



Lokset[®] Resin Capsule J Series Resin

Reinforced polyester resin anchor

Uses

The Lokset Resin Capsule J Series resins 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:

- § Super Strand cables
- § HI - TEN Strand cables
- § Rebars
- § Combination bolts
- § Multicables
- § Torque tension bolts
- § Cables
- § Trusses
- § Slings
- § Megabolts

Advantages

Selection of appropriate capsule enables a wide variety of applications:

- § Contains a specially formulated resin mastic and catalyst to aid mixing in larger annular gaps
- § A unique design of capsule configuration enabling extremely effective mixing of resin mastic and catalyst compartments

Other advantages include:

- § Rapid insertion, easy and quick to use
- § Protects bolt from corrosion, can be used in moderately wet conditions
- § Unaffected by vibration
- § No expansion stresses, can be used in weak strata

Description

The Lokset Resin Capsule J Series 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.

Technical support

Minova Australia, together with your local distributor or agent offers a complete technical and field support service.

Properties

Set time

Typical insertion properties at 25°C are as follows:

Speed	Approx. Spin time (secs)	Minimum Hold time (secs)
Slow	20	> 60
Medium	12	> 20

The hold time is the **minimum** time allowed after completion of the spin time before bolt tensioning is attempted. In many cases the hold time will be greater than that listed. Where high tension loads are applied to the system then the hold time may be several minutes. Consult Minova for further information.

The times listed are an indication only, they may vary with temperature, mining conditions, equipment, hole:bolt annulus, age and storage conditions of resin capsules. Each mine site should be evaluated to determine optimum installation parameters.

For further information on capsule types, size and speed, consult Minova Australia or your local distributor.

Compressive strength

Tested on 40mm cubes with slow set resin in accordance with BS 7861:Part 1:1996 (Strata reinforcement support system components used in coal mines: Part 1, specification for rockbolting). Typical results on slow set mastic:

Age (hours)	Uniaxial compressive strength (MPa)
24	> 50



Punched Shear Strength

Measured according to BS 2782 (part 3) on slow and medium set resin

Age (hours)	Punched Shear strength (MPa)
24	> 22

Pull test

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

Age (hours)	Pull out force (kN)	Tonnes
2	>150	>15

Application instructions

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 27-28mm hole diameters are normally preferred with 22mm core diameter roof bolts. Where long tendon bulbed cables are used then this may necessitate a larger hole diameter, consult the bolt supplier for further information. Do not exceed the manufacturers recommended diameter.
2. Drill hole to correct length for bolt. The ideal hole length is normally 50-60mm shorter than the bolt. Consult the bolt manufacturers for advice on the recommended length of hole in relation to the particular 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 manufacturers 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. Where J Series Medium and J Series Slow Set capsules are used together, when pretensioning, it is essential the Medium set (red capsule) is inserted first followed by Slow set (blue) 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 or encapsulation to a specified distance down the bolt to a plunger or stopper device. 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 through the entire length of the capsule(s), when the top of the hole is 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 OVER MIX 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 then the hold time may be several minutes. Consult Minova for further information.

The following items must also be checked where hand held (air operated) equipment is utilised:

- § Compressed air supply should be clean and dry
- § Air supply from roof bolter to miner should not be more than 100 metres of 2" hose
- § Air pressure must be between 85-100 psi (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

Consult Minova Australia or your distributor for further information.



Limitations

The annular gap between bolt and hole diameter should be at a minimum. It is recommended the annular gap be between 4-6mm eg:

Bolt diameter	:	22mm
Hole diameter	:	28mm
Annular gap	:	6mm

Where long tendon bulbed cables or larger bolts are used then this may necessitate a larger hole diameter than above, consult the bolt supplier for further information.

The Lokset J-Series resin contains a specially formulated resin mastic and catalyst to aid mixing in larger annular gaps. Although it will assist mixing of the two components in larger annular gaps it is recommended that larger deforms or a mixing device on the bolt such as paddles, bulbed strands or Posimix type bolts also be utilised and the installation guidelines followed.

Larger hole diameters/annular gaps may result in extended cure times, less efficient mixing, finger gloving of the bolt into the resin capsule, a reduction in load transfer (strength), a reduction in encapsulation length.

In all cases it is strongly recommended that short encapsulation pull tests be performed to verify that required load strengths are achieved.

Extended tensioning times may be due to:

- § Low temperatures
- § Broken ground
- § Large hole diameters
- § Insufficient spinning
- § High nut break out loads
- § High machine torque load levels
- § Excessive thrust/feed on the installation rig
- § Intermixing of slower setting resin into faster setting resin capsules
- § Excessive water inflow

The resin appearing to be "too quick" with the bolt not reaching the top of the hole may be due to:

- § High temperatures
- § Smaller diameter holes
- § Hole closure
- § Angled holes

- § Misaligned holes/rigs
- § Low feed pressure
- § Premature nut break out
- § Old/out of date resin

All bolting parameters will vary depending on a number of factors such as:

- § Strata condition/type
- § Temperature
- § Hole:bolt annulus
- § Age of resin capsule
- § Equipment
- § Installation method

Consult Minova Australia or your distributor for further information.

Estimating

Packaging

Lokset capsules are available in various lengths, speeds and diameters. They are packaged in cardboard cartons, labelled with colour codes and supplied on wooden pallets.

Contact Minova Australia or your local distributor for further information.

Volume

It is essential the correct length of capsule be 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.

Consult Minova Australia for further information on encapsulation.

Storage

Shelf Life

The Lokset resin capsule suggested shelf life is 4 months when stored between 20-25°C. Storage at lower temperatures such as in cool rooms is highly

recommended and will extend the shelf life when stored at 0-5°C. Stock rotation is strongly recommended. Storage at higher temperatures will severely reduce shelf life.

Storage conditions

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.

Precautions

Health and safety

Wear suitable protective clothing, gloves and eye/face protection.

- § In case of contact with skin remove contaminated clothing and immediately wash with soap and water, seek medical attention if skin irritation persists.
- § In case of contact with eyes, flush with copious amounts of water and seek medical assistance.
- § If inhaled remove from exposure and seek medical advice if effects persist.
- § If ingested wash out mouth with water and obtain medical attention.

For further information see the relevant material safety data sheet, copies of which are available on our website.

Additional information

Minova Australia offers a comprehensive range of strata control products, all of which have been developed after extensive research and testing on a global scale via our international network of operations. These products include:

- § Resin anchor systems
- § High yield grouts and foams

- § High volume output grouts
- § Monolithic chock systems
- § High performance cable bolt grouts
- § Polyurethane resin systems
- § Binder systems and accelerators for backfilling
- § Pre-packaged high build spray cements
- § Sprayable coatings for ventilation control
- § Water stop grouts
- § Ventilation Formwork Systems including: Meshblock, Gunmesh, Tecmesh and Tecplastic
- § Grout Mixers and Batchers both air and hydraulically operated
- § Flexible high strength membrane for strata support
- § Flexible membranes for strata support and waterproofing applications
- § Contract Installations

If further information is required consult Minova Australia.

While Minova Australia makes every effort to ensure the details contained in this data sheet are as current and accurate as possible, the conditions under which its products are used are not within Minova Australia's control. The information on this data sheet is subject to change without notice. Each user is responsible for being aware of the details in the data sheet and the product applications in the specific context of the intended use. The results may depend on the conditions under which the products are stored, transported and used.

Buyers and users assume all risk, responsibility and liability arising from the use of this product and the information in this data sheet. Minova Australia is not responsible for damages of any nature resulting from the use of its products or reliance upon the information. Minova Australia makes no express or implied warranties.

® Denotes the trademark of Minova International Ltd.



Minova Australia Pty Ltd
A.B.N. 78 084 965 962
102 Albatross Road, Nowra
PO Box 554, Nowra NSW 2541
Tel: 0244 214377
Fax: 0244 221637
Solutions@MinovaInt.com
www.minovainternational.com

MIN AUS/MS2254/03/1

