or tank cars that can be emptied rapidly with minimal labor requirements.
7. The pH is adjusted to the customer's requirements.
8. Zinc Sulfate Solution is water white.

You may think of other good reasons for using zinc sulfate in liquid form. The end result is always reduced materials handling and lower costs.

TYPICAL PROPERTIES

Although the following properties are typical, they can be adjusted to meet specific requirements. Your inquiries are invited.

ZnSO ₄ •H ₂ O	37%
Zn	13.5%
Specific Gravity (25°C)	1.48
Fe	15 ppm
Cu	5 ppm
Pb	5 ppm
Color	Water White

Weight per Gallon (lbs)	12.34
Pounds ZnSO ₄ per Gallon	4.6
Crystallization Point	22°C
pH	Adjusted to Customer's Requirement

AGRICULTURE

Zinc is one of the essential elements for plant and animal life. In plants, it serves as a growth hormone and influences protein synthesis. Zinc deficiency causes stunting of the plant, yellowing of the leaves and decreased yields of seed, grain, vegetables or fruit. In the United States, zinc deficient soils can be found in 32 states. At least 41 crops are reported to be affected by the deficiency. Soil application of Zinc Sulfate Solution (37%) at a broadcast rate of two to three gallons per acre is generally an effective means of increasing crop yields. Spray applications of a four to six percent solution may also be employed on trees during the dormant period. Zinc sulfate is often used on crops such as pecans, deciduous fruits, peanuts, cotton, corn and vegetables. Since zinc is required in such small amounts, it is classified as a "trace" element or micronutrient.

Zinc deficiency in animals was not recognized until 1934. Today's sophisticated farmer understands the importance of zinc in maintaining normal health and increased yields, especially in swine and poultry. In swine, a lack of zinc in the diet causes parakeratosis, characterized by dermatitis, diarrhea, vomiting, decreased appetite, severe weight loss and eventual death. In poultry, zinc deficiency results in loss of appetite, growth retardation, blood disorders, arthritic deformities, bone diseases and death. Zinc supplements to the diet often cause prompt recovery. Zinc sulfate may be used in animal feeds as the nutritional source of zinc.

Recommendations for the agricultural use of zinc sulfate for nutritional purposes should be obtained from the United States Department of Agriculture or your state department of agriculture.

Zinc Sulfate Solution may be used in the production of zineb (zinc ethylene bisdithiocarbamate). Zineb, and agricultural fungicide, is commonly employed to protect crops such as apples, pears, cabbage, broccoli and ornamentals as well as citrus, stone-fruit, cotton and wheat.

RAYON

The second major use for zinc sulfate is the manufacture of viscose rayon fiber. Zinc sulfate is one of the ingredients in the spinning bath along with sodium sulfate and sulfuric acid. A thin stream of viscose solution is injected into the spinning bath where it coagulates forming the fiber. The zinc sulfate promotes coagulation and crenulation of the fiber. Rayon of high strength is produced which is especially well suited for tires, rubber hoses, belting and other reinforcing applications.

MISCELLANEOUS

Zinc Sulfate Solution is the ideal source of zinc for the production of zinc stearate.

It is used as a catalyst in numerous chemical operations and in the production of butyl rubber.

Zinc Sulfate Solution is used as the source of zinc in the manufacture of zinc dithiocarbamate rubber accelerators.

In water treatment, zinc sulfate finds application as a corrosion inhibitor in cooling towers and secondary oil recovery.

Zinc sulfate also finds use in production of pigments, preservation and clarification of glue, in flame-proofing compounds, as a mining flotation agent, wood preservative and in electrometallurgy and electrogalvanizing.

STORAGE

Zinc Sulfate Solution slowly corrodes steel. Rubber-lined steel tanks or the more economical fiberglass-reinforced polyester tanks are recommended for storage. The tank should be insulated and heating coils fabricated of type 316 stainless steel should be employed to prevent crystallization. Zinc Sulfate Solution should be maintained at 30°C to 40°C.

Centrifugal pumps constructed of type 316 stainless steel, glass-filled epoxy resins or rubber-lined steel are suggested for transfer of Zinc Sulfate Solution.

Piping for warm solutions should be lined with rubber or plastic (polyethylene, Teflon, polypropylene) or constructed of fiberglass-reinforced polyester (FRP). Solutions below 70°C can be pumped through PVC, polyethylene or rubber hoses. In order to prevent build-up of zinc sulfate crystals, pipes should be blown free after each use.

Our engineers and chemists are available to assist you with the storage, handling and testing of Zinc Sulfate Solution. Your inquiries are invited.

SAFE HANDLING

Zinc Sulfate Solution is acidic and can cause skin irritation. Contact with skin or eyes should be avoided through the use of a face shield and rubber gloves. Protective clothing should be employed in cases where contact with the solution is probable. In case of contact, flush eyes and skin immediately with water for 15 minutes. Obtain prompt medical attention for eyes. Contaminated clothing should be thoroughly laundered prior to re-use. If Zinc Sulfate Solution is ingested, administer large amounts of water or milk. Do not induce vomiting.

SUPPLY

Madison Industries, Inc. ships Zinc Sulfate Solution in clean tank trucks (3,000 to 3,800 gallon capacity) or tankcars (10,000 to 12,000 gallon capacity). No ICC label is required. Freight classification: "Zinc Sulfate, Liquid."

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