The Relationship between Frictional Resistance and Roughness for Surfaces Smoothed by Sanding

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An experimental investigation has been carried out to document and relate the frictional resistance and roughness texture of painted surfaces smoothed by sanding. Hydrodynamic tests were carried out in a towing tank using a flat plate test fixture towed at a Reynolds number (Re): range of $2.8 \times 10^6 - 5.5 \times 10^6$ based on the plate length and freestream velocity. Results indicate an increase in frictional resistance coefficient ($C_F$) of up to 7.3% for an unsanded, as-sprayed paint surface compared to a sanded, polished surface. Significant increases in $C_F$ were also noted on surfaces sanded with sandpaper as fine as 600-grit as compared to the polished surface. The results show that, for the present surfaces, the centerline average height ($R_a$) is sufficient to explain a large majority of the variance in the roughness function ($\Delta U'$) in this Reynolds number range. ©2002 ASME

Results:
As long as the sanding is made in the sailing direction, the friction is lower than on the polished surfaces.
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