

North America's
leading producer
of Ferrous Sulfate
products



Liquid Ferrous Sulfate

GENERAL INSTRUCTIONS

In dissolving **Diamond Brand® Dried Ferrous Sulfate Heptahydrate** (Fe~20%), **Solu-Grade®** (Fe-20% - solution-grade) or **Moist Ferrous Sulfate** (Fe~18%) product in water, the following variables should be considered:

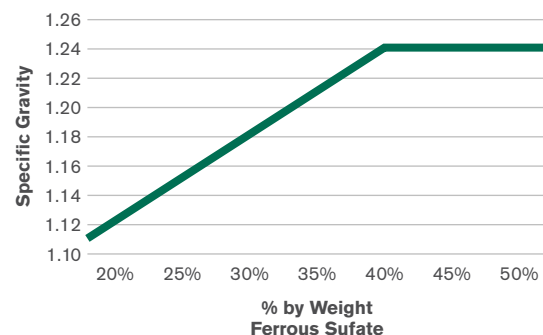
A. Temperature of water used B. Content of water used C. pH of water used

Experiments in dissolving ferrous sulfate have disclosed that distilled water, at a temperature of 60°F, will become totally saturated with iron salts whenever 33.3% by weight of dried ferrous sulfate heptahydrate is added to 66.6% by weight water. The resulting solution should weigh approximately 9.69 Lbs/gallon. To achieve the same solution with moist ferrous sulfate requires 35.5% moist ferrous sulfate by weight added to 64.5% by weight water. In addition, this same solution should have a Baumé of 24.5, a specific gravity of 1.19, and contain approximately 19% FeSO₄. The above calculations will vary with contents, pH and temperature of the liquid being used. Greater quantities of ferrous sulfate can be totally dissolved in water temperatures above 60°F, and conversely, less ferrous sulfate can be totally dissolved in water temperatures below 60°F. If a ferrous sulfate solution becomes over-saturated, the iron salts will begin to precipitate out and drop to the bottom of the container used. An over-saturated solution can be further diluted, heated and treated with small quantities of sulfuric acid to totally re-dissolve the iron back into solution again.

When physically dissolving ferrous sulfate heptahydrate into a solution, it is suggested that a mechanical agitator be used, such as a "Lightnin" type mixer, to expose the crystals to the water solution before they have a chance to settle to the bottom of the mixing vessel. Another means of agitation can be the use of a recirculating pump to draw the solution from the bottom of the mixing vessel and returning it near the top as the ferrous sulfate is being added. Extreme agitation or the use of air generation should be avoided, as these methods would induce oxygen into the solution resulting in a chemical conversion of ferrous iron to ferric iron. Since most ferrous sulfate solutions have a pH of approximately 2, it is recommended that all handling equipment, including mixers, vessels, piping and pumps be made of synthetic, non-corrosive materials of construction, such as PVC or stainless steel.

The above information is to be used as a guide only. Each application of ferrous sulfate heptahydrate should be evaluated on a case-by-case basis by trying to dissolve the material in solution, using various types of water or other solutions.

THEORETICAL VALUES OF SPECIFIC GRAVITY OF FERROUS SULFATE SOLUTIONS @ 68°F



PHYSICAL PROPERTIES LIQUID @ 60°F

Molecular Weight	278
Specific Gravity	1.15 - 1.19
Lbs./Gal. FeSO ₄ Solution	9.69
Lbs. of FeSO ₄ /Gal.	2.86
Lbs. Fe/Gal.	0.50 - 0.59
Crystallization Begins	29°F
pH	1.5 - 2.2
Insolubles (As TSS)	<0.5%

FERROUS SULFATE HEPTAHYDRATE SOLUBILITY

Temp. °C/°F	Gm./Gal.	Lbs./Gal.	Lbs. Iron (Fe)/Gal.	Specific Gravity*
0/32	600.5	1.32	0.26	1.158
10/50	787.1	1.73	0.35	1.208
20/68	1014	2.23	0.45	1.268
30/86	1259	2.77	0.56	1.334
40/104	1545	3.40	0.68	1.411
50/122	1848	4.07	0.81	1.494

Accuracy ± 2%
*Calculated



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PHYSICAL PROPERTIES OF AQUEOUS FERROUS SULFATE SOLUTIONS AT 68° F

Be	Specific Gravity	Percent FeSO ₄	Gm./Liter	Lbs./Cu. Ft.	Lbs./Gal.
0.1	1.0007	0.2%	2.001	0.1249	0.0167
0.4	1.0028	0.4%	4.011	0.2504	0.0335
0.7	1.0046	0.6%	6.028	0.3763	0.0503
0.9	1.0065	0.8%	8.052	0.5027	0.0672
1.2	1.0085	1.0%	10.09	0.633	0.0842
2.6	1.0180	2.0%	20.36	1.271	0.1699
5.2	1.0375	4.0%	41.50	2.591	0.3463
7.9	1.0575	6.0%	63.45	3.961	0.5295
10.6	1.0785	8.0%	86.28	5.386	0.7200
13.2	1.1000	10.0%	110.0	6.867	0.9180
15.8	1.1220	12.0%	134.6	8.405	1.1240
18.3	1.1445	14.0%	160.2	10.00	1.3370
20.8	1.1675	16.0%	186.8	11.66	1.5590
23.2	1.1905	18.0%	214.3	13.38	1.7880
25.5	1.2135	20.0%	242.7	15.15	2.0250

Be	Specific Gravity	Percent FeSO ₄ * 7H ₂ O	Gm./Liter	Lbs./Cu. Ft.	Lbs./Gal.
0.1	1.0007	0.37%	3.663	0.2287	0.0306
0.4	1.0028	0.73%	7.341	0.4583	0.0613
0.7	1.0046	1.10%	11.03	0.6887	0.0921
0.9	1.0065	1.46%	14.74	0.9200	0.1230
1.2	1.0085	1.83%	18.46	1.152	0.1540
2.6	1.0180	3.66%	37.27	2.326	0.3110
5.2	1.0375	7.32%	75.95	4.742	0.6339
7.9	1.0575	11.0%	116.1	7.249	0.9691
10.6	1.0785	14.6%	157.9	9.858	1.3180
13.2	1.1000	18.3%	201.3	12.57	1.6800
15.8	1.1220	22.0%	246.4	15.38	2.0560
18.3	1.1445	25.6%	293.3	18.31	2.4470
20.8	1.1675	29.3%	341.9	21.34	2.8530
23.2	1.1905	32.9%	392.2	24.48	3.2730
25.5	1.2135	36.6%	444.2	27.73	3.7070

Diamond Brand Ferrous (Iron) Sulfate products are registered in Canada as a Pest Control Product (PCP) under the Canadian PCP Act.

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Information regarding the contents and levels of metals in this product is available at www.agr.wa.gov.

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