



# PRODUCT CATALOGUE

**YOUR GLOBAL  
BLASTING PARTNER**



# ABOUT BME

**B**ME is a member of the Omnia Group, a JSE-listed diversified provider of specialised chemical products and services used in the mining, agriculture, and chemicals sectors. With over 30 years of experience, BME supplies explosives and related technical services to more than 20 African countries, with additional operations in Indonesia, Australia, North America, and South America. Our supply chain capacity consists of an extensive logistical network that provides our customers with security and consistency of supply.

**BME offers a full range of:**

- Bulk surface and underground emulsions
- Bulk surface and underground delivery equipment
- Packaged explosives
- Initiating systems
- Electronic blasting systems
- Blasting-related service equipment, such as mobile emulsion plants
- Technical services

BME prides itself in providing world-class technical services to ensure that every blast brings value to its customers.





## **Africa**

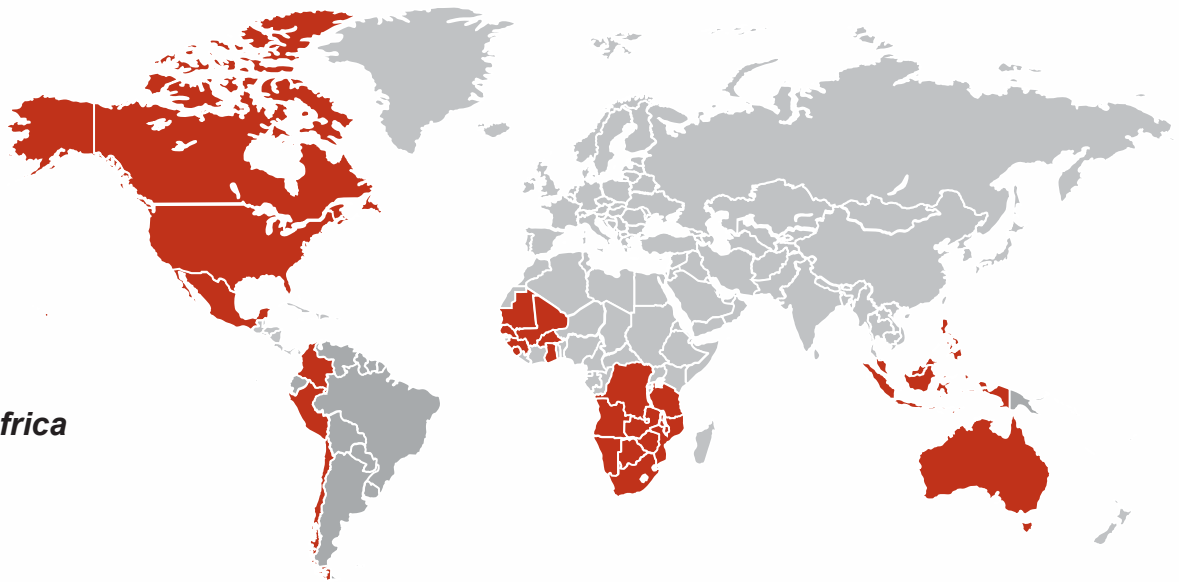
- South Africa
- Lesotho
- Swaziland
- Botswana
- Zimbabwe
- Namibia
- Zambia
- Mozambique
- Malawi
- Tanzania
- DRC
- Rwanda
- Ghana
- Burkina Faso
- Sierra Leone
- Guinea
- Senegal
- Mauritania
- Mali

## **Outside of Africa**

- Singapore
- Indonesia
- Australia
- USA
- Canada (JV)
- Colombia
- Peru
- Chile
- Mexico



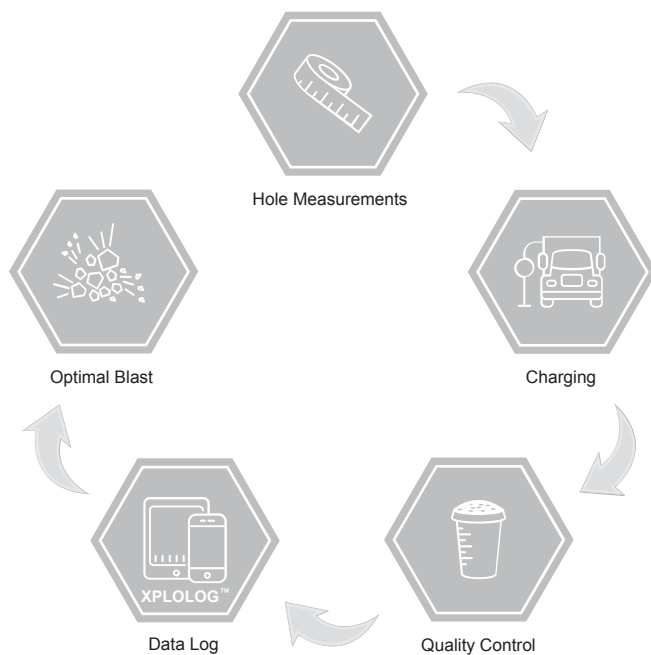
# HAS A FOOTPRINT IN



# FOR EXPLOSIVES, THINK BME.

# BLASTING SERVICES TO DELIVER IMPROVED MINING EXPERIENCE

BME offers a wide range of service packages that deliver real quantifiable value through optimal blasts—leveraging BME’s knowledge base and best-in-class technology, products, and equipment. These service packages can be customised to meet each customer’s unique requirements. Visit [www.bmeexplosives.com](http://www.bmeexplosives.com) for more information.



## DOWN THE HOLE (DTH)

**B**ME’s DTH service utilises its Mobile Manufacturing Units (MMUs) to deliver INNOVEX™, its high-quality, reliable bulk emulsion explosives, to blast holes. BME ensures that its fit-for-purpose products are pumped to achieve improved and consistent fragmentation.

To further enhance blast quality, customers can utilise any of BME’s extensive range of initiating systems, its market-leading AXXIS™ electronic detonation system, and BME’s BLASTMAP™ III software.

## PRIME, LOAD, TIE, AND SHOOT (PLTS)

**B**ME’s PLTS service is designed for customers who require BME’s team to perform a full blasting service. This service from BME ensures that skilled resources are available to the customer to achieve the best blasting results.

The PLTS service, where BME takes on the responsibility for the full operation, safety, and management of the blasting service, is ideal for companies whose core business is not blast planning and execution.





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### PRODUCTS

BULK EMULSIONS  
PACKAGED EXPLOSIVES  
INITIATING SYSTEMS  
BLASTING ACCESSORIES  
SOFTWARE & INFORMATION TECHNOLOGY  
ELECTRONIC DETONATORS  
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### EQUIPMENT (SURFACE)

MOBILE MANUFACTURING UNITS (MMUs)  
E SERIES  
MOBILE MANUFACTURING UNITS (MMUs)  
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MODULARISED EMULSION PLANTS  
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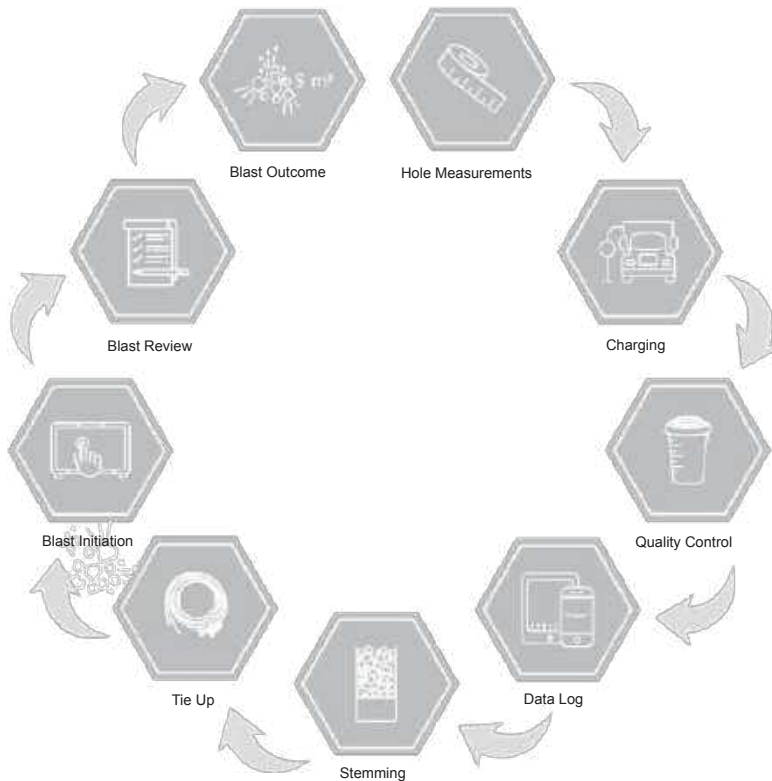
### EQUIPMENT (UNDERGROUND)

VERTICAL PIPELINE  
MEGACHARGER  
EMULSION CHARGING UNIT (ECU) LP 1500  
EMULSION CHARGING UNIT (ECU) HP 2000  
EMULSION CHARGING UNIT (ECU) HP 3000  
DEVELOPMENT CHARGING UNIT (DCU) RAIL BOUND  
MAXICHARGER T3000  
FILLING STATION  
MAXICHARGER  
MINICHARGER  
CENTRALIZED BLASTING SYSTEM (CBS)





# SERVICES



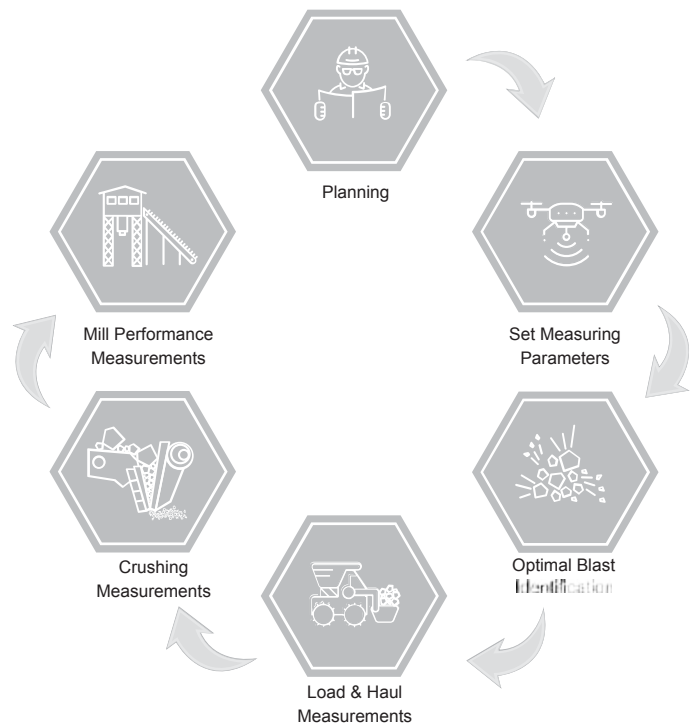
## ROCK ON GROUND (ROG) SERVICE

In this comprehensive blasting service, BME takes full responsibility, from blast design to analysing fragmented rock (excluding drilling), thereby allowing its customers to outsource this function, with value being measured on fragmentation quality and volume of broken rock. BME provides the materials, equipment, and skilled staff required to deliver cost-effective and quality blasting, so that its customers can focus on their core business.

## MINE TO MILL (M2M) OPTIMISATION

**B**ME's exclusive M2M service offering delivers the full range of benefits across the mining value chain. Blast designs can be optimised to achieve required fragmentation, blast movement, and muck-pile shape, delivering improved loading, crushing, and milling rates.

M2M reduces overall mining costs by ensuring increased downstream productivity. The customer can be assured that the professionals who design the blasts and those who apply the designs in the field are competent and fully conversant with the project requirements. Benefits include closer management of downstream costs and overall systems optimisation, offering a cradle-to-grave view of the entire mining process in consultation with mine and plant personnel.







**bme**

*A member of the Omnia Group*

# PRODUCTS



## INNOVEX™ 100

High energy bulk emulsion explosive

### PRODUCT DESCRIPTION

INNOVEX™ 100 base emulsion is a Class 5.1 oxidising agent with UN classification number 3375. When sensitised with the gassing agent, INNOVEX™ 100 becomes a booster-sensitive emulsion designed for opencast mines. INNOVEX™ 100 is a low viscosity black emulsion specially formulated using recycled oil / alternative fuel. It is sensitised to a cup density of 0.9 to 1.2 g/cm<sup>3</sup> by using a suitable sensitising agent.

Product	Water resistance	Nominal bulk density (g/cm <sup>3</sup> )	Relative weight strength	Relative bulk strength
INNOVEX™ 100	Excellent	1.46 –1.50	84	126

Calculated at a density of 1.2 g/cm<sup>3</sup> and a pressure of 100 MPa  
Relative to ANFO at a density of 0.8 g/cm<sup>3</sup>

## PRODUCT FEATURES

### APPLICATION

INNOVEX™ 100 is designed for blasting in opencast mines and quarries

### FEATURES

- Minimum initiation: 150 g (5.3 oz) booster-sensitive when sensitised for holes having a diameter of 127 mm (5 in) or less. Holes with a diameter larger than 127 mm (5 in) and a depth greater than 6 m (19.7 ft) require a 400 g (14.1 oz) booster
- VOD: 3 500 to 5 500 m/s (11 500 to 18 000 ft/s), dependent on hole and rock characteristics
- Critical diameter: 64 mm (2.5 in)
- Sensitisation: The emulsion can be sensitised to densities from 0.95 to 1.25 g/cm<sup>3</sup>
- Excellent water resistance

### RECOMMENDATIONS

- Shelf life: 3 to 6 months
- Store as per the recommended storage conditions
- Sleep life: 21 days in the hole
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations

### PACKAGING

- INNOVEX™ 100 is transported and stored as bulk product
- Class 5.1, UN No. 3375, OXIDISING MATERIAL

### PRODUCT RISK PROFILE

- Classified as hazardous substance, Class 5.1: Oxidising substances
- Non-detonable in the non-sensitised, unconfined bulk form
- Will not readily burn on its own, but if subjected to extreme external heat for a period of time, water may be driven off, resulting in an explosion risk
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

### UN CLASSIFICATION (TRANSPORT)

- Base Emulsion: Class 5.1, UN No. 3375, OXIDISING MATERIAL
- Sensitising Agent: Class 5.1, UN No. 3099, OXIDISING LIQUID, TOXIC, N.O.S.



# INNOVEX™ 100C

High energy bulk emulsion explosive



### PRODUCT DESCRIPTION

INNOVEX™ 100C base emulsion is a class 5.1 oxidising agent with UN Classification number 3375. When sensitised with the gassing agent, INNOVEX™ 100C becomes a booster sensitive emulsion designed for opencast mines. INNOVEX™ 100C is a low viscosity clear emulsion specially formulated using virgin oils. It is sensitised to a cup density of 0.9 to 1.2 g/cm³ by using a suitable sensitising agent.\*

Product	Water resistance	Nominal bulk density (g/cm³)	Relative weight strength	Relative bulk strength
INNOVEX™ 100C	Excellent	1.46 – 1.50	84	126

Calculated at a density of 1.2 g/cm³ and a pressure of 100 MPa  
Relative to ANFO at a density of 0.8 g/cm³

## PRODUCT FEATURES

### APPLICATION

INNOVEX™ 100C is designed for blasting in opencast mines and quarries

### FEATURES

- Minimum initiation: 150 g (5.3 oz) booster-sensitive when sensitised for holes having a diameter of 127 mm (5 in) or less. Holes with diameter larger than 127 mm (5 in) and depth greater than 6 m (19.7 ft) require a 400 g (14.1 oz) booster
- VOD: 3 500 to 5 500 m/s (11 500 to 18 000 ft/s), dependent on hole and rock characteristics
- Critical diameter: 64 mm (2.5 in)
- Sensitisation: The emulsion can be sensitised to densities from 0.95 to 1.25 g/cm³, using the recommended sensitising agent
- Excellent water resistance

### RECOMMENDATIONS

- Shelf life: 3 to 6 months
- Store as per the recommended storage conditions
- Shelf life: 21 days in the hole
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations

### PACKAGING

- INNOVEX™ 100C is transported and stored as bulk product
- Class 5.1, UN No. 3375, OXIDISING MATERIAL

\*Please note this product is for select markets only

### PRODUCT RISK PROFILE

- Classified as hazardous substance, Class 5.1, oxidising substances
- Non-detonable in the non-sensitised, unconfined bulk form
- Will not readily burn on its own, but if subjected to extreme external heat for a period of time, water may be driven off, resulting in an explosion risk
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

### UN CLASSIFICATION (TRANSPORT)

- Base Emulsion: Class 5.1, UN No. 3375, OXIDISING MATERIAL
- Sensitising Agent: Class 5.1, UN No. 3099, OXIDISING LIQUID, TOXIC, N.O.S.





## INNOVEX™ RG

Water in oil emulsion

### PRODUCT DESCRIPTION

INNOVEX™ RG is a specially formulated product for reactive ground conditions.

INNOVEX™ RG contains certain additives to inhibit exothermic reactions in ground containing sulphides or other reactive materials. INNOVEX™ RG base emulsion is a Class 5.1 oxidising agent with UN Classification No. 3375. When sensitised with the gassing agent, INNOVEX™ RG becomes a booster sensitive emulsion designed for opencast mines. It is sensitised to a cup density of 0.9 to 1.2 g/cm<sup>3</sup> by using a suitable sensitising agent.

Product	Water resistance	Nominal bulk density (g/cm <sup>3</sup> )	Relative weight strength	Relative bulk strength
INNOVEX™ RG	Excellent	1.20	78	116

Calculated at a density of 1.2 g/cm<sup>3</sup> and a pressure of 100 MPa  
Relative to ANFO at a density of 0.8 g/cm<sup>3</sup>

## PRODUCT FEATURES

### APPLICATION

INNOVEX™ RG is designed for blasting in reactive ground opencast mines and quarries

### FEATURES

- Minimum initiation: 150 g (5.3 oz) booster-sensitive when sensitised for holes having a diameter of 127 mm (5 in) or less. Holes with diameter larger than 127 mm (5 in) and depth greater than 6 m (19.7 ft) require a 400 g (14.1 oz) booster
- VOD: 3 500 to 5 500 m/s (11 500 to 18 000 ft/s), dependent on hole and rock characteristics
- Critical diameter: 64 mm (2.5 in)
- Sensitisation: The emulsion can be sensitised to densities from 0.95 to 1.25 g/cm<sup>3</sup> using the recommended sensitising agent
- Excellent water resistance

### RECOMMENDATIONS

- Shelf life: 3 to 6 months
- Store as per the recommended storage conditions
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations

### PACKAGING

- INNOVEX™ RG is transported and stored as bulk product
- Class 5.1, UN No. 3375, OXIDISING MATERIAL

### PRODUCT RISK PROFILE

- Classified as hazardous substance, Class 5.1, OXIDISING SUBSTANCES
- Non-detonable in the non-sensitised, unconfined bulk form
- Will not readily burn on its own, but if subjected to extreme external heat for a period of time, water may be driven off resulting in an explosion risk
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

### UN CLASSIFICATION (TRANSPORT)

- Base Emulsion: Class 5.1, UN No. 3375, OXIDISING MATERIAL
- Sensitising Agent: Class 5.1, UN No. 3099, OXIDISING LIQUID, TOXIC, N.O.S



### Extra-high energy emulsion blends **INNOVEX™ 204 and INNOVEX™ 205**

Emulsion blended with ammonium nitrate prill for dry holes



#### PRODUCT DESCRIPTION

INNOVEX™ 204 and INNOVEX™ 205 are high-energy blended emulsions respectively containing 40 % and 50 % emulsion blended with ammonium nitrate prill. These products are formulated for surface mining and quarrying in dry hole applications. They perform best in holes larger than 152 mm (6 in) in diameter. INNOVEX™ 204 and INNOVEX™ 205 are transported and stored as bulk product. They are blended and sensitised in BME's explosives trucks on-site during application. BME is able to formulate any ratio of emulsion to prill to provide the energy and VOD to match your rock and blasting requirements. For more information, consult a BME Product Manager.

Product	Relative weight strength	Relative bulk strength
INNOVEX™ 204	101	152
INNOVEX™ 205	97	146

Calculated at a density of 1.2 g/cm<sup>3</sup> and a pressure of 100 MPa  
Relative to ANFO at a density of 0.8 g/cm<sup>3</sup>

## PRODUCT FEATURES

#### APPLICATION

INNOVEX™ 204 and INNOVEX™ 205 are suitable for use in surface mining and quarrying

#### FEATURES

- Viscosity: 25 000 to 35 000 cP
- Density when sensitised: 1.15 g/cm<sup>3</sup> dependent on hole depth
- VOD: 3 000 to 4 800 m/s (10 000 to 16 000 ft/s) dependent on hole and rock characteristics
- Critical diameter: 120 mm (4.7 in)
- Minimum initiation: 400 g (14.1 oz) booster

#### RECOMMENDATIONS

- Shelf life: 21 days in the hole
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations

#### PACKAGING

- Bulk distribution

#### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Detonation may occur from extreme friction or excessive heating after sensitisation or under confinement
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

#### UN CLASSIFICATION (TRANSPORT)

- Class 1.1 D, UN No. 0241, EXPLOSIVE, BLASTING, TYPE E





High-energy emulsion blends

# INNOVEX™ 206 and INNOVEX™ 207

Emulsion blended with ammonium nitrate  
prill for dry holes

### PRODUCT DESCRIPTION

INNOVEX™ 206 and INNOVEX™ 207 are high-energy blended emulsions respectively containing 60 % and 70 % emulsion blended with ammonium nitrate prill. These products are formulated for surface mining and quarrying in both wet and dry hole applications. They perform best in holes larger than 127 mm in diameter.

INNOVEX™ 206 and INNOVEX™ 207 are transported and stored as bulk product. They are blended and sensitised in BME's explosives trucks on-site during application. BME is able to formulate any ratio of emulsion to prill to provide the energy and VOD to match your rock and blasting requirement. For more information, consult a BME Product Manager.

Product	Relative weight strength	Relative bulk strength
INNOVEX™ 206	93	140
INNOVEX™ 207	90	134

Calculated at a density of 1.2 g/cm<sup>3</sup> and a pressure of 100 MPa  
Relative to ANFO at a density of 0.8 g/cm<sup>3</sup>

## PRODUCT FEATURES

### APPLICATION

INNOVEX™ 206 and INNOVEX™ 207 are suitable for use in surface mining and quarrying

### FEATURES

- Viscosity: 25 000 to 35 000 cP
- Density when sensitised: 1.15 g/cm<sup>3</sup> dependent on hole depth
- VOD: 3 500 to 5 000 m/s (11 500 to 16 500 ft/s) dependent on hole and rock characteristics
- Critical diameter: 120 mm (4.7 in)
- Minimum initiation: 400 g (14.1 oz) booster

### RECOMMENDATIONS

- Ground temperature: Recommended for use in temperatures up to 60 °C
- Sleep time: 21 days in hole
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations

### PACKAGING

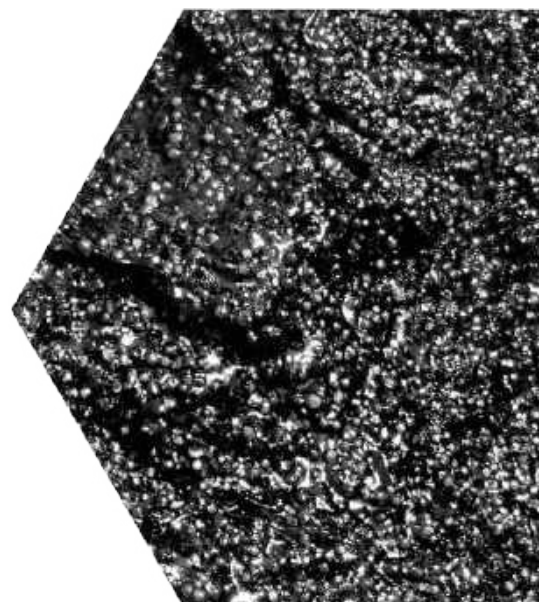
- Bulk distribution

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- INNOVEX™ 206 and INNOVEX™ 207 are non-detonable in non-sensitised, unconfined bulk form
- Detonation may occur from extreme friction or excessive heating after sensitisation or under confinement
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

### UN CLASSIFICATION (TRANSPORT)

- Class 1.1D, UN No. 0241, EXPLOSIVE, BLASTING, TYPE E



## VIPERDET™ QS

Non-electric surface detonators

### PRODUCT DESCRIPTION

VIPERDET™ QS, a non-electric surface detonator consisting of a green shock tube and a connector block with a long rubber plug, is used for the initiation of non-electric detonators in open-pit mines, as well as non-coal and non-methane underground mines.

The connector can hold up to 6 shock tubes and is designed to ensure easy connection and reliable initiation, while minimising shrapnel damage to the shock tube.

## PRODUCT FEATURES

### APPLICATION

- VIPERDET™ QS is used for open-pit mines, and in underground non-coal and non-methane mines, for the initiation of non-electric detonators
- VIPERDET™ QS detonators are intended for use in underground mines, where there is no coal dust and/or firedamp explosion hazard

### FEATURES

#### Physical properties

Shell material	Aluminium
Shock tube colour	Green or according to customer specification
Connector material	PE

#### Initiation

Nominal PETN charge weight	140 to 200 mg
Number of shock tubes which can be initiated with a single surface detonator, depending on the type of connector	6 to 8
Remarks	For the safe and reliable initiation of a VIPERDET™ QS detonator, it is advisable to use a proper initiation device, or any other approved initiation measures, such as electric detonators.

#### Loading

Loading into dry blast holes	Positive
Loading into wet blast holes	Positive

#### Humid and underwater conditions

Applicability in humid conditions	Positive
Water resistance (depth/time)	3 m / 48 hrs
Max. hydrostatic pressure	0.30 MPa

### RECOMMENDATIONS

- Shelf life: 24 months from the date of production
- Store as per the recommended storage conditions
  - Minimum storage temperature (0 °C)
  - Maximum storage temperature (+45 °C)
  - Product should be stored in its original packaging
- First aid: Refer to Safety Data Sheet for first-aid information.
- Safety: All explosives are classified as dangerous goods and may cause death, personal harm, or damage to property, if not used correctly.
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations.
- Disposal: Non-electric detonator waste as well as expired product and its packaging should be disposed of by authorised companies.

### SPECIFIC PROPERTIES

Name	Nominal delay time (ms)	Connector colour
VIPERDET™ QS 0 ms	2	Green
VIPERDET™ QS 17 ms	17	Yellow
VIPERDET™ QS 25 ms	25	Red
VIPERDET™ QS 33 ms	33	Grey
VIPERDET™ QS 42 ms	42	White
VIPERDET™ QS 67 ms	67	Blue
VIPERDET™ QS 109 ms	109	Black
VIPERDET™ QS 200 ms	200	Orange
The colour of the connector may differ according to customer specification		

#### Other parameters

VOD of explosive mixture inside the shock tube	2 000 ± 200 m/s
Thermal stability in 75 °C	48 hrs



# INNOVEX™ UG

Water in oil emulsion



### PRODUCT DESCRIPTION

INNOVEX™ UG is a Class 5.1, oxidising agent with UN classification number 3375. The gassed emulsion INNOVEX™ UG is a booster-sensitive bulk emulsion product designed for use in underground applications. The emulsion is transported and stored in bulk.

INNOVEX™ uphole is a product specifically developed for use in underground uphole applications.

Product	Water resistance	Nominal bulk density	Relative weight strength	Relative bulk strength
INNOVEX™ LATERAL	Excellent	1.47 - 1.51 g/cm <sup>3</sup>	0.81	1.21
INNOVEX™ UP-HOLE	Excellent	1.47 - 1.51 g/cm <sup>3</sup>	0.81	1.21

Calculated at a density of 1.15 g/cm<sup>3</sup> and a pressure of 100 MPa  
Relative to ANFO at a density of 0.8 g/cm<sup>3</sup>

## PRODUCT FEATURES

### APPLICATION

INNOVEX™ UG is designed for blasting in underground applications

### FEATURES

- Minimum initiation: 12 g (0.4 oz) booster sensitive
- VOD: 2 500 to 4 000 m/s (8 000 to 13 000 ft/s) dependent on hole and rock characteristics for underground operation
- Critical diameter: > 32 mm (1.3 in)
- Sensitisation: The emulsion can be sensitised to achieve a blasting density between 0.9 g/cm<sup>3</sup> and 1.20 g/cm<sup>3</sup> depending on low- or high-energy requirements

### RECOMMENDATIONS

- Shelf life: 3 to 6 months if stored correctly
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations

### PACKAGING

- This emulsion is transported and stored as a bulk product

### PRODUCT RISK PROFILE

- Classified as hazardous substance, Class 5.1: OXIDISING SUBSTANCES
- Non-detonable in the non-sensitised, unconfined bulk form
- Will not readily burn on its own, but if subjected to extreme external heat for a period of time, water may be driven off, resulting in an explosion risk
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

### UN CLASSIFICATION (TRANSPORT)

- Class 5.1, UN No. 3375, BULK EMULSION



## PGAN

Porous Granular  
Ammonium Nitrate



### PRODUCT DESCRIPTION

Porous Granular Ammonium Nitrate (PGAN) is designed mainly for ANFO, heavy ANFO and emulsion applications. Bulk density of PGAN granules is in the range 0.76 to 0.80 g/cm<sup>3</sup>. In application, PGAN offers high-quality, reliable and consistent blasting results.

## PRODUCT FEATURES

### APPLICATION

- ANFO
- Heavy ANFO
- Emulsions

### FEATURES

- Ammonium nitrate content: > 99.5 % Bulk density: 0.76 to 0.80 g/cm<sup>3</sup>
- Moisture content: < 0.20 %
- Oil absorption: > 6.0 %
- Particle size (1 mm to 3 mm)\* (0.04 to 0.12 in)\* > 95 %

\*Granule sizes may change due to handling processes

### RECOMMENDATIONS

- Shelf life: 12 months if stored correctly
- Always store Porous Granular Ammonium Nitrate (PGAN) in a dry area. PGAN granules can degenerate due to moisture, humidity, significant temperature variations and pressure conditions, leading to caking, or the formation of lumps
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: PGAN granules can break down due to moisture, humidity, huge temperature variations and pressure conditions. PGAN is an oxidiser and must be stored under dry and protected conditions, away from any combustible material
- Transportation and storage: Oxidiser (PGAN) must be transported and stored in accordance with relevant regulations

### PACKAGING

- PGAN is transported and stored in the following formats, depending on user application:  
Bulk; semi-bulk bags; 25 kg (55 lb) bags and 50 kg (110 lb) bags

### PRODUCT RISK PROFILE

- Classified as hazardous substance, Class 5.1, OXIDISING SUBSTANCES
- Non-detonable in the unfuelled, unconfined bulk form
- Fire risk in the presence of combustible material
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

### UN CLASSIFICATION (TRANSPORT)

- Class 5.1, UN No. 1942, OXIDISER





## INNOPAK™

Water in oil emulsion  
cartridged explosives

### PRODUCT DESCRIPTION

INNOPAK™ packaged explosives provide reliable blasting solutions to hard rock mining, quarrying, and construction applications. The emulsion has a firm rheology and is packed into plastic sleeves of various dimensions and colours. The INNOPAK™ product range offers various high energy options and can be supplied in a number of different lengths and diameters or as a combo pack. Please contact a BME representative for customisation of packaging.

Product	Relative weight strength	Relative bulk strength	Nominal density (g/cm <sup>3</sup> )
INNOPAK™ Plus	100	143	1.14
INNOPAK™ Super	104	149	1.14
INNOPAK™ Super Plus	111	158	1.14

Calculated at a density of 1.14 g/cm<sup>3</sup> and a pressure of 100 MPa  
Relative to ANFO at a density of 0.8 g/cm<sup>3</sup>

## PRODUCT FEATURES

### APPLICATION

- INNOPAK™ is designed for blasting in underground mines, opencast mines, quarries, and civil blasting operations.
- INNOPAK™ Combo Configurations (Only available in African Countries)
  - INNOPAK™ Combo Super Plus 29 x 270 mm / Plus 29 x 580 mm
  - INNOPAK™ Combo Super 27 x 270 mm / Plus 27 x 580 mm

### FEATURES

- Nominal density: 1.14 ± 0.06 g/ml
- VOD: 3 500 to 5 000 m/s (11 500 – 16 500 ft/s) dependent on hole and rock characteristics
- Gap sensitivity: Contact required for propagation

### RECOMMENDATIONS

- Shelf life: 9 months from date of manufacturing
- Store as per recommended storage conditions
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Risk of explosion by shock, friction, fire, or other ignition sources
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

### UN CLASSIFICATION (TRANSPORT)

- Class 1.1 D, UN No. 0241, EXPLOSIVES, BLASTING, Type E

### PACKAGING

- Cartridges are packed in boxes with a 25 kg (55 lb) mass (without tamping)

Cartridge size (mm)	Cartridge size (in)	Nominal weight (g) (±3g)	Nominal weight (lb)	Nominal count (Units)
25 x 200	0.98 x 7.87	111	0.24	227
27 x 270	1.06 x 10.63	186	0.41	135
27 x 580	1.06 x 22.83	404	0.89	62
29 x 270	1.14 x 10.63	202	0.45	125
29 x 580	1.14 x 22.83	434	0.96	58
32 x 270	1.26 x 10.63	246	0.54	102
32 x 580	1.26 x 22.83	529	1.17	47
38 x 270	1.50 x 10.63	346	0.76	72
38 x 580	1.50 x 22.83	747	1.65	33
45 x 200	1.77 x 7.87	358	0.79	70
45 x 270	1.77 x 10.63	484	1.07	52
45 x 580	1.77 x 22.83	1048	2.31	24
50 x 270	1.97 x 10.63	600	1.32	42
50 x 580	1.97 x 22.83	1293	2.85	19

### INNOFEX™

Packaged ammonium nitrate fuel oil (ANFO) blasting agent



#### PRODUCT DESCRIPTION

INNOFEX™ is a blend of porous ammonium nitrate prill and fuel oil. INNOFEX™ is a free flowing blasting agent used in dry blast holes. INNOFEX™ is oxygen balanced to offer optimal energy and it is suitable for small and medium-to-large diameter holes. INNOFEX™ is not suitable for use in wet holes.

## PRODUCT FEATURES

#### APPLICATION

INNOFEX™ is used in dry blast hole conditions for both surface and underground blasting operations

#### FEATURES

- Initiation: Pneumatically loaded INNOFEX™ can be initiated with a high strength detonator, INNOPAK™ cartridge, or a suitable booster
- Bulk density: 0.82 g/cm<sup>3</sup>
- Blow-loaded density: 0.95 to 1.05 g/cm<sup>3</sup>
- VOD: 3 000 to 4 200 m/s (10 000 to 14 000 ft/s) depending on hole diameter
- Water resistance: Not resistant to water
- Relative weight strength\*: 100
- Relative bulk strength\*: 100

\*The effective energy relative to ANFO at a density of 0.8 g/cm<sup>3</sup> and energy of 3.82 MJ/kg (energy values are calculated using BME thermodynamic code – IPX)

#### RECOMMENDATIONS

- Hole temperature: Recommended for use in temperature up to 60 °C
- Shelf life: 12 months in dry storage conditions
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported in accordance with relevant regulations and must be stored in cool, dry, well ventilated magazines

#### PACKAGING

- 25 kg (55 lb) in clear LDPE liner packed in a white poly-woven outer bag

#### UN CLASSIFICATION (TRANSPORT)

- Class 1.1 D, UN No. 0082, EXPLOSIVE, BLASTING, Type B

#### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Severe detonation hazard when exposed to heat
- Detonation can occur from extreme impact, extreme friction, or excessive heating
- Hazardous gases (nitrogen oxides and carbon oxide) are emitted on thermal decomposition
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES



## VIPERDET™ LP

Shock tube with a high strength delay detonator

### PRODUCT DESCRIPTION

VIPERDET™ LP assemblies consist of a specific length of green shock tube with a high strength delay detonator crimped to the one end and an ultrasonic seal used to close it at the other end.

A detonating cord connector clip is attached to the sealed end, with a marked colour-coded label indicating the delay number. LP detonators can be initiated by a single strand of detonating cord with a loading strength from 3.6 g/m to 8 g/m (17 to 37 gr/ft). Colour-coded labels are used to distinguish different delay periods.

## PRODUCT FEATURES

### APPLICATION

VIPERDET™ LP series are designed to provide reliable initiation. These detonators are used in underground and speciality civil blasting applications.

### FEATURES

- Detonator strength: No. 8
- Shock tube: Green colour, double extruded polyethylene
- Shock tube strength: Resistant to abrasion and fully functional in hot and cold temperatures
- Delay timing: Twenty different delay periods with no overlapping between adjacent delay numbers
- Connector: J-hook

### RECOMMENDATIONS

- Shelf life: 36 months if stored in original packaging and under dry conditions in a ventilated approved magazine
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported in accordance with relevant regulations and must be stored in cool, dry, well-ventilated magazines

### UN CLASSIFICATION (TRANSPORT)

- Class 1.1B, UN No. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4B, UN No. 0361, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4S, UN No. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC

### PACKAGING

- Units are placed in plastic inner packaging that is heat sealed and packed in boxes.

Length	Units/box
2.1 m	400
2.4 m	350
3.0 m	350
3.6 m	300
4.2 m	250
4.8 m	250

- Other lengths are available on request.

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Severe detonation hazard when exposed to heat
- Detonation may occur from impact, friction, or excessive heating
- May emit toxic fumes on thermal decomposition
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

## VIPERDET™ SD

Shock tube with two detonators

### PRODUCT DESCRIPTION

VIPERDET™ SD assemblies consist of a specific length of green shock tube with a high strength delay detonator crimped to the one end and a low strength delay detonator crimped to the other end. A connector clip is attached to the low strength detonator, namely the surface detonator, for easy connection to other shock tube assemblies. The connector can hold between 1 and 4 shock tubes and is designed to ensure reliable initiation, while minimising shrapnel damage to the shock tube.

## PRODUCT FEATURES

### APPLICATION

VIPERDET™ SD series are designed to provide reliable sequential initiation of explosives charges in underground narrow reef stoping applications

### FEATURES

- Detonator strength: Low strength No. 3 surface detonator, No. 8 in-hole detonator
- Shock tube: Extruded polyethylene exterior over surlyn inner with min 19 kg (41 lb) tensile strength
- Water resistance: Will function underwater if tube is not damaged
- Delay timing: Two different delay timings (out hole 200 ms, in hole 3 800 ms)
- Connector: T-clip ratchet connector

### RECOMMENDATIONS

- Shelf life: 36 months if stored in original packaging and under dry conditions in a ventilated approved magazine
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported in accordance with relevant regulations and must be stored in cool, dry, well-ventilated magazines

### UN CLASSIFICATION (TRANSPORT)

- Class 1.1B, UN No. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4B, UN No. 0361, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4S, UN No. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC

### PACKAGING

- Units are placed in plastic inner packaging that is heat sealed and packed in boxes.

Length	Units/box
2.1 m	400
2.4 m	350
3.0 m	350
3.6 m	300
4.2 m	250
4.8 m	250

- Other lengths are available on request.

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Severe detonation hazard when exposed to heat
- Detonation may occur from impact, friction, or excessive heating
- May emit toxic fumes on thermal decomposition
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES



## VIPERDET™ MS (DOWN HOLE)

Shock tube with  
non-electric detonator

### PRODUCT DESCRIPTION

VIPERDET™ MS DOWN HOLE assemblies consist of a specific length of green shock tube with a high strength delay detonator crimped to the one end and the other end closed by means of an ultrasonic seal. A colour-coded label marked with the specific delay is attached to the shock tube within 10 cm (4 in) of the seal.

## PRODUCT FEATURES

### APPLICATION

VIPERDET™ MS DOWN HOLE detonator for surface mining and quarrying

### FEATURES

- Detonator strength: No. 8
- Shock tube: Double extruded polyethylene exterior over surllyn inner with a min of 19 kg (41 lb) tensile strength
- Water resistance: Functions reliably in wet deep hole conditions
- Delay timing: Two different delay timings (350 ms and 500 ms)

### RECOMMENDATIONS

- Shelf life: 36 months if stored in original packaging and under dry conditions in a ventilated approved magazine
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported in accordance with relevant regulations and must be stored in cool, dry, well-ventilated magazines

### UN CLASSIFICATION (TRANSPORT)

- Class 1.1B, UN No. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4B, UN No. 0361, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4S, UN No. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC

### PACKAGING

- Units are placed in plastic inner packaging that is heat sealed and packed in boxes.

Length (m)	Length (ft)	Units/Box
2 m	6.5 ft	400
4 m	13 ft	300
6 m	19 ft	200
8 m	26 ft	180
10 m	33 ft	150
12 m	39 ft	120
15 m	49 ft	100
18 m	59 ft	80
21 m	69 ft	50
24 m	79 ft	50

- Other lengths are available on request.

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Severe detonation hazard when exposed to heat
- Detonation may occur from impact, friction, or excessive heating
- May emit toxic fumes on thermal decomposition
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

## VIPERDET™ MS

Millisecond non-electric detonators

### PRODUCT DESCRIPTION

VIPERDET™ MS is a millisecond non-electric detonator consisting of an orange shock tube, a J-hook, and a long rubber plug for open-pit mines, non-coal and non-methane underground mines, for initiation of explosives, as well as in construction and engineering works.

## PRODUCT FEATURES

### APPLICATION

VIPERDET™ MS is used for the initiation of explosives in open-pit mines, non-coal and non-methane underground mines, and in construction and engineering works

### FEATURES

#### Physical properties

Shell material	Aluminium
Shock tube colour	Orange
Shock tube length	Varies
Remarks	Marking on the bottom of the shell consists of the letter S and a delay number

#### Initiation

Nominal PETN charge weight (secondary charge):	700 mg
Remarks	For safe and reliable initiation of the VIPERDET™ MS detonator it is advisable to use proper initiation equipment approved for such applications (e.g. spark igniters) or other initiating means, such as non-electric surface detonators, or detonating cord with nominal PETN charge of 6 to 12 g/m (28 to 56 gr/ft).

#### Loading

Loading into dry blast holes	Positive
Loading into wet blast holes	Positive

#### Humid and underwater conditions

Applicability in humid conditions	Positive
Max. hydrostatic pressure	0.30 MPa

### RECOMMENDATIONS

- Shelf life: 24 months from the date of production
- Store as per the recommended storage conditions
  - Minimum storage temperature (0 °C, 32 °F)
  - Maximum storage temperature (+45 °C, +113 °F)
  - Product should be stored in its original packaging
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause death, personal harm, or damage to property, if not used correctly
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations
- Disposal: Non-electric detonator waste as well as expired product and packaging should be disposed of by authorised companies

### SPECIFIC PROPERTIES

Delay no.	Nominal delay time (ms)	Delay no.	Nominal delay time (ms)
1	25	11	275
2	50	12	300
3	75	13	325
4	100	14	350
5	125	15	375
6	150	16	400
7	175	17	425
8	200	18	450
9	225	19	475
10	250	20	500

#### Other parameters

VOD of explosive mixture inside the shock tube	2 000 ± 200 m/s (~6 500 ft/s)
Thermal stability in 75 °C (167 °F)	48 hrs



## VIPERDET™ MS

Millisecond non-electric detonators

## PRODUCT FEATURES

### PACKAGING

Packaging unit	PE bag filled with bundles of 5 or 10 sets of non-electric detonators with the same delay time (depending on the length of the tube)
Shipping container	Cardboard box
Cargo safety measures	Shipping containers placed on a wooden pallet, secured with stretch film
Remarks	Other packaging methods are available as per agreement with the customer

Shock tube length (m)	Number of detonators in a bunch	Number of detonators in first/second bag	Number of detonators in a box
4.8	10	130/130	260
6	10	125/125	250
10	10	100/100	200
15	5	70/70	140
18	5	60/60	120
20	5	50/50	100
25	5	40/40	80
30	-	40/40	80
35	-	35/35	70
40	-	30/30	60

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Risk of explosion by shock, friction, fire, or other ignition sources
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

### UN CLASSIFICATION (TRANSPORT)

- Class 1.1B, UN No. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4B, UN No. 0361, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4S, UN No. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC



# VIPERDET™ QS

Non-electric surface detonators

## PRODUCT FEATURES

### PACKAGING

Packaging unit	PE bag filled with bundles of 5 or 10 sets of non-electric detonators with the same delay time (depending on the length of the tube)
Shipping container	Cardboard box
Cargo safety measures	Shipping containers placed on a wooden pallet, secured with stretch film
Remarks	Other packaging methods are available as per customer specification

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Risk of explosion by shock, friction, fire, or other ignition sources
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES



### UN CLASSIFICATION (TRANSPORT)

- Class 1.1B, UN No. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4B, UN No. 0361, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4S, UN No. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC



## VIPERDET™ DUAL

Bi-directional non-electric detonators

### PRODUCT DESCRIPTION

VIPERDET™ MS is a millisecond non-electric detonator consisting of an orange shock tube, a J-hook, and a long rubber plug for open-pit mines, non-coal and non-methane underground mines, for initiation of explosives, as well as in construction and engineering works.

## PRODUCT FEATURES

### APPLICATION

- VIPERDET™ Dual has applications for open-pit mines, in underground, non-coal and non-methane mines, and also for construction and engineering works
- VIPERDET™ Dual detonators are utilised in underground mines, where there is no coal dust and/or firedamp explosion hazard. The connector can hold up to 6 shock tubes and is designed to ensure easy connection and reliable initiation, while minimising shrapnel damage to the shock tube.

### FEATURES

#### Physical properties

Shell material	Aluminium
Shock tube colour	Orange
Connector material	PE

#### Initiation

Nominal PETN charge weight in:	In-hole detonator	700 mg
	Surface detonator	140 – 200 mg
Number of shock tubes which can be initiated with a single surface detonator, depending on the type of connector		6 – 8
Remarks	For the safe and reliable initiation of a VIPERDET™ Dual detonator it is advisable to use a proper initiation device or other approved initiation measures, such as electric detonators	

#### Loading

Loading into dry blast holes	Positive
Loading into wet blast holes	Positive

#### Humid and underwater conditions

Applicability in humid conditions	Positive
Water resistance (depth / time)	3 m / 48 hrs

### RECOMMENDATIONS

- Shelf life: 24 months from the date of production
- Store as per the recommended storage conditions:
  - Minimum storage temperature (0 °C)
  - Maximum storage temperature (+45 °C)
  - Product should be stored in the original packaging
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause death, personal harm, or damage to property, if not used correctly
- Transportation and storage: All explosives must be transported and stored in accordance with relevant regulations
- Disposal: Non-electric detonator waste as well as expired product and packaging should be disposed of by authorised companies

### SPECIFIC PROPERTIES

Type of Dual set	Nominal delay time (ms) In-hole detonator/ Surface detonator	Connector colour
350/0	350/0	Green
375/0	375/0	
400/0	400/0	
475/0	475/0	
500/0	500/0	
350/17	350/17	Yellow
375/17	375/17	
400/17	400/17	
475/17	475/17	
500/17	500/17	
350/25	350/25	Red
375/25	375/25	
400/25	400/25	
475/25	475/25	

## VIPERDET™ DUAL

Bi-directional non-electric detonators

## PRODUCT FEATURES

Type of Dual set	Nominal delay time (ms)	In-hole detonator/ Surface detonator	Type of Dual set	Nominal delay time (ms)	In-hole detonator/ Surface detonator	Type of Dual set	Nominal delay time (ms)	In-hole detonator/ Surface detonator
500/25	500/25	Red	375/42	375/42	White	500/67	500/67	Blue
700/25	700/25		400/42	400/42		350/109	350/109	Black
1 000/25	1 000/25		475/42	475/42		375/109	375/109	
350/33	350/33	Grey	500/42	500/42		400/109	400/109	
375/33	375/33		700/42	700/42		475/109	475/109	
400/33	400/33		350/67	350/67	Blue	500/109	500/109	
475/33	475/33		375/67	375/67		4 000/109	4 000/109	
500/33	500/33		400/67	400/67		5 000/200	5 000/200	Orange
350/42	350/42	White	475/67	475/67				

### Other parameters

VOD of explosive mixture inside the shock tube	2 000 ± 200 m/s
Thermal stability at 75 °C	48 hrs
Max. hydrostatic pressure	0.30 MPa

### PACKAGING

Packaging unit	PE bag filled with bundles of 5 or 10 sets of non-electric detonators with the same delay time (depending on the length of the tube)
Shipping container	Cardboard box
Cargo safety measures	Shipping containers placed on a wooden pallet, secured with stretch film
Remarks	Other packaging methods are available according to customer specification

Shock tube length (m)	Number of detonators in a bunch	Number of detonators in first/second bag	Number of detonators in a box
8	10	110/110	220
10	10	100/100	200
12	5	75/75	150
15	5	70/70	140
18	5	60/60	120
20	5	50/50	100
25	5	40/40	80
30	-	40/40	80
35	-	35/35	70

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Risk of explosion by shock, friction, fire, or other ignition sources
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

### UN CLASSIFICATION (TRANSPORT)

- Class 1.1B, UN No. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4B, UN No. 0361, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4S, UN No. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC

# VIPERDET™ TRUNKLINE

Shock tube with short-period non-electric detonator

## PRODUCT DESCRIPTION

VIPERDET™ Trunkline assemblies consist of a specific length of shock tube with a millisecond delay detonator crimped to the one end and closed at the other end by means of an ultrasonic seal. A label marked with the specific delay is attached to the shock tube within 10 cm (4 in) of the seal. Colour-coded labels are used to distinguish different delay assemblies from one another. A colour-coded connector clip is attached to the detonator for easy connection to other shock tube assemblies. The connector can hold between 1 and 6 shock tubes and is designed to ensure easy connection and reliable initiation, while minimising shrapnel damage to the shock tube.

## PRODUCT FEATURES

### APPLICATION

Surface mining and quarrying—provides accurate delay sequence for surface connections

### FEATURES

- Detonator strength: No. 3 Detonator
- Shell: Aluminium alloy
- Shock tube: Double extruded, green in colour
- Shock tube strength: Resistant to abrasion and fully functional in hot and cold temperatures
- Delay timing: Nominal delay timings of 17 ms, 25 ms, 42 ms, and 67 ms
- Connector: Colour-coded to identify respective delay timings

### RECOMMENDATIONS

- Shelf life: 36 months.
- Product must be stored in its original packaging and under dry conditions in a ventilated approved magazine
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported in accordance with relevant regulations and must be stored in a cool, dry, well-ventilated magazine

### UN CLASSIFICATION (TRANSPORT)

- Class 1.1B, UN No. 0360, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4B, UN No. 0361, DETONATOR ASSEMBLIES, NON-ELECTRIC
- Class 1.4S, UN No. 0500, DETONATOR ASSEMBLIES, NON-ELECTRIC

### PACKAGING

- Units are placed in plastic inner packaging that is heat sealed and packed in boxes.

Length (m)	Length (ft)	Units/Box
2	6.6	400
4	13	300
6	20	200
8	26	180
10	33	150

- Other lengths are available on request.

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage conditions
- Severe detonation hazard when exposed to heat
- Detonation can occur from impact, friction, or excessive heating
- May emit toxic fumes on thermal decomposition
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES



# VIPER BOOSTERS™

High strength  
priming charges



### PRODUCT DESCRIPTION

VIPER BOOSTERS™ consist of an explosive charge of high strength and high detonation velocity, designed to be used in the explosive initiation sequence between an initiator or primer and the main charge, mostly non cap-sensitive blasting agents. Cast VIPER BOOSTERS™ are enclosed in a cylindrical printed shell and contain a mixture of RDX and TNT. A PETN capsule positioned internally near the detonator well ensures reliable initiation when using 3.6 g/m (17 gr/ft) detonating cord.

## PRODUCT FEATURES

### APPLICATION

Reliable initiation of booster sensitive blasting agents for surface mining, quarries and civil works

### FEATURES

- Appearance: Smooth and clean, with both ends covered
- Cap well and cord tunnel: Smooth and straight with no distortion or blockage
- Velocity of detonation: Minimum 8 000 m/s (26 000 ft/s)
- Cast density: Minimum 1.8 g/cm<sup>3</sup>
- Sensitivity: Reliable initiation by standard detonator or 3.6 g/m (17 gr/ft) detonating cord
- Water resistance: Retains sensitivity after being immersed in water at 100 PSI
- Consistency: Free from cracking

### RECOMMENDATIONS

- Temperature range: Recommended for use in temperatures up to 70 °C (158 °F)
- Shelf life: Minimum shelf life of 5 years
- First aid: Refer to Safety Data Sheet for first-aid information
- Safety: All explosives are classified as dangerous goods and may cause damage to property, personal harm, or death, if not used correctly
- Transportation and storage: All explosives must be transported in accordance with relevant regulations and must be stored in a cool, dry, well-ventilated magazines

### UN CLASSIFICATION (TRANSPORT)

- Class 1.1D, UN No. 0042, BOOSTER, WITHOUT DETONATOR

### PACKAGING

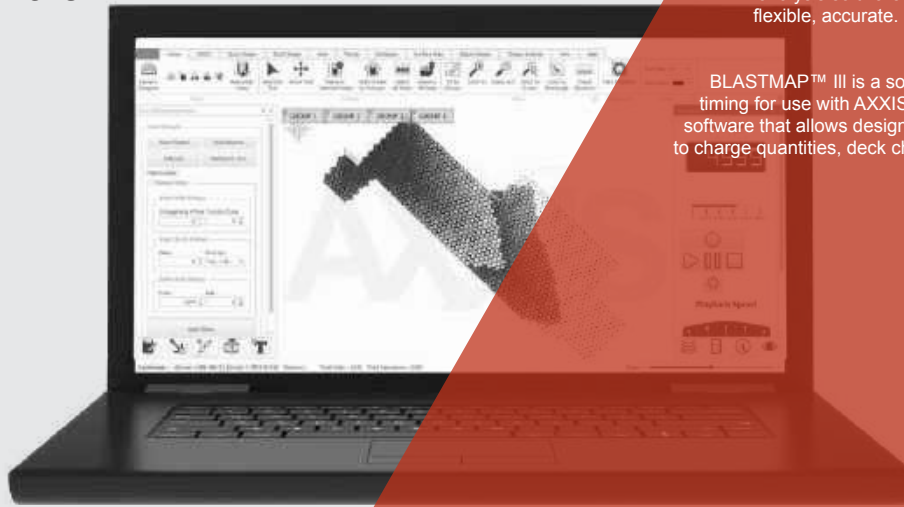
	VIPER BOOSTER™ 150	VIPER BOOSTER™ 400	VIPER BOOSTER™ 800
Unit weight	150 g 5.29 oz	400 g 14.11 oz	800 g 28.22 oz
Unit per case	90 units	35 units	16 units
Net weight per case	13.5 kg 29.76 lb	14 kg 30.86 lb	12.8 kg 28.22 lb
Diameter	36 mm 1.42 in	54 mm 2.13 in	78 mm 3.07 in
Length	125 mm 4.92 in	125 mm 4.92 in	120 mm 4.72 in

### PRODUCT RISK PROFILE

- Classified as hazardous substance, dangerous goods with mass explosion hazard
- Stable under normal storage and handling conditions
- May explode when exposed to fire, especially when confined
- May explode when subjected to high energy projectile impact
- May emit toxic and/or irritating fumes during thermal decomposition
- Incompatible with corrosives
- NEVER ATTEMPT TO FIGHT EXPLOSIVES FIRES

## BLASTMAP™ III

### Blast Design Software



#### PRODUCT DESCRIPTION

Complete blast planning, design and analysis software. Powerful, easy to use, flexible, accurate.

BLASTMAP™ III is a software tool for designing blast timing for use with AXXIS™. It is powerful and modern software that allows design of the blasts from hole layouts to charge quantities, deck charging and blast timing.

## PRODUCT FEATURES

#### FEATURES

- Import survey data of the block geometry, holes and surface
- Virtually create a blast and pattern with hole diameters, adding explosive and rock types
- View a 360° rendering in 3D of a blast
- Charge and timing designs based on actual hole positions
- Calculate costs and quantities based on actual drilling information
- Use the import wizard to import any text or xlsx data file from 3rd party software
- Export design information to a csv file. This allows for 3rd party software such as drill navigation software for drilling according to the design
- Optimised for use with AXXIS™ Electronic Delay Detonators
- Import/export AXXIS™ Electronic Detonator IDs and design timing
- Support for non-electric and electronic timing designs
- Multiple deck capability for designing specialised blasts, such as multi-seam or stratified rock, including vibration control
- Analyse blast timing using various timing simulation options
- Wave interference modelling for optimising timing for either vibration control or optimal fragmentation
- Powerful contouring capabilities for blast timing, surface and floor elevations, vibration maps and energy distribution in a blast (multi-screen display capability)
- Through-seam charge design capability including decked timing for different horizons
- Mine planning—ability to import pit surfaces and triangulate hole collar elevations
- Reporting capabilities for blast design and communicating critical design elements such as costs, quantities and energy

#### MINIMUM SOFTWARE REQUIREMENTS

- Operating system: Windows XP, Vista, Windows 7, Windows 8  
Microsoft Dot Net Framework 4.0

#### MINIMUM HARDWARE REQUIREMENTS

- Ram: 4 Gb
- Disk space: 500 Mb
- Processor: Dual Core 2.00 GHz
- Operating system type: 32 bit

#### RECOMMENDED HARDWARE REQUIREMENTS

- Ram: 8 Gb
- Disk space: 500 Mb
- Processor: Core i7 2.00 GHz
- Operating system type: 64 bit



## XPLOLOG™ SURFACE



### PRODUCT DESCRIPTION

BME knows how important it is to gather blasting information in the field for management to be presented with real-time data, to make informed decisions about blast preparation quality and blast outcomes. This is presented through the reporting dashboard which allows management to monitor and react to problems in the field when they occur.

Our XPLOLOG™ platform integrates with BLASTMAP™ III software, allowing users to view, edit and sync planned and actual data captured to a cloud database. This integration of data allows you to use the powerful blasting simulation and prediction modules in BLASTMAP™ III to further analyse and improve blast outcomes on real data.

Real-time data over local networks (GSM/ Wi-Fi) means that the process can be monitored remotely and dipping, priming, charging and stemming procedures can be efficiently co-ordinated. This technology digitises the pre-blast process, reducing human error, increasing efficiency and ensuring reliable results.

## PRODUCT FEATURES

### DEVICE

- Users are equipped with a rugged hand-held device that is suitable for everyday field use
- It has a powerful 4 500 mAh non-removable battery offering extended usage time, compared to similar devices
- The device is intended for use under rugged conditions
- It carries an IP-68 rating, which means that it is dust proof and up to 1.5 m waterproof.

### FEATURES

- Supply of IP-68 (dust and waterproof) mobile device
- Import design data from any blast design software
- List-view of current blocks
- Summary view of pre-blast progress on a selected block
- Graphical representation of blast hole positions and status
- Recording of dipping, priming, charging, top up and stemming data based on your planned design
- Indicate blast hole discrepancies, supports multiple deck patterns, tolerance and maxi/ min limit checks
- Leveraging cloud-computing to recalculate values when actual data deviates from planned values
- Indicates an alert when a user input values that are out of the pre-blast sequence
- Real-time syncing to a cloud-hosted database over GSM or Wi-Fi
- Addition of unplanned blast holes
- Website dashboard (Reporter)
  - Real-time view of actual block progress
  - Graphical view of the block highlighting dipping, priming, charging, top up, stemming and alerts progress
  - Tolerance checking
  - Graphs indicating a holistic view of the variance for specification function (under, over and correctly charged holes)
  - Export pre-blast data to CSV
  - Access to audit data for accurate customer invoicing







# AXIS

DIGITAL INITIATION SYSTEM

# EQUIPMENT

# AXXIS™ Blasting Box

### PRODUCT DESCRIPTION

The AXXIS™ Blasting Box can be used as a stand-alone unit with a blasting line connected directly to the detonators, or in a wireless configuration with two or more AXXIS™ Blasting Boxes.

For a large blast, a total of 20 boxes can be linked together, for a total of up to 10 000 detonators.

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 24 V rechargeable Li-ion batteries

### BATTERY LIFE

- 15 hours x 500 detonator blasts (battery life dependent on the number of detonators in each blast)

### OPERATING TEMPERATURE RANGE

- -20 to +60 °C (-4 to +140 °F)

### USER INTERFACE

- Black and white LCD screen with two buttons to navigate through menus

### COMMUNICATIONS INTERFACE

- USB port

### NUMBER OF DETONATORS PER BLASTING BOX

- 600 / link 500

### WIRELESS RANGE BETWEEN BOXES

- 1 000 to 5 000 m (3 280 to 16 400 ft) line of site (depending on country's frequency allocation)

### COMMUNICATION

- Two-way communication between blasting box and detonators.
- All detonators are interrogated before blasting time.
- The blast can be fired using wireless communication between a remote blasting box and the blast.





# AXXIS™ Logger



### PRODUCT DESCRIPTION

The AXXIS™ Logger is a small, robust unit that is used to scan each detonator connector and allocate a delay period to that connector.

The unit has a touch screen interface and a numeric keypad for entering detonator firing time values and connector IDs (should this be necessary if a connector has been damaged). The AXXIS™ Logger can be used directly to program delays by blasters, but can also be used in conjunction with the BLASTMAP™ III.

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 9 V Li-ion rechargeable battery

### BATTERY LIFE

- 15 hours continuous room temperature operation

### BATTERY CHARGING

- 4 to 4.5 hours to full charge

### OPERATING TEMPERATURE RANGE

- -30 to +60 °C (-22 to +140 °F)

### STORAGE

- -40 to +70 °C (-40 to +158 °F)

### SHOCK

- MIL-STD-810F, Method 503.4

### LOGGING MODES

- Manual / increments / double prime / BLASTMAP™ III downloads

### USER INTERFACE

- Touch screen and numeric keys

### COMMUNICATIONS INTERFACE

- USB port





# AXXIS™ Smart Line Tester



## PRODUCT DESCRIPTION

The AXXIS™ Smart Line Tester is a small low-current device that is used to safely test a surface line, and the detonators connected to it, for leakage, current consumption, and functionality

## PRODUCT SPECIFICATIONS

### FUNCTIONS

- Safely tests lines for leakage before blasting time
- Safely tests the functionality of the detonators

### MAXIMUM NUMBER OF DETONATORS

- The maximum number of detonators on a line that can be tested is 50.
- The reason for this is that the leakage tester generates a very low energy current for safety reasons.

### MAXIMUM CURRENT OUTPUT

- 20 mA

### POWER SUPPLY

- Li-ion Batteries



### AXXIS GII™ Detonator

#### PRODUCT DESCRIPTION

The AXXIS GII™ Detonator is a standard-sized detonator that functions in all standard-sized boosters that are used in non-electric blasting. AXXIS GII™ Detonators use 2-core double insulated downline cables. Higher resistance to electrostatic discharge and high induced ground currents make the AXXIS GII™ Detonator safer to use in all mining conditions.

## PRODUCT SPECIFICATIONS

#### DETONATOR CASE

- Magnesium aluminium alloy / copper alloy

#### DETONATOR SIZE

- Fits any standard booster

#### CABLE TYPE

- Twin core copper cable, double insulated

#### SPOOL DESCRIPTION

- Cable spooled in shrink-wrapped spools with detonator feed from centre of spool for safety

#### STANDARD LENGTHS

- 10 m, 20 m, 30 m, 40 m, 50 m, 60 m, 70 m
- 33 ft, 66 ft, 98 ft, 131 ft, 164 ft, 197 ft, 230 ft
- Other lengths are available on request

#### CONNECTOR

- Yellow pin-hinged two-way connector with intelligent electronic data capability

#### FIRING TIME RANGE

- 0 to 10 000 ms / 0 to 15 000 ms

#### ACCURACY

- 0 to 5 000 ms < 1 ms scatter

#### OPERATING TEMPERATURE

- -20 to +60 °C (-4 to +14 °F)

#### STORAGE TEMPERATURE

- -30 to +50 °C (-22 to +122 °F)

#### SHELF LIFE

- At recommended storage temperature: 48 months

#### SAFETY FUNCTION

- AXXIS GII™ Detonators do not include any permanent energy source and there is no direct communication with the detonator during logging.
- AXXIS GII™ Detonators will only function with AXXIS™ Blasting Boxes.
- Special security PIN-codes are required to operate the system.
- A dead man's switch disarms all detonators if the blast needs to be aborted at short notice.



# AXXIS TITANIUM™ Blasting Box



## PRODUCT DESCRIPTION

### SYSTEM DETAILS

#### Blast Boxes

AXXIS TITANIUM™ blast boxes are each enclosed in a yellow robust plastic case that is half the size of a GII™ blasting box.

Box control is simple, with double rotary switches for switching a box on, placing it in standby mode to open the communication channels, and firing the blast. Wireless communications are achieved through two selectable open-band frequency channels (400 MHz and 900 MHz) that can be configured based on the site requirements. All AXXIS TITANIUM™ blasting boxes are the same, but each one can be configured either as a blaster, or as a controller, to accomplish its required function.

#### Blaster Box

The blasters are placed at each blast site and connected to the surface wire harness. No power is supplied to the detonators until the controller arms the system at blasting time. Up to 200 blasters can be controlled and fired from a single controller. Each blaster can fire up to 1000 detonators.

## PRODUCT SPECIFICATIONS

### FUNCTIONAL FEATURES

#### VOLTAGE

- 24 V rechargeable li-ion batteries

#### BATTERY LIFE

- 12 000 mAh
- Battery life dependent on the number of detonators in each blast—non-user replaceable

#### OPERATING TEMPERATURE RANGE

- -40 °C to +60 °C (-40 °F to +140 °F)

#### ENCLOSURE

- Lockable steel, IP65 rated

#### BOX MASS

- 3.9 kg (8.6 lb)

#### USER INTERFACE

- Colour LCD with variable intensity and contrast setting
- 2 000 x 1 500 point resolution

#### CONTROLS

- Two rotary switches with spring loading on the full-right position for firing a blast in controller mode

#### COMMUNICATION INTERFACE

- Ports for antenna, charging, USB, harness wires, and link cable





## PRODUCT SPECIFICATIONS

### NUMBER OF DETONATORS PER BLASTER

- 1 000

### MAXIMUM BLASTERS PER CONTROLLER

- 200

### WIRELESS

- Wireless range between boxes 1 000 m to 5 000 m (0.6 mi to 3.1 mi) line of site
- Depending on country's frequency allocation 158.325 MHz, or 433 MHz, or 915 MHz

### DETONATOR COMMUNICATION

- Two-way communication protocol between blasters and detonators
- All detonators are interrogated before blasting time

### ENVIRONMENTAL FEATURES

#### CONFORMS TO SPECIFICATION

- SANS 1717-1: The South African National Standard for:
- The design and approval of EDD initiation systems for use in mining and civil blasting applications.

#### RESISTANCE TO ELECTROSTATIC DISCHARGE

- Electrostatic discharge immunity test ( $\pm 8$  kV contact,  $\pm 15$  kV air)
- Electrical fast transient / burst immunity ( $\pm 2$  kV)

#### CALIBRATION INTERVALS

- Every 2 years from previous certification

#### EFFECTIVE RADIATED POWER

- ETSI EN 300 220-1 V1.3.1 (2000-09) European Standard
- CISPR 11 Radiated Emissions: 30-1 000 MHz

#### WATER RESISTANCE

- IP 67 when closed
- IP 65 when open

#### DROP TEST

- IEC 60068-2-32:1975 with drops from a height of 500 mm (19.7 in)



# AXXIS TITANIUM™ Electronic Delay Detonator



## PRODUCT DESCRIPTION

AXXIS TITANIUM™ is a completely new detonator system based on the successful features of AXXIS GII™, such as dual capacitors, high-strength cable, remote blasting and safety. The system is designed for high safety and security levels but remains easy to use. It requires minimal menu run activity for setting up a blast, making it easier for blast crews to apply this system with the field processes.

The system utilises dual voltage with on-the-block logging and testing at a low, safe voltage. Detonators are programmed and tested during logging by writing the desired firing times and log sequence number (position) into each detonator's memory. Centralised programming using the flexibility of computer-based design is also an option.

Error testing is reported by exception, which considerably speeds up the centralised testing and blasting processes—with the resulting time required at the firing point being less than two minutes, regardless of the number of detonators being fired.

Each detonator can be programmed at 1 ms intervals to a maximum of 35 seconds at a very accurate standard deviation of  $\pm 0.0025\%$  at a 35 second delay. Data transfer between boxes and loggers takes place wirelessly through Bluetooth, but with USB back-up.

## PRODUCT SPECIFICATIONS

### FUNCTIONAL FEATURES

#### DELAY TIME RANGE

- AXXIS TITANIUM™ detonators are programmable in the range: 0 seconds to 35 seconds

#### DELAY ACCURACY (COV)

- $\pm 0.0025\%$  at 35 000 ms from  $-20\text{ }^{\circ}\text{C}$  to  $+80\text{ }^{\circ}\text{C}$  ( $-4\text{ }^{\circ}\text{F}$  to  $+176\text{ }^{\circ}\text{F}$ )

#### SAFETY FUNCTIONS

- Dual voltage and dual capacitors

#### EASE OF USE

- All AXXIS™ EDDs are connected in parallel

### PHYSICAL FEATURES

#### CASE OF ELECTRONIC DETONATOR

- Aluminium magnesium alloy / copper alloy
- Nominal outer diameter 7.5 mm (0.3 in)
- Nominal length 87 mm / 95 mm (3.4 in / 3.7 in)

#### DETONATOR SIZE

- Fits any standard booster



## PRODUCT SPECIFICATIONS

### CABLE TYPE

- HDPE outer insulation and PVC inner insulation over copper clad steel or copper cores

### COILING DESCRIPTION

- Cable coiled in 150 mm (5.9 in) high shrink-wrapped coils with detonator feed from centre of spool for safety

### WEIGHT

- Long duplex wires 10 m (33 ft): 0.116 kg (4 oz)

### STANDARD LENGTHS

- 10 m, 15 m, 20 m, 25 m, 30 m, 35 m, 40 m, 45 m, 50 m
- 33 ft, 49 ft, 66 ft, 82 ft, 98 ft, 115 ft, 131 ft, 148 ft, 164 ft
- Custom lengths are available on request

### FIRING TIME RANGE

- Programmable: 0 to 35000 ms

### SHELF LIFE

- At recommended storage temperature: 48 months

### ENVIRONMENTAL FEATURES

#### DETONATORS PASS TESTS SPECIFIED IN SANS 1717-1

- SANS 1717-1: The South African National Standard for: *The design and approval of EDD initiation system for use in mining and civil blasting applications.*

### OPERATING TEMPERATURE RANGE

- -50 °C to +80 °C (-58 °F to +176 °F)

### STORAGE TEMPERATURE RANGE

- -40 °C to +70 °C (-40 °F to +158 °F)

### RESISTANCE TO WATER

- IP 67

### RESISTANCE TO HYDROSTATIC PRESSURE

- 14 bar (203 psi) for 7 days at ambient temperature (electronic module / lead wires)

### IN-HOLE SLEEP TIME

- Maximum of 45 days (tested at 5 bar / 500 kPa / 73 psi)

### RESISTANCE TO ELECTROSTATIC DISCHARGE

- No unintended detonation: > 1 Joule Energy @ 30 KV - pin to pin / pins to shell

### RESISTANCE TO RADIO FREQUENCY RADIATION

- No unintended detonation: 30 V/m in the range 80 MHz to 1 GHz

### SENSITIVITY TO IMPACT

- IK 10.2 kg (22.5 lb) from a height of 1.6 m (5.2 ft)

### DROP TEST

- Unpackaged: no detonation, free fall and guided drop test from a height of 5 m onto a solid concrete plate

### RESISTANCE TO TENSILE STRENGTH

- Lead-in wires: No breaks: 300 N (67 lbf) 120 s
- Connectors: 200 N (45 lbf)
- Detonator crimps: No pull-outs: 250 N (56 lbf) / 120 s





## PRODUCT SPECIFICATIONS

### RESISTANCE TO ABRASION OF LEAD-IN WIRES

- Satisfy test criteria

### RESISTANCE TO CUTTING DAMAGE OF LEAD-IN WIRES

- Lead-in wires: No breaks (continuity): 300 N (67 lbf) 120 s

### DYNAMIC SHOCK RESISTANCE

- 50 MPa (7 252 psi) Aluminum alloy or >80 MPa (>11 600 psi) copper alloy

### ELECTRICAL FEATURES

#### NO FIRE CURRENT

- 0.18A DC for 300 seconds / 5 minutes

#### NO FIRE IMPULSE

- 0.8 mJ / Ohm

#### FIRE IMPULSE

- 3 mJ / Ohm

#### ALL FIRE IMPULSE

- 2 Amp

### INITIATING CAPABILITY

#### EXPLOSIVE CHARGE

- Base charge - PETN, primary charge - Lead azide / lead styphnate

#### NET EXPLOSIVES QUANTITY

- $\pm 1.00$  g / detonator

#### DETONATOR STRENGTH

- #8 (South African strength definition)

### PACKAGING

#### UN SHIPPING CLASSIFICATION

- UN Recommendations on the Transport of Dangerous Goods: *17th Revised Edition RSA TEN-E Packaging Service Test Report: 18- 19009. 19010*
- 1.1B manufactured in South Africa - UN 0030
- 1.4B manufactured in South Africa - UN 0255
- 1.4S manufactured in South Africa - UN 0456

#### DETONATOR CONFIGURATION

- Shrink wrapped coil

#### CABLE COLOUR

- Yellow

#### CONNECTOR

- Yellow – Yellow/white



# AXXIS TITANIUM™ Logger



## PRODUCT DESCRIPTION

AXXIS TITANIUM™ loggers are small, robust, hand-held devices that facilitate the logging and testing of detonators. These loggers can program a detonator, read from the detonator's memory, test a single detonator or a group of detonators, and transfer the logged blast files to blaster boxes.

The AXXIS TITANIUM™ loggers are light and easy to handle.

They operate on the android system, which facilitates upload of history files and current logging activity reporting apps and web pages.

To configure the blasting boxes for a blast, a key logger is required which operates with a one-time pin. As a security measure, any boxes that have not been configured for the blast and bound through the one-time pin on the key logger will not function for that blast. The key logger and the one-time pin are required at the controller for the system to be armed.

After the blast is fired, all loggers and boxes return to a neutral un-configured state.

## PRODUCT SPECIFICATIONS

### FUNCTIONAL FEATURES

#### USER INTERFACE

- Colour touch screen with graphics interface
- Buttons are provided for cold climates

#### COMMUNICATION WITH DETONATORS

- Via an attached pod that facilitates communication with one detonator through a single detonator port, or up to 500 detonators attached to a harness line via sprung-loaded terminals

#### COMMUNICATION WITH BLASTING BOXES

- Bluetooth or cable

#### LOGGER FUNCTIONS

- Logging and programming the firing times to each detonator's non-volatile memory or detonator testing (one at a time, or multiple detonators connected to a harness line)

#### TESTING FUNCTIONS

- Consumption, programmed/not programmed, detonator voltage, missing or intruder (extra/un-programmed) detonators



## PRODUCT SPECIFICATIONS

### PHYSICAL FEATURES

#### TYPE

- Robust Trimble-based Android logger

#### COLOUR

- Yellow

#### SCREEN SIZE

- 13.4 cm (5.3 in)

#### BATTERY

- Li-ion

#### BATTERY CAPACITY

- 6 600 mAh

#### LOGGER-POD MAXIMUM OUTPUT

- 9 V, 50 mA

#### LOGGER MASS

- 480 g (1 lb)

#### NUMBER OF DETONATORS PER LOG FILE

- 6 600 mAh

#### NUMBER OF INTRUDERS THAT CAN BE DETECTED

- 500

### ENVIRONMENTAL FEATURES

#### CONFORM TO SPECIFICATION

- SANS 1717-1: The South African National Standard for: *The design and approval of EDD initiation systems for use in mining and civil blasting applications.*

#### RESISTANCE TO ELECTROSTATIC DISCHARGE

- Electrostatic discharge immunity test ( $\pm 8$  kV contact,  $\pm 15$  kV air)
- Electrical fast transient / burst immunity ( $\pm 2$  kV)

#### CALIBRATION INTERVALS

- Every 2 years from previous certification

#### WATER RESISTANCE

- IP 67

#### DROP TEST

- IEC 60068-2-32:1975 with drops from a height of 500 mm (19.7 in)





## AXXIS™ CENTRALIZED CONTROL BOX



### PRODUCT DESCRIPTION

The AXXIS™ Centralized Control Box is designed for Centralized firing of AXXIS™ Centralized Blasting Boxes.

Additionally, it continuously monitors and has a dedicated uplink with all connected AXXIS™ Centralized Blasting Boxes underground and provides a real-time system status overview.

The real-time data of the system overview can be accessed via the AXXIS™ CBS Graphical User Interface (GUI) or remotely through a web browser.

The system overview allows the status of the system to be known without the need to venture underground to collect information. The information includes pre- and post-blasting data which can assist in decision-making around blasting.

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 110 – 250V<sub>AC</sub> mains supply

### OPERATING TEMPERATURE RANGE

- -5 to +45 °C (23 to 113 °F)

### ENCLOSURE

- Lockable steel
- IP65 rated

### MASS

- 12.5 kg (27.6 lb)

### NUMBER OF BLASTING BOXES PER CONTROL BOX

- 100

### COMMUNICATION

- Copper or fibre network



# AXXIS™ CENTRALIZED BLASTING BOX



## PRODUCT DESCRIPTION

The AXXIS™ Centralized Blasting Box is specifically designed for the AXXIS™ CBS and is remotely controlled from the AXXIS™ Centralized Control Box installed on surface.

The AXXIS™ CBS provides reliable firing of up to 100 AXXIS™ Electronic Delay Detonators (EDDs) connected in parallel. It incorporates a cradle to allow for the reading of AXXIS™ EDD unique identifications (UIDs).

The Box has automatic cable fault tracing and is able to isolate downstream cable faults.

All EDD files are logged on the AXXIS™ CBS Logger and are transferred, via Bluetooth, to the Centralized Control Box

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 110 – 250V<sub>AC</sub> mains supply

### BATTERY LIFE

- 12 hours backup (built-in battery)

### OPERATING TEMPERATURE RANGE

- -5 to +45 °C (23 to 113 °F)

### ENCLOSURE

- Lockable steel, IP65 rated

### MASS

- 6.2 kg (13.7 lb)

### COMMUNICATIONS INTERFACE

- Bluetooth

### NUMBER OF BLASTING BOXES PER CONTROL BOX

- 100

### RANGE BETWEEN BOXES

- 400 m

### COMMUNICATION

- Copper or fibre network.



# AXXIS™ CBS LOGGER



## PRODUCT DESCRIPTION

The AXXIS™ CBS Logger is a portable device that is used to read the unique identifications (UIDs) and allocate delays to the AXXIS™ Electronic Delay Detonators (EDDs) that will be used for blasting.

After the AXXIS™ EDDs are placed in the blasting face, the AXXIS™ CBS Logger can be used to read their UIDs and allocate delays. The delays can be fixed across all the AXXIS™ EDDs or individually allocated depending on the requirements of the user. The UID and delay information can then be transmitted, via Bluetooth, that is connected to the AXXIS™ EDDs. The AXXIS™ CBS Logger is compatible across the CBS range.

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 3.7 V Li-Ion rechargeable battery

### OPERATING TEMPERATURE RANGE

- Operation: -20 to +50 °C (-4 to +122 °F)
- Storage: -40 to +70 °C (-40 to +158 °F)

### THERMAL SHOCK

- -40 to 70 °C (-40 to +158 °F) rapid transition

### SEALING

- IP65

### LOGGING MODES

- Manual / Automatic

### USER INTERFACE

- Touch panel, finger or gloved finger input

### COMMUNICATION INTERFACE

- Bluetooth

### MASS

- 376 g (13.3 oz)





## AXXIS™ PORTABLE CONTROL UNIT



### PRODUCT DESCRIPTION

The AXXIS™ Portable Control Unit is designed as a portable blasting unit, in the event of the main unit being faulty, for controlled centralized firing of the AXXIS™ Centralized Blasting Boxes underground.

The AXXIS™ Portable Control Unit is designed for controlled firing of up to 100 AXXIS™ Centralized Blasting Boxes.

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 110 – 250V<sub>AC</sub> mains supply

### OPERATING TEMPERATURE RANGE

- -5 to +45 °C (23 to 113 °F)

### ENCLOSURE

- Lockable plastic container, IP65 rated

### MASS

- 2.5 kg (5.5 lb)

### NUMBER OF BLASTING BOXES PER CONTROL BOX

- 100



# AXXIS™ CENTRALIZED CONTROL BOX 500



## PRODUCT DESCRIPTION

The AXXIS™ Centralized Control Box 500 is designed for surface controlled Centralized firing of AXXIS™ Centralized Blasting Boxes.

The CBS 500 system can simultaneously configure and fire up to 500 intelligent detonators with each AXXIS™ Centralized Blasting Box. A maximum of 10 000 detonators can be fired per blast.

Two circuits are incorporated in the CBS 500 system; a telemetry circuit for data gathering purposes and blasting circuitry. The circuitries are kept completely separate but integrated into one enclosure for simple installation.

The real-time data of the system overview can be accessed via the AXXIS™ CBS Graphical User Interface (GUI). The information includes pre- and post-blasting data, battery and blasting circuit status, and cable faults.

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 110 – 250V<sub>AC</sub> mains supply

### OPERATING TEMPERATURE RANGE

- -5 to +45 °C (23 to 113 °F)

### ENCLOSURE

- Lockable steel, IP65 rated

### MASS

- 12.5 kg (27.6 lb)

### NUMBER OF BLASTING BOXES PER CONTROL BOX

- 20

### COMMUNICATION

- Copper or fibre network



# AXXIS™ CENTRALIZED BLASTING BOX 500



## PRODUCT DESCRIPTION

The AXXIS™ Centralized Blasting Box is specifically designed for the AXXIS™ CBS. It is remotely controlled and can only be fired from the AXXIS™ Centralized Control Box installed on surface.

The AXXIS™ CBS provides reliable firing of up to 500 AXXIS™ Electronic Delay Detonators (EDDs) connected in parallel, or up to 10 AXXIS™ stoping EDDs. It incorporates a cradle to allow for the reading of AXXIS™ EDD unique identifications (UIDs).

The Box has automatic cable fault tracing and is able to isolate downstream cable faults. All EDD files are logged on the AXXIS™ CBS Logger and are transferred, via Bluetooth, to the Centralized Control Box.

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 110 – 250V<sub>AC</sub> mains supply

### BATTERY LIFE

- 12 hours backup (built-in battery)

### OPERATING TEMPERATURE RANGE

- -5 to +45 °C (23 to 113 °F)

### ENCLOSURE

- Lockable steel, IP65 rated

### MASS

- 6.2 kg (13.7 lb)

### COMMUNICATIONS INTERFACE

- Bluetooth

### RANGE BETWEEN BOXES

- 400 m

### COMMUNICATION

- Copper or fibre or wireless network





# AXXIS™ CENTRALIZED CONTROL BOX WIRELESS



## PRODUCT DESCRIPTION

The AXXIS™ Centralized Control Box Wireless is designed for surface controlled Centralized firing of AXXIS™ Centralized Blasting Boxes.

The CBS Wireless system allows communication between the AXXIS™ Centralized Control Box and AXXIS™ Centralized Blasting Boxes through secure 128-bit encrypted wireless capability and eliminates the need for communication cable down the shaft.

The CBS Wireless system can fire a maximum of 500 detonators connected to each wireless AXXIS™ Centralized Blasting Box and up to a total of 10 000 detonators per blast.

Real time, local and remote monitoring of the system is possible via the AXXIS™ CBS Graphical User Interface (GUI). The information includes pre- and post-blasting data, battery and blasting circuit status.

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 110 – 250V<sub>AC</sub> mains supply

### OPERATING TEMPERATURE RANGE

- -5 to +45 °C (23 to 113 °F)

### ENCLOSURE

- Lockable steel, IP65 rated

### MASS

- 12.5 kg (27.6 lb)

### NUMBER OF BLASTING BOXES PER CONTROL BOX

- 20

### COMMUNICATION

- Wireless network



# AXXIS™ CENTRALIZED BLASTING BOX WIRELESS



## PRODUCT DESCRIPTION

The AXXIS™ Centralized Blasting Box Wireless is designed for the AXXIS™ Centralized Blasting System. It is remotely controlled, and can only be fired from the AXXIS™ Centralized Control Box installed on surface.

The AXXIS™ Centralized Blasting Box Wireless provides reliable firing of up to 500 AXXIS™ Electronic Delay Detonators (EDDs) connected in parallel or up to 10 AXXIS™ stoping EDDs. It incorporates a cradle to allow for the reading of the AXXIS™ EDD unique identifications (UIDs).

The Box has automatic network fault tracing and is able to isolate downstream network faults. All EDD files are logged on the AXXIS™ CBS Logger and are transferred via Bluetooth to the Centralized Control Box.

## PRODUCT SPECIFICATIONS

### VOLTAGE

- 110 – 250V<sub>AC</sub> mains supply

### BATTERY LIFE

- 12 hours backup (built-in battery)

### OPERATING TEMPERATURE RANGE

- -5 to +45°C (23 to 113 °F)

### ENCLOSURE

- Lockable steel, IP65 rated

### MASS

- 6.2 kg (13.7 lb)

### COMMUNICATIONS INTERFACE

- Bluetooth

### RANGE BETWEEN BOXES

- 200 m

### COMMUNICATION

- Wireless network





# EQUIPMENT

(SURFACE)





# MOBILE MANUFACTURING UNITS (MMUs)

E-Series: Emulsion Unit

## PRODUCT DESCRIPTION

BME provides a full range of locally manufactured Mobile Manufacturing Units (MMUs), which cater for all surface mining and quarrying applications. BME's MMUs are capable of pumping and augering the full range of BME's bulk explosives. All MMUs are designed to operate in the demanding environments encountered during normal mining operations. Design parameters include all necessary safety control systems, as well as ease of operation, maintenance, and reliability. BME's MMUs are SABS approved and meet all transportation of hazardous goods legislation [European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)].

## PRODUCT FEATURES

### APPLICATION

The application of the MMU E-Series is in opencast mining and quarrying operations, where there is a requirement for emulsion bulk explosives products

### FEATURES

- PumpPro pump safety system to guard against dead-heading and dry-running
- Closed-loop hydraulic control system guarantees product quality
- Suitable chassis with all standard safety control systems selected for rugged on-bench conditions

### DESIGN FEATURES

- Closed-loop hydraulic system
- Independent pump safety control system (PumpPro)
- Maximum pump rate of 340 kg/min (750 lb/min) on 160 to 310 mm (6.3 to 12.2 in) hole diameter
- Maximum pump rate of 140 kg/min (309 lb/min) on 89 to 127 mm (3.5 to 5 in) hole diameter
- In-cab control system

### PUMP SAFETY FEATURES

- Independent electronic PumpPro pump safety system monitoring and controlling down hole product pumps against:
  - Dead-heading
  - Dry-running
  - Low and high pressures
  - High temperatures
  - In-line bursting disc



# MOBILE MANUFACTURING UNITS (MMUs)

HA-Series: Blend Unit

## PRODUCT DESCRIPTION

BME provides a full range of locally manufactured Mobile Manufacturing Units (MMUs), which cater for all surface mining and quarrying applications. BME MMUs are capable of pumping and augering the full range of BME's bulk explosives. All MMUs are designed to operate in the demanding environments encountered during normal mining operations. Design parameters include all necessary safety control systems, as well as ease of operation, maintenance, and reliability. BME's MMUs are SABS approved and meet all transportation of hazardous goods legislation [European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)].

## PRODUCT FEATURES

### APPLICATION

Units are configured to deliver blended emulsions and Heavy ANFOs to opencast mining operations

### FEATURES

- PumpPro pump safety system to guard against dead-heading and dry-running
- Closed-loop hydraulic control system guarantees product quality
- Suitable chassis with all standard safety features selected for rugged on-bench conditions

### DESIGN FEATURES

- Closed-loop hydraulic system
- Maximum auger rate of 900 kg/min (1 984 lb/min) on blend and ANFO products
- Maximum pump rate of 480 kg/min (1 058 lb/min) on pump-able Heavy ANFO formulations
- In-cab control system

### PUMP SAFETY FEATURES

- Independent electronic PumpPro pump safety system monitoring and controlling down hole product pumps against:
  - Dead-heading
  - Dry-running
  - Low and high pressures
  - High temperatures
  - In-line bursting disc





## STEMMING TRUCK

### PRODUCT DESCRIPTION

BME provides a stemming plant fitted on a Iveco 380 T42 WH 6x6 cab chassis or chassis specified by the customer. The stemming truck is capable of delivering 15 to 18 m<sup>3</sup> (20 to 24 yd<sup>3</sup>) of crushed aggregate. All stemming trucks are designed to operate in demanding environments encountered during normal mining operations. Design parameters to include all necessary safety control systems, as well as ease of operation, maintenance, and reliability. BME's stemming trucks are SABS approved.

## PRODUCT FEATURES

### APPLICATION

The stemming truck has been perfected for opencast mining. This form of stemming will revolutionise stemming practices

### FEATURES

- 600 mm (23.6 in) wide positive drive conveyor
- Custom length placing conveyor to reach either side of truck for stemming
- In-cab control system identical to BME bulk MMUs to control belts and positioning, on/off and amount of stemming to be discharged
- Joystick control of the placing conveyor, inside or outside mounted
- Water spray system to control dust
- A metering system that can determine how much stemming to put in the hole on a metered basis
- Zero waste of aggregate
- Four emergency stops located around vehicle
- Camera system on discharge conveyor and truck rear for positioning and monitoring

### DESIGN FEATURES

- Closed-loop control system
- Variable discharge rate
- In-cab control system
- Joystick control for stemming conveyor

### SAFETY FEATURES

- Complies with Bell Equipment Company South Africa (BECSA) Fatal Risk Company Protocol (FRCP)



# BULK TECHNICAL SUPPORT VEHICLE

## PRODUCT DESCRIPTION

BME provides a technical support vehicle, fitted on a 4.2 L 4x4 Toyota Land Cruiser or vehicle specified by the customer.

The support vehicle is also retrofitted with roll over protection systems (ROPs) and the necessary requirements to operate on all surface mining operations.

The technical support vehicle is fully equipped to provide full technical monitoring capabilities to enable client operations to optimise their blasting.

## PRODUCT FEATURES

### APPLICATION

Application of the Bulk Technical Support Vehicle is to provide an on-bench full technical service on request

### FEATURES

- Borehole caliper to measure hole diameters from 127 mm to 350 mm (5 in to 13.8 in) at a depth of 40 m (131 ft)
- Velocity of detonation (VOD) recorders
- Seismographs
- 3-D face profiling equipment
- High-speed video-photography camera
- Emulsion and ANFO-testing kits
- Bench scale for truck calibration and auditing
- Reactive ground testing technology

### DESIGN FEATURES FOR THE BOREHOLE CALIPER

- In-cab control system
- Dual power supply system
- External backup control system
- Easy access to probe and winch for maintenance

### SAFETY FEATURES

- Complies with Bell Equipment Company South Africa (BECSA) Fatal Risk Company Protocol (FRCP)





# MODULARISED EMULSION PLANTS

## PRODUCT DESCRIPTION

BME Emulsion Plants are designed to be mobile, robust, and user friendly, making them ideally suited for the mining environment. All plants are divided into two primary systems. Steam generation to provide heat for the process and the production modules, which both generate the base solution from dry raw materials and manufacture the emulsions.

With the Emulsion Plants being modular in design we offer processes with two production outputs: The F1 plant, capable of producing 20T of emulsion in an eight hour shift, or the F3 plant, with a production capability of 40T per shift, which is a F1 plant with additional production and steam generation modules.

Most importantly, while all of our plants have been designed to be easily operated and maintained, they also include all the necessary safety controls to provide an operator-friendly work environment.

## PRODUCT FEATURES

### BENEFITS AND FEATURES

- Proven reliability in remote locations
- Ease of installation in remote sites, as the modules are built into standard-sized containers to facilitate transport and handling
- Installed equipment protection devices to minimise safety risks

### SAFETY FEATURES

- All critical pumps are fitted with an independent electronic pump protection system, which monitors and controls operating pressures and temperatures, thus protecting the system from dead-heading and dry-running scenarios
- All critical pumps are further fitted with mechanical pump protection devices to protect the system from a dead-heading scenario
- The boilers are fitted with all the necessary safety devices to minimise the risk of equipment failure, safety incidents and production losses
- Temperature monitoring systems are installed on the solution preparation tanks
- Emergency stops are situated at critical locations throughout the plant



## CRUISER CHARGING UNIT (CCU) HP1700

### PRODUCT DESCRIPTION

BME's Cruiser Charging Unit (CCU) is one of a range of compact charging systems available for use with BME's INNOVEX™ range of emulsion formulations. The Model 2 CCU is fitted with BME's new Mobile Pump Model 2 and Intelligent Control and Recording (ICR) System with recording and reporting functionality. This represents not only the forefront in mechanised emulsion technology, but significantly improves the safety of underground emulsion pump technology.

The positive displacement Mobile Pump on the CCU delivers both a double salt emulsion and sensitising solution mixed in the charging lance before entering the blasthole.

Though CCUs are limited in emulsion carrying capacity to 700 kg (1 540 lb), they possess distinct advantages over traditional mechanised charging units in both mobility and daily operating expenses. This reduction in capital requirements and maintenance costs is made possible through the greatly improved efficiency of the new Mobile Pump over outdated progressive cavity pump technology. In order to allow for ease of use in high operating areas, a hydraulic lifting platform can also be installed on the vehicle.

## PRODUCT FEATURES

### APPLICATION

The CCU was initially developed for use in underground development blasting where it was designed to pump at rates equivalent to traditional emulsion technology. The CCU has also found acceptance in small-scale surface operations.

### FEATURES

- Low capital outlay
- Low operating and maintenance costs on vehicle
- Low maintenance cost on charging unit
- Intrinsically safe pump operation in instances of:
  - Dry-running
  - Dead-heading
- Short lead time for manufacture
- Intelligent Control and Reporting (ICR)

### VEHICLE MODIFICATIONS

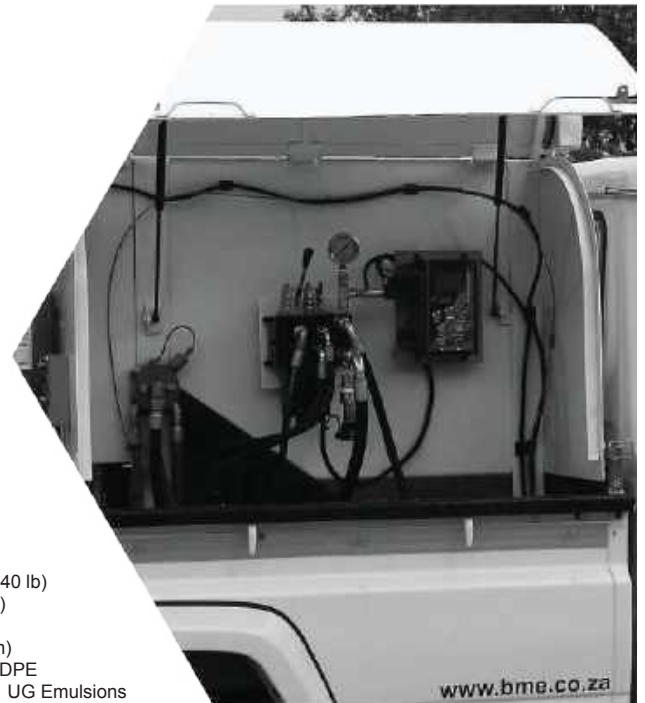
- Suspension upgrade (heavy duty)
- Front and rear impact protection
- Tow bar (drop pin)
- Fire suppression system
- Fire extinguisher (dry powder)
- Stop blocks
- Modified light configuration

### UNDERGROUND VEHICLE MODIFICATIONS

- Emergency brake system (Zips-SABS)
- Rear hydraulic discs (Fail-safe)
- Emissions catalytic purifier
- Emissions fume diluter
- Raised working platform
- Underground light configuration
- Gear lockout selection
  - Low range 4 x 4
  - Gears 1-2, and reverse

### DESIGN FEATURES

- Emulsion tank capacity : 700 kg (1 540 lb)
- Sensitiser tank capacity : 30 L (8 gal)
- Water tank capacity : 50 L (13 gal)
- Pumping rate : 45 kg/min (100 lb/min)
- Max. hose length : 15 m (50 ft) ¾" HDPE
- Compatible emulsions : INNOVEX™ UG Emulsions
- Pre-set mass of emulsion/hole



# EMULSION CHARGING UNIT (ECU)

HP2000

## PRODUCT DESCRIPTION

The Emulsion Charging Unit (ECU) is one of a range of mechanised charging systems developed for use with BME's INNOVEX™ UG emulsion formulations. The unit is fitted with two mobile pumps allowing for maximum safety in charging operations and reduced downtime. The ECU is ideal for vast trackless operations where large quantities of explosives are required within each blast. A basket, raised working platform, or robotic arm, can be fitted to the rear of the charging unit to reach high ends or inaccessible rings.

## PRODUCT FEATURES

### FEATURES

- Double mobile pump configuration
- Increased reliability and reduced downtime
- Low maintenance costs
- Low capital requirements
- Intrinsically safe pump operation in instances of:
  - Dry-running
  - Dead-heading
- High flow rate
- Short lead time for manufacture
- Intelligent Control and Reporting (ICR)

### DESIGN FEATURES

- Emulsion tank capacity : 2 000 kg (4 409 lb)
- Sensitiser tank capacity : 87 L (23 gal)
- Water tank capacity : 87 L (23 gal)
- Pumping rate : 45 kg/min (99.2 lb/min)
- Drive systems : Hydraulic
- Max hose length:
  - No hose lube : 15 m (49.2 ft)
  - With hose lube : 30 m (98.4 ft)
- Compatible emulsions : INNOVEX™ UG Emulsions
- Pre-set mass of emulsion/hole

### PUMP SAFETY FEATURES

- Intrinsically safe pump technology
  - Safe in instances of dry-running
  - Safe in instances of dead-heading
- Pressure bursting disk
- Fail-safe control system
- Charging lance flushing system







# EQUIPMENT

(UNDERGROUND)





# VERTICAL PIPELINE FOR EMULSION EXPLOSIVES



### PRODUCT DESCRIPTION

BME has designed a vertical pipeline system for the bulk transportation of non-sensitised base emulsion explosives from the surface to the underground workings of a mine. The system enables BME's INNOVEX™ UG (Megapump) Lateral to be moved closer to the area where it is required, thus freeing up valuable shaft time. Emulsion can be stored on the surface and/or in the underground working of the mine.

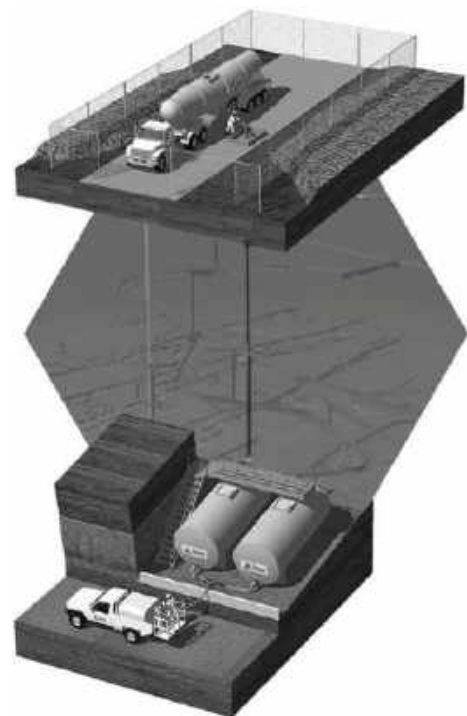
## PRODUCT FEATURES

### FEATURES

- BME's vertical pump line system is a simple design and can be adapted to suit mining conditions
- Electronic monitoring of the system allows for the capturing of all relevant data and information
- Bulk storage has been optimised to suit the road tankers in use and the time taken for the transfer of the emulsion
- In most cases a steel pipeline is used for the vertical transportation of the emulsion.
- The option to pipe the sensitiser in the same borehole is available

### BENEFITS

- Time taken to fill up charging units is greatly reduced
- Travelling time to the underground emulsion filling station is reduced
- Underground emulsion refilling stations can also be used to optimise the output of the charging units and reduce the number of mobile units in use
- Utilisation rates of mobile equipment are improved in instances of decline shafts, where the charging unit is required to drive out from the underground working area to the surface silo area to refill



## MEGACHARGER HP1500

### PRODUCT DESCRIPTION

BME's industry-leading technology has been made possible through its class leading mobile pump technology in partnership with thought leaders in underground equipment manufacturing.

Due to the light weight and low energy consumption of the mobile pump, it has been possible to develop a light-weight, purpose-built carrier to replace high-capital, maintenance-intensive carrier vehicles for use in underground mining operations. Variants of the new technology include both low-profile and standard-profile mechanised carriers with raised working platforms available for high-reach development ends.

## PRODUCT FEATURES

### FEATURES

- Low capital outlay
- Low maintenance requirements
- High flow rate
- Double mobile pump configuration
- Increased reliability and reduced downtime
- Intelligent pump control and data recording system
- Fully ROPS and FOPS certified vehicle
- Two-man lifting basket or compact charging platform
- Intelligent control and reporting (ICR)

### DESIGN SPECIFICATIONS

- Emulsion tank capacity : 1 500 kg (3 307 lb)
- Sensitiser tank capacity : 55 L (14.5 gal)
- Water tank capacity : 55 L (14.5 gal)
- Pumping rate : 45 kg/min (99.2 lb/min)
- Drive system : Hydraulic
- Max hose length
  - No hose lube : 15 m (49.2 ft)
  - With hose lube : 30 m (98.4 ft)
- Compatible emulsions : INNOVEX™ UG Emulsions
- Pre-set mass of emulsion/hole

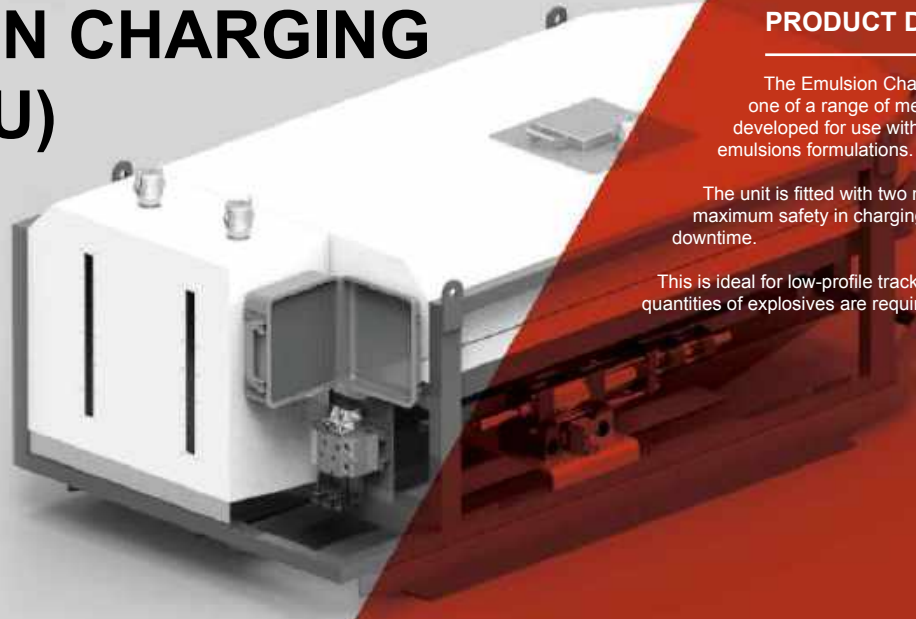
### FEATURES

- Intrinsically safe pump technology:
  - Safe in instances of dry-running
  - Safe in instances of dead-heading
- Pressure bursting disk
- Fail-safe control system
- Charging lance flushing system



# EMULSION CHARGING UNIT (ECU)

LP1500



### PRODUCT DESCRIPTION

The Emulsion Charging Unit (ECU) LP1500 is one of a range of mechanised charging systems developed for use with BME's INNOVEX™ UG emulsions formulations.

The unit is fitted with two mobile pumps allowing for maximum safety in charging operations and reduced downtime.

This is ideal for low-profile trackless operations where large quantities of explosives are required within each blast.

## PRODUCT FEATURES

### FEATURES

- Double mobile pump configuration
- Increased reliability and reduced downtime
- Low maintenance costs
- Intrinsically safe pump operation in instances of:
  - Dry-running
  - Dead-heading
- High flow rate
- Short lead time for manufacture
- Intelligent control and reporting (ICR)

### DESIGN FEATURES

- Emulsion tank capacity : 1 500 kg (3 307 lb)
- Sensitiser tank capacity : 100 L (26.4 gal)
- Water tank capacity : 150 L (39.6 gal)
- Pumping rate : 45 kg/min (99.2 lb/min)
- Drive system : Hydraulic
- Max hose length:
  - No hose lube : 15 m (49.2 ft)
  - With hose lube : 30 m (98.4 ft)
- Compatible emulsions : INNOVEX™ UG Emulsions
- Pre-set mass of emulsion/hole

### PUMP SAFETY FEATURES

- Intrinsically safe pump technology
  - Safe in instances of dry-running
  - Safe in instances of dead-heading
- Pressure bursting disk
- Fail-safe control system
- Charging lance flushing system





## EMULSION CHARGING UNIT (ECU) HP3000



### PRODUCT DESCRIPTION

The Emulsion Charging Unit (ECU) is one of a range of mechanised charging systems developed for use with BME's INNOVEX™ UG emulsions formulations. The unit is fitted with two mobile pumps allowing for maximum safety in charging operations and reduced downtime. The ECU is ideal for vast trackless operations where large quantities of explosives are required within each blast. A basket, raised working platform, or robotic arm, can be fitted to the rear of the charging unit to reach high ends or inaccessible rings.

## PRODUCT FEATURES

### FEATURES

- Double mobile pump configuration
- Increased reliability and reduced downtime
- Low maintenance costs
- High flow rate
- Short lead time for manufacture
- Intelligent control and reporting (ICR)

### DESIGN FEATURES

- Emulsion tank capacity : 3 000 kg (6 614 lb)
- Sensitiser tank capacity : 100 L (26.4 gal)
- Water tank capacity : 200 L (52.8 gal)
- Pumping rate : 45 kg/min (99.2 lb/min)
- Drive system : Hydraulic
- Max hose length:
  - No hose lube : 15 m (49.2 ft)
  - With hose lube : 30 m (98.4 ft)
- Compatible emulsions : INNOVEX™ UG Emulsions
- Pre-set mass of emulsion/hole

### PUMP SAFETY FEATURES

- Intrinsically safe pump technology
  - Safe in instances of dry-running
  - Safe in instances of dead-heading
- Pressure bursting disk
- Fail-safe control system
- Charging lance flushing system



## DEVELOPMENT CHARGING UNIT (DCU)

Rail Bound

### PRODUCT DESCRIPTION

The Development Charging Unit (DCU) is one of a range of compact charging systems developed for use with BME's INNOVEX™ UG emulsion formulations. BME's Model 2 Mobile Pump utilised on the DCU is a positive displacement pump designed to deliver emulsion and sensitising solution simultaneously through the charging lance where it is sensitised to form an explosive on entering the blasthole.

Due to the low energy requirements necessary for the operation of BME's mobile pump technology, the DCU can be powered through a range of energy sources while maintaining a rate of delivery equal to that of mechanised emulsion technology. This places the DCU in a class of its own and allows the unit to function with an independent hydraulic power pack driven by an electric motor, air, or hydro-power.

In order to eliminate down time and the possibility of lost blasts BME's DCU has been designed to facilitate the operation of two mobile pumps on a single charging unit. These are in turn controlled through BME's new Intelligent Control and Recording system (ICR) that allows a predetermined mass of emulsion to be loaded per blasthole.

## PRODUCT FEATURES

### FEATURES

Primarily for use in the underground development environment.

### FEATURES

- Double mobile pump system optional
- Increased reliability and reduced downtime
  - Low maintenance costs
  - Low capital requirements
- Intrinsically safe pump operation in instances of:
  - Dry-running
  - Dead-heading
- High flow rate
- Short lead time for manufacture
- Intelligent Control and Reporting (ICR)

### DESIGN FEATURES

- Emulsion tank capacity : 1 800 L (475.5 gal)
- Sensitiser tank capacity : 40 L (10.6 gal)
- Water tank capacity : 100 L (26.4 gal)
- Pumping rate : 30 kg/min (66.1 lb/min)
- Drive systems : Electric / Air / Hydro
- Max. hose length : 15 m (49.2 ft) [¾" – 1"]
- Compatible emulsions : INNOVEX™ UG Emulsions
- Pre-set mass of emulsion/hole

### PUMP SAFETY FEATURES

- Intrinsically safe pump technology
- Safe in instances of dry-running
- Safe in instances of dead-heading
- Pressure bursting disk
- Fail-safe control system
- Charging lance flushing system



# MAXICHARGER T3000

Rail bound

## PRODUCT DESCRIPTION

The MAXICHARGER is one of a range of compact charging systems developed for use with BME's INNOVEX™ UG emulsion formulations. BME's Mobile Pump Model 2 utilised on the MAXICHARGER is a positive displacement pump designed to deliver emulsion and sensitising solution simultaneously through the charging lance where it is sensitised to form an explosive on entering the blasthole.

Due to the low energy requirements necessary for the operation of BME's mobile pump technology, the MAXICHARGER can be powered through a range of energy sources while maintaining a rate of delivery equal to that of mechanised emulsion technology. This places the MAXICHARGER in a class of its own and allows the unit to function with an independent hydraulic power pack driven by an electric motor, air or hydro-power.

In order to eliminate down time and the possibility of lost blasts BME's MAXICHARGER has been designed to facilitate the operation of two Mobile Pumps on a single charging unit. These are in turn controlled through BME's new Intelligent Control and Recording system (ICR) that allows a predetermined mass of emulsion to be loaded per blasthole.

## PRODUCT FEATURES

### APPLICATION

Primarily for use in the underground development environment.

### FEATURES

- Double mobile pump system
- Increased reliability and reduced downtime
- Low maintenance costs
- Low capital requirements
- High flow rate
- Short lead time for manufacture
- Intelligent Control and Reporting (ICR)

### DESIGN FEATURES

- Emulsion tank capacity : 3 000 kg (6 614 lb)
- Sensitiser tank capacity : 40 L (10.6 gal)
- Water tank capacity : 100 L (26.4 gal)
- Pumping rate : 45 kg/min (99.2 lb/min)
- Drive systems : Electric / Air / Hydro
- Max hose length : 15 m (49.2 ft) [¾" – 1"]
- Compatible emulsions : INNOVEX™ UG Emulsions
- Pre-set mass of emulsion/hole

### PUMP SAFETY FEATURES

- Intrinsically safe pump technology:
  - Safe in instances of dry-running
  - Safe in instances of dead-heading
- Pressure bursting disk
- Fail-safe control system
- Charging lance flushing system





# FILLING STATION

FS3000

## PRODUCT DESCRIPTION

BME's Filling Station is designed to operate in conjunction with BME's Portable Charging Unit (PCU) in narrow reef mining operations. Filling Stations are permanently located near the entrance to operating sections and refilled through the use of mobile transfer cassettes. Through BME's 'Closed Emulsion System', INNOVEX™ UG emulsion is pumped from the Filling Station into re-useable emulsion bags for distribution to working places where the bags are connected to the PCU to load the blastface. The stability of the INNOVEX™ formulation is fundamental to the success of the 'Closed Emulsion System', preventing the generation of waste through the transfer of emulsion and the contamination of emulsion before entering the PCU.

## PRODUCT FEATURES

### TECHNICAL INFORMATION

- Safety release on bag filling head
- Emulsion tank capacity : 3 000 kg (6 614 lb)
- Drive system : Pneumatic / Electric
- Minimum operating pressure : 3 bar (43.5 psi)
- Compatible emulsions : INNOVEX™ UG Emulsions

### DESIGN SPECIFICATIONS

- Low maintenance requirements
- Low capital outlay
- Intrinsically safe pump operation in instances of:
  - Dry-running
  - Dead-heading
- Short lead time for manufacture



# MAXICHARGER

P120

## PRODUCT DESCRIPTION

BME's MAXICHARGER represents the forefront of pumpable emulsion technology available for use in narrow reef mining operations. BME's MAXICHARGER is designed in-house for the delivery in BME's range of INNOVEX™ UG emulsion formulations, increasing the safety of daily blasting practices through their UN 5.1 classification. The MAXICHARGER is a positive displacement pump designed to work with BME's patented 'Closed Emulsion System' but can be modified to run off a traditional emulsion tank set-up for larger development ends. The system eliminates waste while simultaneously delivering a predetermined mass of double salt emulsion and sensitising agent to each blasthole, sensitising the emulsion as it enters the blasthole. The MAXICHARGER is manufactured for rough underground conditions but is compact enough to be carried and operated by mining personnel.

## PRODUCT FEATURES

### APPLICATION

BME's MAXICHARGER is designed primarily for use in the narrow reef mining environment for confined blasting practices, but is compatible with BME's mechanised emulsion systems for larger developments. Due to the unit's flexibility, it can be successfully applied to numerous blasting scenarios.

### FEATURES

- Portable
- Reliable pump control mechanism
- Pre-set mass of explosives per blasthole
- Reduced charging time
- Simplified logistics through UN 5.1 classification
- Short lead time for manufacture
- BME advanced pump control system with data recording and reporting system for increasing operational efficiencies

### SAFETY FEATURES

- Intrinsically safe pump technology
  - Safe in instances of dry-running
  - Safe in instances of dead-heading
- Bursting disk pressure
- Non-flammable, biodegradable hydraulic oil

### DESIGN SPECIFICATIONS

- Pre-set mass of explosives per hole : 820 g (1.81 lb)
- Emulsion capacity (bag configuration) : 120 kg (264.6 lb)
- Emulsion flow rate : 45 kg/min (99.2 lb/min)
- Charging hose length – min : 2.5 m (8.2 ft)
- Charging hose length – max : 30 m (98.43 ft)
- MAXICHARGER P120 dimensions
  - Length : 1.3 m (4.27 ft)
  - Width : 0.77 m (2.53 ft)
  - Height : 0.5 m (1.64 ft)
- Dry weight : 80 kg (176 lb) approx.
- Drive system : Pneumatic / Hydraulic
- Power requirement : 3 HP
- Minimum operating pressure : 5 bar (72.5 psi)
- Maximum operating pressure : 8 bar (116 psi)
- Compressed air requirements : 40 cfm

### SPECIAL FEATURES

- Ability to run with emulsion bags or coupled to larger tanks
- High emulsion capacity : up to six emulsion bags at once: [120 kg (264.6 lb) of emulsion]
- Ability to integrate with high-capacity emulsion tanks fixed to underground carriers
- Can be used with charging lances in excess of 40 m (131.2 ft)
- High loading rate within confined charging operations



# MINICHARGER PCU

Model PP-4

## PRODUCT DESCRIPTION

BME's MINICHARGER PCU represents the forefront of pumpable emulsion technology available for use in narrow reef mining operations. BME's PCU is designed in-house for the delivery of BME's range of INNOVEX™ UG emulsion formulations, increasing the safety of daily blasting practices through their UN 5.1 classification. The PCU is a positive displacement pump designed to work with BME's patented 'Closed Emulsion System'. The system eliminates waste while simultaneously delivering a predetermined mass of double salt emulsion and sensitising agent to each blasthole, sensitising the emulsion as it enters the blasthole. The PCU is manufactured for rough underground conditions but is also light and compact enough to be carried and operated by mining personnel.

## PRODUCT FEATURES

### APPLICATION

BME's PCU is designed primarily for use in the confined narrow reef mining environment, but is compatible with BME's mechanised emulsion systems for confined blasting practices. In order to optimize the use of the PCU in confined environments the PCU can be operated by a single operator minimising labour requirements.

### FEATURES

- Portable and light-weight
- Intrinsically safe design
- Simple and fail-safe pump control mechanism
- Reduced charging time
- Low energy consumption
- Simplified logistics through UN 5.1 classification
- Low operating and maintenance costs
- Short lead time for manufacture

### DESIGN SPECIFICATIONS

- Remote pump activation
- Pre-set mass of explosive per hole : 820 g (1.81 lb)
- Emulsion flow rate : 20 kg/min (44.1 gal/min)
- Charging hose length – min : 2.5 m (8.2 ft)
- Charging hose length – max : 5.5 m (18 ft)
- PCU dimensions
  - Length : 700 mm (27.56 in)
  - Width : 420 mm (16.54 in)
  - Height : 290 mm (11.42 in)
- Dry weight : 14 kg (30.86 lb)
- Drive systems : Air / Hydropower
- Power requirements : < 0.4 Kw
- Minimum operating pressure : 3.2 Bar (320 Kpa) (46.41 psi)
- Maximum operating pressure : 8.0 Bar (800 Kpa) (116.03 psi)
- Compressed air requirements : < 36 L/min (9.51 gal/min)
- High pressure water requirement : < 3 L/min (0.79 gal/min)
- Pre-set mass of explosive per blasthole

### SPECIAL FEATURES

Supply of emulsion to the PCU is maintained through the use of BME's patented 'Closed Emulsion System'. The patented automatic valve system in the re-useable emulsion bag prevents spillage, contamination of emulsion and maximises the service interval of the PCU.

### SAFETY FEATURES

- Intrinsically safe pump technology
  - Safe in instances of dry-running
  - Safe in instances of dead-heading
- Bursting disk pressure
- Fail-safe control system





## ELECTRIC CENTRALIZED BLASTING SYSTEM



### PRODUCT DESCRIPTION

The BME Electric Centralized Blasting System (CBS) provides continuous near real-time local system monitoring with remote access monitoring capabilities.

The continuous monitoring feature built into the system ensures that an up-to-date Centralized Blasting System status and overview are available. This feature greatly improves the pre- and post-blasting decision-making process.

It also provides section and / or level isolation and data information from the connected blasting boxes. Continuous out-going monitoring of the downstream blasting boxes for short circuit and earth leakage detection.

## PRODUCT FEATURES

### FEATURES

- The Centralized Blasting System, which is modular in design, consists of:
  - A Centralized Control Box which is installed on surface,
  - Several Centralized Section Boxes (one for each level / section),
  - Centralized Blasting Boxes located at blasting points throughout the mine.
- The outgoing supply cable is independently fed from inter-level cable during the monitoring mode and enables easy fault finding.
- Information and data downloading occurs within the blasting boxes.
- The system operates over a wide supply voltage range of 160 - 250V<sub>AC</sub>.

### SAFETY FEATURES

- Central point for blasting (centralized blasting), with the blasting signal power available from only this one point (surface control room)
- Can be individually isolated from the supply cable network using the key switch
- Unit will only fire if it is connected to a CBS
- The firing key is removable in the OFF position only, ensuring that unauthorised firing cannot take place
- Blasting Box enclosure cannot close with firing key in position
- Firing cannot be initiated when either a cable fault or an alarm is set
- The cable fault and alarm condition must be cleared prior to switching to ready mode
- If the mains is interrupted at any time the alarm light and buzzer are activated, and remain activated until the reset button is pressed











# FOR EXPLOSIVES SERVICES AND ADVICE

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# CONTACT BME

## BME

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