

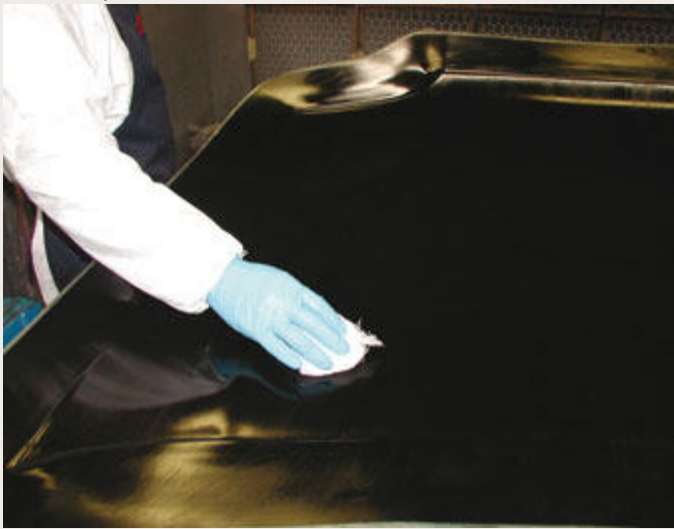
VACUUM BAGGING TECHNIQUES

■ MOLD RELEASE

To prevent a composite part from adhering to a mold surface during cure, 2 to 3 light layers of a mold release is typically applied directly to the mold surface.

■ ALTERNATIVE METHOD OF RELEASE

Another method to prevent a composite part from adhering to a mold surface during cure is through the use of a release liner with a pressure sensitive adhesive backing such as Tooltec® A005 (shown in photo). Tooltec® A005 is a sheet of release film with a pressure sensitive adhesive that can be spread across a mold surface. Once in place, the Tooltec® A005 acts as a release layer between the mold and the composite part. In addition, Tooltec® A005 can often be used for several cure cycles before needing to be replaced.

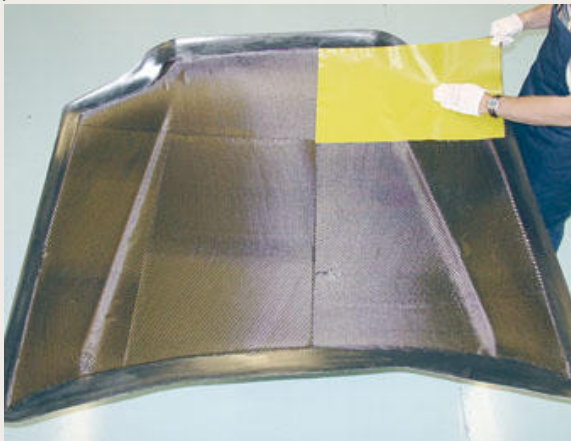


■ LAY-UP

Prepreg/ fabric should be placed on the mold while ensuring complete contact to the mold surface. Each additional ply should have full curvilinear contact with the previous ply. Gaps that occur between plies or the mold surface are known as “bridging”, and should be avoided as much as possible. (note the contour contact of the prepreg in photo).

■ PEEL PLY

As with the prepreg/ fabric, the peel ply should be placed on the completed lay-up with full curvilinear contact. Areas that need to be cut can be butt spliced or have a small overlap of peel ply material. (Econostitch is shown in photo).



Last updated : 2013-10-04

Catalog position : [Technical information](#)

VACUUM BAGGING TECHNIQUES

■ RELEASE FILMS

Release films are typically extended beyond the part lay-up and held in place with pressure sensitive tape. (Flashbreaker® 2R(HT) tape, Wrightlon® 5200 release film shown).

■ BREATHER

A non-woven breather layer is then placed on top of the release film and can be held in place with pressure sensitive tape. (Flashbreaker® 2R(HT) tape is shown in photo. Airweave N10 is the breather shown).



■ VACUUM BAG SEALANT TAPE

A strip of vacuum bag sealant tape is placed around the periphery of the mold. The paper backing should be left on the tape at this time so that the vacuum bag can be easily positioned (see photos). (GS-213-3 is shown in photo).

■ VACUUM BAG APPLICATION

Choosing the right size vacuum bag is critical. Too small of a vacuum bag may cause the bag to stretch (also known as "bridging") which could cause a rupture during the cure. Allowing for approximately 30 % to 40 % excess vacuum bag is a good starting point for complex shapes.



Last updated : 2013-10-04

Catalog position : [Technical information](#)

VACUUM BAGGING TECHNIQUES

■ POSITIONING THE VACUUM BAG

The vacuum bag sealant tape's paper backing is then peeled back in strategic locations and the bag is attached. This process will help to align the bag and place the excess vacuum bag material where it is required.

■ REMOVING THE PAPER AND ADHERING THE BAG

The paper is removed as the vacuum bag is adhered to the sealant tape.



Last updated : 2013-10-04

Catalog position : [Technical information](#)

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VACUUM BAGGING TECHNIQUES

VACUUM BAG PLEATS

The excess vacuum bag material will form pleats. The next step is to carefully place sealant tape inside the pleat to complete the seal. The process of making pleats will improve with practice.



INSTALLING A "THRU THE BAG" VACUUM CONNECTION (SEE VACUUM VALVES AND HOSES SECTION)

The female portion of vacuum valve is applied prior to completely close off bag with sealant tape. The important thing to remember is not to allow the film to twist / wrinkle when twisting the top half. Wrinkling the film under the top piece can cause a leak path. Pictured above and below is the Vac Valve 399 and the AQD 500TF quick disconnect fitting.

Cut a small "X"



Install the top piece and twist



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VACUUM BAGGING TECHNIQUES

■ ALTERNATE VACUUM CONNECTION

Sometimes it is not possible to locate the vacuum valve directly above the tool surface. An "off the bag" connection is created so that there is no mark off on the part itself. A piece of breather is added to provide breather continuity.



■ APPLYING VACUUM

Connect the quick disconnect fitting and pull light vacuum so the film can be moved around and placed where excess is needed. The hoses pictured are Airflow 65R autoclave / oven hoses.

■ COMPLETED VACUUM BAG

Typically, full vacuum is then applied.



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VACUUM BAGGING TECHNIQUES

■ VACUUM GAUGE

Vacuum gauge can detect if there are any leaks. If the gauge starts to drop, there is a leak (see Vacuum Valves and hoses section). Here is a Vac-Gauge 30, displaying the existing amount of vacuum.

■ LEAK DETECTION

Airtech offers ultrasonic leak detectors to assist in locating minor leaks (see miscellaneous section). To the right a VacLeak LEQ-70 is used to detect high pitch frequencies emitted from any vacuum leak paths that may be present.

