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Extended application of test results on durability of self-closing for fire resistance and/or smoke control doorsets and openable windows - Part 2: Durability of self-closing of steel rolling shutters

Erweiterter Anwendungsbereich von Prüfergebnissen zur Dauerhaftigkeit der Selbstschließung für Feuerschutz- und/oder Rauchschutztüren und zu öffnende Fenster - Teil 2: Dauerhaftigkeit der Selbstschließung von Rolltoren aus Stahl

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Application étendue des résultats d'essais de durabilité de la fermeture automatique des blocs-portes et fenêtres ouvrantes résistants au feu et/ou étanches à la fumée - Partie 2 : Durabilité de la fermeture automatique des rideaux à enroulement en acier

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91.060.50	Vrata in okna	Doors and windows

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Extended application of test results on durability of self-closing for fire resistance and/or smoke control doorsets and openable windows - Part 2: Durability of self-closing of steel rolling shutters

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This European Standard was approved by CEN on 26 September 2022.

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European foreword

This document (EN 17020-2:2022) has been prepared by Technical Committee CEN/TC 127 “Fire safety in buildings”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2023, and conflicting national standards shall be withdrawn at the latest by June 2023.

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Introduction

The EN 15269 series of standards covering extended application of test results for fire resistance and/or smoke control for doorsets, rolling shutter assemblies and openable windows, including their items of building hardware, does not yet include their durability of self-closing following an extended application process. This document is one of the EN 17020 series of standards intended to be used for the purpose of producing an extended application report based on the evaluation of one or more durability self-closing tests. These European Standards may also be used to identify the best selection of test specimens required to cover a wide range of product variations.

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1 Scope

This document covers metal (e.g. steel, stainless steel, aluminium) rolling shutter assemblies also covered by EN 15269-10 and EN 15269-20.

This document prescribes the methodology for extending the application of test results obtained from durability of self-closing test(s), see EN 12605:2000.

Subject to the completion of the appropriate durability of self-closing test or tests, the extended application could cover all or some of the following non-exhaustive list:

- shutter curtain;
- wall or ceiling fixed elements (frame or suspension system);
- items of building hardware;
- decorative finishes;
- intumescent or non-intumescent (e.g. smoke, draught) seals;
- alternative supporting construction(s).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1363-1, *Fire resistance tests - Part 1: General requirements*

EN 1363-2, *Fire resistance tests - Part 2: Alternative and additional procedures*

EN 1634-1, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 1: Fire resistance test for door and shutter assemblies and openable windows*

EN 1634-3, *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware - Part 3: Smoke control test for door and shutter assemblies*

EN 12433-1, *Industrial, commercial and garage doors and gates - Terminology - Part 1: Types of doors*

EN 12433-2, *Industrial, commercial and garage doors and gates - Terminology - Part 2: Parts of doors*

EN 12605:2000, *Industrial, commercial and garage doors and gates - Mechanical aspects - Test methods*

EN 13501-2, *Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN 15269-1, *Extended application of test results for fire resistance and/or smoke control for door, shutter and openable window assemblies, including their elements of building hardware - Part 1: General requirements*

EN 15269-10, *Extended application of test results for fire resistance and/or smoke control for door, shutter and openable window assemblies including their elements of building hardware - Part 10: Fire resistance of steel rolling shutter assemblies*

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EN 15269-20, *Extended application of test results for fire resistance and/or smoke control for door, shutter and openable window assemblies, including their elements of building hardware - Part 20: Smoke control for doors, shutters, operable fabric curtains and openable windows*

EN 16034, *Pedestrian doorsets, industrial, commercial, garage doors and openable windows - Product standard, performance characteristics - Fire resisting and/or smoke control characteristics*

EN ISO 13943, *Fire safety - Vocabulary (ISO 13943:2017)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1363-1, EN 1363-2, EN 1634-1, EN 1634-3, EN 15269-1, EN 15269-10, EN 15269-20, EN 12433-1, EN 12433-2 and EN ISO 13943 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/ui>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 full scale test

test of a full size rolling shutter assembly

Note 1 to entry: This test is in accordance with EN 12605:2000.

4 Determination of the field of extended application

4.1 General

4.1.1 Before there can be any consideration for extended application, the metal rolling shutter assembly shall have been tested in accordance with EN 12605:2000 to achieve a test result which could generate a classification for the durability of self-closing in accordance with EN 13501-2 for the required number of test cycles.

4.1.2 A review of the construction parameters can indicate that one or more characteristics may be improved by a particular parameter variation. All evaluations shall be made on the basis of retaining the classifications for the durability of self-closing obtainable from testing to EN 12605:2000, including those with a lower number of opening and closing cycles. However, this shall never lead to an increased classification for any specific parameter beyond that achieved during any one test unless specifically identified in the relevant Construction Parameter Variation tables.

4.1.3 If, when following the extended application procedure, any part of the classified product cannot be achieved by extended application rules, that part shall be omitted from the subsequent extended application report and classification report.

4.2 Procedure for evaluation

4.2.1 Identify the variations from the original test specimen(s) which are required to be covered by an extended application report. Ensure that the variation(s) do(es) not prevent the rolling shutter from self-closing.

4.2.2 Locate the variations in the appropriate parameter variation by reference to columns (1) and (2) of Table A.1.

4.2.3 Establish from the contents of column (3) of Table A.1 whether any extended application is available without the need for further testing.

4.2.4 Where this is deemed to be possible this can be recorded in the extended application report together with any appropriate restrictions and the stated rules from column (3) in Table A.1.

4.2.5 Where the variations required can only be achieved from additional testing according to column (4) of Table A.1, the additional test can be made on a similar test specimen type to the original test against which the extended application is sought. Alternatively, column (4) identifies an option for alternative testing and relevant test parameters.

4.3 Procedure for maximum field of extended application

4.3.1 It is possible to provide a limited field of extended application from the results of a single test. However, where a manufacturer intends to produce a range of rolling shutter assemblies incorporating manual and power operated drives, insulated and uninsulated version, with alternative elements of construction etc. it is recommended that careful consideration is given to the complete range of designs and options in order to minimize the testing required before testing commences.

4.3.2 Establish all the parameter variations which are required to be part of the product range.

4.3.3 Determine which are the most important specification requirements and incorporate as many as possible into the test specimen(s) for the first tests in the series.

4.3.4 Conduct the first durability of self-closing test or a series of tests and then establish which of the original desired parameter variations have not been covered by this test(s).

4.3.5 Identify these parameter variations in Table A.1 and establish if any extended application is possible without further testing.

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4.3.6 Record this for the extended application report together with any restrictions and rules given in column (3) in Table A.1.

4.3.7 Evaluate which, if any, of the desired parameter variations have not been covered by the initial field of extended application derived from 4.3.6 above.

4.3.8 Select the required outstanding parameter variations from column (1) and column (2) of Table A.1 and observe from column (4) of Table A.1 which are the most appropriate weakest test specimen options for further testing.

4.3.9 If the complete selection of required parameter variations has not been covered by the tests completed in accordance with 4.3.8 above, then an appropriate test or tests may be repeated with the additional product variations incorporated.

4.4 Interpretation of test results

4.4.1 In order to maximize the field of extended application, it is important that the test reports shall record details of any failures which occurred throughout the test duration.

4.4.2 Where a series of tests have been conducted, the field of extended application shall be based on the lowest performance achieved from the complete series of tests unless premature failure has been attributed to one or more specific construction parameter variation(s).

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4.4.3 Where it has been possible to identify specific parameter failures, the extended application for all other construction parameter variations can be based on the performance achieved after isolating the premature failure(s). The failed parameter has to be omitted from the extended application report and the subsequent classification report.

5 Extended application report

Prepare an extended application report in accordance with the requirements of EN 15269-1, based on the results of evaluations in accordance with the above.

6 Classification report

The classification report shall be determined from the results of the extended application report and shall be presented in accordance with EN 13501-2.

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Annex A (normative)

Construction parameter variations

Table A.1 below is designed to be used by experts competent in the field of durability of self-closing testing of metal rolling shutter assemblies.

The table shall only be used to assess a field of extended application when at least one positive durability of self-closing test to EN 12605 has generated a classification according to EN 13501-2 for the required number of test cycles.

The first two columns identify possible variations to the construction details of the specimen tested. It is presupposed that the variations do not restrain the rolling shutter assembly from closing.

Column (3) leads to the judgement of the possibility of extending the field of application.

Where additional tests are deemed to be necessary, the type of test specimen approved for incorporation of the changed parameter is defined in column (4). Where it is possible to use information from tests performed on one configuration for evidence on a different configuration, this allowance has been made in order to reduce the overall number of tests required for extended application evaluation.

Where an additional test is required in column (4), the test is a full scale test unless otherwise specified.

In order to maximize the possible field of application from a minimum number of tests, the parameter changes have been spread over a series of test specimens. Where more than a single parameter variation is required, the influence on other variations shall also be taken into account.

All parameter variations in Table A.1 presuppose that the total weight of the curtain does not exceed the maximum weight having been tested. If the durability of self-closing test is carried out with a test specimen that has a lower curtain weight than the maximum weight required by the manufacturer (e.g. due to size reasons), then the higher curtain weight shall be simulated in order to achieve the same mechanical load in all load-bearing components that would result with the required maximum curtain weight. For simulation of a higher weight of the varied curtain the test specimen for durability of self-closing test can be loaded with additional weight(s) attached to the curtain according to the rules in Annex B.

For standard parts (e.g. screws) or parts made exclusively of steel (e.g. barrel, support brackets) the manufacturer may be changed as long as all characteristics of the part (e.g. material, geometry, welding technique) remain the same and unless otherwise stated in Table A.1.

For figures relating to Table A.1 see Annex C.

Table A.1 — Construction parameter variation rules

Construction parameter	Variation	Possibility of extension	Additional evidence required
(1)	(2)	(3)	(4)
A General (See Figure C.1 for an example of a general arrangement of a rolling shutter assembly and Figures C.69 und C.70 for terms and components used in a rolling shutter assembly)			
A.1 Size variations / construction			
A.1.1 Width between vertical guides (See Figure C.2)	Decrease	Possible providing tightness and clearances are not changed. Otherwise not possible without an additional test.	Full scale test
A.1.2 Width between vertical guides (See Figure C.2)	Increase	Possible up to 30 % providing the static requirements to fixings, barrel and load-bearing constructions are fulfilled and the requirements of Annex B are satisfied. Otherwise not possible without an additional test.	Full scale test
A.1.3 Height from floor level to centre line of barrel (See Figure C.3)	Decrease	Possible	-
A.1.4 Height from floor level to centre line of barrel (See Figure C.3)	Increase	Possible up to the maximum tested curtain weight providing the static requirements to fixings, barrel and load-bearing constructions are fulfilled and the requirements of Annex B are satisfied. Otherwise not possible without an additional test.	Full scale test
A.1.5 Expansion allowances between the end of the lath and guide	Decrease	Possible providing a minimum gap of 10 mm will remain during the opening/closing process Otherwise not possible without an additional test	Full scale test
A.1.6 Expansion allowances between the end of the lath and guide	Increase	Possible	-
A.1.7 Mounting	Face fixed to within opening	Possible	-

Construction parameter	Variation	Possibility of extension	Additional evidence required
(1)	(2)	(3)	(4)
A.1.8 Mounting	Within opening to face fixed	Possible	-
A.2 Materials and constructions			
A.2.1 Insulation material whether intumescent or not	Alternative	Possible providing no moving part touches the insulation material during the opening/closing process so that no abrasion will occur. Otherwise not possible without an additional test.	Full scale test
A.2.2 Density of insulation material	Increase	Possible providing no moving part touches the insulation material during the opening/closing process). Otherwise not possible without an additional test.	Full scale test
A.2.3 Density of insulation material	Decrease	Possible providing no moving part touches the insulation material during the opening/closing process). Otherwise not possible without an additional test.	Full scale test
A.2.4 Intumescent material	Alternative supplier and/or manufacturer	Possible but only for an identical composition or if no moving part touches the insulation material during the opening/closing process). Otherwise not possible without an additional test.	Full scale test
A.2.5 Intumescent material	Alternative material	Possible providing no moving part touches the insulation material during the opening/closing process). Otherwise not possible without an additional test.	Full scale test
A.2.6 Thickness of insulation material except curtain's material(s)	Increase	Possible providing no moving part touches the insulation material during the opening/closing process). Otherwise not possible without an additional test.	Full scale test
A.2.7 Thickness of insulation material except curtain's material	Decrease	Possible	-

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Construction parameter	Variation	Possibility of extension	Additional evidence required
(1)	(2)	(3)	(4)
B Curtain			
B.1 Laths			
B.1.1 Height (See Figure C.4)	Decrease	Possible providing the interlock remains the same and the interaction with parts touching the curtain (e.g. press rollers) remains the same or a test has been passed successfully (with a similar type of rolling shutter assembly) with this decreased size of laths. Otherwise not possible without an additional test.	Full scale test
B.1.2 Height (See Figure C.5)	Increase	Possible providing a test has been passed successfully (with a similar type of rolling shutter assembly) with this increased size of laths with the same or lower barrel diameter. Otherwise not possible without an additional test.	Full scale test
B.1.3 Thickness of metal sheet	Decrease	Possible providing a test has been passed successfully (with another type of rolling shutter assembly) with this decreased sheet thickness of the laths with the same or lower barrel diameter. Otherwise not possible without an additional test.	Full scale test
B.1.4 Thickness of metal sheet	Increase	Possible providing a test has been passed successfully (with another type of rolling shutter assembly) with this increased sheet thickness of the laths with the same or smaller barrel diameter. Otherwise not possible without an additional test.	Full scale test

Construction parameter	Variation	Possibility of extension	Additional evidence required
(1)	(2)	(3)	(4)
B.1.5 Thickness of insulation material (See Figure C.6) NOTE: it is assumed that decreased insulation material thickness leads to decreased overall lath thickness.	Decrease	Possible providing a test has been passed successfully (with another type of rolling shutter assembly) with this decreased thickness of insulation material in the laths with the same or smaller barrel diameter. Otherwise not possible without an additional test.	Full scale test
B.1.6 Thickness of insulation material (See Figure C.7) NOTE: it is assumed that increased insulation material thickness leads to increased overall lath thickness.	Increase	Possible providing a test has been passed successfully (with another type of rolling shutter assembly) with this increased thickness of insulation material in the laths with the same or smaller barrel diameter and assuming that the gap between the skins is full of insulating material and that the thickness of lath creates a corresponding increase in the width of the guides. Otherwise not possible without an additional test.	Full scale test
B.1.7 Density of insulation material	Increase	Possible providing the material is not loaded mechanically (e.g. pulled or bended) or a test has been passed successfully (with another type of rolling shutter assembly) with this density of insulation material with the same or smaller barrel diameter and the requirements of Annex B are satisfied. Otherwise not possible without an additional test.	Full scale test
B.1.8 Density of insulation material	Decrease	Possible providing the material is not loaded mechanically (e.g. pulled or bended) or a test has been passed successfully (with another type of rolling shutter assembly) with this density of insulation material with the same or smaller barrel diameter. Otherwise not possible without an additional test.	Full scale test
B.1.9 Material	Mild steel to stainless steel	Possible	-