LITTLE MODELS "FLIT" , LARGE MODELS FLY

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SMALL MODELS “FLIT”, LARGE MODELS “FLY”

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You may have heard this and wondered why this might be so. The reason is a mysterious ‘Reynolds Number’ that roughly describes the size and mass of air molecules flowing over and under the aerodynamic surfaces of any aircraft at various speeds, model or full-scale. When we build a smaller (scaled) model from full-scale sizes, to micro to giant scale, the one factor that cannot be scaled is the size of the air molecules supporting our models in flight.

Full-scale aircraft in the light to medium size have a Reynolds number ranging from 40,000 to 1,000,000 in flight and our models, due to much smaller wing areas, have a Reynolds Number in flight of from 10,000 to 400,000. This doesn’t translate into usable information unless we see the effect of these numbers on our models so we generally use a ratio of weight in ounces to wing area in square feet. Or, Oz/Sq Ft and in models this measurement is usually from 4 oz to 70 oz per square foot of wing area. This is an easy and reasonably accurate measurement for us.

Sheet foamie models may have a wing loading of a few oz per square ft, and a medium RC model can range from 15 oz to 25 oz per sq. ft. A giant scale model can weigh from 35 oz to 70 oz per sq. ft. of wing area. Our turbine models may have an even higher wing loading, but generally higher speeds to generate enough lift.

In contrast, a full scale medium bomber like a B-26 Martin “Marauder” at gross weight has a wing loading of 956 oz/sq ft and a P-51B has a wing loading of 739 oz/sq ft. A piper Cub has a wing loading of 107 oz/sq ft. (almost model range).

Modern airliners with advanced aerodynamics are in a whole different category regarding wing loading. A modern Boeing 747 with a 910,000 pound max take-off weight has a wing loading of a whopping 2,600 oz/sq ft. of wing area!

And it’s all because of the dimensionless number called the Reynolds number derived from a fairly complex formula. So, now you know why Little Models flit and larger models fly. For a more complete description you can go to www.exo-aircraft.com

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