

FAQ on the introduction of DIN EN 16165 - Determination of slip resistance of pedestrian surfaces – Methods of evaluation; German version EN 16165:2021

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Note: *Please note that the FAQ deals with the introduction of DIN EN 16165 in Germany and refers to national regulations that are valid in Germany.*

Why is there now a European standard for measuring the slip resistance of pedestrian surfaces? And why does it contain four different test methods?

In Europe, there have been numerous standards and technical rules regulating the measurement of the slip resistance of floors. In some cases, there were different sets of rules for the same measuring principle, which were technically very similar and only differed in certain subtleties. The areas of application were limited to individual product groups, areas or countries. Floor manufacturers and testing institutes thus had to observe a multitude of different standards and test according to them.

The aim in creating the standard was to standardise test methods commonly used in Europe and to reduce the multitude of regulations to four test methods. The focus is only on the "HOW", i.e. the measurement method, and how the measurement is carried out. The standard does not deal with requirements for floorings, i.e. how the results are to be used. The European legal framework provides that the requirements for the safety in use of a building and also the safety in use of a workplace are determined by the member states.

Four test methods have been included in the standard because good experience has already been gained with the associated safety systems in different countries and because there is no test method that combines all the desired and necessary properties. The ramp tests (Annex A and B) offers the advantage that all types of floors can be tested, especially profiled floors and gratings. The disadvantage is that the method can only be used in the laboratory and is not suitable for permanently installed floors in operational condition. The ramp test by a walking barefoot person (Annex A) has the advantage that the friction properties can be measured in conjunction with human skin, as there is as yet no artificial skin substitute material with comparable properties. The pendulum test (Annex C) and the tribometer test (Annex D) can be used in the laboratory as well as in situ and under operational conditions. They both have the disadvantage that there are difficulties in measuring profiled floors.

There is no transferability of results from the different test methods to each other. This is due to different parameters and test materials.

What opportunities does the new testing standard DIN EN 16165 offer?

Within the scope of the revision, the measurement procedures were improved and a higher measurement accuracy can be expected. At the same time, the new test standard offers the opportunity to reduce the effort for different measurements for manufacturers and testing institutes through standardised test procedures. Although a manufacturer still has to fulfil the requirements (according to building regulations and occupational health and safety law) in the European countries, he can use the same measurement and the same measurement result for different countries. If all member states would refer to EN 16165 in their requirements, this means for a manufacturer that he has to test his floor with a maximum of four test methods, which previously could be up to 27 different methods. This reduces barriers to trade and is in line with the principles for free movement of goods in the European internal market.

Testing institutes can concentrate on four test methods throughout Europe and have to use fewer different test methods overall. This reduces the administrative burden as well as the expenses for equipment, test materials and different accreditations.

European product TCs dealing with the properties of different types of flooring do not need to develop their own test methods, but can refer to the test standard as well as the already existing requirements in the member states.

What happened to the test procedures from the German standards DIN 51097, DIN 51130 and DIN 51131?

The previous German test methods were used as a basis in the development of the EN 16165 standard and in the previous version of CEN TS 16165. All three procedures have been further developed - also with the experience from other European countries - and now represent the current status of the test procedures. The measurement principles are therefore still in place. Therefore

- DIN 51097 were processed in Annex A,
- DIN 51130 were processed in Annex B and
- DIN 51131 were processed in Annex D

of DIN EN 16165.

Why were the German standards DIN 51097, DIN 51130 and DIN 51131 withdrawn with the introduction of DIN EN 16165? Is there a transition period?

When a European standard is published, national standards with the same subject matter must be withdrawn. This is to avoid duplication of regulations.

As this is purely a matter of test procedures, there is no transitional arrangement. The new standard applies immediately and must also be used.

Where has the classification into R-groups and ABC-classes gone?

In the withdrawn German standards (DIN 51097 and DIN 51130), the angle of slip was grouped directly into a class as a test result. This classification corresponded and still corresponds to the specifications from other legal standards for the selection and the requirements of flooring with regard to slip resistance. In the European standard, the result is "only" the angle of slip value. Firstly, this can be better used for product development and secondly, the individual member states set the requirements for the selection of floors anyway, whereby they have the freedom to choose their own or a different (than the German) classification.

In the German version, DIN EN 16165, a national informative annex was included that contains the same classification as before, so that in the test certificates according to the German version, the achieved class can also be stated directly in addition to the angle of slip value.

Are the test results for the "barefoot ramp test" according to DIN EN 16165 - Annex A equivalent to DIN 51097?

Yes. The test procedure and the measurement principle are the same and the conditions are very similar (e.g. specifically named wetting agent, slightly higher water temperature). The new standard is significantly more comprehensive, which is primarily due to a more detailed description and the introduction of a verification and correction procedure. For products that are in the borderline areas of classification according to the old standard, the result may change slightly. Experience gained during the drafting process has shown that equivalent results were obtained when products were retested with the new standard. From the point of view of the German social accident insurance, this means that the test results and the classification derived from them according to the old standard DIN 51097 and the new standard DIN EN 16165 - Annex A are equivalent.

Are the test results for the "shod ramp test" according to DIN EN 16165 – Annex B equivalent to DIN 51130?

Yes, the test method, the measuring principle and the test materials (test shoe, motor oil) are the same. The description of how the angle of slip (previously the acceptance angle) is determined has been made more specific and slightly modified with the aim of being able to determine the "limit of safe walking" more clearly. Depending on how this was previously interpreted, slight deviations may now occur, which may also slightly change the result for products that were in the borderline areas of classification according to the old standard. Experience gained during the drafting process has shown that equivalent results were obtained when products were retested with the new standard. From the point of view of the German social accident insurance, this means that the test results and the classification derived from them according to the old standard DIN 51130 and the new standard DIN EN 16165 - Annex B are equivalent.

Are the test results for the "tribometer-test" according to DIN EN 16165 – Annex D equivalent to DIN 51131?

Yes, the test method and the measuring principle are the same and the test procedure is very similar. Changes have been made to the procedure for grinding the sliders, whereby value was placed on comparable results in the development and precision is to be increased through machine grinding. The verification procedure was changed, but since it is not used to correct the result, this has no direct influence on the test result. Experience gained during the drafting process has shown that equivalent results were obtained when products were retested with the new standard. From the point of view of the German social accident insurance, this means that the test results according to the old standard DIN 51131 and the new standard DIN EN 16165 - Annex D are equivalent (applies to the measurements with the SBR slider).

In the new standard, a new slider was introduced with the "Mix-Slider". As this slider was not included in the old standard DIN 51131 and other friction materials lead to different results, there is no equivalence for measurements with the "Mix-Slider". This slider was/is used in EN 13893 for testing in the context of placing on the market for resilient, laminated and textile floorings. In the development of EN 16165, care was taken to ensure that all parameters of EN 13893 are met. The requirements are partly more concrete, so that a higher precision can be assumed. As an accident insurance, we have not carried out any comparative measurements of our own; but measurements by manufacturers known to us have led to comparable results. The recognition of equivalence is not in our hands as accident insurance; this confirmation must be made by CEN TC 134.

Does the new standard change the requirements for which floors can be used in which areas?

No, the requirements do not change. DIN 51097, DIN 51130 and DIN 51131 were standards with test procedures that did not set requirements for the selection of floors. The requirements for which R-group/R-class must be installed in which work area were also previously regulated in the technical rule for workplaces ASR A1.5 "Floors" (and also in DGUV Regulation 108-003). For the requirements for floors or the "ABC class" in areas used barefoot, DGUV Information 207-006 was and still is valid, and for the interpretation of the results according to DIN 51131, DGUV Information 208-041 is still valid.

ASR A1.5 and DGUV regulation 108-003 still refer to the withdrawn DIN standards. What should be tested for now?

It has already been established that the test results for the described procedures are considered equivalent. For the application of ASR A1.5 and DGUV Regulation 108-003, there is therefore no difference in terms of technical content, as the equivalent safety measures are taken for the protection of employees/insured persons. From a formal point of view, a transitional period cannot be avoided, as the time taken to draft the rules differs and may also depend on each other. It is intended that ASR A1.5 Floors will be amended on this point and will in future refer to DIN EN 16165 in the references.

From the point of view of the accident insurance institutions, the new test standard can and should be applied so that tests are carried out on an up-to-date basis.

Are old test certificates still valid or does a floor covering have to be tested again?

Since the test results for floors according to the old standards and the new standard are equivalent, from the point of view of the German accident insurance institutions there is no need to retest already existing and tested floors. As a rule, test certificates are limited to five years, so that in the course of time only floors that have been tested according to the new standard will still be on the market. This will result in a transition period until all technical rules have been adapted to the new standard and all tests have been carried out according to the new standard. During this transitional period, the results and test certificates may be considered equivalent. The following applies,

- that test certificates according to old standards (and new standard) are sufficient if technical rules and tenders of planners refer to the new DIN EN 16165,
- and test certificates according to the new standard (and the old standards) are sufficient if the technical rules and tenders of planners have not yet been updated to DIN EN 16165.

The tender text has not yet been adapted to the new standard, can I apply for it with a test certificate according to the new standard?

Experience shows that it takes several months or even years until changes in the technical regulations have reached all parties involved and are implemented in the operational processes. It is therefore to be expected that tenders and planning will still refer to the old test standards. Since the test results for the described procedures according to DIN 51097, DIN 51130 and DIN 51131 are considered equivalent to the new test standard DIN EN 16165 and the requirements according to ASR A1.5 and DGUV Regulation 108-003 have not changed, test certificates according to the new standard can also be used as sufficient proof for tenders according to the old status.

DIN EN 16165 does not contain a measurement of the displacement space. What applies instead?

The measurement of the displacement space was not taken over from DIN 51130 into the new EN standard, as European standardisation of this property was not desired by the responsible committee. The measurement of the displacement space is therefore regulated nationally in Germany. The draft standard E DIN 51133 has already been published. Completion and publication of the finished standard is expected in the first half of 2022. From the point of view of the accident insurance institutions, testing can already be carried out in accordance with the draft standard as a transitional measure.

Are the standard surfaces according to DIN EN 16165 Annex A the same as in DIN 51097?

No, the standard surfaces according to DIN EN 16165 Annex A are not the same as in DIN 51097. For tests according to DIN EN 16165 Annex A, the new standard surfaces are required.

Are the test shoes and standard surfaces according to DIN EN 16165 Annex B the same as in DIN 51130? If yes, why do they have different standard values?

Yes, both the test shoes and the standard surfaces according to DIN EN 16165 Annex B are the same as in DIN 51130. Testing laboratories that have the standard surfaces in use can in principle continue to use them. The standard values for the standard surfaces are determined in interlaboratory tests, whereby the number of test persons, different sets of standard surfaces, the test shoes and their condition and the description of the test procedure have an influence on the results. As part of the development of the EN 16165 test standard, an extensive European round robin test was carried out to determine the current standard values of the standard surfaces. Numerous laboratories were involved. The changes in the standard values are minor and can be explained by the conditions mentioned. The previous standard surfaces can therefore continue to be used with the new values.

It is recommended to obtain a certificate from the manufacturer of the standard surfaces stating the serial number that the materials used for production are the same.

Is this information on the introduction of DIN EN 16165 also available as a summary? Is it also available in English for my foreign customers?

Yes, our FAQ on the introduction of DIN EN 16165 is available as a summary in German and English for download (PDF file) on the website of the Expert committee for Trade and Logistics of the German social accident insurance (www.fbhl.de).

Where can I obtain the test materials according to DIN EN 16165?

The procedures for measuring the slip resistance of pedestrian surfaces according to DIN EN 16165 partly require special materials such as test shoes or standard surfaces. Since these cannot be obtained everywhere, we have compiled a list of possible suppliers. The [supplier-list is available for download \(PDF-File\)](#).