FUNDAMENTALS OF CONVECTIVE COOLING OF RAILWAY DISC BRAKES

This report describes the fundamental mechanisms involved in the convective cooling to air of railway brake discs mounted on wheels. The overall cooling of the discs is composed of cooling to air from the front face, and cooling to the wheel web by conduction. Experimental cooling data was obtained in the laboratory for discs rotating in still air as well as in a cross flow of air due to a constant speed fan. Theoretical and empirical equations have been derived to explain the results for various regimes of windflows on the front surface and in the ducts. This data also agrees with previous results. Wind flows through one duct of a rotating disc were measured and the results agree well with Eck's theory for radial fans.

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Report Author(s): MA Tanvir
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