

Currently, the QM-40 rules, AMA 422, allow modified wood propellers of any style and type, and one single APC type carbon fiber injected molded propeller, unmodified. This rule change proposes to bring the AMA 422 rules more in line with the associated AMA 428 rules, which allow multiple APC 8.75 diameter, series D-1 Propellers. This rule change would allow injected molded carbon fiber propellers, diameters 7-8 inches that fall in the same design family as the currently allowed carbon propeller.

16. Event-specific rule formulas

16.1 Event 422 Q-40

16.1.2 Power plant

b. Propeller

1) Material: Either wood or a chopped carbon fiber filled injection-molded compound with material and physical properties equivalent or exceeding that of Ticona Celstran PA6-CF35-15. These material properties, which shall include tensile strength and other industry standard properties, must be equivalent to the above product for temperatures ranging from 30 to 150 degrees Fahrenheit. Substitutions of polymers that fall outside these specifications are not allowed.

2) Dimensions: No limit for wood. Injection Molded propellers shall have a diameter, pitch, blade width, and blade airfoil identical to that of the approved part numbers at every measurable station.

3) Availability, modification: Wood propellers may be modified. Injection molded propellers shall be commercially available and stock except for balancing, etc. as permitted by paragraph 7.5.2 under "General Model Aircraft Requirements".

4) Prior approval: APC part numbers in the family LP07XXXC, where "X" signifies the three numbers indicating diameter and pitch, only, are approved. Approval is considered temporary and continued approval requires the manufacturer, Landing Products, to inform the Chairman of the Contest Board when propeller material or dimensional specifications change, causing potential changes in performance. The Chairman is then required to determine if propeller performance still conforms to the rules, and inform Landing Products of continued approval. The Chairman shall have 60 days to make his determination.

5) Eligibility for competition: A propeller once approved shall be eligible for competition so long as it remains commercially available, as defined in Section 2, "Defined Terms".

There are several issues with the current rule: First and foremost, it does not, in practice, meet the intent of the original rule. The current rule was intended to help eliminate the expensive and time consuming propeller changing required during a contest and when moving to different locals or climates. Competitors were making wooden propellers using NC profiling (and still are) and were usually not offering their product to more than a very select few. When special NC props are offered, the cost is in the range of 30-40 dollars, with little consistency in performance. Prop breakage and costs are high. The intent can not be met because a fundamental problem with high rpm, low torque engines as used in Q40 is ignored: We have propeller problems because the power band of such engines is extremely narrow, and furthermore, it moves with small changes in atmospheric conditions. One single propeller gives us a solution for few actual conditions.

Secondly, to make matters worse, the propeller OKed was not the propeller ultimately produced. However, this addresses the above power and torque problem, rather than APC or quality control. APC made new molds as closely as possible to the prototype molds, but in production things differed, including the batch properties of approved polymer compounds. Probably more so than the new molds, introducing different batches of polymers can easily change propeller performance more than the unforgiving power curve will allow. Polymers are notorious for having different physical properties from batch to batch. We are currently undergoing another change in polymer and can expect more differences as well.

We have experience with this type of rule: We were faced with a similar problem with Q-500 several years ago when people were buying propellers by the hundreds and testing each one in order to obtain an advantage in a stock propeller event. The APC rule solved the problem quickly and cheaply. We now have a reasonable choice of propellers and competitors carry no more than 3 or 4 different sizes to a meet, and then make the changes as needed. No one would even consider running a wood prop.

Also, there was no sudden jump in speeds. In fact, it took about two years for competitors to give up their wood props and start using APC. When the carbon was first proposed for QM-40, "speed creep" was used as an argument against allowing the carbon prop. There are no data to support this after two years using the APC carbon. Speeds are stagnant, and the current AMA record, set with a wooden prop has not been bettered. Many radar tests support this as well.

In summary, our goal of having an alternative to the flurry of activity and money required to find the right prop for QM-40, has not been met by the current rule. Remember not all engines are the same even from the same manufacturer. There needs to be more choice so that competitors can match propellers with the narrow power band of their engines.

No effect on Records.