

**COMPOSITE ENVISIONS KNOWLEDGE HUB  
PRACTICAL AND INSIGHTFUL COMPOSITES INFORMATION**



# **THE MANY WAYS TO LAYOUT YOUR INFUSION SETUP**



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## INTRODUCTION

There is an endless amount of ways one can feed resin into a given part for vacuum infusion. Though some are more efficient than others, there is not always a right or wrong answer when it comes to feeding resin into fabric layers for the infusion process. Experimentation is recommended when nailing down these processes. It is important that before the infusion process should begin that the mold and bagging is leak tight, as the vacuum provides the means for the resin to travel.

Vacuum pressure provides a means for the resin to fill space inside the bag. As the resin works through the vacuum bag it will take the path of least resistance. Without manipulating its path, resin will simply make a run to the vacuum source without wetting the entire part. The addition of flow manipulating media with the use of spiral tubing will extend the inlet and outlet paths to provide fast dispersion of resin for adequate wetting across the laminate surface. For a general rule for common resins, 30-36" should give a good baseline for how far resin should travel before additional feedlines or spiral wrap may be needed.

## LATERAL FEED LINES

Lateral feed lines are best used when a part has a square like dimension or when infusing square panels. Running an inlet and outlet spiral tube of the same length parallel on each side will provide equal resin flow throughout the area of the part. This way there will not be any resin rich areas in the part. This simple method offers the benefit of knowing when to turn the resin feed off to allow for adequate wetting and a more optimal resin / fiber ratio. Resin will quickly be dispersed evenly one side of the mold and drawn to the other side. This method is used best when dimensions are nearly even on end to end, like square shaped parts. Lateral feedlines provide a baseline of infusing simple parts and adjustments should be made accordingly for variations in the part's ranging surfaces. The disadvantage to this method is that resin may need to travel longer distances, the farther the resin goes, the slower it will travel through the laminate. As parts grow more complex in radial areas and as part contours develop, changes can be made to provide resin from the perimeter of the mold to adequately wet out plies.

## CENTER FEED LINES

Center feed lines could best be used when the part has a circular or hull shape. Spiral wrap should be placed along the perimeter to draw resin evenly throughout the surface of the part. This will make for an even draw resin throughout the part. This method may take some experimentation to provide the most effective center line in which resin will reach the spiral wrap throughout the perimeter at roughly the same time. A center feedline is also a good option when there is a gap or hole in the part to provide an easy means to place the vacuum port in which spiral wrap can then be used along the centerline of the part as a means of



dispersing resin. This method can be used for making parts such as kayaks, small hulls, or similar shaped objects.

## MULTIPLE FEED LINES

Multiple feed lines are used generally for larger and more complex parts such as a 20' + boat hull, a yacht, airplane hulls, etc. Composite processes are best when processes are kept as simple as possible. However, a single feedline is not always enough to provide an even amount of resin to enter the part and provide a total wet out of fibers. It is generally a good idea for a more experienced operation to perform this type of infusion. If done improperly it can lead to wasted resources and possibly a scrap part from not wetting all the laminate. Multiple feedlines are best used across complicated or changing surfaces in the tool. In this case the multiple feedlines cater to specific sections of the mold in which may be hard to reach with a single line. Multiple feed lines often take a few times to get correct and can change from layup to layup to produce the most consistent finish. As another advantage, multiple feedlines also give the operator for control over resin flow as each line can be turned on and off as resins travel throughout the laminate. This way an even amount of resin throughout the part may be achieved.

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