



Guidelines for Adding Nulex Liquid Zinc to Fertilizers

1. Addition of Nulex® Liquid Zinc to UAN Solutions

Nulex Liquid Zinc products can be added in any ratio to UAN solutions such as 28-0-0 or 32-0-0 with only light agitation required. If these UAN/Nulex mixes are then mixed with phosphate solutions the guidelines listed below should be observed regarding orthophosphate mixtures and zinc to phosphorus ratios.

2. Addition of Nulex® Liquid Zinc to NP or NPK Fertilizers

A. Orthophosphate Fertilizers (8-24-0, 9-18-9, 3-18-18, etc.)

Nulex Liquid Zinc should NOT be added to clear orthophosphate fertilizers; such as, 8-24-0 or clear, water-white 9-18-9. Immediate precipitation of the zinc as zinc ammonium orthophosphate will occur. The maximum solubility of zinc in an 8-24-0 or 9-18-9 made from orthophosphate is 0.05%. Any desired amount of Nulex Liquid Zinc may be added to orthophosphate suspensions made from MAP or phosphoric acid.

B. Polyphosphate Fertilizers (10-34-0, 11-37-0, 7-21-7, etc.)

Many factors influence the stability of zinc in liquid fertilizers. The most significant considerations listed in descending order are:

1. Polyphosphate Content

Nulex Liquid Zinc may be added to NP fertilizers with a high polyphosphate content. The guidelines in this bulletin apply only to high quality fertilizer solutions in which the polyphosphate level is greater than 60%. Solutions containing less than 60% polyphosphate may produce precipitates and should be jar tested before mixing large quantities.

2. P_2O_5 / Zinc Ratio

Most high polyphosphate/zinc fertilizer solutions will have a good storage life (greater than 35 days) when a maximum ratio of one part zinc-to-20 parts of P_2O_5 is not exceeded. The stability of such mixes is dependent upon the presence of other ions; such as, magnesium, iron or aluminum, the storage temperature and the solution pH.

3. Solution pH, Metal Ions and Storage Temperature

The pH, other metal ions and storage temperature all affect the stability of a fertilizer mixture. High storage temperatures accelerate the hydrolysis rate of polyphosphates. The presence of other ions such as magnesium, iron, aluminum and fluoride tend to destabilize the mixture, particularly at higher pH levels. Generally, the optimum pH for the longest storage life of fertilizer mixtures is from about 5.8 to 6.4. When extended storage life is not a factor and higher levels of zinc are required, higher pH levels can be tolerated so long as the ratio of one part zinc-to-20 parts P_2O_5 is not exceeded. When the zinc-to- P_2O_5 ratio is exceeded, precipitation of zinc ammonium phosphates can occur immediately or within hours of mixing. Once formed these precipitates can be difficult, if not impossible, to redissolve.

4. N-P-K Mixes (7-21-7, 7-24-6, etc.)

The above guidelines all apply to N-P-K mixes. Nulex Liquid Zinc has been formulated with lowered sulfate-sulfur levels to permit the addition of up to 1% zinc in 7-21-7.

3. Addition of NULEX® Liquid Zinc to Ammonium Thiosulfate

Nulex Liquid Zinc may be blended with ammonium thiosulfate solutions in any proportions. If phosphates are present, then the guidelines concerning polyphosphate content and a ratio of not more than one part zinc-to-20 parts P_2O_5 must be adhered to.