Description
The Centra™ Gold ES System of sensitised pumped emulsion blends has been designed for use in wet or dry blasting applications. The Centra™ Gold ES System complements the Centra™ Extend dry hole product range.

Application
Centra™ Gold ES is specifically designed for small diameter quarry and construction blasting applications in both wet and dry conditions. Centra™ Gold ES is a low density and lower energy bulk explosive designed for use where charge weight and total energy needs to be managed.

The Centra™ Gold ES System is not suitable for ground containing reactive sulphides. Incorrect application of this product may result in undesirable blast outcomes, such as poor fragmentation or elevated levels of post blast fume.

Key Benefits
- The Centra™ Gold ES System is manufactured and delivered with precise control at a rate to enhance your productivity compared to traditional quarry blasting.
- Centra™ Gold ES is an energetic explosive with proven reliability in the most difficult blasting applications.
- Centra™ Gold ES delivers lower charge weights with reduced energy for sensitive blasting applications.
- Centra™ Gold ES can be used to reduce energy in situations where burden designed for Centra™ Gold products are not realised in the field, resulting in under-burdened blast holes.
- The Centra™ Gold ES System provides fully coupled explosive charges to maximise blasting outcomes.
- The high on bench productivity of the Centra™ Gold ES System means faster delivery and turnaround of shots.
- OH&S issues around the handling and storage of packaged products is eliminated.

Recommendations for Use

Blasthole Charge Length or Blasthole Depth
The Centra™ Gold ES System is suitable for use in blastholes of up to 20 metres in length, depending on hole diameter, product density and presence of water. Please contact Orica Technical Representative for further information.

Technical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Centra™ Gold ES System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (g/cm³)</td>
<td>1.10</td>
</tr>
<tr>
<td>Minimum Blasthole Diameter (mm)</td>
<td>76</td>
</tr>
<tr>
<td>Maximum Blasthole Depth (m)</td>
<td>30</td>
</tr>
<tr>
<td>Maximum Charge Length (m)</td>
<td>26</td>
</tr>
<tr>
<td>Maximum Hole Angle (Degrees)</td>
<td>30</td>
</tr>
<tr>
<td>Hole Type</td>
<td>Wet, dry or dewatered</td>
</tr>
<tr>
<td>Delivery System</td>
<td>Pumped</td>
</tr>
<tr>
<td>Recommended Pentex™ Booster</td>
<td>H (for up to 102mm)</td>
</tr>
<tr>
<td></td>
<td>G T (102mm and above)</td>
</tr>
<tr>
<td>Typical VOD (km/s)</td>
<td>4.1-5.9</td>
</tr>
<tr>
<td>Relative Effective Energy (REE)</td>
<td></td>
</tr>
<tr>
<td>Relative Weight Strength</td>
<td>103</td>
</tr>
<tr>
<td>Relative Bulk Strength</td>
<td>142</td>
</tr>
<tr>
<td>Access Required for Delivery (m)</td>
<td>50 – Hole Depth</td>
</tr>
</tbody>
</table>

Priming and Initiation
The minimum primer for the Centra™ Gold ES System is a Pentex™ H booster for blast holes up to 102mm in diameter. A Pentex™ G L booster should be used in hole diameters 102mm and above. Both boosters should be used in conjunction with an Exel™, uni tronic™ or i-kon™ detonator. Use of detonating cord with the Centra™ Gold ES System is not recommended.

Charging
The Centra™ Gold ES System is delivered by Orica’s Mobile Manufacturing Units (MMU™) ensuring the reliability and productivity of your blasting operations. Centra™ Gold ES is manufactured on the MMU™ and loaded into blastholes on demand.
Gassing Time
Allow at least 20 minutes between loading and stemming blastholes.

Sleep-Time Within Blastholes
Normal quarry practices are to load and fire products on the same day, however, if required the recommended maximum sleep time is 21 days, dependent on factors such as hole diameter, density, ground water conditions and initiation system. Contact your Orica Technical Representative if special conditions exist.

Reactive Ground and Ground Temperature
Reactive Ground(1) - The Centra™ Gold ES System is not suitable for use in reactive ground.

Elevated Temperature(1) - The Centra™ Gold ES System is suitable for use in ground temperatures of 0º up to 55ºC.

If your application requires you to operate outside this temperature range please contact an Orica Technical Representative for further information.

Product Quality
Orica’s bulk emulsion explosives are manufactured and loaded using an ISO9001 accredited quality process. The Centra™ Gold ES System emulsion explosives have been developed by Orica Australia specifically for the quarrying industry using ISO9001 accredited research and engineering processes.

Storage and Handling
Product Classification
Authorised Name: Centra™ Gold ES System
Proper Shipping Name: Explosive, Blasting, Type E
UN No: 0241
Classification: 1.1D

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 an Orica Technical Representative for information on safe practices.

Safety
The Centra™ Gold ES System 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 such as the Centra™ Gold ES System based on Ammonium Nitrate 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.

More detailed information can be found in the product Material Safety Data Sheet.

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Emergency Telephone Numbers
Within (country): 1800 033 111
Outside (country): 61 3 9663 2130
Notes:
(1.) Reactive ground and elevated temperature as defined in the Australian Explosives Industry Safety Group (AEISG) Code of Practice for Elevated Temperature and Reactive Ground.
(2.) Nominal density only.
(3.) Contact your local Orica Technical Representative for further advice on loading holes smaller than 76mm.
(4.) The actual VOD depends on the conditions of use including the diameter of the hole and the degree of confinement. The range quoted refers to unconfined minimum diameter up to calculated ideal VOD.
(5.) REE is the Effective Energy relative to ANFO at a density of 0.8 g/cm³. ANFO has an effective energy of 2.30 MJ/kg. Energies quoted are based on ideal detonation calculations with a 100MPa cut off pressure.
(6.) Clay collar swelling and rock type may reduce the angle of hole that can be loaded.
(7.) The delivery hose is up to 50m long. For wet holes the access required will be 50m minus the hole depth. This will also be the same for Dry holes loaded with Centra™ Gold ES angled no more than 30 degrees.