Technical Data Sheet

FORCE MAX 365

1 Description

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

Application

Force Max 365 can be used in both tunnelling and underground blasting operations as a high-density column explosive (and is also suitable for cartridge loading) and priming applications.

Key Benefits

- *Force Max 365* is a maximum energy emulsion formulation with high pre-compression resistance. This gives excellent blast results in the toughest ground even with tight drilling patterns as found in shaft sinking and other extreme blasting environments.
- Specially formulated for underground use, *Force Max 365 reduces* post-blast fumes and improves turnaround time. Detonation of 200 g of *Force Max 365 emits* 0.0042 m^3 CO_2 type fumes and gases. *Force Max 365* is one of first class explosive according to Institute of Makers of Explosives (IME) of USA's fume classification standard.

Fume Classification Standard

Fume Class	Toxic Fume Quantity (per 200 g explosive)
1	<0.0045
2	0.0045 – 0.0093
3	0.0093 – 0.0188

- The tight diameter control specifications and wax formulation of *Force Max 365* maximises cartridge loader performance.
- *Force Max 365* is highly water resistant, which minimises leaching and reduces environmental impact.
- Occupational Health & Safety issues around the handling and storage of nitroglycerin are eliminated.

Technical Properties

Product	*Force Max 365*
Density (g/cm^3) (1)	1.20
Typical VOD (m/s) (2)	6.140
Min. VOD. @ 27*225 (m/s)	≥3.500
Transmission of Detonation Value (cm)	2
Relative Effective Energy (REE) (3)	
Relative Weight Strength (%)	131
Relative Bulk Strength (%) ▪ to ANFO @ 0.8 g/cm^3 ▪ to ANFO @ 0.95 g/cm^3	 196 149
CO_2 Output (kg/t) (4)	139

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Recommendations for Use

Blasthole Depth

Force Max 365 is suitable for use in holes of any practical depth providing contained water does not exceed 20 m depth.

Priming and Initiation

Force Max 365 can be reliably initiated by a detonator of No. 8* or greater strength. *Force* detonator can reliably initiate *Force Max365* at temperatures higher than-15 °C. Use of minimum 10 g PETN/meter detonating cord with *Force Max 365* is recommended for reliable initiation.

Charging

In small diameter blastholes maximum energy per metre of blasthole can be achieved by tamping the explosive with a wooden tamping rod appropriate to the hole diameter. No metal instrument should be used to tamp explosives. The primer cartridge containing a detonator must not be tamped.

Sleep Time within Blastholes

In dry blastholes, given the explosives packaging is undamaged; *Force Max 365 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

Both the *Force Max 365* packaging cases and film are colour highlighted in red. It is packaged in white plastic film with coloured printing. 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
27	225	160	125
30	225	191	105
32	200	186	108
34	225	245	82
34	400	436	46
36	225	275	73
36	400	485	41
38	225	306	65
38	400	500	40

Storage and Handling

Product Classification

Authorised Name:	*Force Max 365*
Proper Shipping Name:	Explosive, Blasting, Type E
UN No.:	0241
Classification:	1.1D
EC Type Certificate:	ENB/B/070/09

All regulations on the handling and use of such explosives apply.

Storage

Store *Force Max 365 in* a suitably licensed magazine for Class 1.1D explosives. The cases should be stacked in the manner designated on the cases.

Force Max 365 ***has*** a storage life of up to 12 months in an approved magazine, even in hot and humid extremes.

Force Max 365 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 365* should have an internal temperature of 0 °C or higher, before use with a pneumatic cartridge loading machine.

Transport

Force Max 365 ***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 representative for information on safe practices.

Safety

The post detonation fume characteristics of *Force Max 365* 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.

Force Max 365 can be initiated by extremes of shock, friction or mechanical impact. As with all explosives, *Force Max 365 of* flame and excessive heat.

Disclaimer

Explosives based on Ammonium Nitrate such as *Force Max 365* may react with pyretic 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 pyretic 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^3. 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.