

ESN Handling, Storage, Blending, and Application Guidelines

To get the greatest value from ESN quality should be protected through proper handling, storage, blending, and application. ESN's physical properties — lower angle of repose, low hygroscopicity, less bridging in the bin, more free flowing than conventional fertilizers — result in several notable differences pertaining to storage and application.

These guidelines are based on testing with different types of blending and handling equipment as well as retailer experience.

General Guidelines:

- Although ESN is designed to withstand normal handling and application practices, the ESN coating can be compromised by improper and/or excessive handling. **User assumes responsibility for proper transfer, storage, handling, blending, and application of ESN.**
- The most common type of damage is generally abrasion from contact with moving equipment parts, therefore ESN should be handled and blended as little as possible.
- Equipment should be in good repair and properly adjusted to minimize damage.
- Rust and scale on any equipment used to handle ESN can cause abrasion to the polymer coating. If equipment has not been used for some time and has rust and scale buildup, run several tons of other fertilizer material through the equipment to scour the rust and scale free before using equipment for ESN.
- As a general rule of thumb, handle ESN with the same care as seed.

Transfer Equipment:

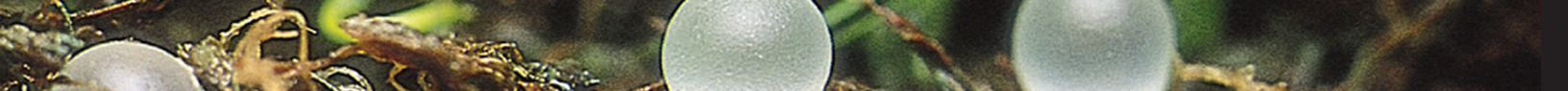
- Belt conveyers are the preferred conveyance systems.
- Minimize use of screw augers and drag chains.
- Augers and drag chains should be run as full as possible and at slower speeds to reduce ESN abrasion.
- Large diameter augers are preferred. Small diameter augers increase the percentage of ESN contacting moving parts.

Maximum Recommended Belt Angle for Unloading/Loading:

- Belt Angle in no circumstance should exceed 18 degrees. Any belts exceeding 13 degrees should be cleated to prevent roll back. There may be further impact with temperatures less than 0 F (-20 C)

Storage:

- **ESN angle of repose is 19.6 degrees** compared to 30 degrees for urea. ESN bin capacity is, therefore, about 75-80% of urea capacity.
- ESN is more fluid than other dry fertilizers and has a tendency to flow out of bin doors into alleyways, even through small openings. Bulkheads are recommended to prevent outward flow from bins.
- ESN exerts more pressure on the lower sidewalls of bins. Bin sidewalls should be reinforced concrete where possible.



- Older, weaker, and/or wooden sidewalls should either be braced, or ESN should be placed in center bins with product in adjacent bins to support the bin wall.
- Avoid storage of ESN in the same facility as ammonium nitrate.
- One of the storage benefits of ESN is that it can be stored for longer periods of time than conventional fertilizers because it does not absorb water from humidity in the air and cake in the bin.
- ESN bulk density is similar to urea, about 48 pounds per cubic foot.

Blending:

- Avoid excessive blending. Blending times should be the minimum necessary for uniform mixing.
- **ESN should be added to the blender last** to minimize physical contact.
- Blenders should be run as full as possible to minimize surface contact with ESN.
- Inclined-axis blenders (cement-mixer type) cause the least product abrasion followed by vertical-auger blenders (Doyle type), and horizontal-auger blenders (Ranco type).
- If using horizontal-auger blenders, **ESN should be loaded in the last bin before the blender exit** to minimize the time in contact with the blending augers.
- Avoid using blenders to transfer ESN if blending is not needed.
- Crop protection chemicals, liquid nitrogen stabilizers, and other liquid additives should not be impregnated on ESN. Some chemicals and solvents can damage the ESN coating. These materials may be impregnated on other dry fertilizers before adding ESN. **Always use a drying agent** to absorb excess liquid before adding ESN. **User assumes responsibility for ESN performance when impregnated with chemicals or additives.**

Field Application:

- Applicators should be properly maintained and in good repair.
- Some physical properties of ESN vary from conventional fertilizers, and different spread patterns are possible.
- As with any field application, calibration of application equipment ensures accurate placement.
- For proper product distribution, all spreaders — whether new or old, both spinners and airflow — must be properly calibrated and adjusted for ESN and ESN blends. Do not assume previous settings and operating conditions will produce the same distribution with ESN.
- Reducing air speeds in airflow spreaders can reduce the impact on deflector shields.
- If spinner spreaders are used, double spreading is highly recommended.

How can we help? To make ESN a part of your nitrogen management program, contact an authorized retailer or ESN representative.

ESN Representative:

