mt-propeller
ENTWICKLUNG GMBH
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Airport Straubing-Wallmühle
94348 Atting / Germany
Telefon 49-(0)9429-9409-0
Telefax 49-(0)9429-8432
E-mail: sales@mt-propeller.com

A Letter from the President!

In the past month, we have received a large number of comments about our propellers, badmouthed by our competitor Hartzell, telling everyone that our blades are not strong enough to withstand the loads from bird strikes or that the blade retention with lag screws is no good, that a Hartzell blade is 10 times stronger than ours and that our airfoils are far too thick.
These are the four major points, Hartzell is focusing on.

Here is my answer:

1. Bird Strike

Every certified propeller has to show compliance of bird impact resistance per CS-P 360 (EASA Requirement) or FAR 35.36 (FAA Requirement) at the most critical location (about 4 inch from the tip) and the flight condition which will cause the highest blade loads (take off power and blade angle of about 15°).
Since all our propellers are certified according to these standards, we have demonstrated that our blades will withstand such impacts of a 4 lbs bird without major propeller effects. Hartzell shows a video of such a test with one of our blades, but with a far too high blade angle (about 40°) with the result of a failure at about mid-blade section. There is no blade, whether aluminum, carbon fibre, aramid fibre, glass fibre or wood composite which will survive such a test and this is why it was performed not within the rules, with the sole intent to destroy it.
Also there is no real case ever reported of such a bird strike condition in more than 110 million flight hours with more than 50.000 blades flying.

2. Blade Retention

Every certified propeller has to show compliance of centrifugal load tests per CS-P 350 (EASA Requirement) or FAR 35.35 (FAA Requirement) to demonstrate a load of twice the maximum centrifugal load at maximum rotational speed.
Since we use different sizes of blade roots for weight optimization, we have different blade root diameters and different number of lag screws.
To compare apples with apples, we will use our large size blade root with 11 lag screws, which hold a centrifugal load of 72 tons vs a maximum load of 9 tons at a usual take off rotational speed.
In other words, our blade retention is 8 times better than required. It further has been fatigue tested to a simulated flight of 20.000 hours without failure.

3. 10 Times Stronger

- What does this mean ?
- 10 times stronger as what ?
- What basis is used to make such a statement ?

Strength of our propellers is based on tests, simulation and calculations per CS-P 330 (EASA Requirement) or FAR 35.24 (FAA Requirement), we have at least a 10 times safety factor built into our blades and this is why we never had a blade failure in more than 110 million flight hours with more than 50.000 blades flying.
Our blade construction (natural composite) of compreg (in the blade root) and select fine grain spruce (in the areodynamic portion of the blade), multiple laminated, was invented by the Schwarz Propeller Company in Berlin (Germany) in 1928 and used in million of propeller blades during WW II from German, British, Russian, French and Japan in the best fighter and bomber planes like the FW-190, JU-88, Spitfire up to Mk-22 with 5-blade propeller, Hurricane, ect.. This technology is not new, new are only the materials and the way we design and make

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them today and to cover such blades, use stainless steel or nickel erosion sheats and protect them from the environmental impacts.
This is a great history, no artificial composite material (carbon, aramid of glass) has so far and this is why we have been granted unlimited life. Not to mention the excellent vibration dampening characteristics of wood as such, which eliminates the reactionless mode vibration in ground operation on 4-blade and 5-blade wood based propellers compared to metal or carbon bladed propellers.

4. Thin Airfoils

We say thin is not always beautiful. Every pilot knows that thin airfoils are good for high speed performance. Every pilots knows also, that thin airfoils are critical in stall behavior. Propellers are not different in this behavior, because they operate always at very high lift coefficients, especially during take-off and climb. These airfoils we use are a special development with the help of the German DLR (German National Aerodynamic Research Institute) taking into account the relative thicker airfoils, required for the properties of spruce.
Fact is, that or natural composite blades have nothing in common with the known wood blades, used in the early days (late 1940 and early 1950) of General Aviation in the U.S.A.
Our blades are high tech products which outperform any other blade type during take-off and climb and in most cases also in cruise. Because of our aerodynamic calculation methods in selecting the pitch distribution, our blades are also much quieter, so noise reduction (inside the cabin and fly-over) is a today's requirement. Since we do all calculations and tests in house with our well educated engineers and test pilots, we have direct comparison to OEM propellers, with either metal or carbon blades on more than 200 STC's we did, from powered sailplanes to regional airliners, certified by EASA, FAA or many other CAA on the globe.

5. Summary

We have no need to make false statements about our products because we know, that our customers enjoy flying them every day under any climatic or environmental conditions and everybody knows that lies will come up very soon.
The General Aviation market is tough and unforgivable and competition is always good as long as it is fair, resulting in most cases in better products.
The success of our propellers in the biggest General Aviation marketplace on earth, the U.S.A. tells us, we are on the right track.

Any comments are very welcome.

Gerd R. Muehlbauer
President
MT-Propeller Entwicklung GmbH
Airportstr.1
D-94348 Atting
Germany
Tel. +49-9429-94090
Fax +49-9409-8432
E-Mail: sales@mt-propeller.com