**Technical Data Sheet**

**Senatel™ Pyrosplit™**

**Australia**

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### Technical Properties

<table>
<thead>
<tr>
<th></th>
<th>1.18g/cc</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal Density</strong></td>
<td>1.18g/cc</td>
</tr>
<tr>
<td><strong>Relative Effective Energy</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Relative Weight Strength</strong></td>
<td>108%</td>
</tr>
<tr>
<td><strong>Relative Bulk Strength</strong></td>
<td>159%</td>
</tr>
<tr>
<td><strong>Minimum Velocity of Detonation</strong></td>
<td>6.5km/s</td>
</tr>
</tbody>
</table>

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### Description

Senatel™ Pyrosplit™ detonator sensitive emulsion explosive is internally traced with 10 g/m detonating cord that ensures fast and complete detonation.

The product is also centrally traced with a robust polyester rope to provide in-hole support and facilitate easy deployment. The product includes a 5m rope for lowering and supporting the product, and a 400mm detonating cord tail to facilitate downline attachment.

The emulsion is white in colour with a putty-like consistency. It is packaged in continuous plastic film and double clipped at 400 mm intervals.

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### Application

Senatel™ Pyrosplit™ is designed for surface mining operations where a continuous length of decoupled explosive charge is required. Senatel™ Pyrosplit™ suits perimeter blasting applications such as smooth wall blasting, trimming and pre-splitting.

Senatel™ Pyrosplit™ is specifically designed for blasting in hot and/or reactive ground.

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### Key Benefits

- Ability to blast safely in hot and reactive ground conditions.
- The small diameter, high velocity of detonation, and low decoupled energy of Senatel™ Pyrosplit™ minimises blast damage to the walls leaving behind a smooth profile with minimal overbreak.
- Senatel™ Pyrosplit™ is water resistant and can be used in wet and dry blastholes.

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### Recommendations for Use

#### Blasthole Depth

Senatel™ Pyrosplit™ is suitable for use in holes up to 36 m. For deeper blastholes please consult your local Orica technical representative.

#### Priming and Initiation

Requirements for Senatel™ Pyrosplit™ are influenced by the temperature of the application.

Refer to the table below for recommendations:

<table>
<thead>
<tr>
<th>Hole temp (°C)</th>
<th>&lt;70</th>
<th>71 - 100</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sleep Time</strong></td>
<td>See Note^4</td>
<td>8 hours max.^5</td>
</tr>
<tr>
<td><strong>In-hole &amp; Surface initiation</strong></td>
<td>Exel™ MS</td>
<td>Cordtex™ Pyrocord</td>
</tr>
<tr>
<td></td>
<td>Exel™ Enduradet™</td>
<td>40 RDX LS detonating cord</td>
</tr>
<tr>
<td></td>
<td>Cordtex™ detonating cord (5g/m or more)</td>
<td></td>
</tr>
<tr>
<td><strong>Trunk Line Connection</strong></td>
<td>Cordtex™ detonating cord (5g/m or more)</td>
<td>Cordtex™ Pyrocord</td>
</tr>
</tbody>
</table>

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**Senatel™ Pyrosplit™** must not be used at hole temperatures greater than 100°C.

Senatel™ Pyrosplit™ may be top (preferable) or bottom initiated by an electric, electronic, or Exel™ detonator of No. 8* strength. It may also be initiated by a surface detonating cord line of 5 g/m or greater, when correctly attached as per Figure 1.

**Cutting to Length**

If length adjustment is required for Senatel™ Pyrosplit™, it should only be cut between the clips using an approved detonating cord cutter.

**Charging**

Initial recommendations are to use 32mm Senatel™ Pyrosplit™ in 76mm – 100mm diameter blastholes.

When blastholes are greater than 100 mm in diameter; two or more lengths of Senatel™ Pyrosplit™ may be combined side by side to increase charge weight.

These are only initial recommendations. The user must take into account the fact that successful pre-split or perimeter results are dependent upon selecting the correct combination of blasthole diameter, spacing and in-hole explosive energy to match the rock type being blasted.

**Recommended Connection Knots for Detonating Cord**

For extending trunklines and downlines, cord should be tied together with a reef knot (Figure 1). The knot should be 150 mm from each cut end and pulled tight, with free ends taped back along the cord to ensure positive contact. For attaching downlines to a surface trunkline, connections should be made using a double wrap clove hitch or double half hitch (Figure 1).

For ground temperatures between 70°C to 100 °C; Cordtex™ Pyrocord must be used for connecting short lengths in-hole and to trunk line.

![Figure 1 – Approved knots for detonating cord, from left to right: Reef knot, Double Wrap Clove Hitch, Double Half Hitch](image-url)

All connections should be tight and made at right angles to minimise the chance of “approach”-type cut off failures.

For more detailed information regarding the use of detonating cord, refer to the manufacturer’s Technical Data Sheet.

The same recommended knot types can be used for creating strong and reliable connections in the supporting rope if required.

**Recommended techniques for joining Senatel™ Pyrosplit™ charge to surface trunkline**

When connecting Senatel™ Pyrosplit™ to a 5 g/m or greater downline; a safe and reliable join can be obtained by utilising the exposed 400mm 10 g/m cord tail, or by exposing a length of the 10 g/m centre cord if you are modifying a length with no cord tail, (taking care to not damage it) and attaching the downline with a reef knot as shown in Figure 2.
Joining two or more Senatel™ Pyrosplit™ lengths together to increase the length of the charge

Two sections of Senatel™ Pyrosplit™ can be joined together to make a longer single charge. The two ends should have the centre cord and rope exposed so that they may be joined with a reef knot as shown in Figure 4 below.

**Figure 2 – Reef knot connection technique**

It is recommended that a support rope be used to redirect the stresses, associated with the weight of the charge, away from the detonating cord and its connections. For this reason, Senatel™ Pyrosplit™ contains a length of centrally traced supporting rope which is of an adequate size to safely hold the suspended load and secure it at the collar of the blasthole to prevent slumping of the charge or the trunkline.

A wooden stake or similar should be used across the collar of the blasthole to secure the support rope.

Care should be taken when charging to ensure that Senatel™ Pyrosplit™ charges reach the desired position in each blasthole and does not become twisted and “hung up” in the hole or end up slumping on the bottom of the hole.

**Sleep-Time Within Blastholes**

In dry blastholes, given that the explosives packaging is undamaged, Senatel™ Pyrosplit™ may be charged and fired several months later (provided the product remains within its recommended shelf life).

| Reactive Ground / Hot & High Temperature Blasting | Maximum sleep time 8 hours |
| Un-Reactive Ground / Temperature < 55°C | Maximum sleep time 14 days |
The maximum sleep times are indicative only. Actual sleep time is to be determined by measured in-hole temperature, reactive ground testing and initiation system.

In wet blastholes, sleeping of the explosive is not recommended due to seepage of water into any exposed ends of the detonating cord. If in doubt when using Senatel™ Pyrosplit™, contact your local Orica technical representative.

**Re-Entry Period after Firing**

When using packaged explosive and detonating cord systems in pre-split applications, consideration must be given to increasing the routine re-entry period after firing. In pre-split applications rare incidents of post-blast events have been observed. In most instances these events have been in the form of flaring or rumbling of the muckpile.

Post blast events typically occur seconds after the blast, but events have been noted after several minutes. One event occurred nearly 30 minutes after the blast. If holes are stemmed, additional care must be taken in setting re-entry times. The use of stemming has been seen to increase the period between the shot and any post blast events. Where holes are stemmed it is also recommended that no potentially combustible materials are used, and re-entry periods must account for any post detonation fumes being trapped in the muckpile. Please consult your local Orica Technical Representative for advice.

**Reactive Ground and Ground Temperature**

Senatel™ Pyrosplit™ has been specifically designed for suitability in hot and/or reactive ground blasting. Senatel™ Pyrosplit™ incorporates ingredients to inhibit exothermic sulphide reactions, which have been known to occur between explosives and ground containing sulphides or other reactive material.

Where Senatel™ Pyrosplit™ is used in hot ground; all holes must be temperature logged prior to loading to ensure adequate safety margins. Consult your local Orica technical representative for further information.

The degree of heat and reactivity is determined by Orica standard temperature and reactive ore tests. Hazardous

**Packaging**

Senatel™ Pyrosplit™ is packaged in continuous film and double clipped every 400 mm. Senatel™ Pyrosplit™ packaging cases and film are colour highlighted in lime green. Each case contains one continuous length.

The product is available in the following configurations to match your bench heights or allow rapid customisation:

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Continuous Charge Length (m)</th>
<th>Nominal Weight Per Case (kg)</th>
<th>Nominal Weight Per 400mm cartridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>25.2</td>
<td>21.3</td>
<td>355g</td>
</tr>
</tbody>
</table>

**Storage and Handling**

**Product Classification**

Authorised Name: Senatel™ Pyrosplit™

Proper Shipping Name: Explosive, Blasting, Type E

UN No: 0241

Class: 1.1D

All regulations pertaining to the handling and use of such explosives apply.

**Storage**

Store Senatel™ Pyrosplit™ in a suitably licensed magazine for Class 1.1D explosives. The cases should be stacked in the manner designated on the cases.

Senatel™ Pyrosplit™ has a storage life of up to 18 months in an approved magazine; however exposure to hot or cold extremes may cause the product to deteriorate prematurely.

**Disposal**

Disposal of explosive materials can be hazardous. Methods of safe disposal of explosives may vary depending on the user’s situation. Please contact an Orica Technical Services Representative for information on safe practices.
Safety
The post detonation fume characteristics of Senatel™ Pyrosplit™ make the product suitable for surface blasting applications. Users should ensure that adequate ventilation is provided prior to re-entry into the blast area.

Senatel™ Pyrosplit™ can be initiated by extremes of shock, friction or mechanical impact. As with all explosives, Senatel™ Pyrosplit™ should be handled and stored with care. Senatel™ Pyrosplit™ does not burn easily, but it must be kept clear of flame and excessive heat.

Explosives based on Ammonium Nitrate such as Senatel™ Pyrosplit™ may react with sulphides in the ground and create potentially hazardous situations. Orica accepts no responsibility for any loss or liability arising from use of the product in ground containing sulphides or other reactive material.

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Emergency Telephone Numbers
Within (country): 1800 033 111
Outside (country): +61 3 9663 2130

Notes:
(1.) REE is the Effective Energy relative to ANFO at a density of 0.8 g/cc. ANFO has an effective energy of 2.30 MJ/kg. Energies quoted are based on ideal detonation calculations with a 100 MPa cut-off pressure.
(2.) VOD will depend on application including explosive density blasthole diameter, temperature and degree of confinement. The minimum VOD quoted is based on unconfined test firing data and is influenced by the presence of detonating cord and emulsion in the product.
(3.) Reactive ground and elevated temperature as defined in the Australian Explosives Industry Safety Group (AEISG) Code of Practice for Elevated Temperature and Reactive Ground.
(4.) Maximum sleep time to be determined by measured in-hole temperature, reactive ground testing and initiation system.
(5.) Sleep time to be determined as in Note 4 with a maximum limit set by the resistance rating of the product (8hrs at 71°C – 100°C).