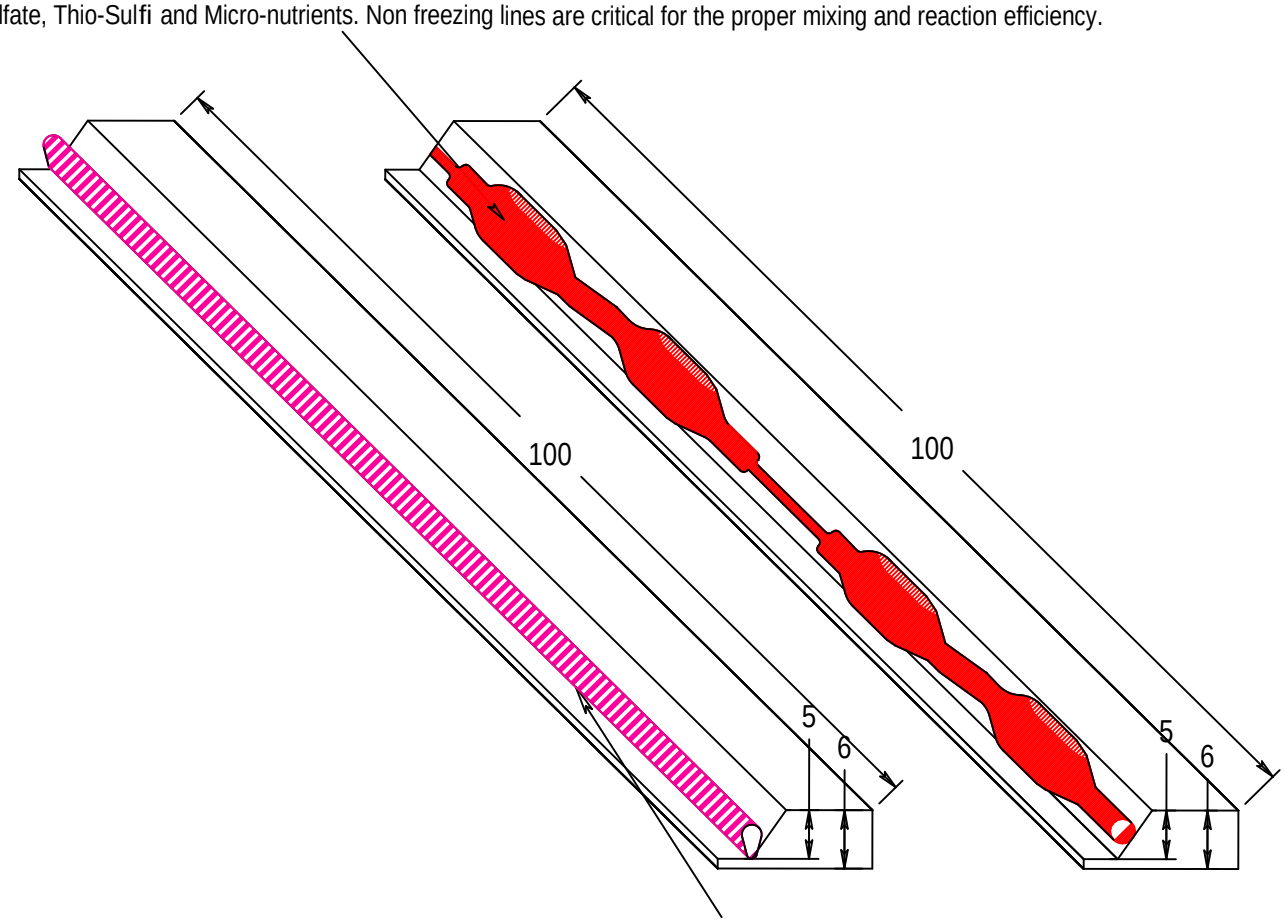
Two state NH3 flow has 1. Gas state and 2. Liquid state flow which results in a sine wave application of the material.

The two state application of old fashioned systems (no terminal orifice under high pressure) is steady by jerks creating hot spots.

NH3 is 800 times more concentrated in liquid state areas as compared to gas state areas of the band. Non-streaming bands have liquid blobs that are released. The blob areas of the lineal band are extremely concentrated and of no value to the growing crop . The applied blobs actually hurt yield. This explains why Aqua Ammonia always outperforms Anhydrous Ammonia in side by side comparisons.

This is called sinusoidal flow in the lineal band length. The oscillating stream flow is very common with the bow tie application technique of shanks. The advantage of liquid state streaming flow is clearly illustrated. The uniformity of the band length produces the yield punch since less nutrient is required and the NH3 can be reacted in the soil with on target Ammonium Poly Phosphate and Ammonium Thio-Sulfate, Thio-Sulfi and Micro-nutrients. Non freezing lines are critical for the proper mixing and reaction efficiency.



NH3 is applied as a liquid state flow with the Exactrix high pressure direct injection system. Terminal Injection Orifices (TIO)maintain a liquid flow for about .5 inches to 2 inches past the injection point mounted very close to the soil cut line. The terminal point is sharp as a pencil point.

The second products such as 10-34-0 and 12-0-0-26S react evenly with the streaming NH3 forming Tri-Ammonium crystals of similar to equal concentrations. The NH3 immediately reacts with soil organic matter, clay containing hydrogen (H2O) and placed products that crystallize as Tri-ammonium Poly Phosphate Sulfate or TAPPS. This is an Acid/Base elevated temperature reaction. The hydrogen is sourced from 3 locations.

The Exactrix band is about 8 to 20 times smaller than the old fashioned NH4 band. Thus Exactrix NH4 remains ammonic longer since the band is not diffused as much. Lower levels of diffusion means the nitro-bacteria or nitro-ammonias have less target area to feed and convert the band to mobile nitrate.

All commodity crops prefer NH4 ammonic nitrogen. Starter fertilizers seldom use nitrate based N since corn can not assimilate nitrate forms in the first 3 weeks of the plants life. This may also explain why highest economic returns are seldom achieved with solution 32 and other nitrate and urea forms. This may also explain why phosphate always works better with ammonic N since the uptake efficiency is much higher early in the plants life. Sulfur also becomes a powerful player when ammonic N assists in the uptake efficiency.