

BRAKE DISC COOLING: MEASUREMENTS ON TRIBOMETER TRAIN

It is important to keep brake disc temperatures as low as possible to prevent cracking and reduce the possibility of pad fade. Additionally, since pad wear increases rapidly with temperature, improved disc design to accelerate cooling between stops can lead to significant reductions in maintenance costs. To achieve this improvement it is necessary to know how heat is transferred from disc to air in service conditions, where cooling is a function of train and wind speed, wind direction, ambient temperature and humidity.

This report details tests made on the tribometer train to obtain experimental values of the disc cooling time constant, from which the heat transfer coefficient may be evaluated, for different train and wind speeds. The results obtained are compared with empirical equations for the variation of heat transfer coefficient and a relationship has been established, based on the mean experimental results, that relates the coefficient to train speed.