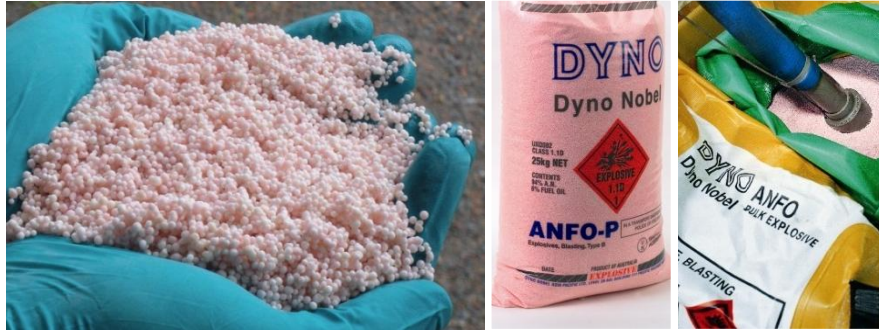


ANFO

Prilled Ammonium Nitrate

Technical
Information



Description

ANFO is a nominal 94:6 (wt%) blend of porous ammonium nitrate prill (Detaprill®) and fuel oil. It is a dry, free flowing bulk explosive; formulated to ensure the appropriate oxygen balance providing optimal energy and sensitivity.

Application

ANFO has zero water resistance and has a wide variety of applications in dry hole blasting conditions.

It is one of the most cost efficient blasting agents available for use in small, medium or large diameter applications. When pneumatically loaded; ANFO may also be used effectively in underground development and tunnelling applications.

Advantages

ANFO provides excellent heave energy compared with explosives that contain a high emulsion content.

The low bulk density of ANFO provides excellent charge distribution throughout the blasthole.

Properties

	Poured	Blow Loaded
Density (g/cm ³) ¹	0.82	0.95
Min Diameter (mm)	75	25
Energy (MJ/kg) ²	3.7	3.7
Typical VOD (m/s) ³	2500 – 4500	2000 – 4000
RWS ⁴	100	100
RBS ⁵	100	116

NOTES:

1. Values are indicative average densities only, determined under laboratory conditions by Dyno Nobel technical personnel at Dyno Nobel's Mt Thorley Technical Centre. Observed densities may differ or vary under field conditions. Nominal in hole density only.
2. All Dyno Nobel energy values are calculated using a proprietary Dyno Nobel thermodynamic code – Prodet. Other programs may give different values.
3. These results represent a range of VODs collected from numerous Dyno Nobel blast sites throughout the Asia Pacific region over a period of time. The velocity of detonation actually recorded in use is dependent upon many factors, including: the initiation system used, the product density, blasthole diameter and ground confinement. The values stated are typical of those recorded for the product in various hole diameters, densities and ground types, and may not be achievable under all circumstances.
4. Relative Weight Strength (RWS) and Relative Bulk Strength (RBS) are determined using a density of 0.82g/cm³ and an energy of 3.7MJ/kg for ANFO.
5. RBS depends on the final density of the product at the time of loading.

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Recommendations

Priming Requirements – It is recommended that ANFO should be primed with a cast booster for all hole diameters. Depending on the application, ANFO may be primed with a suitable diameter detonator sensitive cartridge explosive (Powermite® Pro). For specific priming requirements, please contact your Dyno Nobel representative. Additional boosters should be used when the column height exceeds 10 metres or where there is risk of column disruption.

Maximum Hole Depth – ANFO can be detonated successfully in depths up to 75m.

Shelf Life – ANFO has a maximum shelf life of six (6) months dependent on temperature and humidity conditions. Storage in a high humidity and high temperature environment will accelerate product breakdown and should be avoided. Signs of ANFO degradation are hardening or caking which can lead to difficulty in loading and as a result, may lead to poor blasting performance.

Sleep Time – Under normal conditions in dry and stemmed blast holes, ANFO may be slept for periods up to six (6) weeks. The sleep time may be limited to the recommended sleep time of the initiating system. The presence of water will dramatically reduce the sleep time. For applications where unusual or specific conditions exist please consult your local Dyno Nobel representative for advice.

Reactive Ground Conditions – ANFO is not designed for use in conditions where reactive sulphides are present.

Ground Temperature – ANFO is suitable for use in ground with a temperature of 0°C to a maximum of 55°C. For applications in ground with temperatures outside this range, contact your Dyno Nobel representative.

Packaging

ANFO is available in bulk through specialised truck delivery systems.

Dangerous Goods Classification

Product Name:	ANFO
Correct Shipping Name:	Explosive, Blasting, Type E
UN Number:	0082
DG Class:	1.1D 1



Safe handling, transportation and storage

First Aid – You can find detailed first aid information on the relevant Dyno Nobel Material Safety Data Sheet. Refer to www.dynonobel.com for more information if required.

Safety - All explosives are classified as dangerous goods and can cause personal injury and damage to property if used incorrectly.

Transportation and Storage - All explosives must be handled, transported and stored in accordance with all relevant regulations. Stock should be rotated such that older product is used first.

Remember, the explosive products discussed in this document should only be handled by persons with the appropriate technical skills, training and licences. While Dyno Nobel has made every effort to ensure the information in this document is correct, every user is responsible for understanding the safe and correct use of the products. If you need specific technical advice or have any questions, you should contact your Dyno Nobel representative.

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