

TECHNICAL TIPS ON RUBBER

From the December, 2002 Mid-Hudson Modelmasters' Wing Tips, Jesse Aronstein, Editor

1. STRETCHING THE RUBBER SUPPLY.

There is still some good rubber around, and there are ways to make it last longer. Can't afford to waste it anymore. First thing is to make sure that you keep it clean. Grit and dirt are among the primary causes of breakage. Wash the rubber thoroughly before making up the motor, and don't put it down or drop it on dirty surfaces.

For indoor flying, we no longer have the luxury of being able to experiment with different widths (custom cut) for every different airplane. To conserve rubber, stick with one width of rubber and vary the propeller pitch and blade area to regulate the power. For a competitive Science Olympiad type model, rubber in the standard size of .093" (3/32") is a reasonable choice. There are still some standard smaller cuts (.085") available. Make up a bunch of motors all the same, to the maximum allowable weight, and keep that as a constant factor. If the model is overpowered, increase the propeller pitch and/or change to a propeller with more blade area. Go the opposite way if the model is underpowered. Make a pitch gage to help make the pitch adjustments, and configure the propeller bearing so that the prop can be removed (for adjusting) or replaced.

2 BREAKING IN AND LUBRICATING.

A new rubber motor will stretch permanently when first wound tight. That's why a new motor often appears to be more powerful than an originally-identical used one. In terms of energy storage, there is essentially no significant difference. One reason to break in new motors is to make them dependable and constant in their performance. Break in the motor by stretching it to about seven times its unstretched length, and hold it at that for a half hour or so. (Make a fixture to do this.) While it is stretched is a good time to lubricate it. On first use, wind to about 75% of maximum winds. On the next three or four uses, work up to the maximum. Let the motors rest for at least an hour between each use. Keep the motors clean, and store them in a dark place in a clean plastic bag.

3. MAINTENANCE AND USE.

Keep the motors clean, stored properly (in a bag in the dark, not on the model), and wash and re-lubricate if the strands stick together. Make sure the hooks on both the airplane and winder are free of burrs or scratches. Use sport rubber for casual flying - save any stock of TAN-II for serious competition. You will have to waste some rubber to determine what the maximum torque limit is for the batch and size rubber that you are using. This can be done with short motors, made from broken or scrap pieces. The maximum torque (before breaking) will be about the same for all motors made from the same original strand of rubber, no matter what the length. Stretch wind proportionately.)

4. DON'T WORRY TOO MUCH ABOUT THE RUBBER.

Pay attention to all the other things that make a model competitive. Minimize the weight. Minimize the drag. Eliminate warps. Spend a lot of time trimming (adjusting the flight characteristics) and practicing. Careful building and then systematic refining of the flight trim adjustments can double your flight time. TAN-II vs. TAN-Sport is only worth 5% to 10%. Don't get fixated on the rubber until you are bumping the maximum performance possible for the type of model.