

NON-ELECTRICAL DETONATOR - EXSANEL

EXSANEL is the new non-electrical detonator, manufactured with components of the highest quality and under the most stringent international technical specifications. Used for accurate and safe initiation of detonator-sensitive explosives (high explosives).

EXSANEL consists of a No. 12 blasting cap, one shock tube with high resistance to traction and abrasion, one plastic resistant "J" connector and label. Has two identification points (on clip and on label).

Advantages:

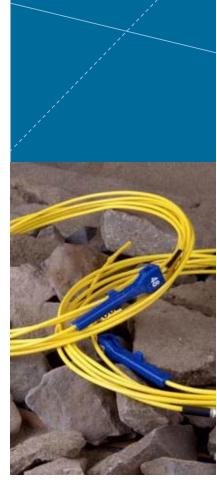
- Movement of fragmented rock to the planned free face.
- Direction of movement of the blasted rock as designed.
- Larger number of delays necessary for blasting sequence design. This minimizes vibrations.
- Better control over fly rock design.
- Better delay time range necessary for the required fragmentation.
- The EXSANEL non-electrical detonator allows a high level of safety against static electricity initiation, stray currents and radiofrequency transmission.
- Includes high resistance to traction and to abrasion, and reliability in transmission of the signal inside the shock tube.

Recommendations for Use:

- Cutting the tube is not recommended, as moisture could seep in, limiting initiation.
- Do not apply tension, twist or stretch the tube, as it may cause malfunctioning.

Technical specifications

| Blasting Cap | |
|------------------------|-------------------------|
| Explosive charge | |
| PETN | 780 mg |
| Lead azide | 150 mg |
| Power | 12 |
| Esopo | 9 mm (min) |
| Trauzl | 32 cc (min) |
| Shock Test | 2 kg a 0.9 m (does not |
| Diameter | 7.5 mm |
| Shell Length | From 53.3 mm to 99.6 mm |
| Shock Tube | |
| Outer | 3.0 mm |
| Internal diameter | 1.1 mm |
| Velocity | 2,000 m/s |
| Resistance to traction | 16 kg min |
| Elongation | 160 % min |



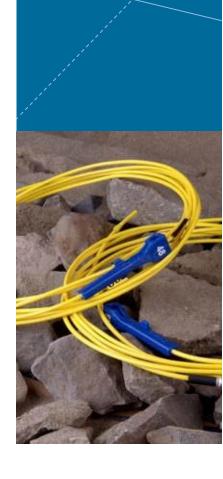


NON-ELECTRICAL DETONATOR- EXSANEL

| PIT, BREASTING, R | OCK | | | |
|-------------------|-------|--|--|--|
| SERIES | DELAY | | | |
| ~ | (MS) | | | |
| EXSANEL N° 1 | 25 | | | |
| EXSANEL N° 2 | 50 | | | |
| EXSANEL N° 3 | 75 | | | |
| EXSANEL N° 4 | 100 | | | |
| EXSANEL N° 5 | 125 | | | |
| EXSANEL N° 6 | 150 | | | |
| EXSANEL N° 7 | 175 | | | |
| EXSANEL N° 8 | 200 | | | |
| EXSANEL N° 10 | 250 | | | |
| EXSANEL N° 12 | 300 | | | |
| EXSANEL N° 14 | 350 | | | |
| EXSANEL N° 16 | 400 | | | |
| EXSANEL N° 18 | 450 | | | |
| EXSANEL N° 20 | 500 | | | |
| EXSANEL N° 24 | 600 | | | |
| EXSANEL N° 28 | 700 | | | |
| EXSANEL N° 32 | 800 | | | |
| EXSANEL N° 36 | 900 | | | |
| EXSANEL N° 40 | 1,000 | | | |
| | | | | |

| FRONTS | | | | | |
|----------------|---------------|--|--|--|--|
| SERIES | DELAY (MS) | | | | |
| EXSANEL N° 1 | 25 | | | | |
| EXSANEL N° 8 | 200 | | | | |
| EXSANEL N° 16 | 400 | | | | |
| EXSANEL N° 48 | 1,200 | | | | |
| EXSANEL N° 56 | 1,400 | | | | |
| EXSANEL N° 72 | 1,800 | | | | |
| EXSANEL N° 92 | 2,400 | | | | |
| EXSANEL N° 120 | 3,000 | | | | |
| EXSANEL N° 140 | 3,800 | | | | |
| EXSANEL N° 180 | 4,600 | | | | |
| EXSANEL N° 220 | 5,500 | | | | |
| EXSANEL N° 240 | 6,400 | | | | |
| EXSANEL N° 288 | 7,400 | | | | |
| EXSANEL N° 340 | 8,500 | | | | |
| EXSANEL N° 400 | 9,600 | | | | |
| | | | | | |

| | Time | | | | | |
|--------|-------|--|--|--|--|--|
| Series | (MS) | | | | | |
| 1 | 25 | | | | | |
| 2 | 50 | | | | | |
| 3 | 75 | | | | | |
| 4 | 100 | | | | | |
| 5 | 125 | | | | | |
| 6 | 150 | | | | | |
| 7 | 175 | | | | | |
| 8 | 200 | | | | | |
| 10 | 250 | | | | | |
| 12 | 300 | | | | | |
| 14 | 350 | | | | | |
| 16 | 400 | | | | | |
| 18 | 450 | | | | | |
| 20 | 500 | | | | | |
| 24 | 600 | | | | | |
| 28 | 700 | | | | | |
| 32 | 800 | | | | | |
| 36 | 900 | | | | | |
| 40 | 1,000 | | | | | |
| 48 | 1,200 | | | | | |
| 56 | 1,400 | | | | | |
| 72 | 1,800 | | | | | |
| 92 | 2,400 | | | | | |
| 120 | 3,000 | | | | | |
| 140 | 3,800 | | | | | |
| 180 | 4,600 | | | | | |
| 220 | 5,500 | | | | | |
| 240 | 6,400 | | | | | |
| 288 | 7,400 | | | | | |
| 340 | 8,500 | | | | | |
| 400 | 9,600 | | | | | |
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Presentation and Packaging

These detonators are packaged in cardboard boxes and the quantity of pieces depends on the shock tube length.

| DD 0D 1100 | | D. 677.6 | PACKAGING 1.1. B | | | NET | GROSS | EXTERIOR |
|----------------|-------|-----------|------------------|-------------|--------|-------|--------|--------------------|
| PRODUCT | | PACKG. | | | | WEIG | WEIGHT | DIMENSIONS |
| DESCRIPTION | UNIT. | BOX | CONTENTS | CAPACITY | PERIOD | HT kg | ka | cm |
| EXSANEL 3.0 m | Piece | Cardboard | 40 rolls x 5 | 200 Pieces. | Series | 7.8 | 9.1 | 53.7 x 31.4 x 35.0 |
| EXSANEL 4.2 m | Piece | Cardboard | 40 rolls x 5 | 200 pieces | Series | 9.3 | 10.6 | 53.7 x 31.4 x 35.0 |
| EXSANEL 6.5 m | Piece | Cardboard | 20 rolls x 5 | 100 pieces | Series | 5.8 | 7.1 | 53.7 x 31.4 x 35.0 |
| EXSANEL 8.0 m | Piece | Cardboard | 20 rolls x 5 | 100 pieces | Series | 5.8 | 7.1 | 53.7 x 31.4 x 35.0 |
| EXSANEL 10.2 m | Piece | Cardboard | 20 rolls x 5 | 100 pieces | Series | 8.2 | 9.5 | 53.7 x 31.4 x 35.0 |
| EXSANEL 15.0 m | Piece | Cardboard | 80 spools at 8 | 80 pieces | Series | 7.2 | 8.5 | 53.7 x 31.4 x 35.0 |
| EXSANEL 18.0 m | Piece | Cardboard | 50 spools at 8 | 50 pieces | Series | 7.2 | 8.5 | 53.7 x 31.4 x 35.0 |
| EXSANEL 21.6 m | Piece | Cardboard | 50 spools at 8 | 50 pieces | Series | 7.2 | 8.5 | 53.7 x 31.4 x 35.0 |
| EXSANEL 30.6 m | Piece | Cardboard | 40 spools at 8 | 40 pieces | Series | 7.2 | 8.5 | 53.7 x 31.4 x 35.0 |

Ask Exsa for other presentation formats.

Storage and Warranty

Kept in its original packaging and stored under normal temperature and moisture conditions, in accordance with applicable laws and provisions, the product is warranted for 24 months from the manufacturing date.

Never place by heat sources, machinery or vehicles in operation, combustible or flammable materials, acids or alkali, electric power lines or close to houses, offices or urban areas. Stack the boxes safely and steadily avoiding, heat, shock and impact.

Transportation

CLASS: 1.1 B UN 0360



DISCLAIMER OF LIABILITY

These explosives have been inspected and found to be in good condition prior to packaging and/or delivery thereof. These explosives must be stored in a cool, dry and well-ventilated place, and be handled and transported in accordance with applicable laws.

Accordingly, as from being delivered to the purchasers, the manufacturer shall not be liable for the safety of these explosives or for obtaining any results sought, whether express or implied. As from the delivery of these explosives, the purchasers thereof shall be liable for any and all risks and liability, regardless of their nature, for any accidents, losses, property or personal damages (including death), whether direct, indirect, special and/or consequential or of any other nature arising from the use of these explosives.