

CLASSIFICATION OF FIRE RESISTANCE ACCORDING TO EN 13501-2: 2016

Classification no.	2020-Efectis-R001582
Sponsor	Metaalwarenfabriek Metacon B.V. Zuidbaan 450 2841 MD MOORDRECHT THE NETHERLANDS
Product name	SGC
Prepared by	Efectis Nederland BV
Notified body no.	1234
Authors	S. Lutz P.W.M. Kortekaas
Project numbers	ENL-20-000153 (and 20-000341: Non-exposed side)
Date of issue	August 2020
Number of pages	11

CONTENTS

1.	Introduction	3
1.1	Normative references	3
1.2	Revision information	3
2.	Details of classified product	3
2.1	General	3
2.2	Description	3
2.2.1	Test specimen	3
2.2.2	Test Frame	4
2.2.3	Supporting Construction	4
2.2.4	Restraint / Free edge	4
2.2.5	Non-combustible floor simulation	4
2.2.6	Sliding door	4
3.	Test reports and test results in support of the classification	5
3.1	test reports	5
3.2	Results	5
3.2.1	2020-Efectis-R000815[Rev.1] – 20000153 – Exposed side	5
3.2.2	2020-Efectis-R000848[Rev.1] – 20000341 – Non-exposed side	6
4.	Classification and field of application	6
4.1	Reference of classification	6
4.2	Classification	6
4.3	Field of application	6
4.4	General	6
4.4.1	Materials and construction	7
4.4.2	Permissible size variations	8
4.4.3	Asymmetrical assemblies	9
4.4.4	Supporting constructions	10
5.	Limitations	10
6.	Drawings	11

1. INTRODUCTION

This classification report defines the resistance to fire classification assigned to a horizontal sliding door assembly type SGC in accordance with the procedures given in EN 13501-2:2016.

1.1 NORMATIVE REFERENCES

European standard	Part
EN 1363-1:2020	Fire resistance tests – Part 1: General requirements
EN 1363-2:1999+ C1:2001	Fire resistance tests – Part 2: Alternative and additional procedures
EN 1634-1:2014 + A1:2018	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 16034:2014	Pedestrian door-sets, industrial, commercial, garage doors and openable windows – Product standard, performance characteristics – Fire resisting and/or smoke control characteristics
EN 13501-2:2016	Fire classification of construction products and building elements - Part 2: Classification using data from fire resistance tests, excluding ventilation services

1.2 REVISION INFORMATION

This is the first issue of the test report.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element, a composite sliding door assembly type SGC is defined as a horizontal sliding door. The door leaf is manually operated and self-closing by the use of a steel counterweight.

2.2 DESCRIPTION

The element, a composite sliding door assembly type SGC is fully described in the test report in support of classification listed in 3.1.

2.2.1 Test specimen

The test specimen was a sliding door of type SGC consisting of composite panels manufactured by Metaalwarenfabriek Metacon B.V. The sliding door was tested first at the exposed side and in the second test at the non-exposed side, mounted onto a rigid standard supporting construction. Below some general details of the door-set. For other details we refer to the test report.

2.2.2 Test Frame

The test frame was constructed of steel beams comprising a fire-resistant concrete lining (density: $1450 \text{ kg/m}^3 \pm 200 \text{ kg/m}^3$), with an aperture of 4000 x 5000 mm (w x h) with an insertion width of 240 mm.

2.2.3 Supporting Construction

The test specimen was built into a low-density rigid standard supporting construction, being an aerated concrete wall built according to EN 1363-1.

Specifications rigid standard supporting construction	
Overall dimensions	4000 x 5000 mm (w x h)
Aperture	3535 x 4500 mm (w x h)
Material	Aerated concrete
Density	$575 \text{ kg/m}^3 \pm 50 \text{ kg/m}^3$
Thickness	150 mm

2.2.4 Restraint / Free edge

The rigid standard supporting construction was erected, according to EN 1634-1+A1, with no freedom to distort perpendicular to the plane of the wall along the vertical edges, i.e. it was fixed to the inside of the test frame.

2.2.5 Non-combustible floor simulation

On the bottom bar of the test frame a calcium silicate board, thickness 20 mm, was placed to simulate a non-combustible floor according to EN 1634-1. The calcium silicate board extended 200 mm on both side of the specimen.

2.2.6 Sliding door

The composite sliding door consisted of 8 panels, 7 full size panels and 1 cut panel. Steel profiles held the composite panels together.
The door runs on the upper side on a rail on seven guide rollers.

Specifications sliding door	
Total dimensions door	3874 x 4659.5 mm (w x h)
Dimensions opening	3585 x 4500 mm (w x h)
Specifications panels	
Type	- Complete panel 550 - Complete panel 147.5 - Cut panel 550
Number	- 6 x complete panel 550 - 1 x complete panel 147.5 - 1 x cut panel 550
Length	4654 mm
Width	- Complete panels 550: 550 mm - Complete panel 147.5: 147.5 mm - Cut panel 550: 423 mm

Thickness	45 mm
Fixing	Steel profiles
Specifications all profiles	
Manufacturer	Metacon
Material	Steel, Sendzimir Galvanized

3. TEST REPORTS AND TEST RESULTS IN SUPPORT OF THE CLASSIFICATION

3.1 TEST REPORTS

Name of laboratory	Name of sponsor	Report ref. no	Test standard
Efectis Nederland BV	Metaalwarenfabriek Metacon B.V.	2020-Efectis-R000815[Rev.1] Exposed side	EN 1634-1:2014 + A1:2018
Efectis Nederland BV	Metaalwarenfabriek Metacon B.V.	2020-Efectis-R000848[Rev.1] Non-exposed side	EN 1634-1:2014 + A1:2018

3.2 RESULTS

3.2.1 2020-Efectis-R000815[Rev.1] – 20000153 – Exposed side

Time of reaching a criterion measured from the start of the test in accordance with EN 1634-1+A1		
Criterion	Time [min]	Result
Integrity (E) -Cotton pad -Gap gauge Ø 6 mm -Gap gauge Ø 25 mm -Sustained flaming > 10 seconds		No Failure Not determined Not determined No Failure
Insulation (I) -Average temperature -Maximum temperature I ₁ -Maximum temperature I ₂	99 89 89	Failure TC 1-5 Failure TC 9 Failure TC 14
Heat Radiation (W)		No failure max. 2.4 kW/m ² at 135 min.
The heating was terminated after 135 minutes after consulting the client.		

3.2.2 2020-Efectis-R000848[Rev.1] – 20000341 – Non-exposed side

Time of reaching a criterion measured from the start of the test in accordance with EN 1634-1+A1		
Criterion	Time [min]	Result
Integrity (E) -Cotton pad -Gap gauge Ø 6 mm -Gap gauge Ø 25 mm -Sustained flaming > 10 seconds		Not determined Not determined Not determined No Failure
Insulation (I) -Average temperature -Maximum temperature I ₁ -Maximum temperature I ₂	88 96 96	Failure TC 1 - 5 Failure TC5 Failure TC5
Heat Radiation (W)		No failure, max. 2.8 kW/m ² at 133 min.
The heating was terminated after 135 minutes after consulting the client.		

4. CLASSIFICATION AND FIELD OF APPLICATION

4.1 REFERENCE OF CLASSIFICATION

This classification has been carried out in accordance with Clause 7 of EN 13501-2:2016.

4.2 CLASSIFICATION

The element, composite sliding door type SGC is classified according to combinations of performance parameters and classes as described in Clause 6.7 of EN 13501-2:2016.

E120-C0*
EI₁60-C0*
EI₂60-C0*
EW120-C0*

* Not including ability to release in accordance with EN 16034:2014. The door leaf is manually operated and self-closing by the use of a steel counterweight.

4.3 FIELD OF APPLICATION

4.4 GENERAL

The field of direct application defines the allowable changes to the test specimen following a successful fire resistance test. These variations can be applied automatically without the need for the sponsor to seek additional evaluation, calculation or approval.

NOTE When extended product size requirements are envisaged, the dimensions of certain components within the test specimen can be less than those intended to be used at full size in order to maximize the extrapolation of the test results by modelling the interaction between components at the same scale.

Where referred to annex B or annex C in this paragraph, the annexes in EN 1634-1 are meant.

4.4.1 Materials and construction

4.4.1.1 General

Unless otherwise stated in the following text, the materials and construction of the door-set or openable window shall be the same as that tested. The number of leaves and the mode of operation (e.g. sliding, single action or double action) shall not be changed.

4.4.1.2 Specific restrictions on materials and construction

4.4.1.3 Metal construction

The type of metal shall not be changed from that tested.

4.4.1.4 Decorative finishes

4.4.1.4.1 Paint

Where the paint finish is not expected to contribute to the fire resistance of the door, alternative paints are acceptable and may be added to door leaves or frames for which unfinished test specimens were tested. Where the paint finish contributes to the fire resistance of the door (e.g. intumescent paints) then no change shall be permitted.

4.4.1.4.2 Decorative laminates

Decorative laminates and timber veneers up to 1,5 mm thickness may be added to the faces (but not the edges) of doors that satisfy the insulation criteria (normal or supplementary procedure).

Decorative laminates and timber veneers applied to door leaves that do not satisfy the insulation criteria (normal or supplementary procedure) and/or those in excess of 1,5 mm thickness shall be tested as part of the test specimen. For all door-sets tested with decorative laminate faces, the only variations possible shall be within similar types and thicknesses of material (e.g. for colour, pattern, supplier).

4.4.1.5 Fixings

The number of fixings per unit length used to attach door-sets to supporting constructions may be increased but shall not be decreased and the distance between fixings may be reduced but shall not be increased.

4.4.1.6 Building hardware

NOTE 1 The number of movement restrictors such as locks and latches is not covered by direct application.

Where a door-set has been tested with a door closing device fitted, but with the retention force released in accordance with 10.1.4 of EN 1634-1, the door-set may be provided either with or without that closing device, i.e. where self-closing characteristics are not required.

NOTE 2 Interchange of building hardware is not covered by the field of direct application.

4.4.2 Permissible size variations

4.4.2.1 General

Door-sets of sizes different from those of tested specimens are permitted within certain limitations, but the variations are dependent on product type and the length of time that the performance criteria are fulfilled.

The increase and decrease of dimensions permitted by the field of direct application are applicable to the overall size and to each door leaf, each side panel and each over panel independently.

4.4.2.2 Test periods

The amount of variation of size permitted is dependent on whether the classification time was just reached (Category 'A') or whether an extended time (Category 'B') in accordance with the values shown in Table 1 were fulfilled before the test was concluded.

For category 'B':

Table 7.1: Category B overrun requirements for E and EW

Classification time (min)	All performance criteria fulfilled for at least minutes
15	18
20	24
30	36
45	52
60	68
90	100
120	132

Table 7.2: Category B overrun requirements for EI₁ and EI₂

Classification time (min)	All performance criteria fulfilled for at least minutes
15	18
20	24
30	36
45	52
60	68

4.4.2.3 Size variation related to product type

4.4.2.3.1 General

The rules to cover increase or decrease of size without additional considerations are applicable only to:

horizontally sliding and vertically sliding door-sets including sectional door-sets.

No increases in size are permitted for door-sets which are required to satisfy radiation control levels unless the insulation criteria are also satisfied. This is because any increase in size will increase the radiation received at a fixed distance away from the door. There are calculation methods which can be used to determine acceptable size increases for such doors; however, these are beyond the scope of direct application. Doors that satisfy both the radiation control levels and insulation criteria may have their sizes increased as outlined in Annex B of EN 1634-1. This is accepted because the increase in radiation resulting from a size increase allowed under this section, for an insulated door, will be such that it will still satisfy the required radiation control levels. Size decreases are permitted for both doors which satisfy radiation control levels and those which satisfy insulation criteria and radiation control levels.

Permissible variations for each product group are detailed in Annex B of EN 1634-1+A1.

4.4.2.3.2 Horizontally sliding and vertically sliding door-sets including sectional doors

For Category 'A' tests (with no overrun of classification period) unlimited size reduction is permitted with the exception of insulated metal door-sets where the size reduction is limited. For Category 'B' tests (with specified overrun of classification period) all smaller sizes are permitted and increases in height and width are permitted as stated below:

For test specimen with door leaves manufactured to the maximum size allowable in a standard 3,0 m by 3,0 m furnace, the height and/or the width can be increased provided that the area is not increased by more than 50%. Additionally, test specimens comprising joined panels shall incorporate at least one full size panel with at least one example of each jointing technique for height and width as applicable.

Both of the above extensions to width and height are only permissible if the overlaps at the rear and head of the door are adjusted to increase the tightness of the interlock (shown in Figure 33 in EN 1634-1) by 10 mm per metre of increase in size.

The maximum gap at the bottom of the door may be decreased from the maximum tested but shall not be increased above the maximum tested.

4.4.3 Asymmetrical assemblies

4.4.3.1 General

EN 1363-1 states that for separating elements required to be fire resisting from both sides, two test specimens shall be tested (one from each direction) unless the element is fully symmetrical, i.e. the construction of the door-set is identical on both sides of the centre line when viewed in plan (from above). However, in some cases it is possible to develop rules whereby the fire resistance of an asymmetrical door assembly tested in one direction can apply when the fire exposure is from the other direction. The possibility to develop such rules increases if the consideration is limited to certain types of door assembly and on the criteria being applicable (e.g. integrity only doors). The following rules represent the minimum level of common agreement which shall be followed. The rationale behind the rules is given in Annex C of EN 1634-1.

4.4.3.2 Specific rules

The rules governing the applicability of tests carried out in one direction to other directions are given in Table 7.7 and are based on the following premises:

- that each of the door leaves are themselves of symmetrical construction with the exception of the edges (e.g. lock/leading edge and hinge edge or double rebated doors)
- that any restraining/supporting elements of building hardware has been included in a test to EN 1634-1 when exposed in both directions so that they will retain their function when exposed to the heat of the test

- that there is no change in the number of leaves or the mode of operation (e.g. sliding, swinging, single action or double action)
- that side, over and transom panels are excluded from Table 2 unless they are fully symmetrical.

Table 7.7 lists the type of door assembly for which rules can be generated and gives the direction in which it should be tested to cover the opposite direction. The separate columns for the integrity and insulation criteria reflect the different ability to make rules for integrity only doors as opposed to those which satisfy both criteria. A 'Yes' means that it is possible to identify the direction of test which covers the opposite direction. A 'No' indicates that it is not possible to identify the direction which will cover the opposite direction.

4.4.4 Supporting constructions

4.4.4.1 General

The fire resistance of a door assembly tested in one form of standard supporting construction may or may not apply when it is mounted in other types of construction. Generally, the rigid and flexible types are not interchangeable and rules governing the direct application.

4.4.4.2 Rigid standard supporting constructions (high or low density)

The fire resistance of a door-set tested in a high- or low-density rigid standard supporting construction as specified in EN 1634-1 can be applied to a door-set mounted in the same manner in a wall provided the density and the thickness of the wall are equal to or greater than that in which the door-set was tested.

5. LIMITATIONS

This classification document does not represent type approval or certification of the product.



S. Lutz
Project leader smoke control & resistant to fire



P.W.M. Kortekaas
Senior project leader resistant to fire

6. DRAWINGS

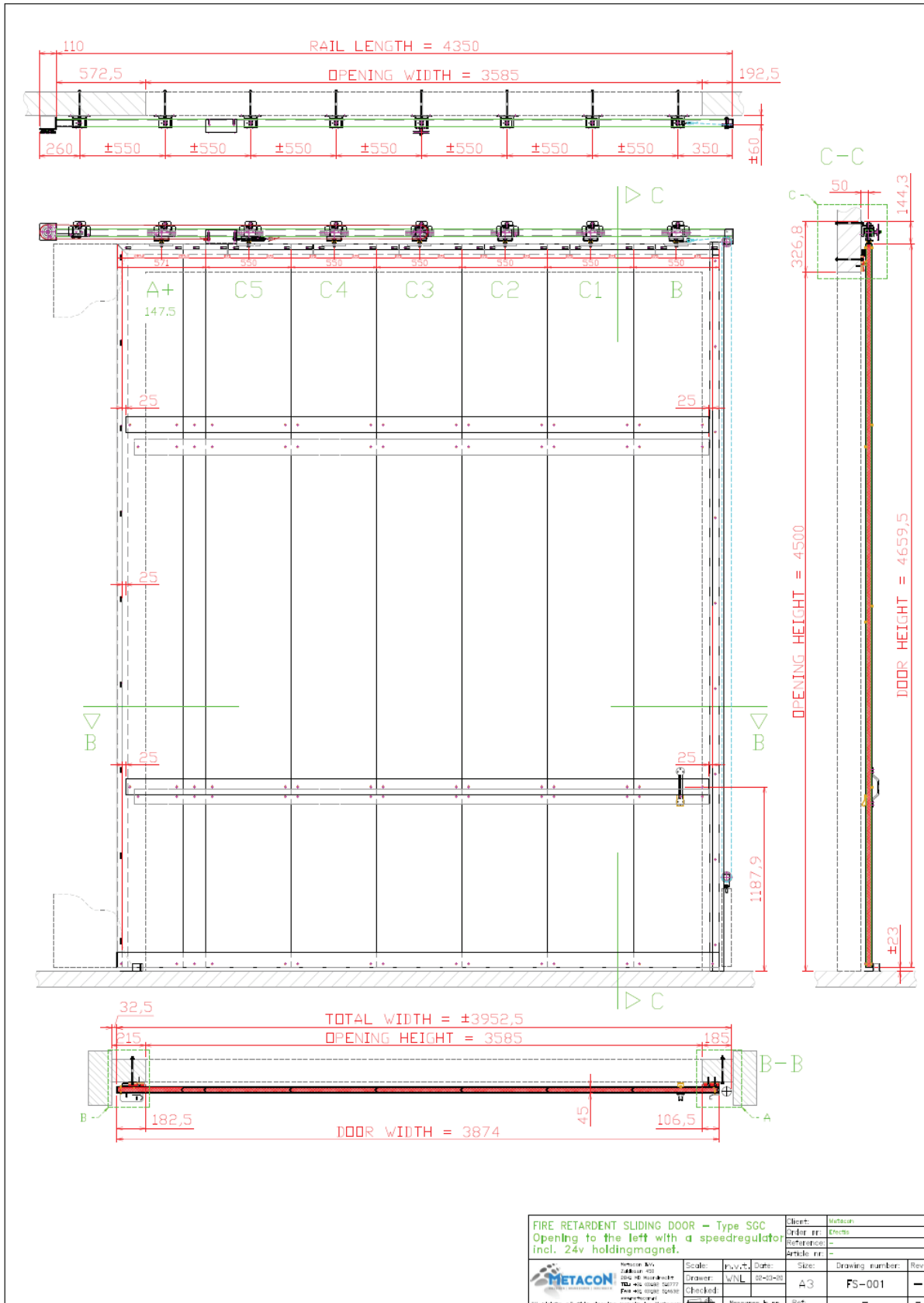


Figure 1 Overview test specimen