

Blasting—Prill modifiers and anticaking agents

Stabilizing ammonium nitrate material behavior for reliable blasting operations



Ammonium nitrate is hygroscopic and structurally sensitive. Uncontrolled crystallization or moisture exposure can lead to caking, fines generation and inconsistent material behavior before blasting begins. Together, internal crystal control and external surface protection ensure ammonium nitrate maintains its performance from production through final use.

Prill modifiers and anticaking agents control the crystal structure and surface behavior of ammonium nitrate, preserving prill integrity, flowability and handling performance from production through storage, transport and explosive manufacturing.

Crystal control during prill formation

Optimizes crystallization and density during prilling to achieve uniform crystal structure, hardness and porosity.

What it controls:

- Crystal morphology
- Density modification
- Prill hardness and friability
- Porosity and absorption behavior
- Moisture reduction during formation

Customer impact:

- Consistent prill structure across production
- Predictable performance in downstream use
- Reduced fines generation during handling

Surface protection during storage and transport

Limits moisture interaction and surface degradation by applying a hydrophobic coating to prill surfaces.

What it controls:

- Moisture ingress and absorption
- Surface solvation and recrystallization
- Friction and abrasion between prills

Customer impact:

- Reduced caking and clumping during storage
- Improved flowability in bulk handling

Key performance outcomes

- Consistent prill structure and material behavior across the value chain
- Reduced fines, caking, and material degradation
- Reliable flowability during storage, transport and use

Core brands:

- Expancel® and Versa-TL® prill modifiers
- Armoflo® anticaking agents

How this works in practice

Together, internal crystal control and external surface protection ensure ammonium nitrate maintains its performance from production through final use.

The examples on page 2 illustrate results delivered in real conditions. Start a discussion to evaluate your materials at nouryon.com/mining/prills-and-anticaking

Case Example: Controlled prill structure through crystal modification

Challenge

Uncontrolled crystallization creates irregular, needle-like crystals—driving variability in prill quality and performance.

Solution

Crystal modifier enables uniform, controlled crystal formation during prilling.

Proven performance

- More uniform crystal structure
- Improved prill consistency (shape, structure)
- Greater control over key properties (hardness, porosity, particle size)
- Significant reduction in final moisture content

Impact

- Predictable handling and processing
- Improved batch consistency
- Reduced downstream variability

Consistent prill structure starts with controlled crystallization.

Case Example: Preventing caking through surface protection

Challenge

Moisture exposure leads to caking, fines formation, and loss of prill integrity.

Solution

Hydrophobic coating creates a protective, lubricating surface layer.

Proven performance

- Reduced moisture interaction and recrystallization
- Lower caking and fines formation
- Improved flowability

Impact

- Maintains free-flowing behavior
- Extends storage and transport stability
- Reduces operational handling risk

Protected prills stay free-flowing and process-ready.

Talk to our experts about improving control of ammonium nitrate material
nouryon.com/mining/prills-and-anticaking

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