

CONSTRUCTION

LOKSET® RESIN CARTRIDGES TUNNELING

REINFORCED POLYESTER RESIN ANCHOR

DESCRIPTION

The Lokset® Resin Cartridge consists of a filled polyester mastic and a catalyst paste, contained in a heat-sealed tube of polyester film. A film barrier prevents premature chemical reaction until the anchor bolt ruptures and mixes the contents. Available in numerous gel times, the cartridge is manufactured in six diameters and length up to 64” long.

The system permits the placing of bolts in any position or angle above or below the horizon, in rock or concrete structures. Drill holes with rotary-percussive equipment to provide for the essential hole profile. Holes must be flushed with air or water so that they are clear of cuttings and debris.

Hole diameters should be within the range of borehole diameters permitted with a specific bolt diameter. To facilitate installation of long, coupled bolts, a larger diameter hole is drilled in the grout zone with a reduction in hole diameter carried out with the last section of drill steel. (Refer to Lokset® Resin Usage Chart).

USES

Rock bolting in mines and tunnels, permanent rock reinforcement on highway rock cuts, dams and underground rock structures, vibration-resistant anchorages for attachment of critical equipment to concrete or rock, uplift anchorages for near surface structures, and immediate post-tensioning steel reinforcements in rock concrete structures.



ADVANTAGES

- Permanence – The durable resin protects the embedded bolt from corrosion.
- Speed – The fast-gelling Lokset® Resin Cartridges enable rapid installation to be carried out, with application of load in minutes
- Vibration – Lokset® Resin Cartridges are not affected by vibration and require no re-tensioning, even after close-proximity blasting
- Safety – Millions of Lokset® Resin Cartridges are used every year for permanent rock reinforcement in mines, tunnels, and foundations.
- Very Low Insertion Force - Cartridges specially formulated for easier penetration when hand held equipment is in use.

ANCHORAGE

The anchorage achieved varies from 2-1/2 tons per inch in granite and other very high strength rocks to 1/2 ton per inch in mudstone and other very weak rock formations. Lokset® resin achieves full strength in less than one hour.

APPLICATION METHOD

General Installation Instructions for Fully Grouted Systems:

1. Before use, read the installation and safety information provided to include the product Safety Data Sheet (SDS).
2. To obtain a consistent set time, make sure the Lokset® Resin Cartridge and bolt are at tunnel temperature before use, preferably 50 °F (10 °C) and 70 °F (21.1 °F).
3. Drill the borehole to the correct diameter at a depth equal to the length of the bolt plus 1-inch. Mark the drill steel to use as a guide.
4. Insert the appropriate Minova resin cartridge(s) slowly rotating the bolt as you push through the resin column.
5. Push the bolt into the hole. Slow rotation of the bolt as it passes through the cartridge is suggested but not required. Ensure each cartridge is completely punctured.
6. Just prior to the bolt head contacting the rock, stop and spin the bolt a minimum 100 rpm to mix the cartridge. Approximately 30 revolutions are recommended.
7. Stop rotation and push the bolt upward with full thrust until the resin sets.

SAFETY INSTRUCTIONS AND LIMITATIONS

Do not over-spin the bolt. If bolt rotation continues through the gel time, damage to the anchor may occur.

Never re-spin the bolt. Bolt rotation after the final spin may damage the partially set resin.

Observe the usual precautionary measures for handling chemicals, see Lokset® Resin Cartridge SDS.

PACKAGING AND TRANSPORTATION

Product packaging is dependent upon cartridge length. Please contact a Minova Customer Service Representative for packaging information.

STORAGE AND SHELF LIFE

Lokset® Resin Cartridges can be stored for 12 months in a cool dry, ventilated place. Store away from direct sunlight or other heat sources which can reduce products usability and shelf life. Stock rotation is strongly recommended.

DISPOSAL

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Dispose of material in accordance with all applicable federal, state/provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

APPROVALS AND CERTIFICATES



an ISO 9001:2015
Quality Management System Certified Company.

DISCLAIMER

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MANUFACTURER

Trading name of Minova USA, Inc.
 150 Summer Court
 Georgetown, KY 40324
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ADDITIONAL DOCUMENTATION

- Lokset® & Eclipse® Resin Cartridge SDS
- The Minova Guide to Resin-Grouted Rockbolts
- Lokset® Resin Cartridge Anchors for Rock and Concrete Reinforcement Brochure
- Lokset® Resin Cartridges Brochure
- Minova Lokset® Product Specification

CUSTOMER SERVICE

For additional support options available at your area, contact our local offices.

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Resin Usage Chart

Hole Diameters	25mm (1")	32mm (1-1/4")	35mm (1-3/8")	38mm (1-1/2")	41mm (1-5/8")	38mm (1-1/2")	41mm (1-5/8")	45mm (1-3/4")	48mm (1-7/8")	51mm (2")	57mm (2-1/4")	51mm (2")	57mm (2-1/4")
Cartridge Diameters	23mm (7/8")	28mm (1-1/8")	32mm (1-1/4")		35mm (1-3/8")			40mm (1-9/16")		45mm (1-3/4")			
Bolt Size	Hole Length per Foot (12") of Resin // (Grouted Length of Bolt)												
#5 (5/8" Ø) B-Series	13.7	Not recommended											
#6 (3/4" Ø) A-Series	19.1	12.4	Not recommended										
#7 (7/8" Ø) E-Series		15.6	14.4	Not recommended									
#8 (1" Ø)			18.2	13.0		15.5	11.8	Not recommended					
#9 (1 1/8" Ø)	Not recommended			16.5	11.8	19.7	14.1	14.1	11.2	Not recommended			
#10 (1 1/4" Ø)	Not recommended				15.0		18.0	16.9	13.0	10.4		13.1	
#11 (1 3/8" Ø)	Not recommended							23.0	16.0	12.0		15.2	
#14 (1 5/8" Ø)	Not recommended										12.7		16.1

Chart indicates inches of bolt encapsulation based on a 12" length of Lokset® Resin Cartridge for anchoring and grouting rock bolts. This chart is prepared as a guide based on average drilling conditions in concrete or rock. Field trials should be conducted to determine actual resin requirements. (Inches grouted data includes a calculated 15% loss, which is typical.) *Example: When a 1 1/2" hole is drilled using a 1" diameter deformed (rebar type) bolt, one 3512 (1 3/8: Ø x 12" long) cartridge will grout 15.5 linear inches of bolt. Conduct field trials to ensure correct resin requirements for both anchor and grout "zones" for individual bolt lengths and diameters.

-Note: Blank spaces are non-recommended bolt and hole combinations.