



ST-534

LOCK-ROK INJECTION RESIN

INTRODUCTION

Stratathane ST-534 *Lock-Rok Injection Resin* is a low viscosity, mildly hydrophillic MDI-based polyurethane injection resin for structural soil modification, rock anchoring, groundwater control and soil stabilization. ST-534 *Lock-Rok* reacts quickly with ST-535 in a 1:1 ratio by volume to form a dense, hard solid.

Stratathane ST-534 *Lock-Rok* is mixed with ST-535 at the work site to form a single injection material. A twin-stream pump is preferred but the material can be bucket-mixed and batch-poured in small quantities for surface gravity feed applications. The inert end product forms a water barrier which is essentially unaffected by acids, gasses, and micro-organisms usually found in rock and soil. The product is water- tolerant, and clean dry surfaces are not required.

ST-534 *Lock-Rok* is useful for a wide range of water control and soil stabilization applications, including fractured rock, water-bearing soils, soil nails, rock anchors, and the like, especially in applications where high strength is required.

ST-534 *Lock-Rok* may be placed by hand pumps or multi-ratio pumps. Stainless parts are recommended but not strictly required because ST-534 is no more corrosive than water. Cleanup of solidified material in the system, however, is often accomplished with strong cleaning compounds, making stainless steel sensible. Before using any pump, verify that its seals are resistant to the cleaners to be used.

The low viscosity of ST-534 makes it easy to inject. The viscosity range of mixed Strathane ST-535 at 75° per ASTM D1638 is 175 – 225 cps. Once cured, the impermeability of ST-534 makes it an effective anchoring and water cut-off system. The permeability of fissured rock or soil grouted with ST-534 depends on how well its voids are filled with grout. Values in the 10-6 cm/sec range should be obtained using ASTM Constant Head Permeability Test Method D-2434.

SET TIME

Set time for the Stratathane ST-534/ST-535 System is defined as the period from first contact of ST-534 with ST-535 to the point where the mix becomes too thick for gravity flow. Set time for any formulation is influenced primarily by mix temperature. Standard formulations provide set times ranging from one minute up to about 30 minutes. Final cure time of the system at 60°F is 24 to 48 hours. Set times may also vary a little with the age of the resin. The viscosity of mixed ST-534 is lowest for the first 85% of the set time and increases rapidly as the mix nears set.

Additives available for use in other grout systems may also be used in the ST-534 Lock-Rok system and will affect set time. Consult the appropriate tables in the Technical Data Sheet of the additive to determine the set time curves for the particular additive in question. The minimum tensile strength of neat Stratathane ST-534 per ASTM D 638 is 7000 psi. After set and cure, the compressive strength of neat Stratathane ST-534 is approximately 3600 psi at 10% or greater deflection. The addition of aggregate to the mix (as in ASTM D695) may increase this value. Cured density, under dry injection, is 71.2 pounds per cubic foot. Injection into 0.75% water may reduce the density of the Stratahane ST-534 to 20 pounds per cubic foot

CLEANUP

ST-590 *Kleen-Purge Flushing, Agent* is recommended for cleaning the liquid components from pumps, hoses and tools, but solvents like acetone and MEK may also be used. When using solvents during cleanup, extinguish all ignition sources and observe proper precautions for handling such materials. For cleanup of cured ST-534, soak the affected parts in a 100% solution of ST-522 *Grout Cleaner* using a covered polyethylene container. Read the ST-522 MSDS prior to use. Grout spills on clothing are permanent, so disposable coveralls are recommended.

3601 104th Street Des Moines, Iowa 50322 PHONE 515/251.7770 FAX 515/251.7705
WEB SITE www.strata-tech.com EMAIL info@strata-tech.com

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HANDLING AND STORAGE

Use reasonable warehouse care in handling and storing ST-534 and ST-535. The materials are hygroscopic (water absorptive) and moderately sensitive to high storage temperatures. These materials are said to have a shelf life of one year but under optimum storage of 40 - 60°F in dry conditions, the material should have a useful shelf life of several years. Storage temperature should not exceed 120°F. Once a container has been opened, the life of the material is reduced. Before handling or using this product, read and understand the Material Safety Data Sheet (MSDS). Instruction in sound safety practices is beyond the scope of this publication.

At 60°F ambient temperature, the standard Stratathane ST-534/ST-535 mix solidifies in one to thirty minutes, but when injected into rock and soils, the final cure time is 24 to 48 hours. Cooler temperatures slow down the set time while warmer temperatures accelerate it. Custom formulations may be available (subject to minimum quantity requirements) with other set times.

PROPERTIES	ST-534	ST-535
Mix Ratio - Volume	I Part	I Part
Viscosity @ 75°F	175 cps	200 cps
Specific Gravity	1.041	1.237
Density lbs/gal	8.7	10.3
PROPERTIES	ASTM	ST-534-535
Specific Gravity	D-792	1.138
Hardness Shore D	D-2240	>80D
Min.Tensile (psi)	D-638	7000
Elongation @ Break	D-412	< 2%
Set Time - minutes		1-30
Impact, Notched Izod		0.4
Flame Resistance		YES
Cured Density. lbs		20-70

Direct contact of ST-534 liquid is essentially non-irritating to the eyes and is not expected to produce any appreciable skin irritation. If ST-534 comes in contact with the skin, wash with soap and water. ST-534 should not be ingested, but single dose toxicity is considered to be moderate. Small amounts swallowed incidental to normal handling operations are not likely to cause injury but may cause gastrointestinal discomfort, nausea, vomiting, lethargy, or diarrhea. Avoid exposure to vapors created from this product when it is burned. Ventilate the work area as a matter of good practice, although hazardous levels of toxic vapors are not generally given off of the bulk product. Small amounts of MDI may be present and some users may be sensitive to MDI.

STATEMENT

Strata Tech believes that the information herein is an accurate description of the accurate properties and characteristics of the product(s), but the user is responsible for obtaining current information because the body of knowledge on these subjects is constantly enlarged. Information herein is subject to change without notice. Field conditions also vary widely, so users must undertake sufficient verification and testing of the product or process herein to determine performance, safety, usefulness, and suitability for their own particular use.

Strata Tech warrants only that the product will meet Strata Tech's then-current specification. NO WARRANTY OF SUITABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE. Users should not assume that all safety requirements for their particular application(s) have been indicated herein and that other or additional actions and precautions are not necessary. Users are responsible for always reading and understanding the Material Safety Data Sheet, the product's technical literature, and the product label before using any product or process mentioned herein and for following the instructions contained therein. Nothing in this or any other document from Strata Tech is to be taken as permission, inducement, or recommendation to practice any patented invention without a license.

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