

related standard	EN 15254-4: 2008 +FprA1:2010 and EN 1364-1
subject	Glazed constructions Exchange of the fire resistant glass
reference of original query	Helpdesk 2011-05, N612rev2 and N647rev1

Extract of relevant standard

EN 15254-4:2008 + EN 15254-4/prA1:2010

6.1 Exchange of the fire resistant glass

The exchange (replacement) of the glass, as tested in the reference test, for another fire resistant glass is allowed, provided that it can be demonstrated that both glasses are within the same glass product group (same manufacturer) and have at least the same or increased nominal thickness.

When the reference glass is being exchanged (replaced), the replacement glass (new glass) must have evidence that it achieves at least the same fire resistance classification (or equivalent fire resistance) as the reference glass (such as previously existing test data).

If the replacement glass was tested (previously existing test data) at a smaller or the same size/area as in the reference test (before extension) then the size/area of the replacement glass cannot be changed from its tested size/area.

If the replacement glass was tested at the same size/area as in the reference test (after extension) then this size/area of replacement glass can be used to replace the reference glass.

If the replacement glass was tested at a larger size/area than in the reference test (after extension) then the maximum size/area of the replacement glass can be no greater than the extended size/area of the glass as tested in the reference test.

Problem:

There are no provisions for the case where the dimensions of the replacement glass are situated between the dimensions of the glass in the reference test and the dimensions of the glass in de reference test after extension.

Recommendation:

The maximum allowed dimensions of the reference glass i.e. $height_{max,ref}$, $width_{max,ref}$ and $area_{max,ref}$ are calculated based on the results of the tests with the reference glass using the rules mentioned in paragraph 6.3 of EN 15245-4 and taking into account the overrun during the test, i.e.:

- No overrun:

$$h_{ext,ref} \leq h_{o,ref}$$

$$W_{ext,ref} \leq W_{o,ref}$$

$$A_{ext,ref} \leq A_{o,ref}$$



- With overrun:

$$h_{\text{ext,ref}} \leq h_{\text{max,ref}} = h_{0,\text{ref}} \times 1,20$$

$$W_{\text{ext,ref}} \leq W_{\text{max,ref}} = W_{0,\text{ref}} \times 1,20$$

$$A_{\text{ext,ref}} \leq A_{\text{max,ref}} = h_{0,\text{ref}} \times 1,21$$

Based on the results of the tests with the exchange glass, the extended dimensions of the exchange glass i.e. height $h_{\text{ext,ex}}$, width $W_{\text{ext,ex}}$ and area $A_{\text{ext,ex}}$ are calculated using the same rules.

Based on the obtained values for both glasses, the maximum allowed dimensions of the exchange glass become:

- $h_{\text{max,ex}} = \text{minimum}(h_{\text{ext,ref}}, h_{\text{ext,ex}})$
- $W_{\text{max,ex}} = \text{minimum}(W_{\text{ext,ref}}, W_{\text{ext,ex}})$
- $A_{\text{max,ex}} = \text{minimum}(A_{\text{ext,ref}}, A_{\text{ext,ex}})$

i.e. in the cases where the extended dimensions of the exchange glass exceed the extended dimensions of the reference glass, the maximum allowed dimensions of the exchange glass are limited to the extended dimensions of the reference glass.

Example

An overrun was obtained during both tests

Reference test: $h_{0,\text{ref}} = 2 \text{ m}$, $W_{0,\text{ref}} = 1 \text{ m}$, $A_{0,\text{ref}} = 2 \text{ m}^2$

$\Rightarrow h_{\text{ext,ref}} = h_{0,\text{ref}} \times 1,20 = 2,4 \text{ m}$, $W_{\text{ext,ref}} = W_{0,\text{ref}} \times 1,20 = 1,2 \text{ m}$ and $A_{\text{ext,ref}} = A_{0,\text{ref}} \times 1,21 = 2,42 \text{ m}^2$

Test with exchange glass: $h_{0,\text{ex}} = 2,25 \text{ m}$, $b_{0,\text{ex}} = 0,8 \text{ m}$, $A_{0,\text{ex}} = 1,8 \text{ m}^2$

$\Rightarrow h_{\text{ext,ex}} = h_{0,\text{ex}} \times 1,20 = 2,7 \text{ m}$, $b_{\text{ext,ex}} = b_{0,\text{ex}} \times 1,20 = 0,96 \text{ m}$ and $A_{\text{ext,ex}} = A_{0,\text{ex}} \times 1,21 = 2,18 \text{ m}^2$

Maximum dimensions of the exchange glass:

$h_{\text{max,ex}} = 2,4 \text{ m}$, $b_{\text{max,ex}} = 0,96 \text{ m}$, $A_{\text{max,ex}} = 2,18 \text{ m}^2$
