

Numerical Study of Base Drag Reduction Using Locked Vortex Flow Management Technique for Lower Subsonic Regime

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Abstract : The issue of turbulence base streams and the drag related to it have been of important attention for rockets, missiles, and aircraft. Different techniques are used for base drag reduction. This paper presents the numerical study of numerous drag reduction technique. The base drag or afterbody drag of bluff bodies can be reduced easily using locked vortex drag reduction technique. For bluff bodies having a cylindrical shape, the base drag is much larger compared to streamlined bodies. For such bodies using splitter plates, the vortex can be trapped between the base and the plate, which results in smooth flow. Splitter plate with round and curved corner shapes has influence in drag reduction. In this paper, the comparison is done between single splitter plate as different positions and with the bluff body. Base drag for the speed of 30m/s can be reduced about 20% to 30% by using single splitter plate as compared to the bluff body.

Keywords : base drag, bluff body, splitter plate, vortex flow, ANSYS, fluent

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