



# **PEEL PLY EXPLAINED AND WHEN TO USE EACH STYLE**



***COMPOSITE  
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## INTRODUCTION

Peel Plys, otherwise known as Release Fabrics, have many uses throughout the composite industry ranging for achieving consistent surface finishes. Peel plys are generally added after all fabric layers have been laid up. However, peel ply may also be laid up on the tool surface to achieve a needed surface consistency. Peel plys are helpful to achieve overall surface finish of composite laminates or placed in general areas of secondary bonding. Most peel plys work by absorbing a small amount of resin during the cure process. When the cure is completed, the peel ply is pulled from the laminate surface, providing the desired surface finish. Peel plys also minimize mistakes in secondary processes as grinding or grit blasting processes are generally needed on parts using peel ply.

The questions around peel plys are often which type or brand of peel ply is best when different bagging types and layups techniques may be performed. Selection of peel plys are determined by how easy a peel ply will release from a surface, which can be used for a layup technique, which may be best secondary bonding, the material's temperature range, drapability, porosity ranges, and the overall ease in using a given peel ply.

## POROUS VS NON-POROUS

When a porous peel ply is placed on top of a part that is placed under vacuum, the part can “breathe” in a sense. A porous peel ply will allow the vacuum to pull excess resin, air, and other volatiles to escape from the part during cure. It allows the vacuum to pull possible entrapments or defects in the part. When controlling excess resin, it can be used in conjunction with the breather to catch the excess resin within the part during cure. A Non-Porous peel ply system is not going to breathe during a cure cycle and resin will not be pulled from the part. Resin that comes to the surface will cure and leave a consistent glossy surface finish. Note that excess resin and air may become trapped inside the part during its cure cycle. If using non-porous peel ply under vacuum, care should be taken to ensure it is laid flat and bagging is done meticulously. Non-porous peel plys should not be used for vacuum infusion processes but are fine with traditional layups and vacuum cures.

## COATED VS NON-COATED

Non-Coated peel plys are usually used for the sole purpose of “texturing” the laminate surface. Because a non-coated peel plys are not treated with any release agent, it is not going to peel from the cured laminate as easily as one that is coated. Care and patience must be taken on during the peel ply removal process of the peel ply to not damage the underlying ply surface, especially with uni-directional laminates. However, non-coated peel plys will not leave release agent residue on the cured laminate surface, which will mitigate possible contaminants in secondary bonding surfaces.



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A Coated peel ply on the other hand will be coated in a release agent such as silicone or Teflon (PTFE). These release agents will often make the process of removing the peel ply off cured laminates much easier. Often without any additional tools such as picks or razor blades. Care should be taken with secondary bonding processes to ensure all release agents left, usually invisible to the naked eye, are removed from the laminate before bonding.

## BEST PRACTICES FOR PEEL PLY USE

- Tools such as a dental pick set, and a razor blade are often used when removing peel ply. When used effectively they are beneficial to removing sticky peel ply easily. Care must be taken to not to damage underlying plies during removal.
- Extend peel plies an inch or more beyond the lay-up surfaces to peel them off effectively.
- Remove all air bubbles between the peel ply and the fabric surface.
- Use caution to ensure peel plies are not bridged in female radii or complex contours of the part. This can cause quality issues with bagging and not getting adequate pressure to the part surface.
- Use multiple pieces as needed. One piece will come up easier once cured on simple laminates. However, there is nothing to say peel ply must be one continuous ply.
- Tighter weaves often leave finer surface finishes but may not be as drapable over complex contours.
- Though data sheets boast that little to no sanding or prep is needed for secondary bonding, it is proven best practice to still roughen surfaces and prep composite parts per “Bonding to Metal and Other Substrates”. Peel ply will get you most of the way there, but the extra care will ensure there are no traces of peel ply remnant left from “peel-off” and ensure a clean bonding surface.

## SUMMARY OF PRODUCTS & USES

**Airtech Econostitch Peel Ply** is made with budget in mind. The nylon material in the Econostitch allows for a service temp composite cure of 375 F. Designed for secondary bonding purposes, Econostitch peel ply ensures a slightly roughened surface on the top side of the laminate. Econostitch is made with red tracers to ensure that it is removed before secondary bonding processes are performed. Otherwise, the peel ply will be almost unnoticed in some fabrics once cured. It is mainly used in vacuum infusion processes but is also used in traditional layups and other vacuum assisted cures. When using a nylon-based peel ply without a Teflon or Silicone release coating, the peel ply may not peel up as easily after cure. Especially with uncoated peel plies such as this, extend surface of peel ply an inch or more beyond the fabric’s layup surface to peel them from the laminate effectively.

**Airtech Bleeder Lease B** is a nylon-based peel ply, however, equipped with a Silicone release agent coated onto the nylon fabric. Meaning that it is going to peel off the cured laminate much easier than a non-coated peel ply. The maximum temperature of 450 F makes this peel



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ply compatible with nearly all resin cure cycles. However, this peel ply should not be used with phenolic resins as the materials are not chemically compatible. With any coating on peel plys, the silicone could potentially transfer onto the laminate. Because the material is tightly woven, the surface finish of the Airtech Bleeder Lease B will be slightly smoother than that of most other porous peel plys, giving a finer texture.

**Airtech Release Ease 234 TFP-1** is a fiberglass peel ply coated with Teflon. Teflon, in industry, is known for not sticking to anything! Likewise, the coating will ensure that the peel ply comes up easily while still providing the advantages of a porous system and working well in vacuum infusion and traditional processes. Service Temperature will exceed most all conventional resin cure cycles at 550F.

**Non-Porous Teflon Coated Peel Ply** is great for providing an almost unnoticeable imprint on the laminate surface once cured. As a non-porous type, it will retain all resin placed into it and will simplify vacuum bagging processes where breather and bleeding clothes are not used. This will be best when achieving a shiny surface finish to exhibit the composite's fabric structure. It will also come off the parts easier than others. Stay away from this peel ply for resin infusion processes.

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