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UNDERWRITERS' LABORATORIES OF CANADA

File CR2669
Application No. 24504
January 21, 1999

REPORT

on

FIRESTOP SYSTEMS

bst-Brandschutztechnik Dopfl GmbH
Vienna, Austria

I N T R O D U C T I O N

This Report describes an investigation undertaken to establish the fire resistance ratings of Firestop Systems. To accomplish this objective, openings were protected with various firestop systems and subjected to fire endurance tests in accordance with ULC-S115-M95, Standard Method of Fire Tests of Firestop Systems.

The assigned fire resistance ratings for the firestop systems were determined on the basis of the occurrence of flame on the unexposed surface and temperature rise in accordance with the current requirements of Underwriters' Laboratories of Canada for this class of product.

The fire endurance tests were supplemented by other tests and examinations intended to furnish information concerning the properties of the materials employed in the tested assembly.

At the end of this Report, reference is made to Firestop System Nos. SP660-SP664 which have been established as a result of the investigation described herein.

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DESCRIPTION

PRODUCTS COVERED:

Firestop System Components designated as follows:

- Bst Rectangular Metal Frames in single or back to back (b+b) applications
 - Types SB4, SB8x2, SB8 (Size Designations 180, 240 and 360)
- Bst Plug Seal Transit in single or back to back (b+b) applications
 - Type RR (Size Designations 50, 70, 100, 103, 150 and 200)
- Synthetic Rubber Inserts
 - Bst Insert Modules (various sizes)
 - Bst Filler Blocks (various sizes)
- Anchor Plates
 - Galvanized steel used between rows of modules and wedge compression unit
- Wedge Compression Unit
 - Used for compressing the insert and filler modules in SB Frames
- Intumescent Material
 - Type 'A'
 - Type 'K'

GENERAL CHARACTER AND USE:

The SB metal frame consists of a rectangular steel cell with a steel flange; the frame is intended to be cast-in-place in concrete floor or walls. Electrical cables or pipes are installed through the frame and secured in place with the Bst Insert modules and Filler Blocks. Anchor plates are used to separate the rows of modules from the wedge compression unit. The wedge compression unit is used to squeeze all the firestop system components together by tightening the metal bolt.

The Plug Seal RR transit consists of a circular synthetic rubber block with adjustable steel plates at four sides. This device is intended to be used in core-drilled holes in concrete slabs or walls. Electrical cables or pipes are installed through the frame and secured in place with the Bst Insert modules and Filler Blocks. The penetrating items are secured in place by the compression of the compression block caused by the tightening of the bolts.

These devices are intended to fill the voids around cables and pipes where they penetrate horizontal and vertical concrete or masonry fire separations. The devices are components of firestop systems and are intended to be installed in accordance with the appropriate requirements of the National Building Code of Canada, where up to 3 h F and FH ratings and up to 1 h FT and FTH ratings are required.

L I S T I N G I E X T

On the basis of the foregoing, the following Listing Text will be promulgated under Guide No. 40 U19.13 and the Follow-Up Service inaugurated.

Guide No. 40 U19.13

January 21, 1999

File: CR2669

Firestop System Components

BST-BRANDSCHUTZTECHNIK DOPFL GMBH, Vienna, Austria

- Type SB4, SB8 and SB8x2 Bst Rectangular single or double metal frames in single or back-to-back applications, for use in System Nos. SP660-SP663.
- Type RR 50,70, 100 103, 150 or 200 Bst Plug Seal in single or back-to-back applications, for use in System Nos. SP660-SP663.
- Type Bst Insert Modules in various sizes for use in System Nos. SP660-SP663.
- Type Bst Filler Blocks in various sizes for use in System Nos. SP660-SP663
- Type anchor plates, galvanized steel used between rows of modules for use in System Nos. SP660-SP663.
- Type wedge compression unit for compressing the insert and filler modules in SB Frames for use in System Nos. SP660 and SP661.
- Type 'A' and Type 'K' intumescent material for use in System No. SP664.

Marking: ULC Labels on each carton of each Bst Insert Modules, Bst Filler Blocks, anchor plates, wedge compression unit and on each SB and RR Frames and on each pail of Type 'A' and Type 'K' intumescent material.

LISTED - Label Service

The ULC label or listed marking on a product is the only evidence provided by Underwriters' Laboratories of Canada to identify products which have produced under the Listing and Follow-Up Service.

See General Information Section under above Guide No. in the ULC List of Equipment and Materials, Firestop Systems & Components (and Supplements thereto).

Authorities having jurisdiction should be consulted before installation.

INVESTIGATION AND REPORT BY:

REVIEWED BY:



Robert Molina, P.Eng.
Project Engineer
Construction Materials



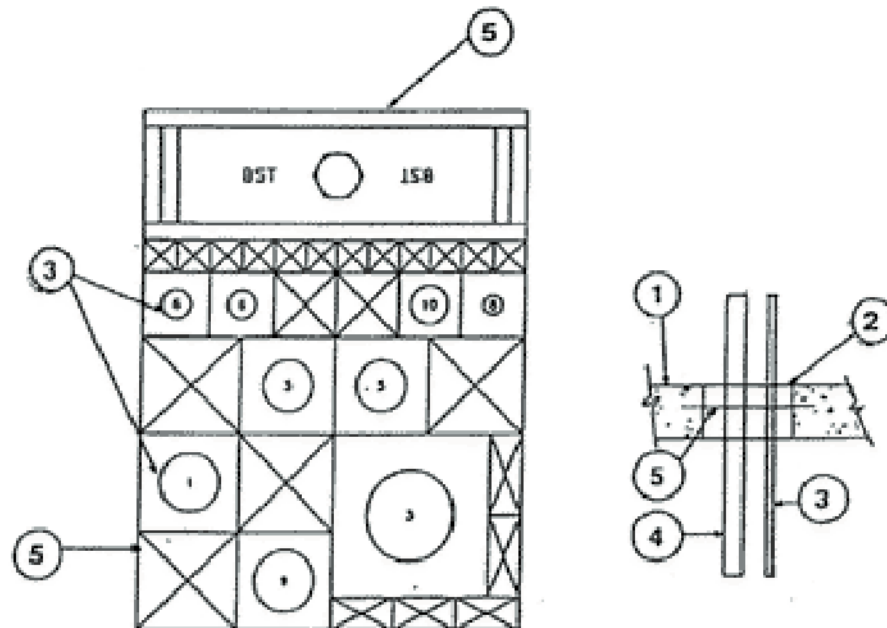
Emmanuel Sopeju, P.Eng.
Project Engineer
Construction Materials

RM/wl

SYSTEM No. SP660

(For Horizontal or Vertical Separation)

F, FT, FH and FTH Ratings – See Item 5



Picture is representative only and does not necessarily represent the system describe herein, see Listing Text.

1. **Floor or Wall Assembly** – Minimum 150 mm thick reinforced concrete floor or wall of normal-density concrete.
2. **Through Opening** – The area of the through opening shall not exceed 19200 mm² with a maximum dimension of 160 mm for the SB4 Frame, 33600 mm² with a maximum dimension of 280 mm for the SB8 Frame and 69440 mm² with a maximum dimension of 280 mm for the SB 8x2 Frame.
3. **Electrical Cables** – The following electrical cables can be installed in the Firestop System as detailed in Item 5:

Cable Identification	Cable Description
1	TECK 90 armored 3/C 14 AWG 600 V PVC jacketed material and cross linked polyethylene (XLPE) insulation
2	TECK 90 armored 3/C 10 AWG 600 V PVC jacketed material and cross linked polyethylene (XLPE) insulation
3	TECK 90 armored 12/C 12 AWG 600 V PVC jacketed material and cross linked polyethylene (XLPE) insulation
5	CLX PLTC 16 AWG 2 Pr 300V PVC jacket and insulation
8	RG 62 A/U Coaxial Cable PVC jacket and polyethylene insulation
10	Telecom 25 pair, 24 gauge PVC jacket, PVC insulation

4. **Steel Conduits** – The steel pipes may be installed in the Firestop Systems as detailed in Item 5:

Pipe Identification	Pipe Description
A	Steel pipe with 30 mm OD and 2.5 mm wall thickness
B	Steel pipe with 20 mm OD and 2 mm wall thickness
C	Steel pipe with 15 mm OD and 1.5 mm wall thickness
D	Steel pipe with 12 mm OD and 1.0 mm wall thickness
E	Steel pipe with 55 mm OD and 2.4 mm wall thickness

The above steel pipes can be substituted with those having smaller outer diameters and equal or greater wall thicknesses.

• **5. Firestop System Components** – (Guide No. 40 U19.13). Installed in accordance with the manufacturer's installation instructions.

- (a) Type SB4, SB8 and SB8x2 single steel frames, cast in place at one side of the concrete floor or wall.
- (b) Synthetic rubber inserts Type Bst Insert Modules and Bst Filler Blocks installed around penetrating cables or to fill voids inside steel frame. Inside dimension of Bst Insert Modules shall be consistent with the outside dimension of the enclosed penetrant.
- (c) Galvanized steel anchor plates installed between rows of synthetic rubber inserts inside the steel frame.
- (d) Wedge Compression Unit installed and activated within the steel frame.

The ratings of the Systems are dependant upon the type and the number of penetrating items used. The following table gives details of the permissible cable or pipe type and the associated ratings in the SB4, SB8 or SB8x2 frames. (The percent loading is calculated by dividing the total cross-sectional area of all the penetrants by the inside area of the frame and expressed as a percentage.)

Profile	Type of Penetrating Items	Max Number of Penetrating Items	Max % Loading	F	Rating Periods (Hours)		
					FT	FH	FTH
1	1	1	2.92	2	1	2	1
	5	2					
	8	1					
	10	1					
2	2	1	5.89	2	3/4	2	3/4
	5	2					
	8	2					
	A	1					
	B	1					
C	2						
3	1	2	3.39	2	1	2	1
	3	1					
	A	1					
	C	2					
D	2						
4	1	2	8.44	2	3/4	2	3/4
	2	2					
	3	1					
	8	3					
	10	3					
	A	1					
	B	1					
	C	2					
	D	2					
	E	1					

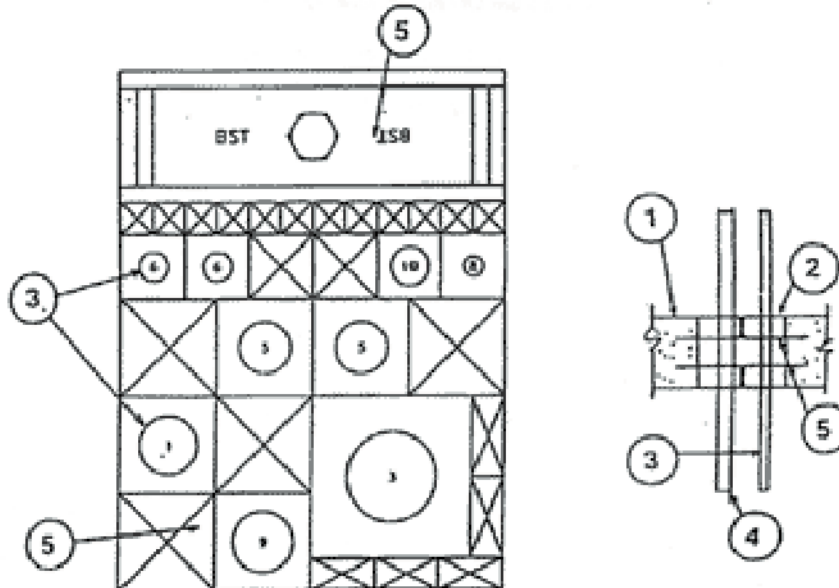
The drawing associated with this System is for graphical purposes, the Listing determines what is allowed.

BST-BRANDSCHUTZTECHNIK

SYSTEM No. SP661

(For Horizontal or Vertical Separation)

F, FT, FH and FTH Ratings – See Item 5



Picture is representative only and does not necessarily represent the system describe herein, see Listing Text.

1. Floor or Wall Assembly – Minimum 200 mm thick reinforced concrete floor or wall of normal-density concrete.
2. Through Opening – The area of the through opening shall not exceed 19200 mm² with a maximum dimension of 160 mm for the SB4 Frame, 33600 mm² with a maximum dimension of 230 mm for the SB8 Frame and 69440 mm² with a maximum dimension of 280 mm for the SB 8x2 Frame.
3. Electrical Cables – The following electrical cables can be installed in the Firestop System as detailed in Item 5:

Cable Identification	Cable Description
1	TECK 90 armored 3/C 14 AWG 600 V PVC jacketed material and cross linked polyethylene (XLPE) insulation
2	TECK 90 armored 3/C 10 AWG 600 V PVC jacketed material and cross linked polyethylene (XLPE) insulation
3	TECK 90 armored 12/C 12 AWG 600 V PVC jacketed material and cross linked polyethylene (XLPE) insulation
5	CLX PLTC 16 AWG 2 Pr 300V PVC jacket and insulation
6	3/0 AWG 2 Pr 600V XLPE RW90 Cross linked polyethylene insulation
8	RG 62 A/U Coaxial Cable PVC jacket and polyethylene insulation
9	THC 300 MCM 1/C 600V XLPE PVC insulation, nylon jacket
10	Telecom 25 pair, 24 gauge PVC jacket, PVC insulation

4. Steel Conduits – The steel pipes may be installed in the Firestop Systems as detailed in Item 5:

Pipe Identification	Pipe Description
A	Steel pipe with 30 mm OD and 2.5 mm wall thickness
B	Steel pipe with 20 mm OD and 2 mm wall thickness
C	Steel pipe with 15 mm OD and 1.5 mm wall thickness
D	Steel pipe with 12 mm OD and 1.0 mm wall thickness
E	Steel pipe with 55 mm OD and 2.4 mm wall thickness

The above steel pipes can be substituted with those having smaller outer diameters and equal or greater wall thicknesses.

- **5. Firestop System Components** – (Guide No. 40 U19.13). Installed in accordance with the manufacturer's installation instructions.
 - (a) Type SB4, SB8 and SB8x2 back-to-back with single or double steel frames, cast in place at each side of the concrete floor or wall.
 - (b) Synthetic rubber inserts Type Bst Insert Modules and Bst Filler Blocks installed around penetrating cables or to fill voids inside steel frame. Inside dimension of Bst Insert Modules shall be consistent with the outside dimension of the enclosed penetrant.
 - (c) Galvanized steel anchor plates installed between rows of synthetic rubber inserts inside the steel frame.
 - (d) Wedge Compression Unit installed and activated within the steel frame.

The ratings of the Systems are dependant upon the type and the number of penetrating items used. The following table gives details of the permissible cable or pipe type and the associated ratings in the SB4, SB8 or SB8x2 frames. (The percent loading is calculated by dividing the total cross-sectional area of all the penetrants by the inside area of the frame and expressed as a percentage.)

Profile	Type of Penetrating Items	Max Number of Penetrating Items	Max % Loading	F	Rating Periods (Hours)		
					FT	FH	FTH
1	1	1	7.46	2	2	2	2
	3	1					
	5	2					
	6	2					
	8	1					
2	10	1	9.05	2	1-1/2	2	1-1/2
	1	1					
	3	1					
	5	2					
	6	2					
3	8	1	6.21	2	2	2	2
	9	1					
	10	1					
	3	1					
	5	2					
	8	2					
	10	3					
4	A	1	8.18	2	1-1/2	2	1-1/2
	B	1					
	C	2					
	2	1					
	3	1					
	5	2					
SB8 Frame	8	2	8.18	2	1-1/2	2	1-1/2
	10	3					
	A	1					
	B	1					
	C	2					

Profile	Type of Penetrating Items	Max Number of Penetrating Items	Max % Loading	F	Rating Periods (Hours)		
					FT	FI	FTH
5 SB8x2 Frame	1	2					
	3	1					
	6	3					
	8	3					
	9	1	8.61	2	2	2	2
	10	3					
	A	1					
	B	1					
	C	2					
	D	2					
	E	1					
6 SB8x2 Frame	1	2					
	2	2					
	3	1					
	6	3					
	8	3					
	9	1	9.45	2	1-1/2	2	1-1/2
	10	3					
	A	1					
	B	1					
	C	2					
	D	2					
E	1						

The drawing associated with this System is for graphical purposes, the Listing determines what is allowed.

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