

# TECHNICAL DATA SHEET

## HiNEL Plus® - MS Series

### Description

HiNEL Plus® MS (Milli-Second) Series are non-electric detonators used in both open pit and underground mines with delay time of 25ms (Milli-second) increments. The extremely accurate and various delay time system of HiNEL Plus® MS Series detonators allow users to minimize blasting vibration and can improve fragmentation. The shock tube is both abrasion resistant and high-strength and transmits the signal to detonator in order to initiate. With a plastic J-hook connector providing a secure and rapid means of attaching shock tubes to the detonating cord, it is color coded and stamped with both delay number and firing time. The shock tube is crimped into the detonator shell at one end and closed by a waterproof seal at the other.

### Features & Benefits

HiNEL Plus® MS Series detonators consist of a non-electric detonator containing a delay element, a high strength Pentaerythritol Tetranitrate (PETN) base charge, a length of yellow shock tube and a color-coded J-Hook connector(optional). HiNEL Plus® MS Series detonator is also available with heavy duty shock tube. Labels showing the lengths and delay times are attached on the shock tube.

HiNEL Plus® MS Series detonators have a base charge of grade #8 PETN to improve the reliability of the ignition of explosives. By adopting a 3 layer shock tube, rubber plug and triple crimping, HiNEL Plus® MS Series detonators also have enhanced tensile strength.



### Usage Instructions

HiNEL Plus® MS Series detonators are made up of a 3 layered shock tube. HiNEL Plus® MS HD Series detonators are made up of HD shock tube that has enhanced tensile strength and impact resistance. However, moisture may become present if the tubing is split or cut in any way, and this may result in a misfire.

HiNEL Plus® MS Series detonators should be fully enclosed within a suitable booster or primer and never be placed inside blastholes or charging hoses directly. Excessive force should not be used when handling shock tubes connected to detonators or primers. A replacement should be used if a primer becomes stuck or non-retrievable.

If used inside blast holes, HiNEL Plus® MS Series detonators should be reversed primed ensuring the detonator base is pointing towards the blasthole collar.

In case of using detonating cord, HiNEL Plus® MS Series detonators should be attached via J-hook connector to the detonating cord trunklines. Each J-hook connector should be clipped to the trunkline, and the cord and shock tube should be kept at right angles. Pull the end of the shock tube through its J-hook connector until the tube is straight and firm between the connection and the blasthole collar. No shock tubes should cross over or lay within 300mm of the detonating cord. Using a detonating cord with a core charge between 5.0 g/m PETN, HiNEL Plus® MS Series detonators can be reliably initiated.

Recommended Sleep time of HiNEL Plus® MS Series detonator is 2 weeks at temperatures below 40°C. Recommended Sleep time of HiNEL Plus® MS HD Series detonators is 4 months at temperatures below 40°C. Sleep time capability may reduce at temperatures above 40°C.

### Hazard classification

<b>UN No. (Class / Division):</b>	0360(1.1B) / 0500 (1.4S)
<b>Proper Shipping Name</b>	DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
<b>EmS</b>	F-B, S-X (1.1B / 1.4S)

### Technical Data

HiNEL Plus® MS		
<b>Base Charge</b>	PETN, #8 (730mg)	
<b>Primary Charge</b>	DDNP	
<b>Shell</b>	Aluminum	
<b>Length of Shell</b>	From 55mm to 90mm	
<b>Outer Diameter of Shell</b>	7.5mm	
<b>Outer Diameter of Shock Tube</b>	3.0mm	
<b>Color of Shock Tube</b>	Standard	HD
	Yellow	Purple
<b>Tensile Strength of Shock Tube</b>	Standard	HD
	Nominal 45kgf	Nominal 51kgf
<b>Length of Shock Tube (m)</b>	3.6 / 4.8 / 6.0 / 7.2 / 9.0 / 12 / 15 / 18 / 21 / 24 / 30 / 36 / 45 / 60 / 80 (Custom made possible)	

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### Standard Delay Range

HiNEL Plus® MS		
No.	Delay Time (ms)	Delay Interval (ms)
# 0 (ID)	0	25
# 1	25	25
# 2	50	25
# 3	75	25
# 4	100	25
# 5	125	25
# 6	150	25
# 7	175	25
# 8	200	25
# 9	225	25
# 10	250	25
# 11	275	25
# 12	300	25
# 13	325	25
# 14	350	25
# 15	375	25
# 16	400	25
# 17	425	25
# 18	450	25
# 19	475	25
# 20	500	-

Grade UN 0500 / 1.4S (470 X 295 X 315 mm)				
Length (m)	Each/Bundle	Each/Box	Net Weight (kg)	Gross Weight (kg)
3.6	5	100	3.0	8.0
4.8	5	100	4.0	8.5
6.0	5	90	4.0	8.0
7.2	5	90	5.0	9.0
9.0	5	90	6.5	11.0
12.0	5	70	6.0	10.0
15.0	5	60	7.0	11.0
18.0	5	50	6.0	9.5
21.0	5	50	7.0	10.5
24.0	4	40	6.0	9.5
30.0	4	32	6.0	9.5
30.0	1/bobbin	24	7.5	10.0
36.0	1/bobbin	24	8.5	11.0
45.0	1/bobbin	24	10.0	12.5
60.0	1/bobbin	10	8.0	10.5
80.0	1/bobbin	10	9.5	12.0

\* Based on one box (UN certified)

\* HD shock tube is available for all length.

### Packaging

HiNEL Plus® MS Series detonators are packed in cardboard boxes. Each box contains only a single lead length and delay.

Grade UN 0360 / 1.1B (470 X 295 X 330mm)				
Length (m)	Each/Bundle	Each/Box	Net Weight (kg)	Gross Weight (kg)
3.6	10	240	7.0	8.5
4.8	10	200	7.5	9.0
6.0	10	180	8.0	9.5
7.2	10	140	7.5	9.0
9.0	5	120	8.0	9.5
12.0	5	90	7.5	9.0
15.0	5	80	9.0	10.5
18.0	5	70	8.0	9.5
21.0	5	50	7.0	8.5
24.0	4	48	7.5	9.0
30.0	4	40	7.5	9.0
30.0	1/bobbin	24	7.5	9.5
36.0	1/bobbin	24	8.5	10.5
45.0	1/bobbin	24	10.0	12.0
60.0	1/bobbin	10	8.0	10.0
80.0	1/bobbin	10	9.5	11.5

### Safety

HiNEL Plus® MS Series detonators are designed to reduce the risk of initiation by static electricity, stray electrical currents and radio wave transmissions. As high-electrical shocks, such as lightning, may cause initiation, it is recommended that personnel evacuate to a safe distance and keep away from the blasting site whenever this hazard is present. HiNEL Plus® MS Series detonators should be isolated from energy sources including impact, heat or friction. HiNEL Plus® MS Series detonators may be used in temperatures up to 70°C.

### Storage

All ignition sources, such as matches and lighters, are strictly prohibited within minimum of 8 meters radius of the detonators.

HiNEL Plus® MS Series detonators should be stored in a properly conditioned magazine of cool and dry atmosphere.

HiNEL Plus® MS Series detonators must be used within 12 months after opening the packaging. Detonators that are older than four years should not be used.

Store in a secure magazine, access to products and storage should be restricted to authorized personnel.

Delay detonators should be used in order of manufacturing date as they deteriorate with age. Use oldest stored product first.

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