

Aerodynamic Drag of Windows and Doors on the Sides of Shinkansen Trains

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The aerodynamic drag of windows and a door on the sides of Shinkansen trains was measured in a large-scale wind tunnel to evaluate the contribution ratio of the aerodynamic drag of windows and doors to the total aerodynamic drag of an intermediate vehicle. Mock-ups of a door and three windows with different sizes and shapes were used. The edge shapes of the window-frames were also varied. It is shown that the aerodynamic drag of windows decreases as the size becomes smaller and the edges become smoother. The aerodynamic drag of an intermediate vehicle can be reduced by 2.6 percent if the edges of all the windows and doors are flattened.