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ATG Technical Approval with Certification

ATG 14/2782

Fire-resistant roller shutters roller shutters (FR 1h) for industrial use

Fireroll VR60

Valid from 13/5/2014
until 12/5/2017

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OBS - UTDRAG UR TESTPROTOKOLL , EJ KOMPLETT

Based on frequency of use tests, these doors can only be used as doors, which close automatically in the event of a fire. For this purpose, they must always be fitted with a system that causes them to close automatically in the event of a fire and a mechanism that keeps then in open position, which is described in this approval document. Except in the event of a fire, they must always be in open position.

1 Scope

In compliance with Standard NBN 713.020 - Addendum 1 - "Fire resistance of construction materials" and the unified technical specifications STS 53.1 – Doors (2006 edition), the term "doors" refers to construction materials that consist of one or more panels, their frame and their connections to the main structure, which may include a transom or other fixed devices, together with suspension, closure and manoeuvring fittings.

The fire resistance of the doors has been examined, based on the results of tests conducted, according to Standard NBN 713.020 - Fire resistance of construction materials - 1968 edition – and Addendum 1 – 1982 edition. The BENOR mark is granted on the basis of all test reports, including possible interpolations/extrapolations and not only the individual reports.

The presence of the **BENOR/ATG mark** on a door certifies that the components listed in the following description and tested in compliance with NBN 713.020 indicates **fire resistance**, as shown on the BENOR/ATG label, subject to the following conditions:

- Compliance with the procedures of the General Regulations and Special Regulations for Use and Monitoring of the BENOR/ATG mark in the Passive Fire Protection sector
- Compliance with installation guidelines, which are issued with the door and included in paragraph 5 of this approval document. For this purpose, all BENOR/ATG doors supplied must be accompanied by a copy of this approval document, together with the installation guidelines.

The **durability, suitability** and **safety** of the doors have been examined, based on the results of tests conducted according to the Unified Technical Specifications STS 53.2 "Industrial Doors" (in preparation).

The technical approval is issued by UBAtc asbl. **Permission to use the BENOR/ATG mark** is granted by ANPI-BOSEC, subject to the conduct of continuous checks during manufacturing and regular external checks of factory-made components by a delegate of the inspection body designated by ANPI-BOSEC.

In order to obtain a satisfactory guarantee that a fire-resistant door has been correctly installed, it is recommended that a fitter is employed to install the doors, who is certified by an accredited body for this task, such as ISIB. This type of certification is issued on the basis of a training course and practical test, in which understanding and correct application of the installation guidelines are assessed.

By adding the ISIB mark, i.e. a transparent label with the certification number of the fitter, based on the following model (diameter: 22 mm), which must be applied to the BENOR/ATG label, and by issuing a certification of installation, the fitter certifies that the door has been fitted according to paragraph 5 of this approval document and assumes responsibility for its installation.

ISIB
XXXX

By adding this label, the certified fitter agrees to have his work checked regularly by the certification body.

2 Description

2.1 Field of application

Fire-resistant Fireroll VR 60:

– With a fire resistance rating of one hour (FR 1 h), which is based on the following test reports:

Test report numbers
Université de Liège, Département de mécanique des Materials et structures, Laboratoire d'essais au feu, Chemin des Chevreuils 1, 4000 Liège
Institut für Brandschutztechnik und Sicherheitsforschung, Petzoldstrasse 45, Postfach 27, 4017 Linz (Austria)

– For the following types:
  - Roller shutter
– The performance of which, according to STS 53.2 (in preparation), has been determined, based on the following reports:

Test report numbers
Centre Technique de l'Industrie du Bois

The shutters are placed in openings created in concrete, brick or cellular concrete walls with a minimum thickness of 90 mm and satisfactory mechanical stability. Lightweight partition walls should not be used.

The various shutters that make up a door are separated by a over-mantel, which must have at least the same fire resistance and mechanical stability characteristics as the partition wall, in which they are installed.

The wall openings must satisfy the conditions described in § 6.1, so that the shutters can be fitted according to the conditions described in § 6.

The floor covering in these openings must hard and flat. Tiling, parquet flooring, concrete or linoleum can be used.

2.2 Marking and checks

These doors are subject to the integrated BENOR/ATG procedure, which enables the manufacturer to obtain permission to use the BENOR/ATG mark shown below.

The BENOR/ATG mark of conformity takes the form of a thin adhesive label (diameter: 22 mm), based on the following model:

These marks are numbered. They are issued to the manufacturer exclusively by Bosec.

This mark is added in the factory by the manufacturer to the left-hand guide at a height of 1.5 m.

No marks must be displayed on the frame.

Only by displaying the above-described BENOR/ATG mark on a component can the manufacturer certify that this component complies with the relevant description included in this approval document:

Component	According to paragraph
Materials	3
Shutter: Description Dimensions	 4.1.1 4.1.1.5
Frame	4.1.2
Guide profiles (1)	4.1.3
Accessories (2)	-
(1): if applicable (2): if mentioned on the delivery note	

2.3 Delivery and on-site checks

Each delivery of BENOR/ATG doors must be accompanied by a copy of this approval document, so that acceptance tests can be conducted after installation.

On-site checks include:

1. Checking that the BENOR/ATG mark is present on the shutter
2. Checking the conformity of the components described in the following table
3. Checking the conformity of the installation with the description included in this approval document

In particular, the checks mentioned in Sections 2 and 3 include:

Component	According to paragraph
Materials for installation	3
Dimensions	4.1.1.5
Accessories (3)	–
Fitting	6
(3): if the latter are not mentioned on the delivery note.	

2.4 Comments regarding requirements described in the specifications

The fire-resistant shutters have special characteristics, which enable them to complement, when in closed position, the fire resistance characteristics of the wall, in which they are installed.

In general, this special performance can only be achieved by means of the specially designed door and depend on the care taken when the complete door is assembled (see "Delivery and on-site checks " - paragraph 2.3).

As a result, the door components (panel, frame, metal fittings, dimensions, accessories, etc.) must be selected according to the restrictions of this approval document (see "Delivery and on-site checks " - paragraph 2.3).

3 Materials (4)

The Bosec-Benor-ATG office is aware of the trade name and characteristics of each constituent component. They are checked by means of samples taken by a delegate of the inspection body, which is designated by BOSEC.

3.1 Panel

3.1.1 Blades

– Pine or multiplex wood (minimum density: 450 kg/m³; wood moisture content: 8 at 12 %)
– PVC profile
– Intumescent product

3.1.2 Bottom joint

– Co-extruded PVC profile (36 mm x 30 mm)

3.1.3 Horizontal blade angle

2 mm-thick steel J-profile

- Fitted to the upper shutter blade
- Used to hold the door in place in the event of fire

3.1.4 Fastener + inox cable

3 mm diameter cable

- Used to assemble the shutter
- The fastener is secured on the lower blade
- The cable is secured on the adjustable cable fastener (Section 3.1.5).

3.1.5 Adjustable cable fastener

Used to fasten the shutter to the drum

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(4) The following table shows the permissible deviations for material characteristics when on-site checks are conducted:

Material characteristic	Permissible deviation
Dimensions of PVC profiles	± 1 mm

The following table shows the permissible deviations for material characteristics when checks are conducted during manufacturing:

Material characteristic	Permissible deviation
Core thickness (mm)	± 0.5 mm (based on an average of 5 measurements)
Wood moisture content (%)	± 2 % (based on an average of 5 measurements)
PVC profiles (mm)	± 0.5 mm
Section of intumescent product (mm x mm)	± 0.2 mm (based on an average of 5 measurements)
Section of frame (mm x mm)	± 0.5 mm
Volume mass (kg/m^3)	- 5 % (based on an average of 5 measurements) - 10 % (based on individual measurements)

3.1.6 Blade support

Plastic component

Secured on the adjustable cable fastener (Section 3.1.5).

Enables the door to be rolled up correctly.

3.1.7 Cover

Secured on the blade support (Section 3.1.6).

Reinforcement and finishing part

3.1.8 Motor arm

Keeps and guides the motor on the universal bearing (3.1.13).

3.1.9 Seal cap

Secured on the motor arm (3.1.8).

Keeps the roller in position

3.1.10 Roller

Roller for 30 mm diameter axle

Enables the drum and motor to slide along the universal support (3.1.13).

3 roll / door

3.1.11 Drum flange

30 mm diameter axle

To be soldered onto one side of the 159 mm diameter tube (3.1.14) in order to create the drum.

3.1.12 Motor flange

30 mm diameter axle with keyway

For connection to the motor

To be soldered onto one side of the drum (3.1.14) in order to create the drum.

3.1.13 Universal support

Support, on which the drum is positioned, so that the shutter can be rolled up

3.1.14 Tube

Outer diameter 159 mm

To be used with the drum flange (3.1.11) and motor flange (3.1.12), in order to create the drum

3.1.15 Rubber sleeve

To be placed around the cable (3.1.4) and fixed onto the drum

Makes it possible to roll up the shutter without damaging it

3.1.16 Bottom plate

To be placed on each side of the lower part of the shutter

Also makes it possible to secure security cells

3.2 Frame

3.2.1 Vertical and horizontal bars of door frame

- PVC profile
- Intumescent product
- Pine (minimum density: 450 kg/m^3; wood humidity content: 8 at 12 %)

To be placed around the opening

3.2.2 Perlau

Perlau 20 mm/ 2 mm - To be placed in the wall baffle

Perlau 35 mm / 2 mm - To be placed in the bottom joint

3.2.3 Horizontal angle of lintel

2 mm thick galvanised steel profile, placed above the frame

3.3 Guide profiles

3.3.1 Outer upper vertical angle

To be bolted onto the inner guide, in order to form a "U" shape

Acts as a fastener for the guide wheel (3.3.5)

3.3.2 Outer universal vertical angle

To be placed as an extension below the upper angle (3.3.1) in order to assemble doors measuring up to 6 metres

3.3.3 Inner universal vertical angle

To be secured on the frame, together with the outer guide (3.3.1), in order to form a "U" shape

Symmetrical on the left or right

3.3.4 Side 'U" profile

PVC finishing profile covered with an intumescent product on the surface that comes into contact with the outer and inner angles (3.3.1 - 3.3.3).

The shutter slides on this part when the door is opened.

3.3.5 Pair of guide rollers

Makes it possible to align the shutter when rolling up and unrolling the door

To be secured on the upper higher angle (3.3.1).

3.3.6 M8X19 bolts

Enable the angles to be fixed together.

3.4 Motor

3.4.1 Electric motor MFZ

Main three-phase motor (220 V or 380 V)

24 V back-up motor

3.4.2 Plate CS300

The plate built into the control box MFZ makes it possible to operate the door automatically and ensure that it is safe.

3.4.3 Adapters

Enable the different motors to be connected to the 30 mm diameter flange.

3.4.4 Safety cells

Mobile photoelectric barrier consisting of:

- 1 a pair of unit 4 cells
- 1 connection box

Makes it possible to ensure that the automatic door is safe.

Maximum movement speed 320 mm/s

3.5 Lightweight partition

It is not permitted to fit a door in a lightweight partition.

4 Components

4.1 Roller shutter, solid, without transom

4.1.1 Panel

The panel consists of:

4.1.1.1 A series of blades

PVC blades with standard dimensions: 63 mm high and 36 mm thick

- Length can be adjusted to the opening (clear width+ 200 mm),
- A profile with PVC finish (section: 36 mm x 30 mm) is placed under the shutter,
- A J-profile (baffle – section: 22 x 57.5 x 65 x 2 mm) is placed on the top blade

The shutter is formed by stacking blades, which are threaded through steel cables. The blades are pierced with 4.5 mm diameter holes at 400 mm intervals in the core, so that the cables can be threaded through.

The 3 mm diameter steel cables are secured on the drum every 400 mm.

4.1.1.2 Filling

The blades consist of:

- A PVC coating with raised spacers on the inside and a tongue and groove joint on both sides
- A core consisting of two horizontal pine battens
- An Intumescent product between the two battens and coating

4.1.1.3 Covering

Paint can be applied

4.1.1.4 Intumescent product

A strip of intumescent product (section: 35 mm x 2 mm) is placed on:

- The upper edge of the top blade between the blade and J-profile
- The upper edge of the lower blade between the blade and profile finished with PVC.

4.1.1.5 Dimensions

The dimensions of each blade are shown in the following table.

Dimensions	
Height	63 mm
Thickness	36 mm

The dimensions of the shutter must fall within the following limits:

Dimensions	Minimum	Maximum
Height	1000 mm	6000 mm
Width	1000 mm	6000 mm
Thickness without coating	36 mm	

The maximum surface of the shutter is limited to 30 m².

4.1.2 Frame

The frame consists of:

- A PVC profile, filled with pine and intumescent product (width: 124 mm, thickness: 22 mm) on three sides of the opening (sides and top);
- A steel J-profile (baffle – section: 22 x 24 x 50 x 2 mm) is placed above the PVC profile on the lintel across the entire width of the opening; a strip of intumescent product (section: 20 mm x 2 mm) is placed in this steel profile.

4.1.3 Guide profiles

- Z-profile made from galvanised steel (section: 35 x 77 x 124 x 24 x 2 mm)
- J-profile made from galvanised steel (section: 21 x 51 x 103 x 2 mm)

The guide profiles are placed on the frame. The 2 parts form a U-profile, which is necessary in order to guide the shutter, in which the PVC side U-profile covered with an intumescent product slides on the surface that comes into contact with the guide profiles. This side U-profile serves as an airtight and watertight finish profile.

4.1.4 Movement mechanism

These roller shutters must always be fitted with a mechanism that causes them to close in the event of fire, together with a mechanism that keeps them in open position.

The roller shutter works by means of a motor (3 phases / 400 V), which is connected to a worm drive.

In the event of fire, an additional 24 V motor, powered by a low-voltage back-up device, ensures that the door is fully closed.

The motor and drive controls form a single unit and are always supplied with the shutter.

The electric motor of the MFZ type consists of a range of 5 motors, according to the weight of the shutter:

Ref.	Maximum shutter weight
4501 (FDF 20-22-12)	226 kg
4502 (FDF 30-42-12)	431 kg
4503 (FDF 50-60-10)	615 kg
4504 (FDF 50-75-10)	769 kg
4505 (FDF 60-100-9)	1000 kg

5 Manufacture

The office is informed of the manufacturing plants where the shutters and frame are made, which are also listed in the control agreement with Bosec. They are labelled in the manner described in paragraph 2.2.

6 Position

The shutters are stored, processed and positioned as normal internal doors, according to STS 53.1; it is recommended that the doors are only installed indoors.

6.1 The opening

The dimensions of the opening are determined, in order to position the door as described in paragraph §6.2.

The perimeter of the opening must be smooth and level across a minimum width of 15 cm on the door side.

The finish and level surface of the partition walls must always allow the door to function properly.

The level floor surface must allow the door to function with the clearance stipulated in paragraph 6.4.

6.2 Position of the frame

6.2.1 PVC frame

The frame complies with the provisions of § 4.1.2.1.

It must be placed in an opening created in concrete, brick or cellular concrete walls with a minimum thickness of 90 mm. Lightweight partition walls should not be used.

The different shutters that make up a door must be separated by an over-mantel, which must have the same characteristics and stability as the wall, in which they are installed.

The frame must be square and level.

The PVC profiles and Z-shaped guide profiles are fastened to the wall at 600 mm intervals using screws and the appropriate plugs (minimum diameter: 8 mm). The Z-shaped guide profiles are directly fastened to the wall at 600 mm intervals using screws and the appropriate plugs (minimum diameter: 8 mm).

If the door is fitted in a cellular concrete partition wall, it must be secured using torpedo plugs at 600 mm intervals.

If the perimeter of the opening is not sufficiently smooth and a clearance of over 3 mm is created between the profile and the wall, it will be necessary to place rockwool between the wall and PVC profile.

The PVC side U-profile covered with an intumescent product slides into the guide rail created by the J-profile and Z-profile.

6.3 Fitting the panel

The shutter is slipped in to the U-profile.

The BENOR/ATG mark of conformity is displayed in a visible place on the left guide at a height of 1.5 m.

The fitter is not permitted to score, cut, pierce, trim or shrink, extend or enlarge the panel.

Any other necessary adjustments must be carried out by the manufacturer, in compliance with this technical approval.

6.4 Clearances

The maximum permissible clearances are shown in the following table.

The maximum permissible clearance between the panel(s) and floor must be respected throughout the entire thickness of the panel when the door is in closed position.

For this purpose, the floor under the door must be sufficiently level.

The latter must be prepared by companies, which are responsible for levelling floors so that the maximum difference between the lowest and highest point in the finished floor between the door (zone 1 in Fig. 3) is equivalent to the maximum permissible clearance between the panel and the floor.

Maximum permissible clearance (mm)	
Between the shutter and bottom of the rail	18
Between the panel and the floor (*)	5
(*): The floor covering must be hard and level, such as tiling, concrete, linoleum or parquet flooring.	

The clearances are measured in all places with a 10 mm wide gauge.

6.5 Commissioning

The (certified) fitter must, after installation, check that the door functions properly.

The full closure of the door, from any position, must be checked and recorded in the installation report.

6.6 Maintenance

The proper functioning of the roller shutter must be checked regularly (according to the manufacturer's instructions). This maintenance, which should preferably be carried out by skilled persons (e.g. the manufacturer, fitter, etc.) is vital when it comes to guaranteeing that the doors provide a barrier against fires.

Maintenance includes:

- Checking that the door closes fully if a fire is detected,
- Checking that it moves freely inside the opening,
- Checking the anti-jamming device,
- Maintaining the moving parts and motor,
- Checking for cable wear,
- Immediately repair or replacement by the fitter or customer of all damaged parts in the shutter or guide/movement mechanism.

6.7 Safety – personal safety recommendations

In order to ensure that all persons are safe, it is recommend that the European standard NBN EN 13241-1 (Industrial Doors) is respected, even though it does not apply to this type of door.

General safety requirements

- Motorised shutter
  1. Maximum closure speed in the final 1.5 m: 0.3 m/s
  2. Danger of persons becoming trapped:
  - Automatic shutdown per detection zone or
  - Maximum brake power: 400 N

Note: 1 and 2 also apply in the event of an emergency, detection and power failure.

General fire safety requirements

- The shutter, which closes automatically in the event of fire, must close from any position if a fire occurs.
- The closing system must be controlled by a fairly sensitive detection system, so that the door closes at a fairly low temperature, in order to ensure that the door functions effectively.
- Roller shutters should be seen as an emergency exit.

7 Performance

The performance of the above-described doors has been determined, based on the following standards:

7.1 Fire resistance

NBN 713.020 "Fire resistance of construction materials", 1968 edition and Addendum 1, 1982 edition: Fire Resistance: 1 hour, NBN EN 13501-2 2003 edition: EI_1 60, provided the immediate scope of application of Standard NBN EN 1634-1, 2000 edition, is respected.

7.2 Mechanical resistance

Tests were conducted on a shutter with the clear dimensions of 4 m x 4 m, according to the STS 53.2 specifications, unless otherwise mentioned.

7.2.1 Mechanical durability according to NBN EN 12605, requirements according to NBN EN 12604

Number of cycles: 2000

7.2.2 Safe opening according to NBN EN 12605, requirements according to NBN EN 12604

The door meets these requirements (for max. 750 kg)

7.2.3 Manoeuvring forces according to NBN EN 12445 or NBN EN 12978, requirements according to NBN EN 12453 or NBN EN 12978

The door meets these requirements.

7.3 Conclusion

A VR60 roller shutter, with the clear dimensions of 4 m x 4 m, is classified as follows:

Fireroll VR 60	
Performance	Class
Fire resistance	Fire resistant for 1 hour EI_1 60
Frequency of use	2000 cycles
Safe opening	The shutter meets the requirements
Manoeuvring forces	The shutter meets the requirements

UBAtc asbl is an approval body and member of the European Union of Agrément for construction (UEAtc, see www.ueatc.com) notified by the FPS Economy within the framework of Directive 89/106/EEC and member of the European Organisation for Technical Approvals (EOTA, see www.eota.eu). Certification bodies designated by UBAtc asbl operate in compliance with a system that is set to be accredited by BELAC (www.belac.be).

This technical approval has been published by UBAtc, under the responsibility of the approval body BCCA, and based on favourable feedback from the specialist "Passive Fire Protection" Group, issued on 13 June 2013.

In addition, the ANPI certification body declares that the production process meets the conditions for certification and that a certification agreement was signed by the ATG holder.

Date of issue: 13 May 2014

For UBAtc, declaration of the validity of the approval process

Peter Wouters,
Director

Benny De Blaere,
Managing director

For the approval and certification body

Michèle Vandendoren,
Secretary general

Bart Sette,
Director

This technical approval shall remain valid, provided the product, its manufacture and all processes that are appropriate for this purpose:

- are maintained, in order to achieve, as a minimum, the performance levels defined in the approval document;
- are continuously monitored by the certification body, which confirms that the certification continues to be valid;

If these conditions are no longer met, the technical approval shall be suspended or withdrawn and the approval document shall be deleted from the UBAtc website.

The validity and latest version of this approval document can be verified by consulting the UBAtc website (www.ubatc.be) or by directly contacting the UBAtc office.