

# EASA Runway Friction & Aircraft Braking -The Way Forward-



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# Hi Tech Measures



**3 mm**

# Stakeholder's Perspective



What do we want?

Safety

Compliance

Auditable records

No accidents or incidents

# How do we achieve this?



CAP 168 Chapter 3

CAP 683 The Assessment of Runway  
Surface Friction Characteristics

CAP 781 Runway Rehabilitation

# Munich 6<sup>th</sup> February 1958

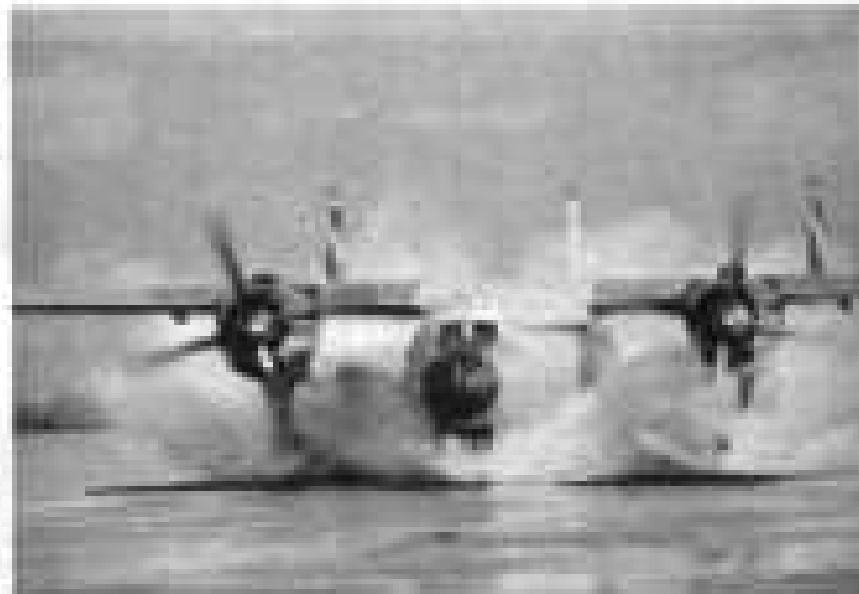
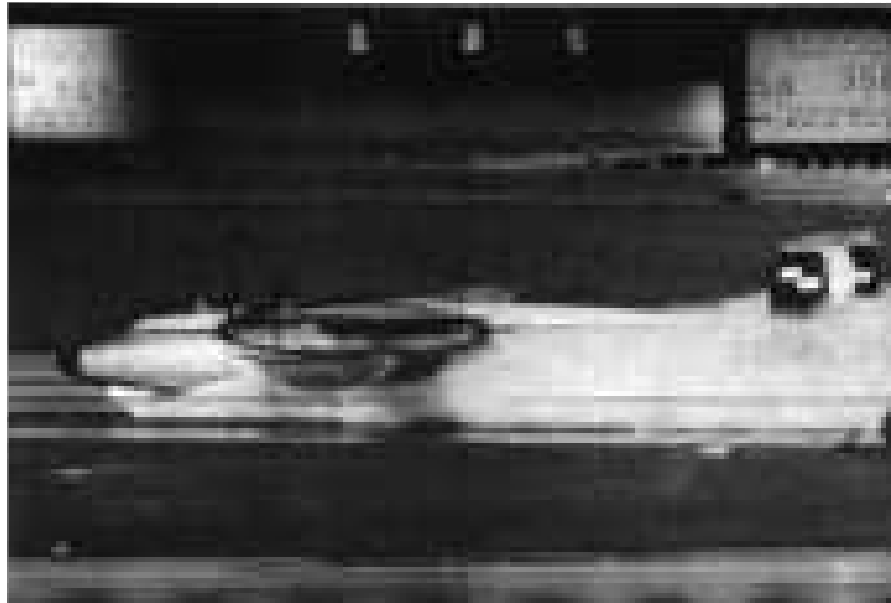


12 March 2010

Runway Friction & Aircraft Braking

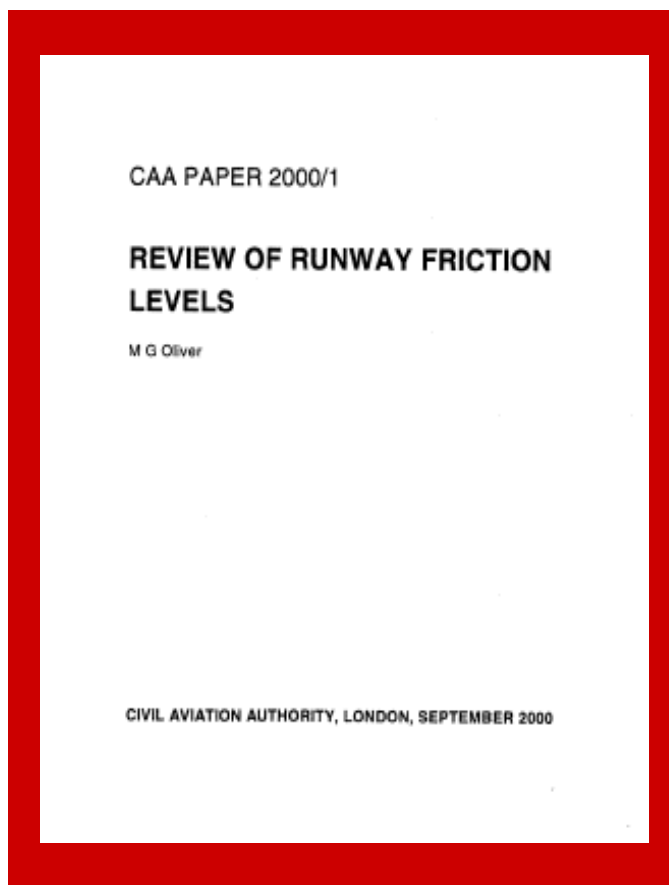
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# The Measurement of the Effects of Slush and Water on Aircraft During Take-Off



## Royal Aircraft Establishment Bedford 1968-69

# CAA Research



1999 study by Gibbs  
(now Jacobs)

# CAA Research

Analysed data from Civil & Military  
runways over many years

Compared readings at different speeds

Created the 100m Rolling Average

Adopted new figures for DOL MPL & MFL



# CAP 683 V4



## **Chapter 1 Introduction**

Purpose

Scope

Limitations to Operational Use of CFME

## **Chapter 2 Runway Surface Friction Assessments**

Assessment Periodicity

Trend Analysis

Additional Assessments

## **Chapter 3 Runway Surface Friction Assessment Procedures**

Equipment Checks

Operators Training and Competence

Assessment Conditions

Assessment Procedure

Records

## **Chapter 4 Evaluation of Runway Surface Friction Assessment Results**

100 m Rolling Averages

Action to be taken as a Result of a Runway Friction Assessment

Assessments made following Maintenance Activities

# CAP 683 Para 3.3



The procedures in this document should only to be used for the acquisition of friction levels of a runway surface for maintenance purposes. Data gathered concerning friction characteristics should be made available to aerodrome users on application, **but should not be communicated to the crews of aircraft intending to use the runway during periods of surface contamination.**

# Periodicity



The recommended maximum intervals between runway surface friction assessments is outlined in Table 1.

**Table 1** Recommended Maximum Interval Between Runway Surface Friction Assessments

Average number of movements on the Runway per day	Maximum Interval between Assessments
Less than 400	11 months
400 or more	5 months

**NOTE:** The total number of movements, on both runway directions, determines the average number of movements on a runway.

# Speed reveals texture

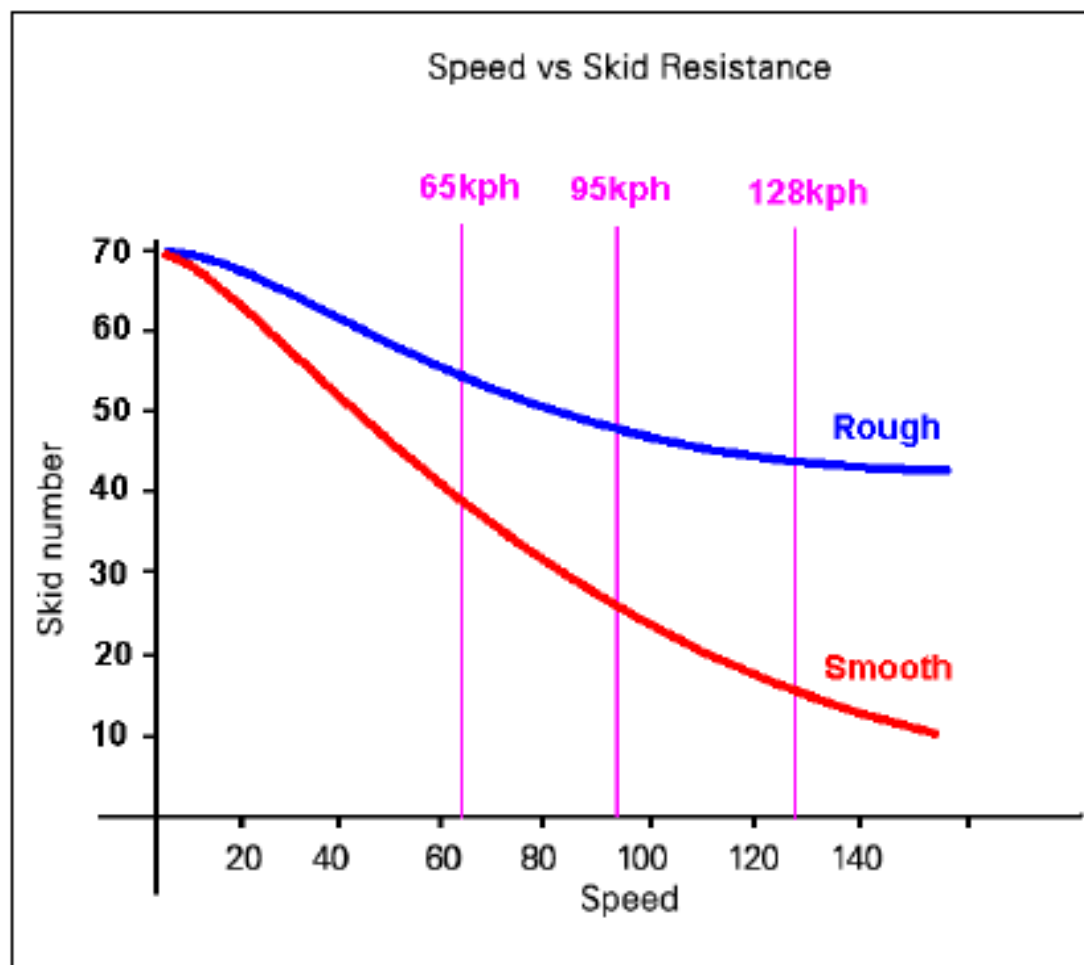


Figure 1

# Number of Runs

**Table 2** Recommended Format for Runway Surface Friction Assessment  
Standard Runs Based on Nominal Runway Width

Runway Width	Recommended lateral displacement of standard runs each side of the centreline (metres)					
	Central portion			Outer portion		
18 m	1.5	3.5	6			
23 m	1.5	3	6	9		
30 m	1.5	4	7	12		
45 m	1.5	4	7	11	17	
60 m	1.5	4	7	11	17	23

# Records



**Date and time of assessment, including operative's name;**

**Runway assessed;**

**Run number and runway direction;**

**Distance from the centreline and on which side of centreline the run was performed;**

**Constant run speed (km/h) for each run;**

**Run length;**

**Test water depth;**

**Test tyre type;**

**Measure of tyre wear;**

**Surface condition and air temperature;**

**Average friction level per run; and**

**Friction levels indicating 100 m rolling average by Portion.**

# Table 3

**Table 3** Friction Level Values

	Test speed	Test water depth	Test tyre type	DOL	MPL	MFL
<b>Mu-Meter</b>	65 kph	0.50 mm	ASTM E670 <sup>1</sup>	0.72 or greater	0.57	0.50
<b>Grip Tester</b>	65 kph	0.25 mm	ASTM E1844 <sup>2</sup>	0.80 or greater	0.63	0.55
<b>ASFT</b>	65 kph	1.00 mm	ASTM E1551 <sup>3</sup>	0.74 or greater	0.47	0.34

1. This is the Standard Test Method for Side Force Friction on Paved Surfaces Using the Mu-Meter, which includes the specification for the Mu-Meter test tyre.
2. This is the Standard Specification for A Size 10 × 4-5 Smooth-Tread Friction Test Tire, which is the tyre used by the GripTester
3. This is the Standard Specification for Special Purpose, Smooth-Tread Tire, Operated on Fixed Braking Slip Continuous Friction Measuring Equipment, which is the tyre used by the CFMEs like the ASFT.

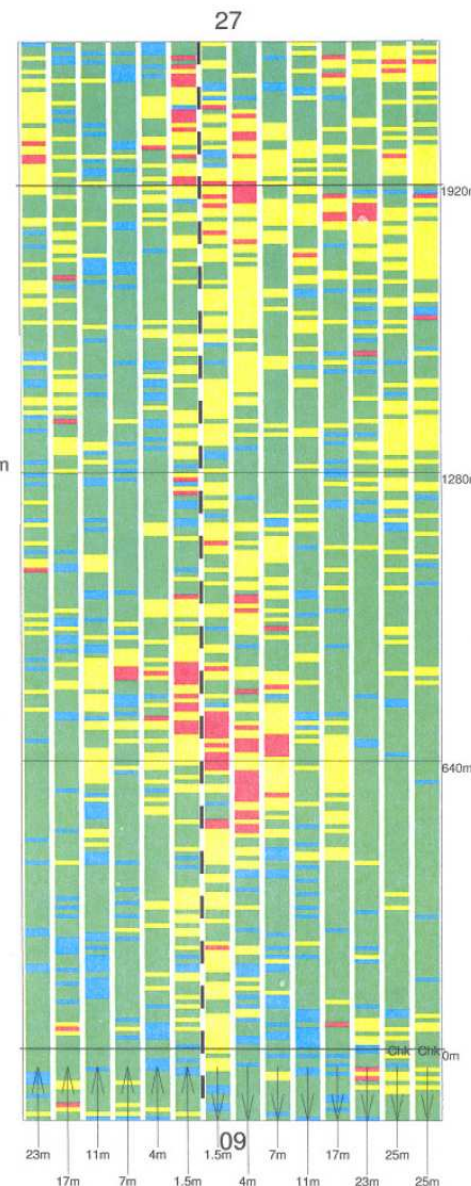
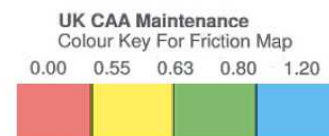
# Data from runway assessment



Header data and friction map

Runway classification survey:  
Bristol Filton Airport

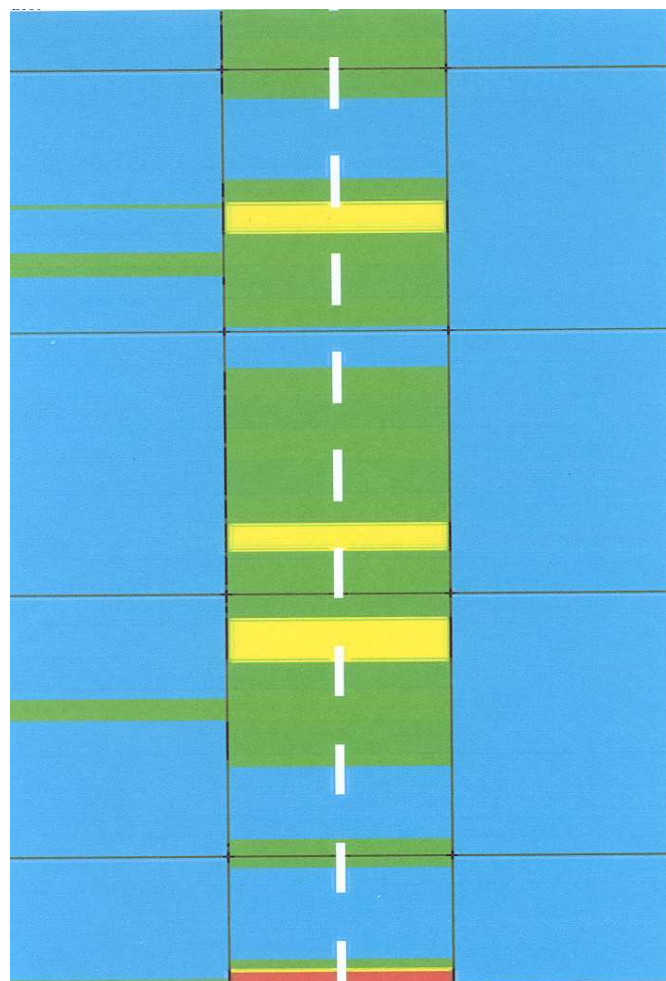
ICAO code:EGTG  
Runway designation:09-27  
Date of survey start:16-Dec-08  
Time of survey start: 10:25  
Runway length between thresholds:1920m  
Target speed:65km/h  
Water film:0.25mm  
GripTester:GT430  
Measuring tyre:A-Series



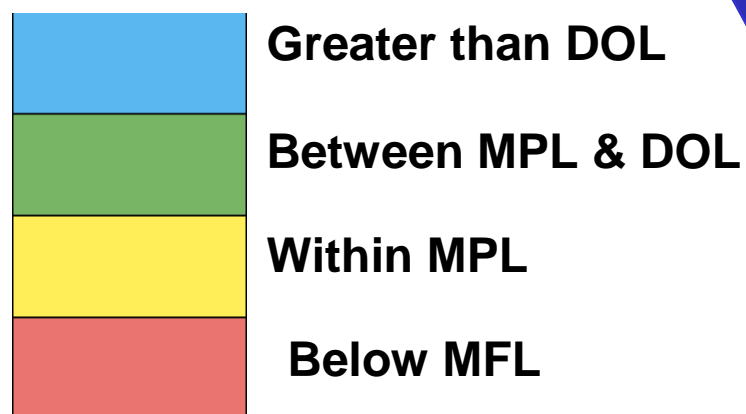
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# Use of Data



Example of a Quick View showing 100m rolling averages by runway portion



# Remember this meeting

Possibly one of the most significant multi-disciplinary gatherings of aviation safety professionals in recent years!

**Thank you EASA & DGAC**