Description
Subtek™ Velcro bulk emulsion explosive is a primer sensitive pumped explosive which has the appearance of an opaque fluid, similar in viscosity to heavy grease. Subtek™ Velcro has excellent water resistance as an inherent characteristic of an emulsion explosive.

Application
Subtek™ Velcro is manufactured at the blast site from an Orica designed underground pumping unit. This combines non-explosive emulsion with sensitiser to deliver the water resistant explosive product into the blasthole. The density of the final product can be varied to suit ground conditions or blast design. Subtek™ Velcro is specifically designed for use in upholes and is also suitable for downholes and development headings.

Key Benefits
- Subtek™ Velcro has been designed specifically to provide enhanced retention in upholes in underground mining.
- The final product density of Subtek™ Velcro can be varied to match desired product performance criteria.
- Subtek™ Velcro pumped emulsion reduces spillage and with excellent water resistance, minimises nitrate leaching and the resultant environmental impact.
- Subtek™ Velcro provides fully coupled explosive to maximise blasting outcomes.
- The increased speed of charging and reduced post-blast fumes when using Subtek™ Velcro, dramatically improves stope turnaround time.
- Subtek™ Velcro reduces potential for sulphide dust explosions.
- Occupational Health & Safety issues around the handling and storage of packaged products is eliminated.

Recommendations for Use
Blasthole Charge Length
Subtek™ Velcro is suitable for use in holes of up to 50 m in length, depending on hole diameter, inclination and presence of water. Mechanical retention devices may be required under certain circumstances. For use in downholes please contact Orica Technical Services Personnel for further information.

Technical Properties

<table>
<thead>
<tr>
<th>Product</th>
<th>Subtek™ Velcro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (g/cm³) (1)</td>
<td>0.8 0.9 1.0 1.1 1.2</td>
</tr>
<tr>
<td>Minimum Blasthole Diameter (mm) (2)</td>
<td>38 38 38 38 42</td>
</tr>
<tr>
<td>Hole Type</td>
<td>Wet and dry</td>
</tr>
<tr>
<td>Delivery System</td>
<td>Pumped</td>
</tr>
<tr>
<td>Typical VOD (km/s) (3)</td>
<td>4.5 4.9 5.3 5.7 6.2</td>
</tr>
<tr>
<td>Relative Weight Strength (%) (4)</td>
<td>72 78 85 92 98</td>
</tr>
<tr>
<td>Relative Bulk Strength (%) (4)</td>
<td>72 89 106 127 147</td>
</tr>
<tr>
<td>Heat of explosion (MJ/kg) (6)</td>
<td>2.99</td>
</tr>
<tr>
<td>CO₂ Output (kg/t) (5)</td>
<td>183</td>
</tr>
<tr>
<td>Sleep time (months)</td>
<td>3</td>
</tr>
</tbody>
</table>

Priming and Initiation
Subtek™ Velcro can be reliably initiated using a Pentex™ primer or equivalent in conjunction with an Orica non-electric or electronic detonator. Pentex™ primers must be appropriate to the blasthole size. Use of detonating cord with Subtek™ Velcro is not recommended. Contact Orica Technical Service Personnel for further information.

Charging
Charging is carried out using specialised proprietary underground pumping equipment. Retention of the explosive in a blasthole will depend on hole diameter, inclination, cleanliness of the hole and presence of water. Contact Orica Technical Service Personnel for further information.

Sleep-Time within Blastholes
The recommended maximum sleep time is 3 months. Sleep time is dependent on factors such as hole diameter, density, ground water conditions, initiation system and mining method. Orica Mining Services Technical Personnel should be consulted if special conditions exist.

Gassing
The gassing rate of Subtek™ Velcro is temperature dependent. Typical gassing time is approximately 30 minutes at 30 °C. Sixty minutes should be allowed between loading and firing blastholes at 25 °C.

**Ground Temperature**
These products are available for use in ground temperatures 0 °C to a maximum of 55 °C. If your application requires you to operate outside this temperature range, please contact your local Orica Account Manager.

**Storage and Handling**

**Product Classification**

- **Authorised Name:** Subtek™ Velcro
- **Proper Shipping Name:** Explosive, Blasting, Type E
- **UN No.:** 0241
- **Classification:** 1.1D
- **EC Type Certificate:** EXP 1395-004/2019

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

**Disposal**
Disposal of explosive materials can be hazardous. Methods of safe disposal of explosives may vary depending on the user’s situation. Please contact a local Orica representative for information on safe practices.

**Safety**
The post detonation fume characteristics of Subtek™ Velcro make it suitable for underground blasting applications. Users should ensure that adequate ventilation is provided prior to re-entry into the blast area.

Subtek™ Velcro is relatively insensitive to accidental initiation by shock, friction or mechanical impact under normal conditions of use. Detonation may occur from heavy impact or excessive heating particularly under conditions of confinement.

Explosives based on Ammonium Nitrate such as the Subtek™ Velcro may react with pyritic materials 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 pyritic or other reactive material.

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**Notes**

1. Nominal Density Only.
2. Contact your local Orica Representative for further advice on loading at minimum hole diameters.
3. VOD will depend on application including explosive density blasthole diameter and degree of confinement. The VOD range is based on minimum unconfined and calculated ideal.
4. Energies quoted are based on ideal detonation calculations with a 100 Mpa cut off pressure. Non-ideal detonation energies are also available on request. These take account of blasthole diameter, rock type and explosive reaction behaviour.
5. Carbon dioxide is the main greenhouse gas produced. The output is calculated assuming ideal detonation.
6. Calculated at STP.