



Development Work Notice

This document has been prepared as a notification of work in progress within the ESDU committees that will result in future product updates. It will be updated and re-issued throughout the development process.

ESDU Topic:

Computer program for estimation of the performance of aircraft type tyres rolling or braking on dry and precipitate contaminated runways.

Scope:

ESDU 10009 presents a computer program, ESDUpac A1009 that implements the mathematical models of ESDU 05011 for estimation of the performance of aircraft type tyres rolling or braking on dry and precipitate contaminated runways.

The parent Item, ESDU 05011, provides procedures for predicting the tyre braking force and tyre rolling resistance for an aircraft operating on a contaminated runway surface. Additionally, procedures are provided for predicting the drag force acting against a tyre due to the presence of contaminant on a runway surface. From these the total resistance force due to contaminant acting against a single aircraft tyre can be predicted. Additional procedures are provided for estimating the total resistance force due to contaminant acting against a single aircraft undercarriage. These can be summed to predict the total resistance force due to contaminant acting against an aircraft.

ESDUpac A1009 can be used to calculate the predicted forces acting against either a single tyre, an undercarriage of the form specified in ESDU 05011, or an aircraft comprising such undercarriages when operating on a dry runway surface or a runway surface that is covered by a layer of one of the following contaminants: water, slush, ice or snow. Additionally, the computer program incorporates the methods of ESDU PERF EG 5/1, 'Estimation of take-off distance', and ESDU PERF EG 6/4, 'Estimation of ground run during landing', enabling the user to predict how the presence of contaminant on a runway surface influences the expected take-off and landing distances required for an aircraft.

Keywords: aircraft, braking, computer, contaminated, drag, force, friction, ice, macro-texture, model, program, ratio, rolling, runway, skidding, slip, slush, snow, three-zone, tyre, undercarriage, water.

ESDU Series: Performance.

ESDU Related Data Items/Software: ESDU 05011, ESDU 10015.

Target Completion Date: July 2013.

Issued ESDU Data Item No: ESDU 10009.

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