



# Reynaers Safety Systems

Product overview – Fire, Smoke, Bullet, Explosion

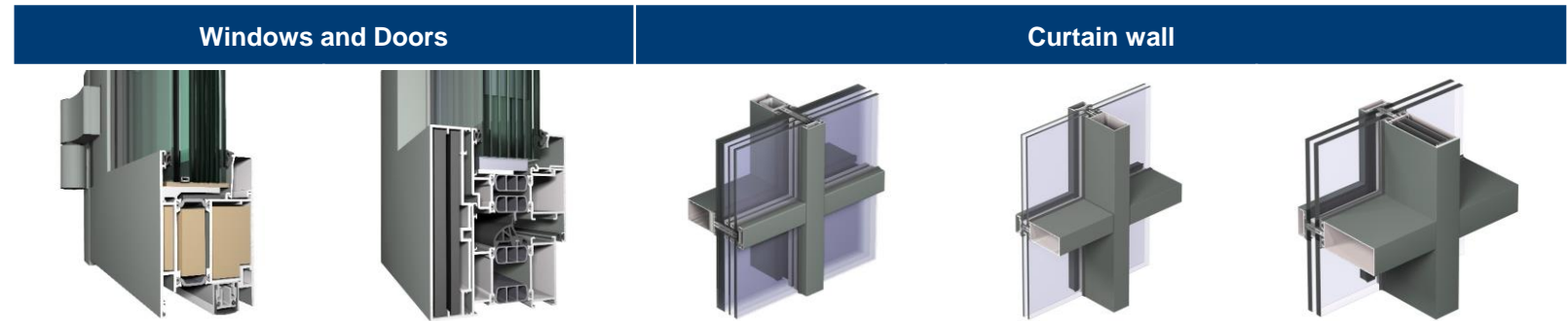
27/01/2022







Reynaers  
Aluminium

# Safety systems overview

Reynaers Safety Systems are designed for a specific safety requirement such as fire or bullet resistance. Besides also fulfilling basic requirements such as weather tightness and thermal insulation they can be offered with additional safety features such as burglar resistance and panic exit devices.



Safety aspect	standard	ConceptSystem 77-FP	ConceptSystem 77-BP	ConceptWall 50-FP	ConceptWall 50-EP *	ConceptWall 80-EP *
Burglar 	EN 1627	RC2	RC3			
Fire	EN 13501-2	EI 30, EI 60		EI 30, EI 60		
Smoke 	EN 13501-2	Sa, S200				
Bullet 	EN 1522		FB4, FB6			
Explosion	ISO 16933				EXV 33	EXV 25, 19, 15
Panic 		EN 179, 1125				

\*only as project solution

# Fire resistance introduction

A photograph of two firefighters in full protective gear, including helmets and jackets, working at a fire scene. They are positioned in front of a large, bright fire that fills the background. The scene is dimly lit, with the primary light source being the fire itself, creating a high-contrast, dramatic atmosphere. The firefighters are silhouetted against the bright light of the flames.

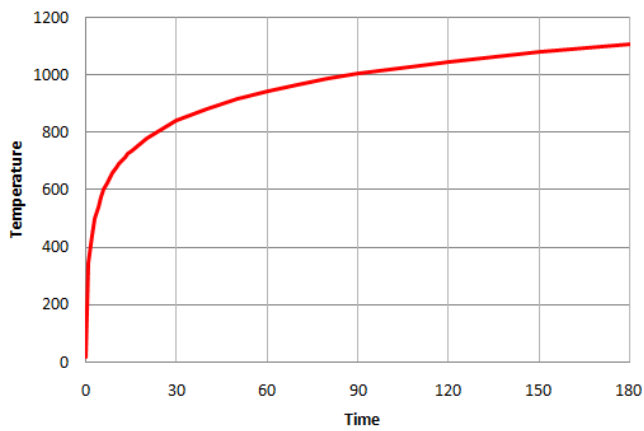
Fire resistant windows, doors and façades play a key role in mitigating harm to people and damage to property in case a fire breaks out in a building.

They form an effective barrier to block a fire from spreading for a given amount of time, during which people can evacuate the building and fire fighters can arrive on the scene.

# Fire resistance introduction

Before a product can be labelled fire resistant it has to undergo rigorous testing. Real size elements are installed in an oven and heated up to temperatures simulating a fully developed fire, well beyond the melting point of aluminium.

During the test data is recorded on surface temperature, heat radiation and deflection of the construction. These parameters will determine the classification.



Standardized temperature curve

1. Thermocouples installed all over the test element monitor the surface temperature increase.
2. In the first minutes of the fire the protective layer in the glass reacts and turns opaque. This blocks the heat and helps to reduce panic by obscuring the flames from view.
3. For the duration of the test nothing may ignite on the protected side. The testing officer makes sure of this by holding a cotton pad in critical areas.
4. The test is ended after integrity is lost and flames pass through. The fire exposed side can be seen to be charred and molten.



# Fire resistance introduction

Fire resistance of construction products is classified according to EN 13501-2  
 For windows, doors and façades the following parameters are important:

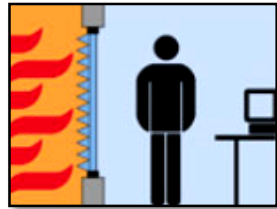


## E = Integrity

Criteria:

- No sustained flaming (>10s)
- No openings
- No ignition of cotton pad

*Without E no classification is possible*



## I = Thermal insulation

Criteria:

- Average temperature increase <140K
- Maximum temperature increase <180K

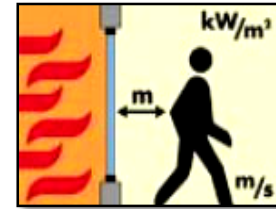
For doors and openable windows there is a distinction between I<sub>1</sub> and I<sub>2</sub>

I<sub>1</sub> → max. temp. increase <180K anywhere on the element, extra measurement points on opening part

I<sub>2</sub> → max. temp. increase <360K on frame surrounding opening part, anywhere else <180K

EI<sub>1</sub> is only required by regulation in Belgium

*Requires E  
Includes W*



## W = Radiation

Criteria:

- <15 kW/m<sup>2</sup>

EW is only required by regulation in The Netherlands

*Requires E*



## tt = Duration

In minutes, rounded down to:

- 10
- 15
- 20
- **30**
- 45
- **60**
- **90**
- 120
- 180
- 240
- 360

30, 60 and 90 are the most common

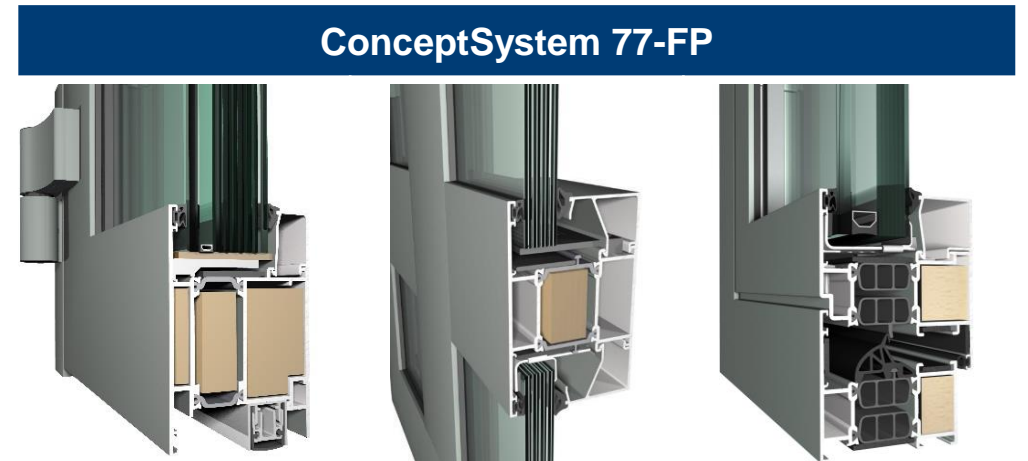


# ConceptSystem 77-FP

Extensively tested in various laboratories across Europe, CS 77-FP has been a reference in the market for many years. Full compliance with CE-marking according to EN 16034 as well as various national approvals mean that the product is widely accepted for application on the interior as well as on the exterior of the building.

CS 77-FP delivers up to 60 minutes of fire resistance along with all the benefits of our CS 77 system: thoroughly tested, a wide range of possibilities and a uniform way of working for all types of elements.

A wide range of tested glass and hardware types offers maximum flexibility and operational efficiency.



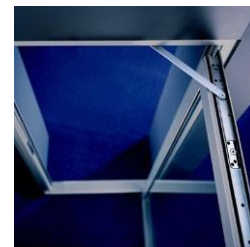
Fire rating	Door	Partition wall	Window
EW 30		•	•
EI 30		•	
EI <sub>1</sub> 30	•		
EI <sub>2</sub> 30	•		•
EW 60		•	
EI 60		•	
EI <sub>1</sub> 60	•		
EI <sub>2</sub> 60	•		

# ConceptSystem 77-FP Doors

CS 77-FP doors are available with 30 or 60 minute fire resistance along with all the benefits of our CS 77 system: thoroughly tested, a wide range of possibilities and a uniform way of working for all types of doors.

Design options include various hinge types, design handles and a concealed door closer. The various bottom solutions offer a tailored solution for the specific end-use condition, whether accessibility, water tightness or elimination of draft is of primary importance.

Single and double doors as well as configurations with top- or sidelights are possible.



Characteristics	
Uf-value (W/m <sup>2</sup> K)	3,6 (EI <sub>2</sub> 30: 3,2)
Burglar resistance EN 1627	RC 2
Panic door EN 179	Y
Panic door EN 1125	Y
Infill thickness	13 – 52 mm
Self-closing durability	C5
Max. leaf weight	250 kg



## ConceptSystem 77-FP Fire resistant doors

		EI <sub>2</sub> 30	EI <sub>2</sub> 60	EI <sub>1</sub> 30	EI <sub>1</sub> 60
Element types	Single door	1.4 x 3.0	1.4 x 3.0	1.32 x 2.75	1.32 x 2.75
	Double door	2.8 x 3.0	2.6 x 2.75	2.6 x 2.75	2.6 x 2.75
	Top- / sidelights	•	•	•	•
Glass	Monolithic glass	•	•	•	•
	Double glass	•	•	•	•
	Triple glass	•		•	
Hinges	Rollenband hinge	•	•	•	
	Türband hinge	•	•	•	•
Supporting constructions	Rigid wall	•	•	•	•
	Lightweight partition	•	•	•	
	Glazed partition	•	•	•	•
Bottom solutions	Drop seal	•	•	•	•
	Threshold	•	•	•	•
	Brush	•	•	•	•
	Bottom rail	•	•	•	•

# ConceptSystem 77-FP Doors

Inhalation of toxic fumes can be lethal and is statistically the primary cause of fatality in a fire. Furthermore smoke development limits visibility and may complicate evacuation.

Doors with the classification Sa or S200 (EN 13501-2) have been proven to be sufficiently air tight to effectively limit the spread of smoke under ambient (room) temperature or 200°C respectively.

CS 77-FP doors can meet both classifications with only a few additional measures.



		ConceptSystem 77-FP Fire resistant and smoke tight doors			
		El <sub>2</sub> 30-Sa	El <sub>2</sub> 30-S200	El <sub>2</sub> 60-Sa	El <sub>2</sub> 60-S200
Element types	Single door	1.4 x 3.0	1.4 x 2.6	1.4 x 3.0	1.4 x 2.6
	Double door	2.6 x 2.75	2.6 x 2.75	2.6 x 2.75	2.6 x 2.75
	Top- / sidelights	•	•	•	•
Glass	Monolithic glass	•	•	•	•
	Double glass	•	•	•	•
	Triple glass	•	•		
Hinges	Rollenband hinge				
	Türband hinge	•	•	•	•
Supporting constructions	Rigid wall	•	•	•	•
	Lightweight partition	•	•	•	•
	Glazed partition				
Bottom solutions	Drop seal	•	•	•	•
	Threshold				
	Brush	•		•	
	Bottom rail	•	•	•	•

# ConceptSystem 77-FP Windows

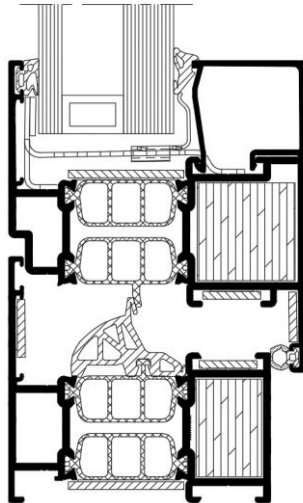
CS 77-FP opening windows offer a solution to create a fire resistant yet openable glazed enclosure.

Having achieved EW 30 and EI<sub>2</sub> 30 performance and being certified for CE-marking mean that it is widely applicable in Europe.

Various hardware options allow the creation of turn, tilt, turn-tilt and tilt before turn opening types, with the choice of visible or concealed hinges. Lockable handles are available in different designs.



**CE** EN 16034



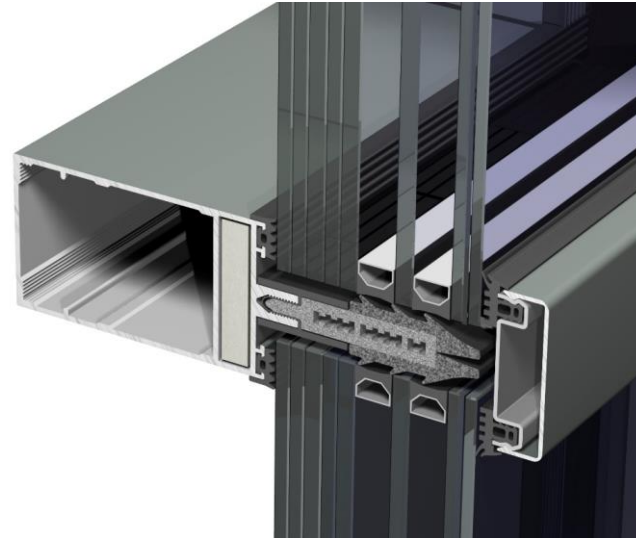
		ConceptSystem 77-FP Opening Window	
		EW 30	EI <sub>2</sub> 30
Element types	Single window (Fb x Fh)	1.2 x 1.8 (m) or 1.0 x 2.16 (m)	1.2 x 1.8 (m) or 1.0 x 2.16 (m)
	Combined element (Fb x Fh)	1.2 x 1.8 (m) or 1.0 x 2.16 (m)	1.0 x 1.8 (m)
Uf (W/m <sup>2</sup> K)		2,4	
Dimensions	Infill thickness	13 – 52 mm	
	Visible width (frame+leaf)	115 mm	
	Frame depth	68 mm	
	Vent depth	77 mm	
	Maximum element height	3000 mm	
	Maximum leaf weight	170 kg	
Glass	Monolithic glass	•	
	Double glass	•	•
	Triple glass	•	•

# ConceptWall 50-FP

Transparency, insulation and fire protection come together in our recently updated ConceptWall 50-FP façade system.

The system design enables very large and heavy glass panels up to 550 kilograms.

Thermal comfort and energy savings are not compromised: triple glazing and insulation foams were tested and may be used to achieve very low U-values.



	ConceptWall 50-FP	
	EI 30	EI 60
Max span	4.59 m	5.74 m
Uf	0.80	0.80
Max glass weight	550 kg	550 kg
Max glass size (portrait)	1950 x 3200 mm	1800 x 3840 mm
Max glass size (landscape)	2050 x 1678 mm	2640 x 2013 mm
Glass thickness	34 – 78 mm	
Glass suppliers	Vetrotech; AGC	Vetrotech; AGC
Mullion depth	83 – 167.5 mm	
Max inertia	562 cm <sup>4</sup>	
Vertical facade	•	•
Inclined facade	+/- 10°	+/- 10°
Double glass	•	•
Triple glass	•	•



# Fire resistant glass

For fire resistance the profiles and the glass can not be evaluated separate from each other.

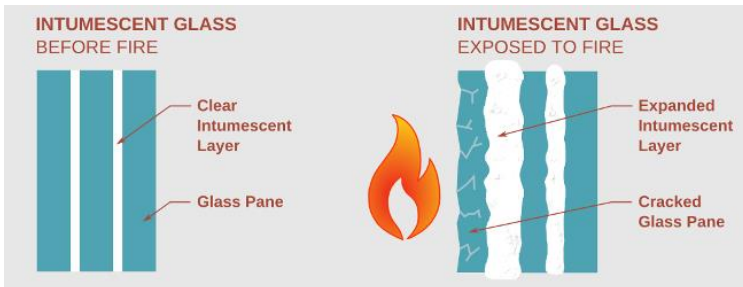
As the performance depends on the interaction between both, classifications are only valid for the tested combination.

Generally speaking there are two types of fire resistant glass for EI application:

1. Float glass with silicate interlayers
2. Tempered glass with gel filling

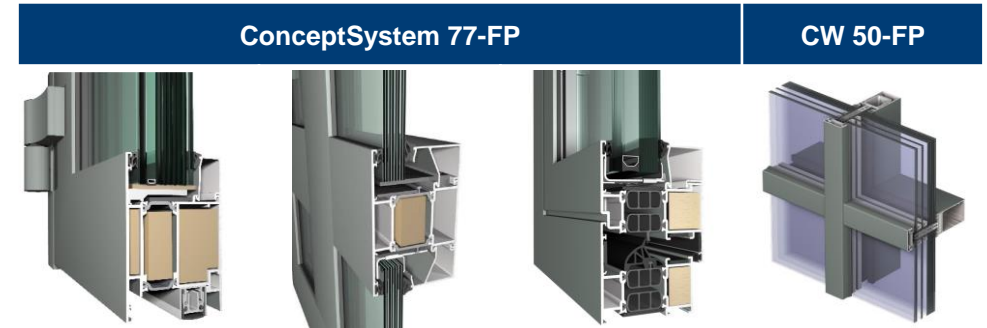
Float glass can be cut to size for shorter lead times while tempered glass is stronger, more stable and allows bigger dimensions.



Both are possible also as double- or triple glass units for improved energy, comfort & safety levels.



*This is a simplified overview and does not give conclusive information. For full details and limitations consult the relevant approval.*

*M = monolithic (single) glass  
D = double glass  
T = triple glass  
Te = tempered  
Fl = float*



Manufacturer	Type	Door	Partition wall	Window	Curtain wall
<b>vetrotech</b> <small>SAINT-GOBAIN</small>	Contraflam Lite 30	Te		M D	
	Contraflam 30	Te	M D T	M D T	D T
	Contraflam 60-3	Te	M D	M D	D T
 <b>PILKINGTON</b>	Pyrostop 30	Fl	M D T	M D	
	Pyrostop 60	Fl	M D	M D	
<b>AGC</b> <small>GLASS UNLIMITED</small>	Pyrobel 16 (EG)	Fl	M D T	M D	
	Pyrobel 25 (EG)	Fl	M D	M D	
	Pyrobel-T EI30	Te	M D T		D T
	Pyrobel-T EI60	Te	M D		D T
 <b>Pyroguard</b>	Pyroguard T-EW30	Te		M D T	D T
	Pyroguard T-EW60	Te		M D	
	Pyroguard T-EI30	Te	M D T	M D T	
	Pyroguard T-EI60	Te	M D	M D	

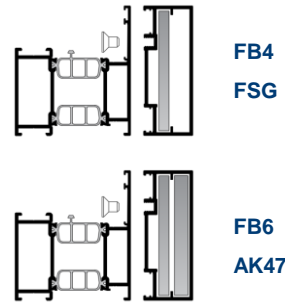


# ConceptSystem 77-BP

For situations where there is a risk of attack with firearms, CS 77-BP offers bullet resistance up to FB6 on fixed as well as opening windows, inward and outward opening doors.

Elements from the standard CS 77 system are made bullet proof by the addition of steel plating in an aluminium casing which is simply bolted to the outer surface of the construction. The modularity allows optimal use of material and freedom of design.

By selecting the right type of hardware the doors as well as the fixed windows are certified burglar resistant class 3.



**Modular system**  
CS 77 + Add-on profile + Armor



## System specifications



	Fixed window	Turn-tilt window	Inward opening door	Outward opening door
Profile depth	97 mm			
Visible width	77 mm	128 mm	159 mm	184 mm
Infill thickness	25 - 52 mm			
U <sub>w</sub> / U <sub>d</sub> value (U <sub>g</sub> 1,1)	U <sub>w</sub> 1,7	U <sub>w</sub> 1,8	U <sub>d</sub> 2,2	U <sub>d</sub> 2,1
Burglar resistance	RC 3	-	RC 3	RC 3
Panic door	-	-	-	-
Maximum leaf weight	-	170 kg	300 kg	300 kg

	Resistance class (EN 1522)			
	FB4	FSG	AK47*	FB6
Fixed window	•	•	•	•
Inward opening window	•	•	•	•
Inward opening door	•	•	•	
Outward opening door	•	•	•	
Combined elements	•			
Monolithic glass	•	•	•	•
Insulated glass	•			



\* Caliber: 7,62x39mm, M43, FMJ/PB/FeC @ 720 m/s

# Blast resistance

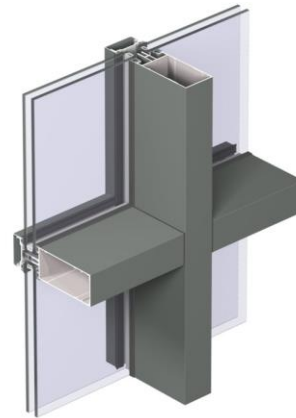
A blast-resistant façade protects people and goods in case of an explosion. The extreme pressure from a blast can shatter an ordinary façade and the flying shards can cause major injuries and damage.

The huge cost in terms of human lives and damaged property an explosion can cause may warrant the investment in blast protection of a façade, especially for strategic locations such as embassies, airports and military buildings.

The solutions have been tested according to the ISO 16933 standard, which assesses the danger to people inside a building resulting from the explosion of 100kg TNT at a specified distance. With our 80mm curtain wall a rating of EXV 15 (C) was achieved, meaning a distance to the explosive of 15 m without dangerous fragments on the protected side (C = minimal hazard).

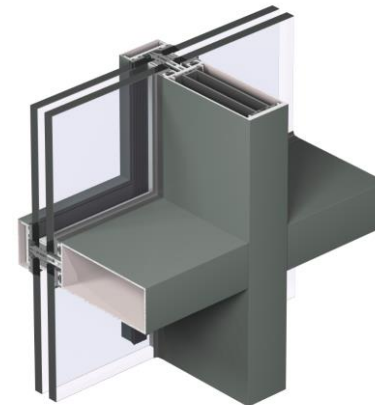


Scan the QR-code to watch our **Blast Resistance Test Video**



## CW 50-EP

*'Slim, Sturdy and Economical'*



## CW 80-EP

*'Maximal protection & transparency'*

	CW 50-EP	CW 80-EP
	EXV 33	EXV 15
System width	50 mm	80 mm
Max tested glass size	1400 x 2800 mm	1760 x 3540 mm
Air tightness	AE 1950	AE 1950
Water tightness	RE 1950	RE 1950
Acoustic	R <sub>w</sub> (C;C <sub>tr</sub> ) = 43 (-2;-4) dB, depending on glass	
Blast classification	EXV 33 (C)	EXV 15 (C)

Closely based on our versatile and extensively tested CW 50 system, CW 50-EP combines a basic level of blast resistance while maintaining a slender appearance.

For higher levels of protection a bespoke 80 mm system was designed. With its increased glass rebate the glazing is held securely in place even under the extreme forces resulting from a close-range explosion. With a large tested glass size of 1760 x 3540mm (w x h) blast resistance does not need to come at the expense of transparency.

These products are offered exclusively as project solutions, with an optimized design based on the available test data and further calculations.



Reynaers  
Aluminium

**Together  
for better**