Higher temperature also increases the number of reactive sites available and sets up the perfect condition for amine blush to occur. With all this technical goop set aside, most builders only want to know how to prevent amine blush or how to cure the problem that they now have on their laminate. The following are remedies for amine blush:

1. Use peel ply. Amine blush forms most generally on the outer most portion of the lay-up. By using peel ply the amine blush is removed when the peel ply is removed, leaving a laminate free of amine blush and ready for secondary bonding.

2. Use a high quality resin, or a fast hardner. The length of time that resin is uncured is the length of time of exposure for the formation of amine blush. Reduce this time and you will reduce the amount of amine blush.

3. Cap all resins as soon as possible. This reduces exposure to the elements that cause amine blush. (DO NOT USE EPOXY PUMPS) Humidity the fiberglass and core material will effect how a laminate will turn out too.

4. Work in a controlled environment if possible. It is often hard to have a temperature and humidity controlled shop, but we can do our lay-ups at times when the temperature and humidity is not extremely high as we frequently see it in North Carolina.

5. Amine blush can be washed off with a clean cloth and warm water once the initial cure has occurred.

6. Sanding will remove the amine blush and also gum up your sandpaper. **Amine blush must be removed before subsequent or secondary laminates or lay-ups are initiated. If the amine blush is not removed, the interlaminar sheer strength is only as strong as the amine blush.** I find that the easiest method is to purchase a high quality resin that is not so susceptible to amine blush and use peel ply. By doing this, I get the best of both worlds. I get a resin that is easy to work with and that has higher qualities in virtually every area. I reduce sanding work and lighten my laminate by using peel ply. With these issues in mind, we use only EPOLITE 2183, 2184, 2187 hardners which eliminate amine blush.

We, at AeroCad, have had bad results testing Amine base hardeners. On a glass to glass bond (tape glassing cured bulkheads in place to other cured glass) the tape glass would peel off like it was bonded to wax paper. We also found fully cured laminates to have poor peel strength between plies. Vacuum bagging also produced the same reaction.

We deal with 80 to 90 percent humidity in our areas most of the time. We feel you should <u>always test your resin systems</u> to see if these types of problems come up. Most of our peel strength problems were seen in the winter time. The longer the cure rate the more moisture that seemed to creep into the laminate. We had material reps examine the problems we found in our testing and, surprisingly, no answers came from them.

Our fix is to just use Styrene-Monomer base hardners.

RAF is in the desert with almost no humidity so they will not have our high humidity problems. Use all resins as if you are a Guinea pig in your area. TEST - TEST - TEST until you know the resins will work for your needs in your area.

We also found that the T_g *(glass transition temperature)* was not what the resin manufacturer said it was. We took nose struts made of S-2 glass and sample resin from manufacturers and post cured it, slowly stepping up to 190°. We would then let it cool and re-heat it to 160° then 170° and so on until the resin became rubbery. Some samples would only reach 160° and others maybe 180°. Are resin manufacturers lying to us as end users? They told us to expect 10-20% lower T_g values because we were not in THEIR lab. If that is the answer you can expect from them, you had best TEST - TEST - TEST.

VHF Antennas in Long-EZ/Cozy Aircraft

Tony Rothwell (Australia) - I am building a Cozy 3 and am at the stage where I was making the winglets. I did some calculations and figured I knew better than the original designer of the radio antennae. I thought that each half of the VHF communications dipole should be around 22.6" rather than the 20.3" specified. I made one winglet antenna to the book dimension and one to my dimension and covered both.

Wrong! Fortunately, in those days I worked for the Australian Civil Aviation Authority and knew the fellow who ran the measurement and calibration laboratory. I took the winglets to the lab and had them measured for "bandwidth" and resonant frequency.

The plans built, 20.3" antenna was tuned nicely to 124.038 Mhz and the reflection co-efficient was less than 0.4 from 114-135 Mhz and less than 0.3 from 117 to 130 Mhz. Clever me had produced an antenna tuned to 111.04 Mhz, way down near the bottom of the navigation band and with a reflection coefficient below 0.3 only from 108 to 116 Mhz. Truly woeful!

I had to carry out an operation and shorten each antenna leg to its correct figure then repair the holes. More work and a heavier airplane resulted. I wish I could say I had truly learned a lesson and not made any more changes but it wouldn't be true.

I just hope my IO-320 with an MT prop delivers results to justify the weight and the cost. With a little luck, I'll know within the year. Gee doesn't work interfere with building?

For Sale

Cozy III, $16,000. All glass work done, primed and ready for engine, instruments and paint.
O-200 Vari-Eze for sale, $15,900, low time, light weight electric starter, etc. Call Chuck (352-637-1184