

TECHNICAL DATA SHEET

Exel™ MS Sweden



Description

Exel™ MS detonators are a series of full-strength nonelectric detonators with millisecond (MS) delay intervals between successive firing times. The detonator assemblies consist of a non-electric detonator and a length of Exel™ signal tube.

Exel™ MS detonators from Orica Sweden use the NPED (Non Primary Explosives Detonator) technology and are therefore free of lead azide. The detonators have an aluminium shell and an initiation output strength of a Reference Detonator #3. The Exel™ shock tube is a high strength and abrasion resistant tubing, which transmits the initiation signal to the detonator. One end of the shock tube is crimped into the detonator shell, and the other end is closed off by an ultrasonic seal.

Exel™ MS detonators 475 (#19), 500 (#20) and 1000 (#40) also meet the tighter delay time accuracy acceptance requirements for the combined use of in-hole detonators with surface delay connectors. In these applications all blast holes are charged with Exel™ MS in-hole detonators with the same delay time. The initiation sequence is then determined on the surface by means of the surface delay connectors. To minimize the risk of out of sequence firing when using the Exel™ MS in-hole detonators in combination with Exel™ Connectadet™ SL, the Exel™ MS in-hole detonators 475 (#19), 500 (#20) and 1000 (#40) have a more uniform delay.

Technical Properties

PRODUCT	Exel™ MS
SHOCK TUBE	Exel™ 3L orange
Outer diameter (mm)	3.0 ± 0.2
Nominal tensile strength (min)	300 N at +20 °C
Length (m)	3.6 – 45.0
Shock wave propagation (m/s)	2000 ±100
DETONATOR	
Initiating capability	REF. DET. #3
PETN/RDX Base charge (mg)	650
Shell material	Al
Hydrostatic pressure resistance	3 bar for 7 days
NEQ/NEM (mg/unit)	940

Application

Exel™ MS detonators provide a series of delay times suitable for surface mining, quarrying & construction and underground blasting applications.

Exel™ MS detonators will directly initiate cap sensitive boosters and packaged explosives. Refer to the relevant Technical Data Sheets for details.

Delay Range

Delay #	Nominal Delay Time* (ms)	Max. Std. Deviation (ms)	Delay #	Nominal Delay Time (ms)	Max. Std. Deviation (ms)	
1	25	8.3	12	300	8.3	
2	50		13	325		
3	75		14	350		
4	100		15	375		
5	125		16	400		
6	150		17	425		
7	175		18	450		
8	200		19	475	6.7**	
9	225		20	500		
10	250					
11	275					
			40	1000	10.0**	

*including 6 m shock tube

**rk according to EN 13763-16



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Recommendations for Use

Exel™ MS detonator should always be secured inside a suitable primer, which fully encloses the detonator. Exposed detonators should not be placed inside blastholes or charging hoses. Exel™ MS detonators used inside blastholes should normally be “reverse-primed”, with the detonator base pointing towards the collar of the blasthole. Excessive force should not be applied to signal tubes connected to in-hole detonators and primers. If a primer becomes stuck when attempting to retrieve or reposition it, a replacement unit should be used.

Exel™ MS detonator assemblies can be reliably initiated by:

- Other Orica surface delay systems e.g. Exel™ Connectadet™ SL.
- Detonating cord with a core load of approx. 5.0 g/m.

Packaging

Exel™ MS detonators are packed into plastic or aluminium bags inside cardboard cases. All units within a case have the same tube length and delay.

Tube length (m)	Qty per bag (1.1B)	Qty per box (1.1B)	Delay numbers
3.6	10	100	# 1-20
4.8	10	100	# 1-20
6.0	10	100	# 1-20
7.8	10	100	# 1-20, (20,40)*
9.0	10	70	# 19-20
10.2	10	70	# 18-20, 40, (20)*
12.0	10	50	# 1-20, (40)*
15.0	10	50	# 18-20, 40
18.0	5	40	# 18-20
21.0	5	30	# 18-20, 40, (19)*
24.0	5	30	# 18-20, 40
27.0	5	25	# 18-20, 40
30.0	4	20	# 19-20
36.0	4	20	# 1-20, 40
45.0	2	10	# 1-20

*delays in brackets are available with yellow shock tube 1.4S packaging is available to special order. Other tube lengths, delay numbers or detonator assemblies with clips may be available upon request. Please ask your local Orica representative for further information.

Storage and Handling

Product Classification

Authorised Name: Exel™ MS

Proper Shipping Name: Detonator assemblies, non-electric

UN No: 0360 0500

Classification: 1.1B 1.4S

EC Type Certificate: 0589.EXP.2783/18

Storage

Exel™ MS detonators should be stored in a cool, dry detonator magazine. Stacks of cases should be no more than 2 metres high.

Exel™ MS detonators should be used in temperatures from -45 °C up to 70 °C.

Exel™ MS detonators have a shelf life of 3 years.

Disposal

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

Safety

Avoid damage to the shock tube. Never pull so hard as to stretch or break shock tubing. A premature initiation may result. Do not use the Exel™ MS assembly as a lowering line. Keep the shock tube taut until loading has been completed. Avoid damage to the shocktube during loading and stemming operations.

Exel™ MS detonators provide a high level of safety against initiation by static electricity, electrical stray currents and radio frequency transmissions. However, they contain sensitive explosives, which can initiate under intense impact, friction or heat. As with all explosives these detonators must be handled and stored with care.

Training

This Technical Data Sheet is for information only. The Exel™ system including the Exel™ MS should only be used by personnel who have been properly trained to use this system.



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Orica Sweden AB
Gyttorp
713 82 Nora
Sweden
Phone: +46 587 85000
Fax: +46 587 25345
Email: info.gyse@orica.com

Emergency Telephone Numbers

Within Sweden: +46 20 850001
Outside Sweden: contact local representative



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