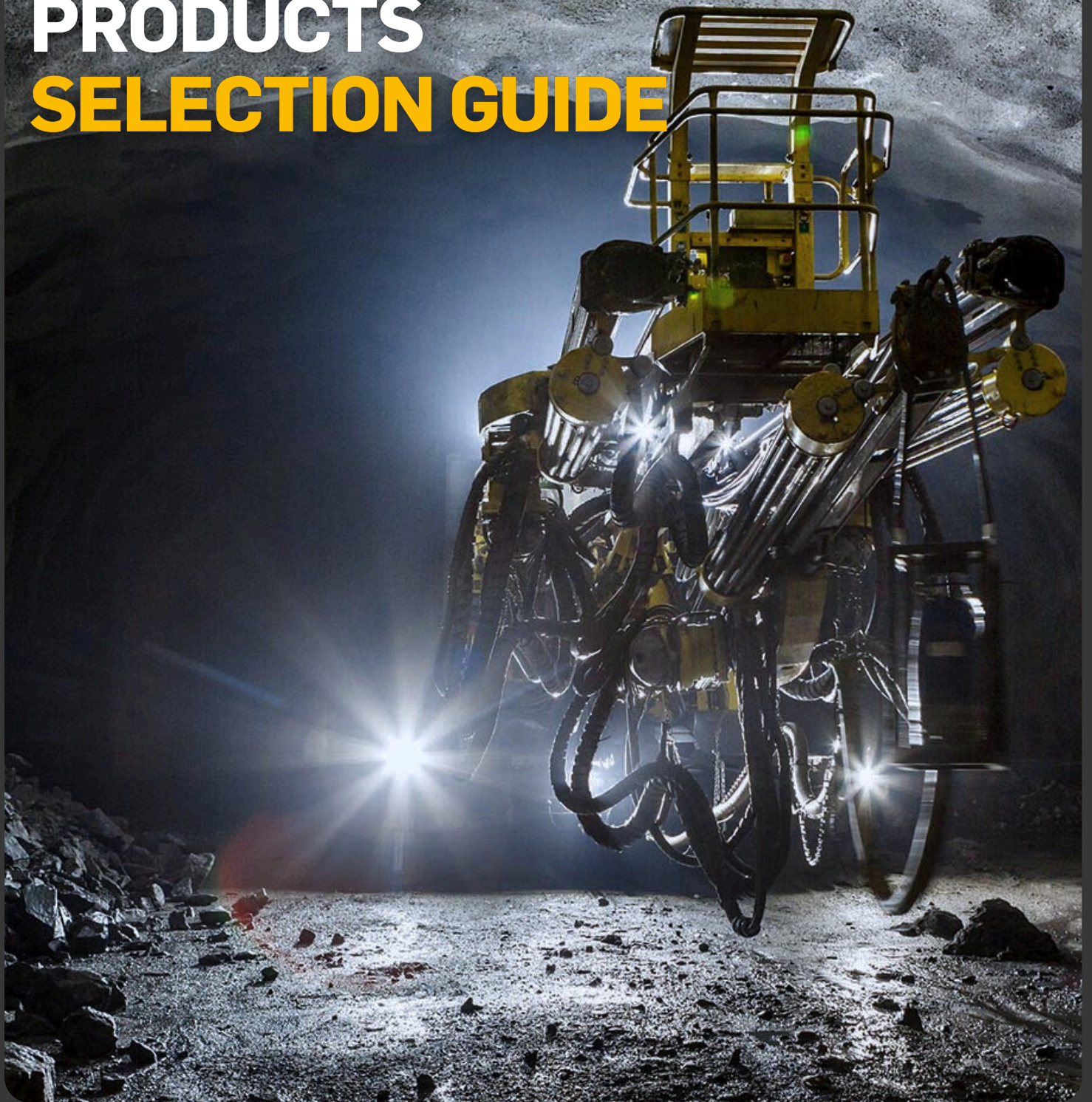



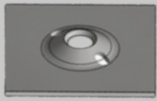
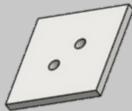

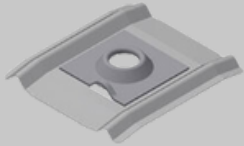

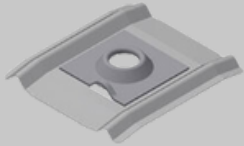
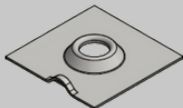
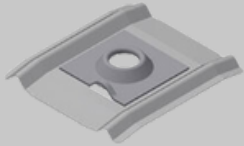
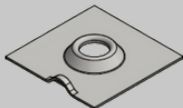






# HARDROCK GROUND SUPPORT PRODUCTS SELECTION GUIDE








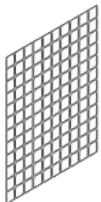



| PRODUCT FAMILY  | PRODUCT NAME            | PRODUCT CHARACTERISTICS  | PRODUCT APPLICATION   |
|---|-------------------------|--|---|
| <b>CHEMICAL BOLTS</b><br>        | Secura Bolt R24/R28     | <ul style="list-style-type: none"> <li>• Solid 22mm/25mm reinforcing bar that is threaded at one end with an R (Nova) thread profile and an integrated 36AF dome torque nut.</li> <li>• Standard lengths 1.8-3m, additional sizes are available upon request.</li> <li>• Design includes a unique paddle system to improve resin mixing providing higher bond strength in large diameter boreholes.</li> </ul>   | <ul style="list-style-type: none"> <li>• Permanent primary support.</li> <li>• Galvanized finish available for corrosive applications.</li> <li>• Primary use is strata reinforcement in underground hardrock mines.</li> </ul>                   |
|   | Secura DB (Debonded)    | <ul style="list-style-type: none"> <li>• Smooth solid bar with paddle on one end. The bolt end is equipped with Nova R thread and an integrated 36AF dome torque nut.</li> <li>• Standard lengths 1.8-3m, additional sizes are available upon request.</li> <li>• Custom alloy steel enables the smooth section of the bar between the anchor point and face plate capable of deforming thereby absorbing large amounts of energy in dynamic grounds.</li> </ul> | <ul style="list-style-type: none"> <li>• Highly effective ground support element in underground installations and tunnels, subjected to large deformations in rock mass such as rock burst and squeezing rock.</li> </ul>                         |
| <b>CHEMICAL BOLT PLATES</b><br> | Crown Plates            | <ul style="list-style-type: none"> <li>• Crown plates are high load bearing capacity plates that provide optimal support in a range of strata conditions.</li> <li>• These plates are typically used with solid (Secura®) bolts.</li> <li>• Available sizes: 150/200mm</li> </ul>  | <ul style="list-style-type: none"> <li>• Primary use is strata reinforcement in underground mines.</li> <li>• Designed to transfer the load onto the rockface and secure the mesh.</li> </ul>   |
|   | Combi Crown Plates      | <ul style="list-style-type: none"> <li>• Combi Crown plate is where a Crown plate is welded onto a strata plate. Combi plates are typically used for meshing application with Secura bolts.</li> </ul>   | <ul style="list-style-type: none"> <li>• Combi Crown plates are available with or without a utility slot for supporting miscellaneous services. Plates can be supplied in black steel or hot dip galvanised.</li> </ul>                           |
| <b>CABLE BOLTS</b><br>          | Twin Strand Cable Bolts | <ul style="list-style-type: none"> <li>• Cable bolt range includes continuous roll or cut to length cable bolts. Available in various lengths and bulb configurations.</li> <li>• Available in 15.2 mm plain and bulbed cable bolts and Superstrand 21.8mm diameter cables.</li> </ul>   | <ul style="list-style-type: none"> <li>• Primary use is hard rock mining.</li> <li>• Bulbs at the top to aid resin capsule mixing. Reinforced bulbs every 1000/500mm down the groutable length of the cable. Tensionable to 25 tonnes.</li> </ul> |

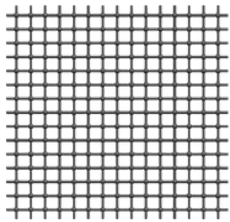
| PRODUCT FAMILY   | PRODUCT NAME  | PRODUCT CHARACTERISTICS  | PRODUCT APPLICATION   |  |   |  |   |  |  |                              |   |  |
|--|---|--|---|--|---|--|---|--|--|------------------------------|---|--|
| <b>CABLE BOLT PLATES</b>   | Dome Plates<br>    | <ul style="list-style-type: none"> <li>High load bearing capacity plates that provide optimal support in a range of strata conditions.</li> <li>Available in various sizes to suit flat/domed Barrel &amp; Wedge type and diameter.</li> </ul>   | <ul style="list-style-type: none"> <li>Dome plate applicable for single strand use, flat plate applicable for single and twin strand cables.</li> <li>Designed to transfer the load onto the rockface and secure the mesh.</li> </ul>   |  |   |  |   |  |  |                              |   |  |
|  | Flat Plates<br>    |  |   | <b>FRICITION BOLTS</b><br> | Strata Bolt   | <ul style="list-style-type: none"> <li>Bolts provide immediate frictional support at the face and can be installed with handheld or mechanised equipment.</li> <li>Pull test collars available for QA.</li> <li>For additional load bearing capacity, the bolts can be post grouted with cement grouts.</li> <li>Diameter available: 34mm, 40mm 47mm</li> </ul>                  | <ul style="list-style-type: none"> <li>Primary use is strata reinforcement in underground mines.</li> <li>Used in the development and production headings for immediate support.</li> </ul>   | HCF Bolt (High Capacity Friction Bolt)   | <ul style="list-style-type: none"> <li>HCF Bolt increased load performance in heavy ground conditions.</li> <li>Diameter available: 47mm</li> </ul>  | <b>FRICITION BOLT PLATES</b> | Combi Plates<br> | <ul style="list-style-type: none"> <li>Combi plates are high load bearing capacity plates that provide optimal support in a range of strata conditions.</li> <li>Combi plates are designed where a dome plate is welded onto a strata plate.</li> <li>Assists in improving mine efficiency by reducing handling multiple plates.</li> <li>Available in: 280x300x1.8mm</li> </ul> |
| <b>FRICITION BOLTS</b><br> | Strata Bolt   | <ul style="list-style-type: none"> <li>Bolts provide immediate frictional support at the face and can be installed with handheld or mechanised equipment.</li> <li>Pull test collars available for QA.</li> <li>For additional load bearing capacity, the bolts can be post grouted with cement grouts.</li> <li>Diameter available: 34mm, 40mm 47mm</li> </ul>                  | <ul style="list-style-type: none"> <li>Primary use is strata reinforcement in underground mines.</li> <li>Used in the development and production headings for immediate support.</li> </ul>   |  |   |  |   |  |  |                              |   |  |
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| <b>FRICITION BOLT PLATES</b>   | Combi Plates<br> | <ul style="list-style-type: none"> <li>Combi plates are high load bearing capacity plates that provide optimal support in a range of strata conditions.</li> <li>Combi plates are designed where a dome plate is welded onto a strata plate.</li> <li>Assists in improving mine efficiency by reducing handling multiple plates.</li> <li>Available in: 280x300x1.8mm</li> </ul> | <ul style="list-style-type: none"> <li>Primary use is strata reinforcement in underground mines.</li> <li>Designed to help prevent loose material from falling between the roof bolt patterns and provide strength to the immediate roof.</li> <li>Available in black and galvanised versions to suit installation conditions.</li> </ul> |  |   |  |   |  |  |                              |   |  |
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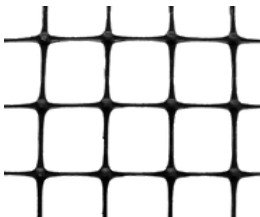
| PRODUCT FAMILY                | PRODUCT NAME   | PRODUCT CHARACTERISTICS   | PRODUCT APPLICATION  |
|-------------------------------|--|---|--|
| <b>LOKSET® RESIN CAPSULES</b> | <p>Classic</p>        | <ul style="list-style-type: none"> <li>The Lokset® resin capsule consists of a reinforced, thixotropic polyester resin mastic in one compartment and an organic peroxide catalyst separated by a physical barrier in the other.</li> </ul>  | <ul style="list-style-type: none"> <li>The Lokset® resin capsule is used primarily as an anchoring medium for Secura Bolts/ Secura DB and Cable Bolts.</li> <li>They provide roof and sidewall support in mines and tunnels.</li> <li>Suitable for Jumbo installation and/or pneumatic hand bolters.</li> <li>Suitable for Trajectaflex or alternative resin capsule shooter systems.</li> <li>The rotation of the bolt during installation ruptures the capsule, shreds the skin and mixes the two components causing a chemical reaction and transforming the resin mastic into a solid anchor.</li> </ul> |
|                               | <p>Advance®</p>     | <ul style="list-style-type: none"> <li>Lokset® Advance® Resin has all the advantages of the Lokset Classic, with extended shelf life of 12 months at 25°C reducing waste and disposal.</li> </ul>   | <ul style="list-style-type: none"> <li>The Lokset® Advance® resin capsule is used as an anchoring support in strata especially where long tendon support is required.</li> </ul>   |
|                               | <p>TooSpeedie®</p>  | <ul style="list-style-type: none"> <li>The Lokset® Toospeedie® is a two-speed resin capsule that is available in variations and combinations from extra-extra slow, to extra fast.</li> <li>Specific percentages of TooSpeedie® components are available on request.</li> </ul>   | <ul style="list-style-type: none"> <li>The Lokset® Toospeedie® resin capsule is used primarily as an anchoring medium for rockbolts and long tendons. They provide roof and sidewall support in mines and tunnels. Suitable for Jumbo installation and/or pneumatic hand bolters.</li> </ul>   |
|                               | <p>X2</p>           | <ul style="list-style-type: none"> <li>Lokset® X2 resin capsules have been developed to enable full encapsulated mechanised resin bolting, utilising the Quick-Chem™ resin capsule insertion system.</li> <li>Profit Quick-Chem™ versions are available to increase installation efficiency and assist waste reduction.</li> <li>The Lokset® X2 system incorporates two resin capsules that are joined and folded in half for packaging. Available in 1.5m X2 and 1.2m X2 lengths.</li> </ul> | <ul style="list-style-type: none"> <li>The Lokset® X2 resin capsules are typically installed using development Jumbos in underground headings with an excavation height of 4–6 m, where hand insertion is not safe or practical.</li> <li>The Lokset® resin capsule is used primarily as an anchoring medium for rockbolts.</li> </ul>   |

| PRODUCT FAMILY   | PRODUCT NAME                               | PRODUCT CHARACTERISTICS  | PRODUCT APPLICATION  |
|--|--|--|--|
| <p><b>QUICK CHEM™ SYSTEM</b></p>  | <p>30mm</p> <hr/> <p>36mm</p>              | <ul style="list-style-type: none"> <li>• Quick-Chem™ is a patented system developed to assist resin capsule installation into boreholes for hardrock bolting.</li> <li>• The Quick-Chem™ system consists of a specially designed cap (Parachute) pre-fit/ suitable for attaching to 30 mm diameter and 36 mm diameter Lokset® resin capsules.</li> <li>• The insertion tube consisting of a threaded R32 adaptor sleeve (that locates in the drill coupling of the Jumbo drifter in seconds) and is secured to a 3-meter length of clear, high strength, flexible plastic tubing.</li> </ul> | <ul style="list-style-type: none"> <li>• <b>Safe</b>; enables resin capsule to be inserted in bolt hole from remote location under supported ground.</li> <li>• <b>Quick</b>; no requirement for lifting baskets or manual resin insertion, capsule can often be placed in insertion tube from operator's cab.</li> <li>• <b>Efficient</b>; up to 200-hole insertions can be achieved from each tube.</li> <li>• <b>Easy to use</b>; clear tubing indicates position of resin capsule.</li> <li>• <b>Robust</b>; strong and flexible insertion tube.</li> <li>• <b>Versatile</b>; can be used with most drill rigs such as Robolters, Jumbo's, Boltec etc and in most rock bolting situations.</li> <li>• <b>Adaptable</b>; can be inserted through mesh and broken ground.</li> <li>• <b>Reliable</b>; assists the resin capsule in reaching the back of the hole undamaged.</li> </ul> |
| <p><b>HYBRID BOLTS</b></p>       | <p>MY BOLT*<br/>(Minova Yielding Bolt)</p> | <ul style="list-style-type: none"> <li>• MY Bolt is an easy to install mechanical combination bolt. Enables immediate support.</li> <li>• Yield design engineered to effectively absorb exceptionally high dynamic loads.</li> <li>• Available in 2.4M &amp; 3M versions. Additional lengths available to suit mine specifications.</li> <li>• Available in HDG version to extend service life.</li> </ul>   | <ul style="list-style-type: none"> <li>• Easy installation with standard Jumbo attachments.</li> <li>• Immediate load bearing capacity on installation.</li> <li>• High load bearing capacity without use of grouts or resin.</li> <li>• A versatile bolt designed to accommodate various rock conditions, including fractured, highly fragile, robust, and seismic environments.</li> <li>• No resin or grout application is necessary, streamlining the installation process considerably. It can be seamlessly hammered into wet and fragmented ground without encountering any complexities or impediments.</li> </ul>   |

| PRODUCT FAMILY  | PRODUCT NAME   | PRODUCT CHARACTERISTICS   | PRODUCT APPLICATION  |
|---|--|---|--|
| <p><b>SELF DRILLING ANCHORS</b></p>  | <p>Carbothix</p>        | <ul style="list-style-type: none"> <li>• Carbothix consists of two resin/hardener components, A and B.</li> <li>• After the two components have been effectively mixed, the resulting viscous emulsion will not absorb any water.</li> </ul>  | <ul style="list-style-type: none"> <li>• When intensively mixed together via a specialised static mixer from the metered pumping system the mixture thickens very quickly to form a tough interpenetrating network of non-porous elastic silicate or organomineral resin.</li> <li>• This minimises leakage from the bolt hole, displaces drilling water helping to ensure full encapsulation.</li> </ul>  |
|   | <p>28, 32 and 38</p>  | <ul style="list-style-type: none"> <li>• The self-drilling anchor system is a bolting solution that enables drilling and grouting in one operation.</li> <li>• The anchor bar features a hollow bore for flushing or simultaneous drilling and grouting. Fitted with a left-hand or right-hand R-thread for easy extension and connection to conventional rock drilling equipment.</li> </ul> | <ul style="list-style-type: none"> <li>• Primary use is strata reinforcement as alternatives to conventional rock bolting systems.</li> <li>• When coupled together, SDA's provide an efficient alternative to long tendon support.</li> <li>• Ideal for use in poor ground conditions and spiling applications.</li> </ul>  |
| <p><b>MESH</b></p>  | <p>Steel</p>          | <ul style="list-style-type: none"> <li>• Multiple configurations of mesh are available including numerous sheet sizes, apertures, wire diameters and black or galvanised wire.</li> </ul>   | <ul style="list-style-type: none"> <li>• Primary use in metal mining and tunneling development used in conjunction with ribbed and friction bolts.</li> <li>• Mesh provides surface support coverage for loose rock.</li> </ul>  |
|   |                       | <ul style="list-style-type: none"> <li>• Ausro straps are yielding straps which allow the straps to yield under load conditions allowing better load distribution between bolts.</li> </ul>   | <ul style="list-style-type: none"> <li>• Ausro straps allow for larger deformation and load distribution as the longitudinal members are able to slip through the looped cross-members, ensuring containment even with large strata movements.</li> <li>• Applicable in unstable ground conditions where seismic activity is present, to improve surface support and to ensure better connection between the surface support and bolts.</li> </ul> |

| PRODUCT FAMILY | PRODUCT NAME | PRODUCT CHARACTERISTICS | PRODUCT APPLICATION |
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|----------------|--------------|-------------------------|---------------------|

|                    |  |  |   |
|--------------------|--|--|---|
| <p><b>MESH</b></p> | <p>GFRP</p>  | <ul style="list-style-type: none"> <li>• GFRP mesh provides surface support coverage for loose rocks between installed bolts.</li> <li>• This mesh complies with standard grid applications while providing the added benefits of durability and cuttability.</li> <li>• The high load capacity at each joint, comparable to welded steel mesh, is unique and makes the design of GFRP grid reinforced RC structures a viable option.</li> <li>• GFRP Mesh is available FRAS rating upon request.</li> </ul> | <ul style="list-style-type: none"> <li>• Primary use is roof support and shotcrete reinforcement in underground mines and tunnels.</li> </ul> |
|--------------------|--|--|---|

|  |  |   |  |
|--|--|---|--|
|  | <p>Tensar®</p>  | <ul style="list-style-type: none"> <li>• Tensar Biaxial Geogrid® mesh is a stiff, lightweight and monolithic geogrid mesh made from flame retardant polypropylene.</li> <li>• The mesh has integral junctions that give strength in two directions and a rectangular rib cross-section with square edges.</li> <li>• Available in black or white UV inhibitor.</li> </ul> | <ul style="list-style-type: none"> <li>• Primary use is roof and rib control and soft bottom reinforcement.</li> <li>• Flexible and can be cut according to the mine site requirements.</li> </ul> |
|--|--|---|--|





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