

Res-I-Glas® Banding Tape

Res-I-Glas® by Fibertek - The One & Only Original Glass Banding Tape

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Introduction

Known throughout the rotating electrical equipment industry as the trade name of choice for glass banding tapes. Over all competitors, the original Res-I-Glas® is superior in tensile strength, durability, insulation value, ease of application, & storage shelf life, due to the uncompromised use of highest grade raw materials and consistent manufacturing process. No wonder the leading electric motor manufacturers and service centers world wide always insist on the one and only original Res-I-Glas® banding tape by Fibertek.

Res-I-Glas® Banding Tape is constructed of high tensile electrical grade glass yarns laid parallel and bonded with fully catalyzed thermosetting resins. It is not a woven tape; thus it utilizes the full tensile strength of the glass. This results in a high tensile, high modulus, low elongation, high impact strength band. Because Res-I-Glas® tape is itself an insulation, it requires no underlying insulation pad. It thus eliminates insulation and creepage problems experienced with steel wire banding.



Res-I-Glas® tape is supplied semi-cured (B-Stage) in a soft well balanced flat ribbon form and this assures that each yarn bears an equal share of the load. The B-Stage resin isolates the individual glass yarns, thereby preventing cutting and shearing of these yarns. These thermosetting resins have been rigorously checked through laboratory tests and extensive and continuous services usage for many years.

In the completely cured stage (C-Stage), Res-I-Glas® tape is stiff, hard and springy. During the early stages of curing the resins flow. This flow fills all the voids and air spaces in the band, welding the laminate into a homogenous mass and greatly improving the heat dissipation factor. This flow of the resin also penetrates between coil openings, anchoring the coils against side movement and actually adding insulation between coils. In effect, the Res-I-Glas® tape band molds to coil configuration and in operation is practically part of the coil system, greatly adding to it's stability under all conditions.

Res-I-Glas® tape bands have a very high arc resistance and attempts to induce flashover failure in 20 cycles have failed. Many instances have been recorded where severe coil burnouts underneath Res-I-Glas® tape bands have destroyed as much as two thirds of the band, yet the remnant has held the coils in place. Bands of Res-I-Glas® tape also result in cooler coils.

Res-I-Glas® tape bands are successfully used on all types of armatures including traction, large generator, motor generator, power shovel, steel mill and diesel locomotive traction motors and generators. Res-I-Glas® tape is very popular with winders because of its ease of application. Application is fast and, depending on the size, armatures are banded in 10-60 minutes.



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Res-I-Glas[®] Type F Banding Tape

Res-I-Glas[®] Type F

For use on motors of temperature ranges up to and including Class H Plus (220°C). Type F Res-I-Glas[®] has a resin system with a nominal resin content of 27%. As can be readily seen from the technical data in the following pages, Type F represents a significant improvement in quality. Not only can Class H motors be glass banded, but motors of lower thermal ratings will obtain indefinite protection from aging or thermal degradation. Type F Res-I-Glas[®] has excellent resin flow characteristics. Armatures can be banded with this tape either hot or cold because of the superior flow characteristics that it possesses. This resin flow also results in greater pre-stress retention, thereby minimizing coil movement.



Properties

Thickness	:	0.38mm
Temperature Rating	:	220°C
Resin Content	:	27% Nominal
Arc Resistance after Cure	:	120 seconds min
Ultimate Tensile Strength ¹	:	240,000 PSI min
Elastic Limit ¹	:	240,000 PSI min
Elongation	:	2 - 3%
Recovery after Elongation	:	100%
Volumetric Shrinkage of Resin During Cure Cycle	:	8%
Linear Shrinkage of Glass During Cure Cycle	:	0

¹Based on glass area at elevated temperature after thorough cure

Armature Banding

Once the armature coils are seated, the function of the band is to hold them in that position under all operating conditions likely to be experienced. To do this the band must exert a restraining force greater at all times than the centrifugal forces generated by the rotating armature.

Terminating Tape Bands

When cold banding with RES-I-GLAS[®] tape, the band must be terminated before the application tension is released. Use either a hot soldering iron or a hot air gun to fuse layer to layer and then snub the cut end under as in string banding.

When hot banding with RES-I-GLAS[®] tape (either hot armature or heated tape) the tension should be relaxed to about hand tension prior to cutting. If the armature is retained in the lathe for a few minutes, still under full tension, the hot tape band will fuse to a point where the maximum pre-stress will be retained after the tension is released and the tape cut. Many winders pull the cut end under several underlying layers to insure freedom from delamination.



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Curing Res-I-Glas® Tape Bands

Complete cure is effected after baking for 5 hours at 150°C.

Higher temperatures will accelerate the cure and of course the reverse is true. Cure will not, however, take place regardless of the time cycle at temperatures lower than 110°C. Normally the cure is accomplished during the varnish dip and bake cycle. However, phenolic varnishes can inhibit (but not prevent) the curing. This inhibiting effect can be offset by tightly covering the freshly wound bands with a layer of Fibertek RES-I-BAND Shrinkable Mylar Banding Film, (removed after the cure) or by a heat cycle, prior to the varnish dip and bake, of sufficient length to at least partly set up the RES-I-GLAS® tape bands.



Recommended Procedure for Banding Armatures & Generators

Before applying RES-I-GLAS® tape bands, the armature coils must be pulled down and well seated. The coil pull down may be effected in any acceptable and approved manner now employed.

1. Remove the RES-I-GLAS® banding tape from the cold storage area, allowing it to reach room temperature throughout before use.
2. Place the RES-I-GLAS® banding tape on the tensioning mechanism of the lathe.
3. Place Fibertek RES-I-STRAINT Tadpole Edging Tape edge restraint on the area to be banded. Edges should be accurately positioned so that the edge of the glass band will present a nearly perpendicular appearance to the armature axis.
4. Terminate and pull tight with the aid of pressure sensitive tape, smoothing out the wrinkles as much as possible.
5. Commence winding using an acceptable level of pre-stress tension. The recommended pre-stress tension is 400 pounds per inch of tape width, although higher pre-stress tension is acceptable.
6. Place the second turn over the first turn at a slight angle to prevent slippage. Low areas should be filled first to level the band and the succeeding turns half lapped back and forth.
7. Wind the RES-I-GLAS® evenly and smoothly, traversing the width of the band. Maintain a near uniform cross section of the band, being careful not to create thin flange like edges. Maintain the wind angle as close to 90° to the armature shaft center line as possible in order to realize optimum tensile properties of the RES-I-GLAS® banding tape.
8. Wind as many turns as required for the design operating temperature and the design centrifugal force, using an appropriate safety factor. The glass band should not extend to core iron. The resultant clearance allows the varnish to penetrate into the coils under the band.
9. Terminate the band by heating the tape with a flat iron, soldering iron or industrial hot air gun while maintaining pre-stress tension. As the tape cools, it will fuse to the adjacent layers of tape and the tension can be released and the tape cut.
10. Wrap and cover the glass band with Fibertek RES-I-BAND Shrinkable Banding Film with release coating.
11. Pull the film snug using hand tension and terminate using a pressure sensitive tape. This banding process incorporates the vital components of the Fibertek complete banding system.



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