

# mullafex Heavy ANFO Blends

## Technical Data Sheet



VERSION 2.0

Feb 2021

### Product Description

Mullafex Heavy ANFO Blends are ANFO rich emulsion blend bulk explosives specifically designed for use in dry or dewatered, medium to large diameter, blast holes in surface mining applications.

The blends are formulated to provide excellent heave energy for loosening of medium to hard ground in surface mining applications.

This product is suitable in situations where reactive ground conditions exist.

### Advantages and Benefits

Mullafex Heavy ANFO Emulsion Blends are reactive ground inhibited blends designed for excellent fragmentation of hard ground in surface mining and use in dry blast holes.

The addition of Mullafex Emulsion to ANFO provides the ability to vary the relative weight strength and the gas volume generated during detonation by modifying the ammonium nitrate content and density of the down hole explosive.

The densities and energy output can then be tailored to match the ground conditions to enable pattern expansion and blasting cost savings.

### Technical Properties

Property	30/70	40/60	50/50
Percent Emulsion	30%	40%	50%
Percent ANFO	70%	60%	50%
Nominal Cup Density - g/cc	1.07	1.21	1.30
Minimum Diameter <sup>1</sup> - mm	102	127	127
Maximum Charge Depth <sup>2</sup> - m	Up to 25 m	Up to 20 m	Up to 20 m
Hole Type	Dry	Dewatered	Dewatered
Typical VOD <sup>5</sup> - km/s	3.7 - 6.0	3.7 - 6.6	3.7 - 6.8
Effective Energy <sup>3</sup> - MJ/kg	2.47	2.62	2.63
RWS <sup>3,4</sup>	111.1	117.9	118.0
RBS <sup>3,4</sup>	148.5	178.4	191.7
Maximum Sleep Time <sup>5</sup> - days	7 Days	7 Days	7 Days

#### NOTES:

1. Minimum blast hole diameter is dependent on the density, ground conditions, and the initiation system used.
2. Maximum charge length is dependent on the density, blasthole diameter, ground conditions, and the initiation system used.
3. CSBP's energy values, relative weight strength, and relative bulk strength are calculated independently using an ideal detonation modelling computer program developed by Professor Martin Braithwaite (working independently via Imperial Consultants). The calculated energy is to a cut-off pressure of 100 MPa.
4. For calculation of Relative Weight Strength (RWS) and Relative Bulk Strength (RBS); ANFO - density 800 kg/m<sup>3</sup> and effective energy of 2.23 MJ/kg.
5. When used in ideal conditions.

### Application

Mullafex Heavy ANFO Blends can be blended and delivered into boreholes using the customer's own Mobile Processing Units.

The blends are designed to be delivered into bore holes by way of the MPU's discharge auger. High volume discharge rates can be achieved with this method of loading.

This booster sensitive bulk explosive can be used in boreholes with minimum diameters from 102 mm.

Mullafex Heavy ANFO Blends are designed for use in dry or dewatered blast holes. The 40/60 and 50/50 blends may be used in dewatered blast holes where dynamic water is not present.

Blends containing less than 30% mullafex emulsion may not be suitable for highly reactive ground types.

### Charging of Blastholes

The MPUs used to manufacture Mullafex Heavy ANFO Blends must be calibrated and maintained on a regular basis. The customer shall ensure MPU safety systems are functioning before blending is to take place.

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### Blasthole Charge Length

Mullafex Heavy ANFO Blends are suitable for use in explosive columns up to 30 m in depth, depending blend type, on hole diameter, and ground conditions. Multiple primers may be required with charge lengths greater than 20 m.

It is recommended to sensitise the emulsion in the 50/50 blend if the intended blast hole depths are greater than 20 m. This sensitisation may lead to a reduction in the in-hole density.

Please contact CSBP Product Support for advice if intended charge lengths exceed 20 m in length.

### Priming and Initiation

Priming of blastholes greater than 127mm in diameter or greater than 10m in length must be with 400gm cast boosters. 150gm cast boosters can only be used in blast hole diameters less than 127mm and less than 10m in length.

The use of detonating cord in hole with Mullafex Heavy ANFO Blends is not recommended.

### Sleep Time Within Blastholes

The recommended maximum sleep time in optimal, non-reactive ground conditions is 7 days. The maximum sleep time should be confirmed by reactive ground Sleep Time Testing using rock samples sourced from the site of use. Mullafex Inhibited Heavy ANFO Blends must not be slept for more than 1 week.

CSBP product support should be consulted before using Mullafex in reactive ground.

### Ground Temperature

Mullafex Heavy ANFO Blends must only be used where the ground temperature is less than 55°C.

Contact a CSBP product support representative for advice with regards to product suitability in situations outside these conditions.

### Authorisation and Transport

Mullafex Heavy ANFO Blends are created during the blast hole loading process.

If transported on a road, Mullafex Heavy ANFO Blends are classified as 1.1D explosives and must be transported in accordance with Federal and State laws and regulations governing the transport of explosives.

**Authorised Trading Name:** Mullafex Heavy ANFO Inhibited Emulsion Blends

**Proper Shipping Name:** Explosive, Blasting, Type B

**UN No.:** 0082

**Classification:** 1.1D Explosive

### Disposal

Disposal of Mullafex Heavy ANFO Blends can be hazardous. Methods of safe disposal can vary depending on the user's situation. Contact a CSBP product support representative for disposal advice.

### Safety and First Aid

Reactive Product Selection Tests must be performed to confirm that the chosen Mullafex Inhibited Heavy ANFO Blend is suitable for the site requirements.

Mullafex Inhibited Heavy ANFO Blends are relatively insensitive to accidental initiation under normal conditions of use. Detonation may occur from heavy impact or excessive heating, particularly under conditions of confinement.

Post detonation fumes are a health hazard. Users should ensure that adequate ventilation is provided prior to re-entry into the blast area.



More detailed safety information can be found in the Mullafex Ammonium Nitrate Granules and Emulsion Blend Safety Data Sheet (SDS).

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