

## Technical Data Sheet

# FORCE MAX

### 1 Description



*Force Max* 365 packaged emulsion explosive is a robust, maximum strength, detonator sensitive explosive. The explosive is white in colour with a firm putty-like consistency.

#### Application

*Force Max* is a water resistant packaged explosive designed for priming applications, and as a medium density column explosive, in surface and underground mining and general blasting. The high detonation velocity and the robust nature of *Force Max* make it an ideal primer for the initiation of ANFO columns.

#### Key Benefits

- *Force Max* delivers excellent fragmentation with improved digability.
- *Force Max* is highly water resistant, which minimises leaching and reduces environmental impact.
- Occupational Health & Safety issues around the handling and storage of nitroglycerin are eliminated

#### Recommendations for Use

##### Blasthole Depth

*Force Max* is suitable for use in holes of any practical depth providing contained water does not exceed 20 m depth.

##### Charging

No metal instrument should be used to tamp explosives. The primer cartridge containing a detonator must not be tamped.

*Force Max* as a primer, must be provided a good contact with the main charge and must be prevented to deem into mud which can be found at the bottom of the blasthole.

Product	<i>Force Max</i>
Density (g/cm <sup>3</sup> ) <sup>(1)</sup>	1.18
Minimum Cartridge Diameter (mm)	50
Hole Type	Wet and Dry
Velocity of Detonation Range (m/s) <sup>(2)</sup>	6.330
Min. VOD. @ 50*225 (m/s)	≥3.500
Transmission of Detonation Value (cm)	2
<b>Relative Effective Energy (REE) <sup>(3)</sup></b>	
Relative Weight Strength (%)	119
Relative Bulk Strength (%)	
▪ to ANFO @ 0.80 (g/cm <sup>3</sup> )	176
▪ to ANFO @ 0.95 (g/cm <sup>3</sup> )	133
CO <sub>2</sub> Output (kg/t) <sup>(4)</sup>	184



### Priming and Initiation

*Force Max* can be reliably initiated by a detonator of No. 8\* or greater strength. Force detonator can reliably initiate *Force Max* at temperatures higher than -15 °C.

Use of minimum 10 g PETN/meter detonating cord with *Force Max* is recommended for reliable initiation.

### Sleep Time within Blastholes

In dry blastholes, given the explosives packaging is undamaged; *Force Max* may be charged and fired several months later. If the explosives packaging are damaged, the sleep-time in a blasthole is influenced by the extent of damage to the packaging and by the nature of any water present. Even with full length slitting of cartridges, the explosive will give good performance after two weeks immersion.

### Packaging

*Force Max* is packaged in white plastic film, colour highlighted in blue. Cartridges are packed in cases having capacity of net 20 kg. Standard cartridge sizes are as follows:

Diameter (mm)	Nominal Length (mm)	Nominal Mass (g)	Nominal count per case
50	225	500	40
50	450	1000	20
65	250	1000	20
65	500	2000	10
75	200	1000	20
75	400	2000	10
90	150	1000	20
90	290	2000	10

### Storage and Handling

#### Product Classification

Authorised Name: *Force Max*  
Proper Shipping Name: Explosive, Blasting, Type E  
UN No: 0241  
Classification: 1.1D

All regulations pertaining to the handling and use of such explosives apply.

#### Storage

Storage can be done for *Force Max* in a suitably licensed explosive magazine. The cases should be stacked in the manner designated on the cases.

*Force Max* has a storage life of up to 12 months in an approved magazine, even in hot and humid extremes.

*Force Max* is best stored at temperatures above -15 °C & should be stored between -15 - +30 °C. This is especially important in cold weather "load and shoot" worksites where there is insufficient inhole warm-up time. *Force Max* should have an internal temperature of 0 °C or higher, before use with a pneumatic cartridge loading machine.



### **Transport**

*Force Max* should be transported between -15 °C and +30 °C.

### **Disposal**

Disposal of explosives materials can be hazardous. Methods for safe disposal of explosives may vary depending on the user's situation. Please contact a local Nobel Explosives representative for information on safe practices.

### **Safety**

The post detonation fume characteristics of *Force Max* make the product suitable for both underground and surface blasting applications. Users should ensure that adequate ventilation is provided prior to re-entry into the blast area.

Explosive fumes may contain carbon monoxide, nitrous gases, other gases, vapours or airborne solid residues and before the first use shall be determined the conditions according to the local regulations.

*Force Max* can be initiated by extremes of shock, friction or mechanical impact. As with all explosives, *Force Max* should be handled and stored with care and must be kept clear of flame and excessive heat.

### **Disclaimer**

Explosives based on Ammonium Nitrate such as *Force Max* may react with pyritic materials in the ground and create potentially hazardous situations. Nobel Explosives accepts no responsibility for any loss or liability arising from use of the product in ground containing pyritic or other reactive material.

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#### Notes

1. Nominal Density Only.
2. VOD will depend on application including explosive density blasthole diameter and degree of confinement. The VOD range is based on minimum unconfined and calculated ideal.
3. REE is the Effective Energy relative to ANFO at a density of 0.8 g/cm<sup>3</sup>. ANFO has an effective energy of 2.30 MJ/kg. Energies quoted are based on ideal detonation calculations with a 100 Mpa cut off pressure. Non-ideal detonation energies are also available on request. These take account of blasthole diameter, rock type and explosive reaction behaviour.
4. Carbon Dioxide is the main greenhouse gas produced. The output is calculated assuming ideal detonation.