

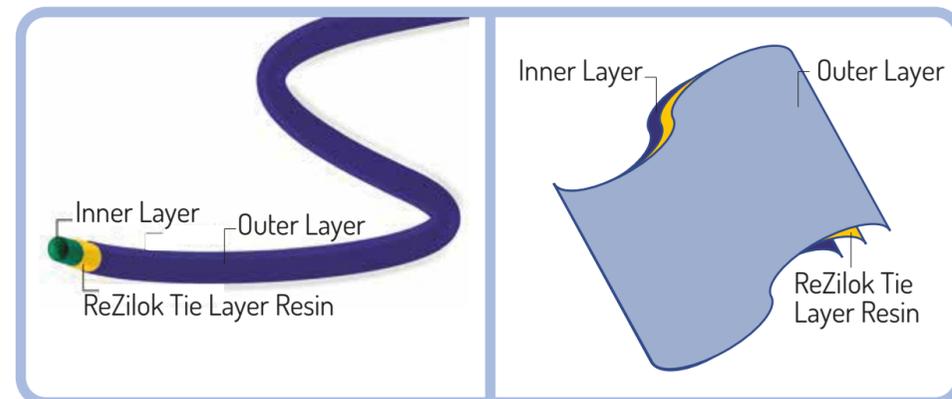
Tie-Layer Resin for Adhesion Promotion in Multi-Layer Extrusion

Today's medical device regulations and patients needs demand the use of multilayer product designs to combine the properties of two or more materials. The benefits of combining different polymer layers include reduction cost and improved the mechanical properties. Unfortunately during the coextrusion process dissimilar materials do not adhere well to each other, resulting in delamination and poor mechanical properties. To improve adhesion between poorly adhering layers, Compounding solutions' R&D team developed ReZilok Rx, a tie-layer resin for multilayer extrusions.

ReZilok Rx is designed for multilayer co-extruded tubing and film, providing solutions for different materials that typically do not bond well during the melt processing. ReZilok Rx, tie-layer adhesive, offers better adhesive properties, product consistency, strength, and dimensional stability.

ReZilok Rx is not considered to have cytotoxic potential according to ISO 10993-5 test results. ReZilok Rx is supported for use in disposable devices classified by the FDA as Class I & Class II.

- Suitable for medical applications
- ISO 10993-5 compliant
- Offsets current resins
- Short lead time
- 10 lbs low minimum order quantity
- 12 months of minimum change notification.



ReZilok Rx For Each Application

Depending on the type of polymer used for to achieve desired, Compounding Solutions would suggest the use of ReZilok 101 or ReZilok 201.

ReZilok Rx 101

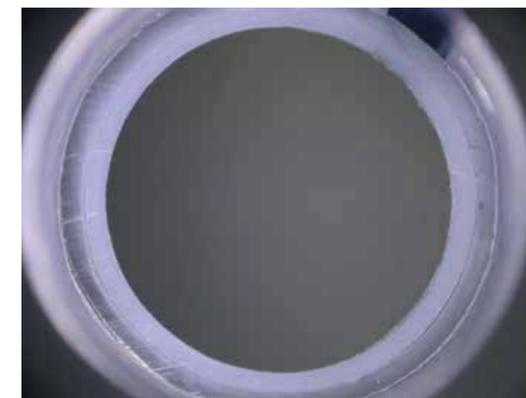
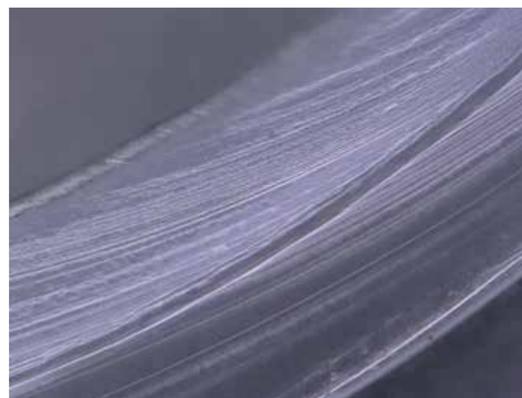
ReZilok Rx 101 tie-layer resin is a maleic anhydride grafted linear low-density polyethylene. This tie-layer resin is used to bond dissimilar materials in coextrusion or reflow processes.

ReZilok Rx 201

ReZilok Rx 201 tie-layer resin is a functionalized EVA based tie-layer. This tie-layer resin is used to bond dissimilar materials in coextrusion or reflow processes. ReZilok Rx 201 is optimized for adhesion to a variety of materials through chemical and physical bonding mechanisms.



Tri layer tubing using ReZilok Rx 101 as tie-layer between PEBA 5533 and HDPE.



Tri layer tubing using ReZilok Rx 201 as tie-layer between TPE & PE

Physical Properties

Property		ReZilok 101	ReZilok 201	Method
Hardness	shA	95	93	D22vo
Melt Flow Index	g/10min	1,5	2,9	D1288
Density	g/cm3	0,92	0,94	Pycnometer
Ultimate Tensile Strength	psi	1910	1470	D638
5 Elogatron	%	420	350	D638

Storage:

The typical shelf life of ReZilok Rx is two years from the date of manufacture per our shelf life statement in unopened packaging. After using ReZilok Rx, the container and liner should be sealed and stored in a cool dry environment protected from UV light.

Handling:

ReZilok Rx 101 Resin is supplied in free-flowing pellets and should be handled like a standard polyolefin. The Safety Data Sheet for ReZilok Rx 101 resin should be consulted for additional information related to safety and handling.

ReZilok Rx 201 is supplied as free-flowing pellets. In general, ReZilok Rx 201 can be handled similarly to standard polyethylene polymers. A Safety Data Sheet for ReZilok Rx 201 should be consulted for other detailed guidelines.

Purging:

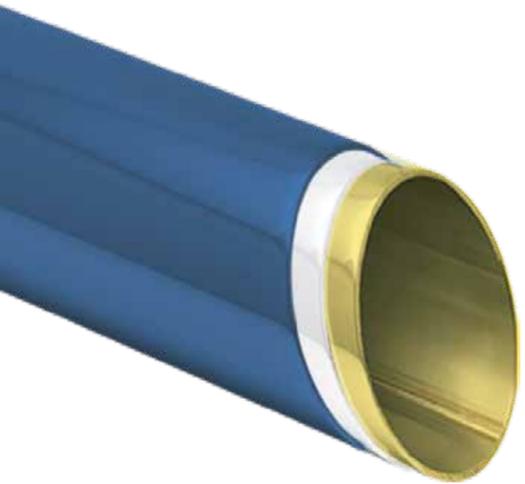
Purging should be done using a resin other than ReZilok Rx 101, such as LDPE. Typically, an extruder should not be allowed to idle more than 30 minutes when containing ReZilok Rx 101 resin, and even then, a small amount of throughput is recommended.

An EVA resin is recommended for purging prior to or after the extrusion of ReZilok Rx 201. To prevent gel or char formation, it is recommended to maintain a slow throughput while the line is sitting idle with ReZilok Rx 201 in the barrel.

How to Select the Right Tie - Layer Resin For Your Device

The tie-resin should be chosen based on the resins being bonded. The exhibit below shows the adhesion characteristics of different polymers, which play a crucial role in the choice and use of ReZilok Rx, tie - layer.

Substrate	Tie-Layer	
	ReZilok Rx 101	ReZilok Rx 201
Polyether Block Amide (PEBA)	Excellent	Poor
Polyamide 12 (PA12)	Excellent	Poor
Thermoplastic Polyurethane (TPU)	Excellent	Excellent
Polyethylene (PE)	Excellent	Excellent
Thermoplastic Elastomer (TPE)	Good	Excellent
Polyvinyl Chloride (PVC)	Poor	Excellent



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