Prillex®
High Performance Ammonium Nitrates
Ammonium nitrate Prillex® characteristics

Prillex® Low Density Ammonium Nitrate is the main raw material for manufacturing high-quality explosives and blasting agents, especially ANFO (Ammonium Nitrate/Fuel Oil). It is manufactured by Enaex in the largest and most modern plant in the world, resulting in a product noted for its low density and oil absorption, which gives it a low critical diameter, optimum sensitivity and velocity of detonation. Enaex has developed three porous grades to offer a wider range for different applications: Prillex®, Prillex® ULD and Prillex® LR.

Its microporous and microcrystalline structure is obtained through the most advanced technology which gives it a specific density, absorption and strength properties to ensure maximum performance of explosive blends. All Prillex® products can be used in any kind of weather, polar or tropical, without caking or prill deformation (under recommended storage conditions).

Ammonium nitrate Prillex® uses

The main use of Prillex® ammonium nitrates is the manufacture of ANFO and heavy ANFO, as a low-cost blasting agent compared to other products available in the market.

ANFO
The high porosity of the Prillex® prills allows great oil retention capacity, which reaches over 10%.

Experience has shown that to obtain the Oxygen Balance (5.7% Oil and 94.3% Ammonium Nitrate), the ANFO blend requires a high oil retention capacity prill. Prillex® ensures excellent oil retention, allowing a stoichiometric blend along with an excess of free porosity that allows an effective action of the "Hot Spots" in the explosive blend.

The small dimensions of the pores increase surface tension, thus obtaining better contact between liquid and solid due to the effect of capillarity on the oil that is drawn to the center of the Ammonium Nitrate prills.

Heavy ANFO blends
For instance, in the heavy ANFO's, Prillex® porosity can sensitize the emulsion phase, thus eliminating the use of glass microspheres or gasifying agents, which is quite interesting from the economical point of view. Prillex® can be used with good results in pumpable AN/emulsion blends that have more than 50% of the desensitized emulsion, which is not possible with other ammonium nitrates. Prillex® delivers the same advantages when used in watergels, doped slurries, and emulsions.

Prillex® in other explosives
In other explosive blends such as Dynamites, Prillex® can also provide better sensitivity and performance due to its high microporosity. Likewise, absorption of Nitroglycerin and Nitroglycol by Prillex® guarantees a product of great stability over time. These same advantages are also obtained in watergels, doped slurries and emulsions.

In Dynamites, absorption of Nitroglycerin/Nitroglycol by Prillex® guarantees a product of great stability in time.
**Benefits**

Compared to higher density ammonium nitrates, benefits include:

- Fast and homogeneous absorption of oil.
- Its free flowing properties allow a fast loading at the boreholes.
- Any kind of blender can be used improving blending efficiency (stationary, mobile, auger, drums, spray type, auger trucks, etc.).
- The blend is stable and does not lose oil even after several months.
- Higher sensitivity to the shock wave allows reduction of the initiation methods. For this same reason, the detonation stability is quickly reached and closer to the initiation point.
- An increase in the detonation efficiency (a velocity of detonation closer to the theoretical one is reached) is more important for smaller diameters, but keeps its importance for larger diameters.

- Reduction in the explosives consumption.
- Additional energy per foot of drilling.
- Smaller cast booster could be used. Higher safety and blasting reliability.
- Savings in blasting direct costs (drilling, initiators and explosives) and indirect costs such as interruptions during operations.
- Savings in removal and fragmented material costs: reduction in secondary blasting, transportation, loading and milling costs.

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**Main Products**

**Prillex®**
This is the main specialized ammonium nitrate Low Density grade for ANFO production and show Enaex state of the art production level.

**Prillex® ULD**
This newly developed grade, with lower density than standard Prillex®, is specially suitable for smaller diameter applications. The higher internal porosity marks this product as the most sensitive product in the Prillex® family.

**Prillex® LR**
It is a special porous product for use in the manufacture of ANFO, especially Heavy ANFO types. Its low density and controlled porosity produces a good oil absorption and good detonation velocity. The particles has a high degradation resistance ensuring good quality even after long storage or transport times. Can be used in both mining and civil applications.

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**Emulsion Grade Applications**

**Prillex® FR**
Coated Ammonium Nitrate
This ammonium nitrate has high fluidity and it is easy to handle. It is recommended for the manufacture of pumpable emulsions and compatible with most emulsifiers used by the explosive industry.

**Prillex® H-Pure**
High Purity Ammonium Nitrate without additives;
For particular purposes such as the preparation of Ammonium Nitrate solutions used in the manufacture of pumpable and cartridge emulsions, Enaex has developed Prillex® H-Pure which allows compatibility with all kinds of emulsifiers.

**Nasol 84**
Enaex can supply, if the distances to the customer facilities allow it, a high purity (84%) ammonium nitrate solution. This solution is transported in inland road tankers or isotanks where loading is done at over 120°C in order to reach destination at proper temperatures for use.

This kind of product greatly facilitates the preparation of emulsions at the customer facilities, where no additional heating is required to dissolve the AN, and the product must be maintained at its storage temperature.
As a general recommendation, Prillex® bags must be stored protected from rain and sunlight, preferably in a dry environment and respecting the safety distances established by the authorities in each country.

It is highly recommended to rotate the ammonium nitrate while stored, under FIFO rule (First In, First Out).

UV-protected polypropylene outer packing with inner polyethylene bag.

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### Technical Features

<table>
<thead>
<tr>
<th>Description</th>
<th>Prillex® ULD</th>
<th>Prillex® LR</th>
<th>Prillex® FR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purity (NH₄NO₃)</strong></td>
<td>Ultra Low Density Ammonium Nitrate</td>
<td>Low Density Ammonium Nitrate</td>
<td>Low Density Ammonium Nitrate</td>
</tr>
<tr>
<td><strong>Moisture</strong></td>
<td>99.6% Min</td>
<td>99.4% Min</td>
<td>99.5% Min</td>
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<tr>
<td><strong>pH 25°C (sol 10% w/w)</strong></td>
<td>6.0 ± 0.5</td>
<td>5.5 ± 0.5</td>
<td>5.0 ± 0.5</td>
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<td><strong>Fragility Test</strong></td>
<td>(DuPont TL-53)</td>
<td>35 Max</td>
<td>35 Max</td>
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<tr>
<td><strong>Bulk Density</strong></td>
<td>&gt; 2 mm - 15% Max</td>
<td>&gt; 2 mm - 15% Max</td>
<td>&gt; 2 mm - 15% Max</td>
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<tr>
<td><strong>Oil Absorption (F.O. N°2)</strong></td>
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<td>&gt; 2 mm - 15% Max</td>
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<tr>
<td><strong>Particle Size</strong></td>
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<td>&lt; 2 mm - 5% Max</td>
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<tr>
<td><strong>External Additive</strong></td>
<td>1050 ppm</td>
<td>1000 ppm</td>
<td>950 ppm</td>
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<tr>
<td><strong>Internal Additive</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td><strong>Velocity of Detonation (m/s)</strong></td>
<td>4.412</td>
<td>4.216</td>
<td>4.167</td>
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</table>

(1) Measured as normal ANFO, confined in 6” Ø, steel pipe, initiated with a 450g cast booster-typical values.

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### International Classification

- **Class 5.1**
- **Number UN 1942**
- **Group III**

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### Transport

<table>
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<tr>
<th>Type</th>
<th>Packing Type</th>
<th>Prillex® ULD</th>
<th>Prillex® LR</th>
<th>Prillex® H-PURE</th>
<th>Prillex® FR</th>
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<td>Breakbulk</td>
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* Expressed in Kg.
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