

Non-Electric Initiators

SHOCK TUBE ASSEMBLIES

AEL's extensive portfolio of non-electric shock tube initiating systems and global manufacturing capability offer world class solutions for all mining applications.

Our shock tube initiating systems and components are highly adaptable, designed with the user in mind and are available as "Standard" and "Made-To-Order" products, globally.

Some of the benefits to the customer are:

- Incorporating rugged, abrasion resistant tubing
- Ergonomically designed connectors facilitating ease of coupling while ensuring positive retention during handling and upon initiation
- Immune to hazards of radio frequency radiation, stray currents and electro-static discharge
- One of the preferred ways to initiate shock tube is with a piezo-electric shot exploder
- Using colour coded connectors for specific delays
- Available in a wide range of delay times

As a sector of the IntelliBlast™ total value proposition, AEL is fully equipped to offer technical support and services globally providing customers a turnkey solution and complete peace of mind.





BENEFITS

- Immune to hazards of radio frequency radiation, stray currents and electro-static discharge
- The shock tube has an 18 kg minimum breaking load
- Rugged, abrasion-resistant tubing
- Ergonomically designed connectors facilitate ease of connecting while ensuring positive retention during handling and upon initiation
- Where applicable, coloured connectors are used for specific delays ensuring easy identification and verifying coupling sequences at a glance

SPECIAL PRECAUTIONS

- Handle with care-detonators are explosive
- Temperatures > 90 °C may result in spontaneous explosion
- Severe impact on the detonator or tubing can result in accidental initiation and explosion

STORAGE AND EXPIRY

STORAGE CONDITIONS	MODERATE TEMPERATURES AND DRY CONDITIONS IN A WELL-VENTILATED, APPROVED MAGAZINE
Product Shelf Life	36 months [†]
Legal Storage*	27 months
Expiry Date*	6 months

[†] Subject to ideal storage conditions, inclusive of extension period

* Ideal storage conditions-may vary upon region or country of operation

From issue date following delivery/collection from the AEL magazines (within the 36 month storage window)

Transport (UN Classification)

Class 1.1B UN No 0360, DETONATOR ASSEMBLIES, Non-electric
Class 1.4S UN No 0455, DETONATOR ASSEMBLIES, Non-electric

Shock Tube

UNI-DELAY LP

A Uni-Delay LP (long period) is a non-electric initiation system which is designed for use in underground mines. The unit consists of an out-hole and an in-hole delay detonator. Assembled with clear or brilliant yellow shock tube, the latter for the Vivid product series where improved visibility characteristics are required.

The Vivid series is assembled with neon orange connectors to maximise product visibility in potentially dark, dusty and muddy underground conditions. The Vivid series is also suitable for surface mining and civil operations where a long burning front is required i.e. trenching.

APPEARANCE

A length of clear or brilliant yellow shock tubing, which incorporates a 4000 ms delay in-hole detonator that is crimped onto one end and a 200 ms short delay out-hole detonator crimped onto the other end. Both detonators include either a rubber plug or sleeve. The out-hole detonator is located in a plastic connector body. The plastic body consists of two variants, one which holds up to 3 shock tubes and the other can hold up to six tubes simultaneously. The Vivid series offering is the same with the exception of the highly visible yellow shock tube and the neon orange connectors to improve the visibility in dark, muddy and dusty working environments.

APPLICATION

A SHOCK TUBE-UNI-DELAY LP assembly is used:

- Underground for use in narrow reef stopes, gullies, development ends, bord and pillar applications.
- Surface/Civil for use in trenching

FEATURES

- High strength 8D in-hole detonator
- 20 Hole burning front
- Clear or Neon Orange connector block, capable of containing 6 shock tubes or the orange/neon connector clip capable of holding 3 shock tubes
- Clear or brilliant yellow coloured shock tube, 18 kg breaking load, resistant to hot and cold temperatures, oil resistant for 4 days in Anflex® at 40 °C, water resistant

Shock Tube Uni-Delay LP 200/4000 ms (Conventional)



Shock Tube Uni-Delay LP 200/4000 ms (Vivid)



- Reliably initiates shock tube in both directions
- The in-hole detonator reliably initiates pneumatically loaded Anflex®, cartridge and pumpable emulsions, Watergels and Pentolite boosters
- The initiation signal in the tubing propagates through loose kinks, bends, knots and constrictions
- The tubing is left intact after use

BENEFITS

- Accurate pyrotechnic delay timing
- Rugged, abrasive resistant tubing which reduces the likelihood of tangling
- Easy to use, quick and secure connections
- Reliable
- Low noise
- Low shrapnel
- All in-hole detonators have the same delay
- Easy to check connection sequence
- Ergonomically designed connector block allows easy connection of tubing
- Vivid product variant remains highly visible in dark, dusty and muddy environments

SAFETY BENEFITS

Shock tube cannot be initiated by:

- Radio transmissions
- Radiations
- Stray currents
- Static discharge (when tubing is intact)
- Burning/heat
- Impact with a hammer or similar implement on the shock tube
- Friction
- Vivid variant ensures improved visibility in the harsh underground environments

INITIATION

SHOCK TUBE-UNI-DELAY LP assemblies can be initiated by any of the following products:

- Electric detonators
- Electronic detonators
- SHOCK TUBE-UNI-DELAY LP assemblies
- SHOCK TUBE-TRUNKLINE delay assemblies

SPECIAL PRECAUTIONS

- Handle with care; damage to clip, block or tubing could lead to misfires
- Never carry SHOCK TUBE-UNI-DELAY LP assemblies by holding onto the detonator
- Always keep detonators pointing away from you
- Severe impact on the detonator can result in an explosion
- Never pull, stretch or kink the shock tube
- Never connect the blast until all the charging operations have been completed
- Ensure that the detonator is in intimate contact with the explosive column for reliable initiation
- When coupling out-hole connectors to subsequent assemblies, ensure the receptor shock tube is correctly inserted into the donor assembly connector

- Avoid coupling the donor out-hole assembly onto the following unit within 150 mm of the receptors out-hole assembly, ideally at 500 mm distance
- Avoid placing two or more out-hole connectors directly alongside one another, ideally a hands breadth apart

STORAGE

- The shelf life of the product is 36 months from the date of manufacture
- Store in moderate temperatures and dry conditions in a well-ventilated magazine
- Abide by the legal storage requirements for the region
- Temperatures above 90 °C may result in spontaneous explosion
- Always rotate stock (first in, first out)

PRODUCT SERIES

	OUT-HOLE	IN-HOLE
Nominal Delay Periods (ms)	200	4000
Colour Code	Clear (6) or Neon Orange (6)	N/A
	Orange (3)	N/A

PACKAGING (22 kg GROSS)

LENGTH (m)	UNITS PER CASE	NEQ (kg)
2.0, 2.5 & 3.0	300	0.45
3.5 & 4.0	250	0.38
4.5 & 5.0	200	0.30
6.0	180	0.23
7.0	150	0.23

Transport (UN Classification)

Standard Packaging: Class 1.1B, UN no. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
 Special Packaging: Class 1.4S, UN no. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting

Shock Tube SPLITTER

A Splitter is a non-electric initiation system which is designed for splitting the blast timing in multiple directions in underground mines. The unit consists of two out-hole delay detonators in the desired colour coded connector body.

APPEARANCE

A length of shock tubing, which incorporates out-hole delay detonators crimped onto each end. Both detonators include either a rubber plug or sleeve. Both detonators are located in plastic connector bodies. The plastic connectors are colour-coded according to the delay of the out-hole detonators.

APPLICATION

- SHOCK TUBE-SPLITTER assemblies have been developed to work in conjunction with SHOCK TUBE-UNI-DELAY LP assemblies to initiate tunnel rounds, in underground mining only

FEATURES

- Green coloured shock tube, 18 kg minimum breaking load, resistant to hot and cold temperatures, oil resistant for 4 days in Anfex® at 40 °C, water resistant
- The initiation signal in the tubing propagates through loose kinks, bends, knots and constrictions
- Connector block, capable of containing 6 tubes
- Reliably initiates shock tube in both directions
- The tubing is left intact after use
- Uni-delay timing system: 100ms or 200ms
- Connector blocks are colour coded to indicate delay period

BENEFITS

- Accurate pyrotechnic delay timing
- Rugged, abrasion resistant tubing which reduces the likelihood of tangling



- Ergonomically designed connector block allows easy, quick and secure connection of tubing
- Highly visible components
- Reliable
- Low noise
- Low shrapnel
- The unit will initiate up to twelve (2x6) Uni-Delay and/or TRUNKLINE assemblies

SAFETY BENEFITS

Shock tube cannot be initiated by:

- Radio transmissions
- Radiations
- Stray currents
- Static discharge (when tubing is intact)
- Burning/heat
- Impact with a hammer or similar implement on the shock tube
- Friction

INITIATION

SHOCK TUBE SPLITTER assemblies can be initiated by any of the following products:

- Electric detonators
- Electronic detonators
- SHOCK TUBE-UNI-DELAY LP assemblies
- SHOCK TUBE-TRUNKLINE assemblies

SPECIAL PRECAUTIONS

- Handle with care; damage to clip, block or tubing could lead to misfires
- Never carry SHOCK TUBE SPLITTER assemblies by holding onto the detonator/connector block
- Always keep detonators pointing away from you
- Severe impact on the detonator can result in an explosion
- Never pull, stretch or kink the shock tube
- Never connect the blast until all the charging operations have been completed
- When coupling out-hole connectors to subsequent assemblies, ensure the receptor shock tube is correctly inserted into the donor assembly connector
- Avoid coupling the donor out-hole assembly onto the following unit within 150mm of the receptors out-hole assembly, ideally at 500mm distance
- Avoid placing two or more out-hole connectors directly alongside one another, ideally a hands breadth apart

STORAGE

- The shelf life of the product is 36 months from the date of manufacture
- Store in moderate temperatures and dry conditions in a well-ventilated magazine
- Abide by the legal storage requirements for the region
- Temperatures above 90 °C may result in spontaneous explosion
- Always rotate stock (first in, first out)

PRODUCT SERIES

SHOCK TUBE SPLITTER PRODUCT

Nominal Delay Periods (ms)	100/100	200/200	100/200
Colour Code	Brown	White	Brown/White

PACKAGING (22 kg GROSS)

LENGTH (m)	UNITS PER CASE	NEQ (kg)
1.0	200	0.1
1.5	200	0.1
2.0	200	0.1

- * Combo packs containing 100 assemblies of 100 ms and 100 assemblies of 200 ms are available on request

Transport (UN Classification)

Standard Packaging: Class 1.1B, UN no. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
 Special Packaging: Class 1.4S, UN no. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting

Shock Tube

MULTI SPD

A Multi SPD (short period delay) is a nonelectric initiation system which is designed for use in underground and surface mines. The unit contains an in-hole delay detonator.

APPEARANCE

A length of yellow shock tubing, which includes a short period delay in-hole detonator. The detonator includes either a rubber plug or sleeve that is crimped on one end. The detonator delay period is printed along the length of the detonator shell. The free end of the shock tube is sealed and incorporates a colour-coded connector clip, which indicates the delay period.

APPLICATION

A SHOCK TUBE-MULTI SPD assembly is used:

- Underground for use in tunnelling, stoping, ring blasting applications
- Surface/Civil for use in trenching, quarries, opencast/open pit mines and civil engineering projects

FEATURES

- Three primary short period delays
- Additional delays and lengths are available on request
- Colour coded connector clip indicating delay time
- Connector clip is used for coupling to detonating cord
- High strength detonator with the delay time printed on shell
- Yellow coloured shock tube, 18 kg minimum breaking load, resistant to hot and cold temperatures, oil resistant for 4 days in Anfex® at 40 °C, water resistant
- Reliably initiates Pentolite boosters, Cartridge explosives and Cap-sensitive high explosives
- The initiation signal in the tubing propagates through loose kinks, bends, knots and constrictions
- The tubing is left intact after use



BENEFITS

- Accurate pyrotechnic delay timing
- Rugged, abrasive resistant tubing which reduces the likelihood of tangling
- Easy to tie-up
- Easy to check connection sequence
- Easy to check blast for correct timing sequence due to highly visible connector clip colour coding
- Eight strength detonator
- Reliable initiation

SAFETY BENEFITS

Shock tube cannot be initiated by:

- Radio transmissions
- Radiations
- Stray currents
- Static discharge (when tubing is intact)
- Burning/heat
- Impact with a hammer or similar implement on the shock tube
- Friction

INITIATION

SHOCK TUBE-MULTI SPD assemblies can be initiated by any of the following products:

- Electric detonators
- Electronic detonators
- Detonating cords (minimum 5 g PETN/m)
- SHOCK TUBE-CLUSTER assemblies
- SHOCK TUBE-TRUNKLINE assemblies

SPECIAL PRECAUTIONS

- Handle with care; damage to clip, block or tubing could lead to misfires
- Never carry SHOCK TUBE-MULTI SPD assemblies by holding onto the detonator
- Always keep detonators pointing away from you
- Severe impact on the detonator can result in an explosion
- Never pull, stretch or kink the shock tube
- Never connect the blast until all the charging operations have been completed
- Ensure that the detonator is in intimate contact with the explosive column for reliable initiation

STORAGE

- The shelf life of the product is 36 months from the date of manufacture
- Store in moderate temperatures and dry conditions in a well-ventilated magazine
- Abide by the legal storage requirements for the region
- Temperatures above 90 °C may result in spontaneous explosion
- Always rotate stock (first in, first out)

PRODUCT SERIES

SHOCK TUBE MULTI SPD PRODUCT

Nominal Delay Periods (m/s)	350	450	500
Colour Code	Fern Green	Silver	Light Pink

PACKAGING (22 kg GROSS)

LENGTH (m)	UNITS PER CASE	NEQ (kg)
3	250	0.25
4.5 & 5	200	0.20
6 & 7	180	0.18
8	150	0.15
9	130	0.13
10 & 12	100	0.10
15 & 18	90	0.09
20 & 25	60	0.06
30	50	0.05
30, 40 & 45	25	0.025

Transport (UN Classification)

Standard Packaging: Class 1.1B, UN no. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
 Special Packaging: Class 1.4S, UN no. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting

Shock Tube

MULTI LPD

A Multi LPD (long period delay) is a nonelectric initiation system which is designed for use in underground and surface mines. The unit contains an in-hole long period delay detonator.

APPEARANCE

A length of green shock tubing, which includes a long period delay in-hole detonator. The detonator includes either a rubber plug or a rubber sleeve that is crimped on one end. The detonator delay period is printed along the length of the detonator shell. The free end of the shock tube is sealed and incorporates a colour coded connector clip, which indicates the delay period.

APPLICATION

A SHOCK TUBE-MULTI SPD assembly is used:

- Underground for use in development ends and tunnelling

FEATURES

- High strength detonator with the delay time printed on the shell
- 22 Different delay periods
- Colour coded connector clip indicating delay time
- Connector clip is used for coupling to detonating cord
- Green coloured shock tube, 18 kg minimum breaking load, resistant to hot and cold temperatures, oil resistant for 4 days in Anflex® at 40 °C, water resistant
- Reliably initiates Pentolite boosters, Cartridge explosives and Cap-sensitive high explosives
- The initiation signal in the tubing propagates through loose kinks, bends, knots and constrictions
- The tubing is left intact after use

BENEFITS

- Accurate pyrotechnic delay timing
- Rugged, abrasive resistant tubing which reduces the likelihood of tangling



- Easy to tie-up
- Easy to check connection sequence
- Easy to check blast for correct timing sequence due to highly visible connector clip colour coding
- Eight strength detonator
- Reliable initiation

SAFETY BENEFITS

Shock tube cannot be initiated by:

- Radio transmissions
- Radiations
- Stray currents
- Static discharge (when tubing is intact)
- Burning/heat
- Impact with a hammer or similar implement on the shock tube
- Friction

INITIATION

SHOCK TUBE MULTI LPD assemblies can be initiated by any of the following products:

- Electric detonators
- Electronic detonators
- Detonating cords (minimum 5 g PETN/m)
- SHOCK TUBE-TRUNKLINE delay assemblies

SPECIAL PRECAUTIONS

- Handle with care; damage to clip or tubing could lead to misfires
- Never carry SHOCK TUBE-MULTI LPD assemblies by holding onto the detonator
- Always keep detonators pointing away from you
- Severe impact on the detonator can result in an explosion
- Never pull, stretch or kink the shock tube
- Never connect the blast until all the charging operations have been completed
- Ensure that the detonator is in intimate contact with the explosive column for reliable initiation

STORAGE

- The shelf life of the product is 36 months from the date of manufacture
- Store in moderate temperatures and dry conditions in a well-ventilated magazine
- Abide by the legal storage requirements for the region
- Temperatures above 90 °C may result in spontaneous explosion
- Always rotate stock (first in, first out)

PACKAGING (22 kg GROSS)

LENGTH (m)	UNITS PER CASE	NEQ (kg)
2, 2.5 & 3	250	0.25
3.5, 4, 4.5, 5 & 5.5	200	0.20
6	175	0.18
8	150	0.15
12	100	0.10
20 & 25	60	0.06
45	25	0.025

UN CLASSIFICATION

SHOCK TUBE MULTI LPD PRODUCT

DELAY PERIOD	0	1	2	3	4	5	6	7
Nominal Delay (ms)	0	100	200	300	400	500	600	700
Colour Code	Turquoise	Brown	Clear	Curry	Pearl Violet	Light Pink	Dark Blue	Powder Blue
Delay Period	8	9	10	11	12	13	14	15
Nominal Delay (ms)	800	1000	1250	1500	1750	2000	2500	3000
Colour Code	Lime Green	Light Brown	Light Grey	Burnt Orange	Sapphire	Agate	Rose Quartz	Emerald
Delay Period	16	17	18	19	20	21	22	
Nominal Delay (ms)	3500	4000	5000	6000	7000	8000	9000	
Colour Code	Coral	Aqua Marine	Amethyst	Stone	Tanzanite	Ruby	Jade	

Transport (UN Classification)

Standard Packaging: Class 1.1B, UN no. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
 Special Packaging: Class 1.4S, UN no. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting

Shock Tube

UNI-DELAY SP

A Uni-Delay SP (short period) variant is a non-electric initiation system which is designed for use in underground and surface mines. The unit consists of an in-hole and an out-hole delay, each with a selection of delay time combinations.

APPEARANCE

A length of shock tubing, which incorporates a long period delay in-hole detonator crimped onto one end and a short period delay out-hole detonator crimped onto the other end. Both detonators incorporate either a rubber plug or sleeve. The out-hole detonator is located in a plastic connector body, which is colour-coded according to the delay of the out-hole detonator. The in-hole detonator delay period is printed along the length of the detonator shell.

APPLICATION

A SHOCK TUBE-MULTI SPD assembly is used:

- In stoping, trenching, quarries, opencast/open pit mines, civil engineering projects and trenching

FEATURES

- Various out-hole and in-hole delays
- Additional delays and length combinations are available on request
- Colour-coded connector block indicates out-hole delay time
- Connector block, capable of containing 6 tubes
- High strength in-hole detonator with the delay time printed on the shell
- The in-hole detonator reliably initiates Anfex®, cartridge and pumpable emulsions, Watergels and Pentolite boosters
- Reliably initiates shock tube in both directions
- Yellow coloured shock tube, 18 kg minimum breaking load, resistant to hot and cold temperatures, oil resistant for 4 days in Anfex® 40 °C, water resistant



- The initiation signal in the tubing propagates through loose kinks, bends, knots and constrictions
- The tubing is left intact after use

BENEFITS

- Accurate pyrotechnic delay timing
- Rugged, abrasive resistant tubing which reduces the likelihood of tangling
- Easy to use, secure connections
- Highly visible components
- Economical, reduced inventory
- Eliminates detonating cord and relays
- Reliable
- Reduced noise levels compared to detonating cord

SAFETY BENEFITS

Shock tube cannot be initiated by:

- Radio transmissions
- Radiations
- Stray currents
- Static discharge (when tubing is intact)
- Burning/heat
- Impact with a hammer or similar implement on the shock tube
- Friction

INITIATION

SHOCK TUBE UNI-DELAY SP assemblies can be initiated by any of the following products:

- Electric detonators
- Electronic detonators
- SHOCK TUBE-UNI-DELAY SP assemblies
- SHOCK TUBE-TRUNKLINE assemblies
- SHOCK TUBE-CLUSTER assemblies

SPECIAL PRECAUTIONS

- Handle with care; damage to clip or tubing could lead to misfires
- Never carry SHOCK TUBE-UNI-DELAY SP assemblies by holding onto the detonator
- Always keep detonators pointing away from you
- Severe impact on the detonator can result in an explosion
- Never pull, stretch or kink the shock tube
- Never connect the blast until all the charging operations have been completed
- Ensure that the detonator is in intimate contact with the explosive column for reliable initiation
- When coupling out-hole connectors to subsequent assemblies, ensure the receptor shock tube is correctly inserted into the donor assembly connector

- Avoid coupling the donor out-hole assembly onto the following unit within 150 mm of the receptors out-hole assembly, ideally at 500 mm distance
- Avoid placing two or more out-hole connectors directly alongside one another, ideally at a hands breadth apart

STORAGE

- The shelf life of the product is 36 months from the date of manufacture
- Store in moderate temperatures and dry conditions in a well-ventilated magazine
- Abide by the legal storage requirements for the region
- Temperatures above 90 °C may result in spontaneous explosion
- Always rotate stock (first in, first out)

PACKAGING (22 kg GROSS)

LENGTH (m)	UNITS PER CASE	NEQ (kg)
3, 4, 5 & 7	175	0.27
9 & 10	100	0.15
12, 15 & 18	75	0.14
20, 21, 25 & 30	50	0.08
35 & 40	25	0.04

UN CLASSIFICATION

SHOCK TUBE UNI-DELAY SP PRODUCT

	OUT-HOLE				IN-HOLE
Nominal Delay Periods (ms)	17	25	42	75	350 or 450 or 500
Colour Code	Blue	Orange	Yellow	Red	N/A

Transport (UN Classification)

Standard Packaging: Class 1.1B, UN no. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
 Special Packaging: Class 1.4S, UN no. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting

Shock Tube

TRUNKLINE

A TRUNKLINE is a non-electric initiation system which is designed for use in underground and surface mines. The unit consists of an out-hole detonator. For surface mining applications, the new Rhino connector is used to ensure positive shock tube retention during handling and initiation providing improved reliability of initiation and ease of use.

APPEARANCE

A length of shock tubing, which includes a short period out-hole delay detonator crimped on one end. The out-hole detonator is located in a plastic connector block, which is colour-coded according to the delay of the detonator. The free end of the shock tube is sealed and incorporates a colour-coded connector clip which matches the nominal delay time and colour as indicated by the connector block.

APPLICATION

A SHOCK TUBE-MULTI SPD assembly is used:

- In all mining applications to provide additional delay options within or between blasting patterns

FEATURES

- Five primary short period delays
- Additional delays and shock tube lengths available on request
- Matching colour-coded connector clip and block indicating delay time
- Connector block capable of holding 6 tubes
- Green coloured shock tube, 18kg minimum breaking load, resistant to hot and cold temperatures, oil resistant for 4 days in Anfex® at 40 °C, water resistant
- Reliably initiates shock tube in both directions
- The initiation signal in the tubing propagates through loose kinks, bends, knots and constrictions
- The tubing is left intact after use



BENEFITS

- Accurate pyrotechnic delay timing
- Rugged, abrasive resistant tubing which reduces the likelihood of tangling
- Easy to use, secure connections
- Highly visible components
- Economical, reduced inventory
- Eliminates detonating cord and relays
- Reliable
- Reduced noise levels compared to detonating cord

SAFETY BENEFITS

Shock tube cannot be initiated by:

- Radio transmissions
- Radiations
- Stray currents
- Static discharge (when tubing is intact)
- Burning/heat
- Impact with a hammer or similar implement on the shock tube
- Friction

INITIATION

SHOCK TUBE TRUNKLINE assemblies can be initiated by any of the following products:

- Electric detonators
- Electronic detonators
- Detonating cords (minimum 5 g PETN/m)
- SHOCK TUBE-UNI-DELAY SP assemblies
- SHOCK TUBE-TRUNKLINE assemblies
- SHOCK TUBE-CLUSTER assemblies

SPECIAL PRECAUTIONS

- Handle with care; damage to clip or tubing could lead to misfires
- Never carry SHOCK TUBE-TRUNKLINE assemblies by holding onto the detonator
- Always keep detonators pointing away from you
- Severe impact on the detonator can result in an explosion
- Never pull, stretch or kink the shock tube
- Never connect the blast until all the charging operations have been completed
- Ensure that the detonator is in intimate contact with the explosive column for reliable initiation
- When coupling out-hole connectors to subsequent assemblies, ensure the receptor shock tube is correctly inserted into the donor assembly connector
- Avoid coupling the donor out-hole assembly onto the following unit within 150 mm of the receptors out-hole assembly, ideally at 500 mm distance
- Avoid placing two or more out-hole connectors directly alongside one another, ideally at a hands breadth apart

STORAGE

- The shelf life of the product is 36 months from the date of manufacture
- Store in moderate temperatures and dry conditions in a well-ventilated magazine
- Abide by the legal storage requirements for the region
- Temperatures above 90 °C may result in spontaneous explosion
- Always rotate stock (first in, first out)

PACKAGING (22 kg GROSS)

LENGTH (m)	UNITS PER CASE	NEQ (kg)
2	250	0.15
3	220	0.13
4, 4.5 & 5	200	0.12
6	175	0.11
7 & 8	150	0.09
9	140	0.08
10	120	0.07
12	100	0.06
15	75	0.05
20	60	0.04

UN CLASSIFICATION

SHOCK TUBE TRUNKLINE PRODUCT

Nominal Delay Periods (ms)	0	17	25	42	75	100
Colour Code	Turquoise	Blue	Orange	Yellow	Red	Brown

Transport (UN Classification)

Standard Packaging: Class 1.1B, UN no. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
 Special Packaging: Class 1.4S, UN no. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting

Shock Tube CLUSTER

A Cluster is a non-electric initiation system which is designed for use in a multitude of applications. The unit consists of a trunk line delay detonator housed in a Cluster connector block. Used for initiating shock tube assemblies or detonating cord. Ideal for civil applications, line blasting where simultaneous initiation is advantageous; replaces the detonating relay.

APPEARANCE

A length of green shock tubing that incorporates a short period delay detonator. One end of the tubing is crimped into a short period delay detonator. The free end of the shock tube is sealed and incorporates a colour coded connector clip which indicates the delay period. The delay period is also printed along the length of the detonator shell. The detonator is fitted into a colour-coded cluster connector block which indicates the detonator delay period.

APPLICATION

A SHOCK TUBE-CLUSTER assembly is used:

- Surface delays in trenching, open pit, quarries, surface mines, civil engineering projects and demolition

FEATURES

- A cluster connector block which accepts shock tube or detonating cord, with a positive locking cover
- Additional delays and lengths are available on request
- Three primary delays, other custom delays and length combinations available on request
- Colour coded connector clip and cluster connector block indicate delay time
- Green coloured shock tube, 18 kg minimum breaking load, resistant to hot and cold temperatures, oil resistant for 4 days in Anfex® at 40 °C, water resistant
- Reliably initiates shock tube or detonating cord in both directions
- The initiation signal in the tubing propagates through loose kinks, bends, knots and constrictions



- The tubing is left intact after use
- Can initiate up to 2 strands of detonating cord (5,5 mm Ø) at the same time
- Can initiate up to 6 strands of shock tube (3 mm Ø) at the same time

BENEFITS

- Accurate pyrotechnic delay timing
- Rugged, abrasive resistant tubing which reduces the likelihood of tangling
- Easy to use, secure connections
- Flexible blast design
- Highly visible components
- Reliable
- Positive initiation control

- Initiates detonating cord or shock tube

SAFETY BENEFITS

Shock tube cannot be initiated by:

- Radio transmissions
- Radiations
- Stray currents
- Static discharge (when tubing is intact)
- Burning/heat

- Impact with a hammer or similar implement on the shock tube
- Friction

INITIATION

SHOCK TUBE-CLUSTER assemblies can be initiated by any of the following products:

- Electric detonators
- Electronic detonators
- Detonating cords (minimum 5 g PETN/m)
- SHOCK TUBE-UNI-DELAY SP and LP assemblies

SPECIAL PRECAUTIONS

- Handle with care; damage to clip or tubing could lead to misfires
- Never carry SHOCK TUBE-CLUSTER assemblies by holding onto the detonator
- Always keep detonators pointing away from you
- Severe impact on the detonator can result in an explosion
- Never pull, stretch or kink the shock tube
- Never connect the blast until all the charging operations have been completed

- **Never connect shock tube and detonating cord in the connector block to be initiated simultaneously**

STORAGE

- The shelf life of the product is 36 months from the date of manufacture
- Store in moderate temperatures and dry conditions in a well-ventilated magazine
- Abide by the legal storage requirements for the region
- Temperatures above 90 °C may result in spontaneous explosion
- Always rotate stock (first in, first out)

PACKAGING (22 kg GROSS)

LENGTH (M)	UNITS PER CASE	NEQ (kg)
3	200	0.14
4 & 5	175	0.13
6	150	0.11
10, 12 & 15	75	0.06

UN CLASSIFICATION

SHOCK TUBE CLUSTER PRODUCT

Nominal Delay Periods (ms)	0	17	25	42	75	100
Colour Code	Turquoise	Blue	Orange	Yellow	Red	Brown

Transport (UN Classification)

Standard Packaging: Class 1.1B, UN no. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
 Special Packaging: Class 1.4S, UN no. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting

Shock Tube

LEAD-IN

Shock tube lead-in line is a reel of shock tube with a detonator encased in a Cluster connector block, used to extend the blast to a safe initiation point.

APPEARANCE

A reel of shock tubing that incorporates a short period delay detonator. One end of the tubing is crimped into a short period delay detonator. The detonator includes either a rubber plug or sleeve that is crimped on one end. The free end of the shock tube is sealed and incorporates a colour-coded connector clip which indicates the delay period. The delay period is also printed along the length of the detonator. The detonator is fitted into a colour-coded cluster connector block which indicates the delay period.

APPLICATION

A SHOCK TUBE-LEAD-IN assembly is used:

- Surface delays in opencast/open pit mines, quarries, surface mines, civil engineering projects

FEATURES

- A cluster connector block which accepts shock tube or detonating cord, with a positive locking cover
- Spooled for easy off-reeling
- Green coloured shock tube, 18 kg minimum breaking load, resistant to hot and cold temperatures, oil resistant for 4 days in Anflex® at 40 °C, water resistant
- Reliably initiates shock tube or detonating cord in both directions
- The initiation signal in the tubing propagates through loose kinks, bends, knots and constrictions
- The tubing is left intact after use
- Can initiate up to 2 strands of detonating cord (5,5 mm Ø) at the same time
- Can initiate up to 6 strands of shock tube (3 mm Ø) at the same time



BENEFITS

- Rugged, abrasive resistant tubing which reduces the likelihood of tangling
- Easy to use, secure connections
- Highly visible components
- Reliable
- Low noise
- Cost effective
- Positive initiation control
- Initiates detonating cord or shock tube
- Low shrapnel

SAFETY BENEFITS

Shock tube cannot be initiated by:

- Radio transmissions
- Radiations
- Stray currents
- Static discharge (when tubing is intact)
- Burning/heat
- Impact with a hammer or similar implement on the shock tube
- Friction

INITIATION

SHOCK TUBE TRUNKLINE assemblies can be initiated by any of the following products:

- Electric detonators
- Electronic detonators
- Detonating cords (minimum 5 g PETN/m)
- SHOCK TUBE-TRUNKLINE assemblies

SPECIAL PRECAUTIONS

- Handle with care; damage to clip or tubing could lead to misfires
- Never carry SHOCK TUBE-LEAD-IN assemblies by holding onto the detonator
- Always keep detonators pointing away from you
- Severe impact on the detonator can result in an explosion
- Never pull, stretch or kink the shock tube
- Never connect the blast until all the charging operations have been completed
- **Never connect shock tube and detonating cord in the connector block to be initiated simultaneously**

STORAGE

- The shelf life of the product is 36 months from the date of manufacture
- Store in moderate temperatures and dry conditions in a well-ventilated magazine
- Abide by the legal storage requirements for the region
- Temperatures above 90 °C may result in spontaneous explosion
- Always rotate stock (first in, first out)

PACKAGING (15 kg GROSS)

LENGTH (m)	UNITS PER CASE	NEQ (kg)
200	10	0.01
500	2	0.01

UN CLASSIFICATION

SHOCK TUBE LEAD-IN PRODUCT

Nominal Delay Periods (ms)	25
Colour Code	Orange

Transport (UN Classification)

Standard Packaging: Class 1.1B, UN no. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting
 Special Packaging: Class 1.4S, UN no. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC for blasting

Shock Tube EXTENDER

The shock tube extender is a reel of shock tube with a separate 10 cm length of clear plastic joiner tubing, which can be used to join shock tube ends in order to extend the initiation point to a safe distance from the blast.

APPEARANCE

A reel of green shock tubing including separate 10 cm lengths of clear plastic joiner tubing. The shock tube is used to extend the initiation point to a position of safety. Black end caps are used to seal both ends of the tubing to prevent powder loss. This product is used with a Lead-In line or a TRUNKLINE.

APPLICATION

A SHOCK TUBE EXTENDER is used:

- In non-electric blast pattern initiation in open-pit mines, quarries, tunnelling, stoping, ring-blasting, trenching, and civil engineering projects

FEATURES

- Spooled for easy off-reeling
- Green coloured shock tube, 18 kg minimum breaking load, resistant to hot and cold temperatures, oil resistant for 4 days, at 40 °C, water resistant
- The tubing is left intact after use
- Joiner tube enables easy extension to required length



BENEFITS

- Rugged, abrasive resistant tubing which reduces the likelihood of tangling
- Easy to tie-up
- Reliable
- Low noise
- Cost effective
- Positive initiation control
- No shrapnel
- Joiner increases distance from point of initiation
- Joiner tube instruction leaflet

SAFETY BENEFITS

Shock tube cannot be initiated by:

- Radio transmissions
- Radiations
- Stray currents
- Static discharge (when tubing is intact)
- Burning/heat
- Impact with a hammer or similar implement on the shock tube
- Friction

INITIATION

SHOCK TUBE EXTENDER can be initiated by any of the following products:

- Electric detonators
- Electronic detonators
- Detonating cords (minimum 5 g PETN/m)
- SHOCK TUBE-TRUNKLINE assemblies

SPECIAL PRECAUTIONS

- Handle with care; damage to connector or tubing could lead to misfires
- Never pull, stretch or kink the shock tube
- Never connect the blast until all the charging operations have been completed
- Before coupling, always cut 2.5 m shock tube from ends to ensure shock tube is free from contaminants i.e. moisture ingress

STORAGE

- The shelf life of the product is 36 months from the date of manufacture
- Store in moderate temperatures and dry conditions in a well-ventilated magazine
- Abide by the legal storage requirements for the region
- Temperatures above 90 °C may result in spontaneous explosion
- Always rotate stock (first in, first out)

PACKAGING (15 kg GROSS)

LENGTH (m)	UNITS PER CASE	NEQ (kg)
200	10	0.01
500	2	0.01
3000	1	0.06

Transport (UN Classification)

Standard Packaging: Class 1.4S, UN no. 0349, ARTICLE, EXPLOSIVE, n.o.s. (Shock Tube)

Blast Initiation Timer

BIT

The BIT is lightweight, durable and portable timer designed to initiate Electric Shock Tube Starters connected in series, where the total circuit resistance does not exceed 55 Ω .

APPEARANCE

- A red unit for specific minute timing activation
- A yellow unit for fixed time-of-day activation

APPLICATION

Tunnelling; Stopping; Massive (uphole); Ring Blasting; Trenching; Open Pit; Quarrying; Civils

FEATURES

- Operation is by means of a key switch and fires at a specific time as indicated
- A continuity tester is included which indicates that a blast circuit is connected. Should no blast circuit be connected, a timing light will flash six times and the unit will switch off
- An indicator light flashes at 2 s intervals during the timing cycle and then at 0.4 s during the last hour before initiation time. The light turns on at the end of the delay timing cycle and 5-10 s later the unit fires

BENEFITS

- Approved for use in fiery mines

SAFETY BENEFITS

- The unit is powered by a rechargeable battery, which must be recharged when the timing light double flashes at the start of the timing cycle



BIT PRODUCT SERIES

PRODUCT	COLOUR	RANGE (minutes)
BIT Delay Time	Red	15/30/45/60/120
BIT Fixed-time	Yellow	Will be activated in the window period as specified on the unit

PACKAGING

PRODUCT	UNITS PER CASE	MASS (kg)
BIT Delay Time	25	0.55
BIT Fixed-time	25	0.55

Transport (UN Classification)

Not applicable