

---

**Značilnosti cestnih in vzletnih površin - 6. del: Postopek določanja torne sposobnosti vozne površine z meritvijo količnika trenja poševno vodenega kolesa (SFCS): SCRIM®**

Road and airfield surface characteristics - Part 6: Procedure for determining the skid resistance of a pavement surface by measurement of the sideway force coefficient (SFCS): SCRIM®

**iTeh STANDARD PREVIEW**  
(standards.itih.si)  
Oberflächeneigenschaften von Straßen und Flugplätzen - Teil 6: Verfahren zur Bestimmung der Griffigkeit von Fahrbahndecken durch Messung des Seitenreibungsbeiwerts (SFCS): das SCRIM-Griffigkeitsmessgerät

[SIST-TS CEN/TS 15901-6:2010](https://standards.itih.ai/catalog/standards/sist/0d3e4a1a-9af0-4efc-8a74-621005255a3a/sist-ts-cen-ts-15901-6:2010)

<https://standards.itih.ai/catalog/standards/sist/0d3e4a1a-9af0-4efc-8a74-621005255a3a/sist-ts-cen-ts-15901-6:2010>  
Caractéristiques de surface des routes et aéroports - Partie 6: Mode opératoire de détermination de l'adhérence d'un revêtement de chaussée en procédant au mesurage du coefficient de frottement transversal (CFTS): le SCRIM

**Ta slovenski standard je istoveten z: CEN/TS 15901-6:2009**

---

**ICS:**

17.040.20	Lastnosti površin	Properties of surfaces
93.080.10	Gradnja cest	Road construction
93.120	Gradnja letališč	Construction of airports

**SIST-TS CEN/TS 15901-6:2010**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST-TS CEN/TS 15901-6:2010

<https://standards.iteh.ai/catalog/standards/sist/0d3e4a1a-9af0-4efc-8a74-9721e513552e/sist-ts-cen-ts-15901-6-2010>

TECHNICAL SPECIFICATION  
SPÉCIFICATION TECHNIQUE  
TECHNISCHE SPEZIFIKATION

**CEN/TS 15901-6**

November 2009

ICS 93.080.20

English Version

**Road and airfield surface characteristics - Part 6: Procedure for  
determining the skid resistance of a pavement surface by  
measurement of the sideway force coefficient (SFCS): SCRIM(r)**

Caractéristiques de surface des routes et aéroports - Partie  
6: Mode opératoire de détermination de l'adhérence d'un  
revêtement de chaussée en procédant au mesurage du  
coefficient de frottement transversal (CFTS): le SCRIM

Oberflächeneigenschaften von Straßen und Flugplätzen -  
Teil 6: Verfahren zur Bestimmung der Griffigkeit von  
Fahrbahndecken durch Messung des  
Seitenreibungsbeiwerts (SFCS): das SCRIM-  
Griffigkeitsmessgerät

This Technical Specification (CEN/TS) was approved by CEN on 27 June 2009 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Contents

Page

Foreword.....	3
1 Scope .....	4
2 Normative references .....	4
3 Recommended uses .....	4
4 Terms and definitions .....	4
5 Safety .....	7
6 Essential characteristics .....	7
6.1 Principle of measurements .....	7
6.2 Operating Principle .....	7
7 Key Characteristics .....	8
7.1 General .....	8
7.2 Test equipment .....	8
7.3 Test wheel assembly .....	9
7.4 Test tyre .....	9
7.5 Pavement wetting system, water film thickness .....	9
7.6 Measurement control system and recorder .....	10
7.7 Parameters recorded .....	10
8 Test procedure .....	10
8.1 Standard test conditions .....	10
8.2 Prior to testing .....	11
8.3 Testing .....	11
9 Data recording .....	12
10 Calibration .....	12
10.1 General .....	12
10.2 Static calibration of horizontal load measurement .....	12
10.3 Static calibration of vertical load measurement .....	13
10.4 Vertical load recording static check .....	13
10.5 Vertical load static check .....	14
10.6 Dynamic calibration check .....	14
10.6.1 General .....	14
10.6.2 General .....	14
10.6.3 Operational procedures for dynamic comparison checks .....	15
10.7 Distance calibration .....	15
11 Precision .....	15
12 Test Report .....	15
Bibliography .....	17

## Foreword

This document (CEN/TS 15901-6:2009) has been prepared by Technical Committee CEN/TC 227 “Road materials”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST-TS CEN/TS 15901-6:2010](https://standards.iteh.ai/catalog/standards/sist/0d3e4a1a-9af0-4efc-8a74-9721e513552e/sist-ts-cen-ts-15901-6-2010)

<https://standards.iteh.ai/catalog/standards/sist/0d3e4a1a-9af0-4efc-8a74-9721e513552e/sist-ts-cen-ts-15901-6-2010>

## CEN/TS 15901-6:2009 (E)

## 1 Scope

This Technical Specification describes a method for determining the wet-road skid resistance of a surface by measurement of the sideway force coefficient SFCS.

The method provides a measure of the wet-road skid resistance properties of a bound surface by measurement of sideway-force coefficient at a controlled speed. The method has been developed for use on roads but is also applicable to other paved areas such as airport runways.

This Technical Specification covers the operation of the Sideway-force Coefficient Routine Investigation Machine SCRIM®. This is a device developed by W.D.M. Limited, Bristol, England from original research by the Transport Research Laboratory in the United Kingdom. It uses the side force principle to make routine measurements of skid resistance continuously on long lengths of road. SCRIM test equipment has been built onto a number of different vehicle chassis and functions independently of vehicle choice.

A machine conforming to the general characteristics of the SCRIM and the specific provisions of this Technical Specification may also be used for the tests.

The skid resistance of a pavement is determined by friction measurements and measurements of pavement texture. Where measurement of pavement texture is required the standard for this measurement and the device is described in EN ISO 13473-1.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 48, *Rubber, vulcanized or thermoplastic – Determination of hardness (hardness between 10 IRHD and 100 IRHD)*

ISO 4662, *Rubber – Determination of rebound resilience of vulcanizates*

## 3 Recommended uses

This method provides a means for the evaluation of the skid resistance of a road surfacing. It is suitable for use for the following situations:

- testing new surfacing materials when installed in a road trial for Type Approval purposes;
- testing new surfacing materials for contractual compliance purposes;
- routine determination of the in-service skid resistance of the surface of a road or airport runway;
- research.

## 4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 4.1

#### friction

resistance to relative motion between two bodies in contact

NOTE The frictional force is the force which acts tangentially in the contact area.

**4.2****skid resistance**

characterisation of the friction of a road surface when measured in accordance with a standardised method

**4.3****wet road skid resistance**

property of a trafficked surface that limits relative movement between the surface and the part of a vehicle tyre in contact with the surface, when lubricated with a film of water

**NOTE** Factors that contribute to skid resistance include the tyre pressure, contact area, tread pattern, and rubber composition; the alignment, texture, surface contamination, and characteristics of the road surface; the vehicle speed; and the weather conditions.

The skid resistance of a road surface in Europe varies seasonally. Generally, wet skid resistance is higher in winter as a result of the effects of wet detritus and the effects of frost and wear by tyres on microtexture and macrotexture. Wet skid resistance is lower in summer as a result of dry polishing by tyres in the presence of fine detritus.

The change in skid resistance of a surface in service is affected by the volume of traffic and the composition of the traffic, i.e. cars, buses, commercial vehicles of different sizes, as the tyres of these vehicles polish and/or wear away the surfacing material in different ways. The geometry of the road will affect the change in skid resistance. Generally, tyres polish less on straight roads than on bends.

Where the surface contains aggregate with a coating of binder, e.g. bitumen, resin or Portland cement, the skid resistance will change as the coating is worn away by tyres.

**4.4****bound surface**

top layer or surface course of a road with the aggregates secured permanently in place

**NOTE** Aggregates are commonly secured in place by bitumen or Portland cement.

**4.5****operating speed**

speed at which the device traverses the test surface

[SIST-TS CEN/TS 15901-6:2010](https://standards.iteh.ai/catalog/standards/sist/0d3e4a1a-9af0-4efc-8a74-9721f513552e/sist-ts-cen-ts-15901-6-2010)

<https://standards.iteh.ai/catalog/standards/sist/0d3e4a1a-9af0-4efc-8a74-9721f513552e/sist-ts-cen-ts-15901-6-2010>

**4.6****contact area**

overall area of the road surface instantaneously in contact with a tyre

**NOTE** This term describes the overall area generally covered by the tyre. Due to the effects of surface texture or any tyre tread pattern, not all of the tyre or road surface in the contact area can be in contact at any instant.

**4.7****slip speed**

relative speed between the test tyre and the travelled surface in the contact area

**4.8****slip ratio**

slip speed divided by the operating speed

**NOTE** For devices meeting the requirements of this Technical Specification the slip ratio is fixed by the angle of the test wheel.

**4.9****horizontal force****side force**

force acting horizontally perpendicular to a freely rotating, angled test wheel

## CEN/TS 15901-6:2009 (E)

## 4.10

**sideway force coefficient****SFC**

ratio between the vertical force (load) and horizontal force (sideway force) in controlled conditions, which is normally a decimal number quoted to two significant figures

NOTE SFC varies depending on the wheel angle of the device and the operational speed.

## 4.11

**SFCS**

sideway-force coefficient measured with a device using a narrow wheel in accordance with this Technical Specification

## 4.12

**SCRIM®**

device developed by W.D.M. Limited, Bristol, England from original research by Transport in the United Kingdom that uses the side force principle to make routine measurements of skid resistance continuously, all devices being manufactured under license from TRL Ltd UK

## 4.13

**sampling length**

distance over which responses of the sensors are sampled to determine a single measurement of the recorded variables

NOTE 1 The sampling length depends upon the detailed operation of device and its recording system; a number of samples may be combined to determine a measurement for a subsection.

NOTE 2 This should not be confused with horizontal resolution which is the shortest distance over which a change in the measured parameter can be detected.

## 4.14

**subsection**

defined length of surface for which one set of the measured variables is reported by the device

NOTE Different devices may use different subsections depending on the context of the measurements, such as 5 m, 10 m or 20 m.

## 4.15

**test section**

length of road between defined points (e.g. location references, specific features, or measured distances) comprising a number of subsections over which a continuous sequence of measurements is made

## 4.16

**water delivery system**

system for depositing a given amount of water in front of the test tyre so that it then passes between the tyre and the surface being measured

## 4.17

**water flow rate**

rate at which water is deposited on the surface to be measured in front of the test tyre

NOTE Water flow rate is expressed in litres per second (l/s).

## 4.18

**theoretical water film thickness**

theoretical thickness of a water film deposited on the surface in front of the measuring tyre, assuming the surface has zero texture depth



**4.19****wheelpath**

part of the pavement surface where the majority of vehicle wheel passes are concentrated

**NOTE** The wheelpath is not a fixed location on a pavement surface. On a worn pavement, the wheelpath is usually easily identified visually. On a newly laid surface, the position of the wheelpath needs to be estimated by experienced operators.

For special circumstances such as acceptance tests, a particular path may be defined, for example  $(700 \pm 150)$  mm from the edge of the running lane of a road.

**4.20****nearside wheelpath**

wheelpath that is closest to the edge of the road in the normal direction of travel

**NOTE** For countries that normally drive on the right, this is the right-hand side and for countries that normally drive on the left, this is the left-hand side.

**5 Safety**

Safety measures shall be in place to maintain safe working practice in accordance with current regulations, and to ensure the safety of other road users, including measures to control traffic as necessary.

**NOTE** The wetting of surfaces can have an effect on other users of the site and every effort should be made to ensure that they do not have to make any sudden changes in speed or direction.

When measuring skid resistance on trafficked roads the device may operate at speeds different to normal road speeds and as a result can create a hazard to other road users. The test speed specified when calling for tests in accordance with this standard should take this into account.

Testing should not be carried out if there is a risk of water freezing on the pavement.

Most devices are fitted with a test wheel on one side only, positioned for testing in the nearside wheelpath of their home country. Such machines cannot normally be used to test in the other wheelpath without straddling the edge of the lane and should not be used so unless there is sufficient room to do so safely and appropriate safety measures regarding other traffic are taken. Some machines are fitted with a test wheel on both sides.

**6 Essential characteristics****6.1 Principle of measurements**

Machines meeting this Technical Specification operate on the sideways-force principle using a special narrow test wheel, similar to a motorcycle wheel, set an angle to the direction of travel which generates a slipping condition as it is towed along the wetted pavement surface. The slipping force and load on the wheel are measured. A typical device is illustrated in Figure 1.

**6.2 Operating Principle**

A controlled slipping condition is achieved by mounting a freely rotating test wheel with its vertical plane at an angle to the longitudinal plane of the test vehicle. When the vehicle is in motion, the test wheel slides or slips in the forward direction.

A freely rotating wheel fitted with a special pneumatic, smooth, rubber tyre, mounted mid-machine in line with the nearside wheelpath and angled at  $20^\circ$  to the direction of travel of the vehicle, is applied to the road surface under a known vertical load.