

Thoughts on Turbulators

By Don Deloach

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If turbulators are good is there a benefit using "wrinkled" tissue? I would say at least for the upper surface. Lower surfaces, on the other hand, should always be glassy smooth. Generally speaking, for most high performance free flight airfoils in the range of Re (Reynolds numbers) 25,000 to 80,000, a .020 square or round turbulator placed about 5% to 8% back from the leading upper surface can offer some improvement. Of course there is a drag penalty, so models with very broad speed ranges (notably HLG, CLG and gas events) are usually not good candidates for turbulators. The empirical test I've always heard about is to trim the model for a floating glide going dead straight with no turbulators. Now add a turbulator to one wing but not the other and observe the glide. If the model yaws toward the turbulated side, the turbulator is adding more drag than lift; if the turbulated wing picks up higher than the other and turns the model toward the unturbulated side, you have achieved an increase in lift. Further experimentation with multiple turbulators at various locations along the upper surface can give you brain damage but also possibly gain you significant improvements in decreasing sink rate. There has been a lot of empirical research done on turbulators in the Re of free flight models...! suggest the NFFS Symposium CD archive from www.indoorduration.com for more information.