

Ammonium Sulphate: Fertilizer Storage and Handling

Proper handling ensures product integrity throughout storage. It is important to consider handling touch points and environmental factors to maintain a high product quality.

Granular ammonium sulphate generally stores well in all environments, however, it is at risk of deteriorating in warm and humid environments, especially when stored in upright bins. This is due to the Critical Relative Humidity (CRH) of the fertilizer.

Critical Relative Humidity: Is a value used to determine the relative potential for moisture uptake. It is the value indicating the relative humidity of the surrounding air, above which a fertilizer will absorb moisture, and below which, it will not absorb moisture. A fertilizer material having a high CRH is easier to store and handle in humid conditions, and it does not tend to cake.

Table 1: Critical Relative Humidity of Individually Stored Fertilizers at 30C

Fertilizer	Critical Relative Humidity
Urea (46-0-0)	75.2%
MAP (11-52-0)	91.6%
Potash (0-0-60)	84.0%
Ammonium Sulphate (20-0-0-20.5)	79.2%

As the ambient temperature increases, the CRH of a fertilizer reduces meaning with warmer temperatures, it is more likely to absorb moisture. As Table 1 shows, at an ambient temperature of 30C, ammonium sulphate will start to absorb moisture at 75% humidity. Compare this to MAP which needs a humidity level of over 90% to start absorbing moisture. It is noteworthy that single products have higher CRH's than blended products. Blending product reduces the CRH value and results in potentially easier uptake at a given humidity. The CRH of Ammonium Sulphate when blended with Urea is reduced to 56.4%.

The most common outcome of moisture absorption is caking. Caking is the formation of a mass or lumps of fertilizer product. It's caused by the formation of salt or crystal bridges between fertilizer particles due to moisture absorption. In addition to CRH of the fertilizer, another factor that increases the propensity of fertilizers to exhibit caking is increased physical handling. Excessive physical handling can lead to dust formation due to product degradation. Dust results in larger surface area of product to absorb moisture.

Tips for Preserving High Product Quality of Ammonium Sulphate in Storage

1. Store cool product in a cool or ambient temperature storage vessel
2. Flat storage allows for better temperature management than upright bin storage
3. Minimize temperature differentials between product and storage
 - a. If product is warmer than the storage vessel, moisture uptake is likely when warm product contacts the inside of storage vessel. Moisture contained within the fertilizer will condense against the cold vessel surface.
4. Reduce excessive and aggressive handling through the use of belt conveyers
5. Maximize loads in blender
 - a. Full blends minimize abrasion and granule impact