



SLOVENSKI STANDARD SIST-TP CEN/TR 581-4:2006

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Outdoor furniture - Seating and tables for camping, domestic and contract use - Part 4:
Requirements and test methods for durability under the influence of climatic conditions

iTeh STANDARD PREVIEW

Außenmöbel - Sitzmöbel und Tische für den Camping- Wohn- und Objektbereich - Teil
4: Anforderungen und Prüfverfahren für die Dauerhaltbarkeit unter dem Einfluss von
Klimabedingungen

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Mobiklier d'extérieur - Sieges et tables a usages domestique, collectif et de camping -
Partie 4 : Exigences et méthodes d'essai pour la durabilité sous l'influence des
conditions climatiques

Ta slovenski standard je istoveten z: CEN/TR 581-4:2005

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TECHNICAL REPORT
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November 2005

ICS 97.140; 97.200.30

English Version

**Outdoor furniture - Seating and tables for camping, domestic
and contract use - Part 4: Requirements and test methods for
durability under the influence of climatic conditions**

Mobiklier d'extérieur - Sièges et tables à usages
domestique, collectif et de camping - Partie 4 : Exigences
et méthodes d'essai pour la durabilité sous l'influence des
conditions climatiques

Außenmöbel - Sitzmöbel und Tische für den Camping-,
Wohn- und Objektbereich - Teil 4: Anforderungen und
Prüfverfahren für die Dauerhaltbarkeit unter dem Einfluss
von Klimabedingungen

This Technical Report was approved by CEN on 30 June 2005. It has been drawn up by the Technical Committee CEN/TC 207.

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

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Foreword

This Technical Report (CEN/TR 581-4:2005) has been prepared by Technical Committee CEN/TC 207 “Furniture”, the secretariat of which is held by UNI.

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Introduction

This standard is part of a series of standards dealing with various aspects of outdoor furniture. Preceding parts of that series are dealing exclusively with safety. This part covers the aspects of durability, i.e. the ability of outdoor furniture to withstand long-term mechanical damage and damage arising from the weather. As far as the weather has an impact not only to the appearance (surface finish) but also to safety features, there is sufficient evidence to deem that the interior load bearing structure of plastic outdoor furniture remains sufficiently strong as long as the outer surface shows no significant signs of cracks caused by UV- radiation.

An undamaged surface is additionally an important durability characteristic in itself. Due to different materials and surface treatments the ability of outdoor furniture to withstand damages caused by natural weather differs. Therefore this standard provides a range of "weatherability" levels in order to classify the surface finish regarding its durability to weather. That characteristic is named in the following text as "weatherability". A standardised information label is foreseen in that context in order to inform the consumer about structural durability, recommended application and the degree of "weatherability". The level to be classified is voluntary, it aims to allow informed choice for the customer when buying outdoor furniture.

Levels of structural durability of an outdoor furniture are set by opening the three areas applications respectively levels of strength as set by ENV 581-2 and EN 581-3 and making them a tool to declare enhanced durability. To meet the higher strength requirements of a following application means to prolong durability. The durability level to be chosen is voluntary and this matter of declaration. The three applications: CAMPING / DOMESTIC / CONTRACT include consequently three levels of durability. Therefore the group of experts felt, that the three levels of strength respectively fields of application constitute automatically three levels of structural durability.

The issue of resistance to UV-radiation, i.e. of long-term strength and safety, is taken into account in this part of the standard (5.2) by deriving structural strength and safety from an undamaged surface after artificial weathering.

"Weatherability" for the purpose of this standard is related to the ability of outdoor furniture to maintain its original aesthetic look respectively appearance for a prolonged time.

In accordance with usual practice in the outdoor furniture market three performance levels for "weatherability" of surface finish were specified in order to make the mentioned ability assessable. An additional "zero level" indicates the case where no "weatherability" in terms of unchanged appearance is claimed. In that case the influences of weather may lead to a rapid change in the surface finish of the outdoor furniture. Subjectively and individually that need is not to be considered as a deficiency. The declaration of the "zero level" fact was felt to be a question of fair practice and the avoidance of misunderstandings between supplier and customer that might otherwise cause complaints. Additionally the informative label together with the instructions for use give advice how through care and maintenance the durability of the outdoor furniture can be prolonged.

Outdoor furniture made from wood which is inherently weather proof (as e.g. teak wood) and where the change in appearance due to weather is rather seen as a typical and even desired "patina" than a deficiency are intentionally exempt from the weather testing. Consumer information in this case means: Declaration of wood within the product information label (see Clause 8)

Due to the fact that natural weather does not consider the diversity of materials from which the piece of furniture might be made, the "weatherability" test follows a "general approach" submitting any outdoor furniture to the same conditions of exposure. As the existing test facilities for artificial weathering do not provide the possibility to check an entire piece of furniture, the group follows the traditional way to test specimens. For the need to get test results in an adequate time a natural weathering test was not specified. Furthermore the document does not include requirements for chemical or mechanical surface stresses as they may arise from food stuff, cleaning agents, scratching, abrasion, smouldering cigarettes etc.

1 Scope

This part of EN 581 specifies requirements and test methods for the determination of structural and surface finish durability of outdoor furniture for camping, domestic and contract use for adults without regard of materials, design/construction or manufacturing process.

Additionally this CEN Report specifies requirements covering the safety hazard which arises from the effect of weathering (in particular UV) on plastic materials.

For the presentation of the various durability levels, a consumer information label is specified.

This CEN Report does not apply to:

- specifications on surface resistance against chemical and mechanical stresses
- outdoor furniture for severe contract use where higher requirements may be necessary
- permanently fixed outdoor furniture, street furniture
- removable upholstery and coverings
- spectator facilities
- severe contract use

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2 Normative references (standards.iteh.ai)

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.

EN 581-1, *Outdoor furniture - Seating and tables for camping, domestic and contract use — Part 1: General safety requirements.*

ENV 581-2, *Outdoor furniture - Seating and tables for camping, domestic and contract use — Part 2: Mechanical safety requirements and test methods for sampling.*

EN 581-3, *Outdoor furniture - Seating and tables for camping, domestic and contract use — Part 3: Mechanical safety requirements and test methods for tables.*

EN ISO 544, *Welding consumables -- Technical delivery conditions for welding filler materials -- Type of product, dimensions, tolerances and markings (ISO 544:2003)*

EN ISO 4628-2, *Paints and varnishes -- Evaluation of degradation of coatings -- Designation of quantity and size of defects, and of intensity of uniform changes in appearance -- Part 2: Assessment of degree of blistering (ISO 4628-2:2003)*

EN ISO 4628-3, *Paints and varnishes -- Evaluation of degradation of coatings -- Designation of quantity and size of defects, and of intensity of uniform changes in appearance -- Part 3: Assessment of degree of rusting (ISO 4628-3:2003)*

EN ISO 4628-4, *Paints and varnishes -- Evaluation of degradation of coatings -- Designation of quantity and size of defects, and of intensity of uniform changes in appearance -- Part 4: Assessment of degree of cracking (ISO 4628-4:2003)*

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EN ISO 4628-5, *Paints and varnishes -- Evaluation of degradation of coatings -- Designation of quantity and size of defects, and of intensity of uniform changes in appearance -- Part 5: Assessment of degree of flaking (ISO 4628-5:2003)*

EN ISO 4892-1, *Plastics -- Methods of exposure to laboratory light sources -- Part 1: General guidance (ISO 4892-1:1999)*

EN ISO 4892-2, *Plastics -- Methods of exposure to laboratory light sources -- Part 2: Xenon-arc sources (ISO 4892-2:1994)*

3 Terms and definitions

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

3.1

durability

ability of the entire outdoor furniture to last for a shorter or longer period of use in all its features

3.2

structural durability

ability to withstand stresses arising from mechanical forces and loads for shorter or longer periods of use

3.3

weatherability

ability of a material or surface treatment to withstand stresses arising from weather for shorter or longer periods of use

3.4

severe contract use

extreme stresses beyond the applications as defined in EN 581-1

3.5

levels with regard to structural durability

structural durability level "CAMPING": outdoor furniture (seat or table) meets all requirements of ENV 581-2 or EN 581-3 for the application "CAMPING"

structural durability level "DOMESTIC" : outdoor furniture (seat or table) meets all requirements of ENV 581-2 or EN 581-3 for the application "DOMESTIC"

structural durability level "CONTRACT" : outdoor furniture (seat or table) meets all requirements of ENV 581-2 or EN 581-3 for the application "CONTRACT"

3.6

levels with regard to weatherability of surface finish

for the purpose of this CEN Report there are three levels of weatherability. The levels are defined as follows:

One pictogram	surface finish meets the lowest requirements of this CEN Report with regard to artificial weathering (one share of weatherability)
Two pictograms	surface finish meets the medium requirements of this CEN Report with regard to artificial weathering (two shares of weatherability)
Three pictograms	surface finish meets the highest requirements of this CEN Report with regard to artificial weathering (three shares of weatherability)

A pictogram represents a share of weatherability. Multiple pictograms represent increasing shares. The expression is non verbal and not qualified in terms of years or use. Pictograms are always shown in their complete range as specified in Clause 7.

4 Levels of structural durability and their presentation

4.1 Levels

Three levels of structural durability are available by this CEN Report. These levels are identical with the applications CAMPING, DOMESTIC AND CONTRACT as specified in ENV 581-2 and EN 581-3 but they are used here as an indication for stepwise enhanced structural durability. Thus, for the purpose of this standard, each higher level of application can include enhanced structural durability of the respective preceding lower applications if appropriate by design.

4.2 Determination of levels

Structural durability is to be determined in accordance with the requirements related to mechanical safety and strength in ENV 581-2 and EN 581-3.

An outdoor furniture (seat / table) that meets:

- all requirements for CAMPING shall be only declared for structural durability and application CAMPING
- all requirements for DOMESTIC can be declared for enhanced structural durability and application CAMPING or for application DOMESTIC only
- all requirements for CONTRACT can be declared for enhanced structural durability and application of DOMESTIC or application CONTRACT use only.

4.3 Declaration and presentation

Declaration and presentation of the structural durability levels shall be done in accordance with Clause 8.

5 Levels of weatherability of surface finish and their presentation

5.1 Levels

Three levels of weatherability are specified.

Their determination shall be performed in accordance with Clauses 5.2.2 and 5.2.7, their presentation in accordance with Clauses 7, 8 and 9.

Outdoor furniture made from uncoated wood are exempted from the determination of weatherability according to Clause 5.2. In this case the declaration of behaviour under natural weather conditions shall be done in accordance with Clauses 7 and 8. Additional explanations concerning the wood species and its adequate treatment of uncoated wood may be given in row 12 of the information label.

5.2 Determination of weatherability levels

5.2.1 General

Regardless of material the surface of a piece of outdoor furniture is considered the more resistant from the stresses arising from the effect of weather the more the surface of a test specimen maintains its original

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appearance under artificial weathering. The levels of resistance against weather - weatherability levels - are related by this standard to the following number of test hours (EN ISO 4892-2 A) and the degree of damage which is caused by them.

5.2.2 Requirements

In order to comply with one of the three specified weatherability levels the specimen tested shall meet the requirements given in 5.2.7 and 5.3 after having been submitted to one of the related number of test hours as specified below:

weatherability level 1	200 hours min	one share of weatherability
weatherability level 2	400 hours min	two shares of weatherability
weatherability level 3	750 hours min	three shares of weatherability

5.2.3 Surface damages

For the evaluation of weatherability of surface finish the following damage criteria apply:

- a) cracks
- b) flaking
- c) blistering
- d) chalking
- e) loss of gloss Q
- f) change in colour
- g) corrosion (if applicable)

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5.2.4 Sampling

Specimens shall be cut out from the piece of furniture at appropriate place, preferably at the seating area or the table top. The specimens shall:

- be free of joints or connections
- have the cut edges sealed if any stress to that part of the specimen is likely to cause failure or misleading results
- comprise a total number of four per test level, one of which shall be retained as original for comparisons in a dark room under normal climate conditions
- have dimensions of preferably 100x452 mm or dimensions as close to these values as possible¹⁾ but in any case equal within its number. The thickness shall not be less than 1 mm.

1) due to the visual testing any deviation in dimensions depend rather on the weathering device than on standardised specimen dimensions for material testing. For concluding from a visually undamaged surface appearance to an undamaged interior structure the thickness of plastic specimens shall not be less than 1 mm.

If an outdoor furniture is made from a combination of materials, e.g. steel tube frame and plastic seating and backrest, all materials shall be submitted to testing.

5.2.5 Conditioning

Specimens shall be stored for a period of 72 hours in a dark room at an air temperature of $(23 \pm 20)^{\circ}\text{C}$ and a relative humidity of $(50 \pm 5) \%$ (EN ISO 544). For outdoor furniture having coated surfaces the time between manufacturing and testing shall be not less than 8 weeks regardless of the place of storage. It is recommended that plastic furniture does not exceed a period of 8 weeks between manufacturing and testing.

5.2.6 Artificial weathering – Test procedure

The test shall be carried out in accordance with EN ISO 4892-1 and 4892-2 applying the following test parameters:

- laboratory light source Xenon-arc lamp, method A
- procedure continuous mode
- light intensity 60 W/ m²
- black-standard temperature $(65 \pm 2)^{\circ}\text{C}$ at the end of the dry period
- spray cycle :
 - duration of spraying $(18 \pm 0,5) \text{ min.}$
 - dry interval $(102 \pm 0,5) \text{ min.}$
 - spray deionized or distilled water

5.2.7 Requirements and evaluation of results

5.2.7.1 General

The test specimens have met the requirements if the damage criteria listed under 5.2.3 a) to d) cannot be recognised after the respective number of test hours to achieve a chosen level of weatherability.

Specimens taken from plastic furniture shall be submitted to a supplementary safety related evaluation for cracks under a magnification of 100. In this case the piece of furniture is deemed to be sufficiently safe if there are no cracks visible after the test specimen has been submitted for at least 200 hours to artificial weathering. For any higher level of weathering the number of test hours for safety purposes shall be increased according to the chosen level of weatherability.²⁾

After exposure to the respective number of test hours (see 5.2.2) the specimens shall be investigated for the criteria specified in 5.2.3. Criteria a) to f) are applicable for all materials, g) only for metals.

2) there is sufficient evidence that the non existence of surface cracks corresponds to an undamaged interior structure of the piece of furniture