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BSI Standards Publication

Flexible sheets for waterproofing — Statistical definition of manufacturer's limiting value and declared value (MLV and MDV) — 95 % Statistic

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Flexible sheets for waterproofing - Statistical definition of manufacturer's limiting value and declared value (MLV and MDV) - 95 % Statistic

Feuilles souples d'étanchéité - Définition statistique de la valeur limite annoncée par le fabricant (VLF) et de la valeur déclarée par le fabricant (VDF) - Statistique à 95 %

Abdichtungsbahnen - Statistische Definition des Hersteller-Grenzwertes und des Hersteller-Nennwertes (MLV und MDV) - 95 %-Statistik

This Technical Report was approved by CEN on 28 October 2013. It has been drawn up by the Technical Committee CEN/TC 254.

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Foreword

This document (CEN/TR 16625) has been prepared by Technical Committee CEN/TC 254 “Flexible sheets for waterproofing”, the secretariat of which is held by NEN.

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.

1 Scope

This Technical Report is a guideline for the statistic approach for the definition of MLV/MDV within the declaration of values according to the product standards of CEN/TC 254 'Flexible sheets for waterproofing' (see Bibliography). Characteristics with classes (for example fire behaviour) or pass/fail criteria (for example UV exposure) are not covered by the statistical rules of this report.

2 Terms and definitions

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

NOTE Terms for statistics are common knowledge and are described in different standards (for example ISO 3534-1; ISO/IEC Guide 98-3; ISO/TR 13425).

2.1
manufacturer's declared value (MDV)[1)]
nominal value including a double sided specification according to the product standard for a given test method or property

2.2
manufacturer’s limiting value (MLV)[1)]
nominal value including a single sided specification according to the product standard for a given test method or property

Note 1 to entry: The MLV can be a minimum or a maximum value according to statements made under product characteristics of the relevant product standard.

2.3
single value
value of one test specimen as described within the test standard

2.4
test result
result as defined in the test standard

Note 1 to entry: The test result is described in the Clause ´Expression of results´ of the test standard and reported in the test report.

3 Statistical principles

3.1 General

The declaration of the product performance as defined in the product data sheet should be based on statistical interpretation of the factory production control (FPC), the interpretation of the initial type testing (ITT) and the precision of the test methods. For characteristics controlled by FPC tests, where indirect control applies, the statistics of the direct test method apply to the indirect test method including expanded uncertainty.

1) The MLV and MDV definitions are also defined in all product standards given in the Bibliography of this Technical Report. This Technical Report describes the agreed current position of CEN/TC 254. CEN/TC 254 plans to adjust the statistic definition given in the product standards in accordance with this Technical Report.

3.2 MLV/MDV defined by 95 % performance based confidence level

The sample shall be taken following the sampling procedure defined by specific product standards. This statistical approach has to be applied either for sampling at the site or within the factory. For a given test method or property used within the factory production control (as defined in the specific product standard) the 95 % performance based confidence level of the test results (as defined in the test method, typically the mean of a set of single measurements) should be within the limits of the MLV/MDV declaration. The continuous characteristic as the base to calculate the distribution is the test result as defined in the test standard.

The precision of the test method is the lowest possible range of the MDV declaration of the datasheet of the manufacturer. 50 % of the precision of the test method is the lowest possible difference between the average of the measured values and the MLV single side declaration of the datasheet of the manufacturer.

If there is not enough statistical data (less than 50 test results) available for a new product then the statistic of a similar product can be transferred.

An outlier can be detected in accordance to ISO 5725-2 or in a simpler approach if the difference between this single value (the potential outlier) and the mean (as defined in the test method) is more than 4 times the standard deviation determined by the test results of the quality control. In this case the single value of one specimen is an outlier and this single value can be deleted.

NOTE The 95 % confidence interval corresponds to 2 times “experimental standard deviation of the mean” as defined in 4.2 of ISO/IEC GUIDE 98–3.

Bibliography

[1] EN 13416 *Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Rules for sampling*

[2] EN 13707 *Flexible sheets for waterproofing - Reinforced bitumen sheets for roof waterproofing - Definitions and characteristics*

[3] EN 13859-1 *Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 1: Underlays for discontinuous roofing*

[4] EN 13859-2 *Flexible sheets for waterproofing - Definitions and characteristics of underlays - Part 2: Underlays for walls*

[5] EN 13956 *Flexible sheets for waterproofing - Plastic and rubber sheets for roof waterproofing - Definitions and characteristics*

[6] EN 13967 *Flexible sheets for waterproofing - Plastic and rubber damp proof sheets including plastic and rubber basement tanking sheet - Definitions and characteristics*

[7] EN 13969 *Flexible sheets for waterproofing - Bitumen damp proof sheets including bitumen basement tanking sheets - Definitions and characteristics*

[8] EN 13970 *Flexible sheets for waterproofing - Bitumen water vapour control layers - Definitions and characteristics*

[9] EN 13984 *Flexible sheets for waterproofing - Plastic and rubber vapour control layers - Definitions and characteristics*

[10] EN 14695 *Flexible sheets for waterproofing - Reinforced bitumen sheets for waterproofing of concrete bridge decks and other trafficked areas of concrete - Definitions and characteristics*

[11] EN 14909 *Flexible sheets for waterproofing - Plastic and rubber damp proof courses - Definitions and characteristics*

[12] EN 14967 *Flexible sheets for waterproofing - Bitumen damp proof courses - Definitions and characteristics*

[13] ISO/IEC GUIDE 98-3:2008, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

[14] ISO 3534-1, *Statistics — Vocabulary and symbols — Part 1: General statistical terms and terms used in probability*

[15] ISO/TR 13425, *Guidelines for the selection of statistical methods in standardization and specification*

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