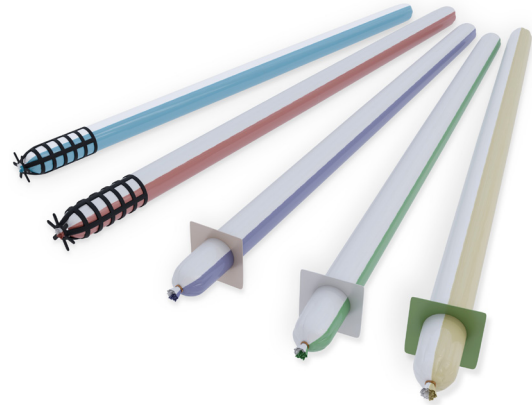


MINOVA

LOKSET® J SERIES

LONG TENDON RESIN CAPSULE



Lokset capsule colours and retainers may differ based on specification.

DESCRIPTION

The Lokset® J series is a long tendon resin capsule that contains specially formulated resin mastics to aid insertion and push through where long tendon support is required (example, up to 8 meters).

The Lokset J series 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. 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.

APPLICATION AND USES

The Lokset J Series Resin Capsules are normally used as an anchoring support in strata where larger annular gaps between bolt and hole diameters are encountered with long tendon strand cables:

- > Intersections
- > Cut throughs
- > Long life roadways e.g. belt roads
- > Secondary support
- > Additional primary support

The capsule can be used with a range of long tendon support cables:

- > HI-TEN Strand cables
- > SuperStrand cables
- > Flexibolts
- > Spinbolts
- > Multicable
- > Megabolts
- > Megastrands
- > Flexicable
- > Cable bolts
- > Flex-bolts

ADVANTAGES

- > Specially formulated resin mastic and catalyst support effective mixing in larger annular gaps, with a unique capsule configuration for consistent performance
- > Flexible installation options – point anchoring with fast-set capsules, or full encapsulation with or without pre-tensioning using fast and slow combinations.
- > Rapid and simple installation, delivering strong, consistent anchorage with high compressive strength and modulus.
- > Performs in wet or underwater conditions, protects against corrosion and remains unaffected by vibration
- > No expansion stresses, making it suitable for weak strata.

TECHNICAL PROPERTIES

Typical insertion properties at 25°C are as follows:

SPEED	¹ SPIN TIME	² HOLD TIME	CAPSULE COLOUR	LABEL COLOUR
J Slow	20 sec	>60 ³ sec	Blue	Blue
J Medium	12 sec	>20 ³ sec	Red	Red

¹ Approximate spin time in seconds

² Minimum hold time in seconds

³ Where high tension loads are applied to the system the hold

The data is based on laboratory testing. Hold times and installation parameters may vary in the field depending on ambient temperature, mining conditions, equipment, hole-to-bolt annulus, and resin age or storage conditions. Each mine site should be evaluated to determine optimal performance.

MECHANICAL DATA

PARAMETER	UNIT	LOKSET J SERIES
Compressive Strength	(MPa)	≥60 (age 24 hours)
Pull out Force	(kN)	≥150 (age 2 hours for >15 Tonnes)

COMPRESSIVE STRENGTH

Tested in accordance with ¹BS 7861: Part 1:1996.
Tested on 40 mm cubes with slow-set resin.

¹ Strata reinforcement support system components used in coal mines: Part 1 - specification for rock bolting

PULL STRENGTH

Tests performed by Wollongong University Dept of Mining and Civil Engineering on a 21.7 mm bolt encapsulated to 250 mm depth in a 35 mm hole with J Series slow set resin.

PUNCHED SHEAR STRENGTH

This test provides excellent correlation with mine pull out tests (without the variances) and is directly related to the strength of the resin. With fast setting resins the test can be performed in a very short time after the resin mixture has gelled (15 seconds).

Measured according to BS 2782 (part 3).

- > The appropriate quantities of resin mastic and catalyst are mixed for six (6) seconds.
- > The resultant mixture is squashed between two uniform flat steel plates and allowed to gel.
- > The plates are taken apart and the cured slice of resin is placed between two steel templates.
- > The device is placed in a tensiometer, and a plunger is forced into a hole in the plates at a predetermined rate, thus pushing a flat circular disc out of the resin slice (i.e. shearing the resin).
- > The force applied to shear the resin is recorded electronically by the tensiometer and converted to shear stress in MPa using the thickness of the disc in mm.

SAFETY INSTRUCTIONS AND LIMITATIONS

Observe the usual precautionary measures for handling chemicals and refer to the Lokset SDS. In case of incorrect anchor selection, wrong hole dimensions or the incorrect anchoring method, i.e., lack of anchor rotation or low rotation speed, the capsule components might be insufficiently mixed. In such cases, the bond strength may be less than the theoretical strength. The capsules should not be used in weak, loose, incoherent or highly porous soil, such as sands and clays. Capsules should not be used in holes with flowing water, with a strong presence of water and near groundwater sources. When working with resin capsules wear, safety gloves, goggles and protective clothing. Do not open or puncture capsules prior to use. If clothes become saturated with any of the capsule's components it is recommended to change into a set of clean clothing. For skin contact, wash thoroughly with soap and water. For detailed safety information, please refer to the corresponding Safety Data Sheet.

APPLICATION METHOD

It is essential that good bolting procedures are followed and the instructions on the box are observed. As a guide, the following steps must be taken:

1. Drill hole to correct diameter, ensuring water/air flush is used. The hole should be clean and free from dust and other loose particles. In Coal mining, 27-28 mm hole diameters are normally preferred with 22 mm core diameter roof bolts or cables. Do not exceed the manufacturer's recommended diameter.
 2. Drill hole to correct length for bolt. The ideal hole length should be at least 100 mm shorter than the bolt, dependent on the bolt/cable being used. Do not deviate from the manufacturers recommended length of hole in relation to the bolt.
 3. Select the correct resin capsule(s) that has been specified for the job
 4. Check that the use by date on the box label has not expired.
 5. The manufacturer's operating instructions for the use of the drilling and insertion machine must be followed. Where pneumatically operated machines are used, it is essential the minimum required air supply pressure is exceeded.
 6. When pre-tensioning and when FR Slow and FR Extra Extra Slow capsules are used together, follow the steps below:
 - Step 1: Insert the slow set (light green) capsule first
 - Step 2: Next, insert the Extra Extra Slow set (light pink) capsule.
- Cable ties may be used to lodge the capsules in the hole and conduit tubes to assist in insertion. Ensure the capsule reaches the top of the hole.
- Usually, the correct length, diameter and number of capsules are inserted to ensure full column encapsulation. Should insertion problems occur then the problem must be investigated.

7. Connect the bolt to the spinning dolly/spanner.
 8. The bolt is pushed and spun at maximum rpm at a constant feed rate through the entire length of the capsule(s). When the top of the hole has reached a further 2 - 4 seconds, spinning will suffice to ensure complete mixing. Total spin time through the capsule and at the top of the hole should not exceed the "approximate spin time" on the box label. It is essential the bolt is pushed and spun to the top of the hole before mixing is completed.
 9. Do not overmix the resin. If mixing continues beyond the recommended spin time and into the gel time, the solidifying chemical may be ground up and destroyed.
 10. The bolt is then held stationary and after the hold time has elapsed the bolt may be tensioned as required. The hold time is the minimum time allowed after completion of the spin time before bolt tensioning can be attempted. In many cases, the hold time will be greater than that listed. Where high tension loads are applied to the system the hold time will be extended significantly. As a rough guide, in laboratory tests, approximately half the ultimate strength of the resin is reached after 30 minutes. The following items must also be checked where hand-held (air-operated) equipment is utilised:
 Clean and dry supply of compressed air
 Air supply from roof bolter to miners should not be more than 100 metres of 2" hose
 Air pressure must be between 85 - 100psi (586 - 690 KPa) when bolter(s) are operating
 Water pressure should be between 80-90 psi (550 - 620 KPa) and hoses flushed out prior to connection

PACKAGING AND TRANSPORTATION

Lokset J Series Resin Capsules are available in standard diameters of 20 mm, nominal 25 mm (actual 23.6 mm), 26 mm, 30 mm, 36 mm and 38 mm. Lengths range from 300 mm to 1700 mm. They are packaged in water resistance cardboard cartons labelled with colour codes and supplied on wooden pallets.

VOLUME

It is essential the correct length of capsule is selected to fill the volume left in the hole after allowing for the volume of the bolt.

It is good practice to use a capsule size which exceeds this volume by around 10% to allow for variations in hole diameter and length, bolt size and strata conditions.

QUALITY

The superior quality of the Lokset resin capsule is assured through a four-part quality control program:

1. Raw Material Testing
2. In-process quality control testing
3. Finished product acceptance testing
4. Quality system management to ISO 9001

Testing levels and specifications for each of the above programs have been established statistically, based on actual historical data, to ensure the customer receives a uniform quality product which will perform dependably under field conditions.

STORAGE CONDITIONS AND SHELF LIFE

Suggested shelf life for Lokset J-Series resin capsule is 4 months when stored between 20- 25°C. Extended shelf life can be expected when stored at lower temperatures of 0-5°C in cool rooms and is highly recommended. Stock rotation is strongly recommended. Storage at higher temperatures will severely reduce shelf life.

Store in a cool, dry place away from direct sunlight. Do not double stack pallets. When using cool room storage, the resin capsules should be allowed time to attain ambient temperature before use otherwise SPIN and HOLD TIMES will be extended.

DISPOSAL

Follow local regulations.

TECHNICAL SUPPORT

We provide technical advisory service by a team of specialists in the field. The service includes on-site assistance and advice on evaluation trials and laboratory work.

MANUFACTURER

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