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Short Title	B99 – Ballard Container Fire Resistance
Full Title	B99 – Ballard Container Fire Resistance
Abstract	

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Revision Record

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1.0	First Release	KHE	January 24, 2025

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1.0 Purpose

The purpose of this document is to provide Material Safety Data Sheet, for the insulation material installed in the Ballard Fuel Cell container to provide passive fire protection. The container deliver for the Crosswind project is in accordance with standard container solution from Ballar Power systems and do not fulfill requirements for Offshore installation as stated in the contract (As a minimum, the Fuel Cell container shall provide 2 hours fire rating). The Ballard Container delivered do not have fire rating.

2.0 Overview of Material Data Sheets

The complete list of insulation material used in the 1MW fuel cell container (MEGABLOCK) is shown below.

Manufacturer	Type	Name	Description / Use	Sub-assembly
TRIMOTERM	Insulation	Insulation	Installed inside the container to create fire protection as well as creating protection for low temperature.	Container Solution

COMPANY PROFILE



Trimo is a one of the leading European companies developing original and complete building envelope solutions in the areas of fire-proof façades and roofs .

Located in Trebnje, Slovenia, Trimo sells products and services under its own brand cross more than 100 countries worldwide and has a sales network in almost 30 countries. We are a reliable, trustworthy global supplier of innovative, flexible, energy-efficient and environmentally friendly architectural building solutions.

Our customers are at the heart of our operations as we deeply understand their needs and provide them with the highest level of service and product quality. The list of outstanding and reputable partners such as Airbus, London Heathrow, Nestle, Philips, DHL, Porsche, IKEA, Prologis, Mercedes Benz, Coca Cola and many others is a true reflection of our passion, responsibility and committment to our work.

ISO 9001 ISO 14001 ISO 45001 BUREAU VERITAS Certification

Mitglied des: IFBS Industrieverband für Bausysteme im Metalleichtbau

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For information about the delivery of panels see Trimo's General conditions (https://www.trimo-group.com/en/general-conditions-of-sales).

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Ballard Container

PROFILE TYPES



S (standard) profile



V profile



V2 profile



V6 profile

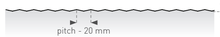


G (smooth) profile

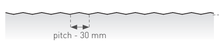
M (micro-lined) profile



M2 (micro-lined) profile



M3 (micro-lined) profile



M8 (micro-lined) profile



Trapezoid profile



Trimoterm FTV profile type	A	B
S (standard) profile	•	•
V profile (V, V2, V6*)	•	•
G (smooth) profile	•	•
Micro-lined profile (M, M3)	•	
Micro-lined profile (M2)		•
Micro-lined profile (M8)	•	•

* Available with 1.200 mm module width only.

Trimoterm FTV HL profile type	A	B
S (standard) profile	•	•
V profile (V, V2, V6*)	•	•
G (smooth) profile	•	•
Micro-lined profile (M, M3)	•	
Micro-lined profile (M2)		•
Micro-lined profile (M8)	•	•

* Available with 1.200 mm module width only.

Trimoterm SNV profile type	A	B
Trapezoid	•	
S (standard) profile		•
V profile (V, V2)		•
G (smooth) profile		•
Micro-lined profile (M2)		•

NOTES: The internal and external Trimoterm profiles seen in this document present the main range of profile options. Some combinations are mutually exclusive depending on the type of profile and product. For the approval of the requested profile combination please contact Trimo's technical support team. The arrangement of V profile (and all others) typically starts on the middle (centred) of panel steel sheet prior to forming stage. Module end, grove and the distance from the panel edge depends on Trimoterm panel module and may vary. Any other V profile arrangements are declared as non-standard and a subject of individual order. The arrangement of S profile typically starts on the middle (centred) of the Trimoterm panel module. Module end and the distance from the panel edge depends on Trimoterm panel module and may vary. Smooth profile (G) - to ensure an optimal smooth surface for building façades external side of the panel 0,7 mm steel sheet thickness must be used in lieu of standard 0,55 mm.

COLOURS

White RAL 9010	Grey White RAL 9002	Cream RAL 1015	Light Grey RAL 7035	Agate Gray RAL 7038	Tele Grey 2 RAL 7046
Silver RAL 9006	Dark Silver RAL 9007	Traffic Red RAL 3020	Moss Green RAL 6005	Gentian Blue RAL 5010	Anthracite RAL 7016

NOTES: Colours may slightly deviate due to different monitors and prints compared to original colours.

Trimo can send you a metal swatch upon request. Colour range does not in any case define delivery terms or any other terms of specific skin colour.

Colour range presented shows only a fraction of most usable colours within the variety of colours available.

PANEL MARKING

SPECIFICATION TEXT

Trimoterm Power T FTV-60/1000 MS
external: 0,55 mm SP 25 µm ANTHRACITE
internal: 0,50 mm SP 25 µm GREY WHITE

Trimoterm Power T FTV-60/1000 MS

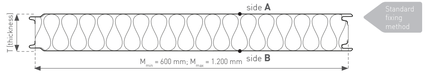
Steel sheet thickness
Steel sheet coating
Colour
Product family
Mineral wool core type
Product type (FTV, FTV-HL, SNV)
Thickness
Module width
Side A profile type
Side B profile type

* Side A usually presents the external side of a panel.

PRODUCT TYPES

Trimoterm FTV
Horizontal and vertical panel orientation

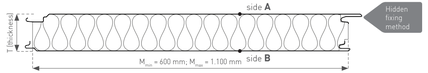




Standard fixing method

Trimoterm FTV HL
Horizontal and vertical panel orientation

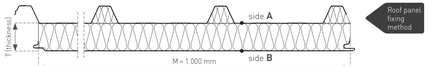




Hidden fixing method

Trimoterm SNV
Panel laying according to roof inclination





Roof panel fixing method

CORNER ELEMENTS



L-corner
Horizontal
Transversal sharp-edged corner element



U-corner
Horizontal
Double transversal sharp-edged corner element



L-corner
Vertical
Longitudinal sharp-edged corner element



Rounded L-corner
Vertical
Longitudinal curved corner element



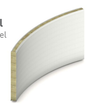
Rounded U-corner
Vertical
Double longitudinal curved corner element

SEGMENTED PANELS

Horizontal
Convex panel



Horizontal
Concave panel

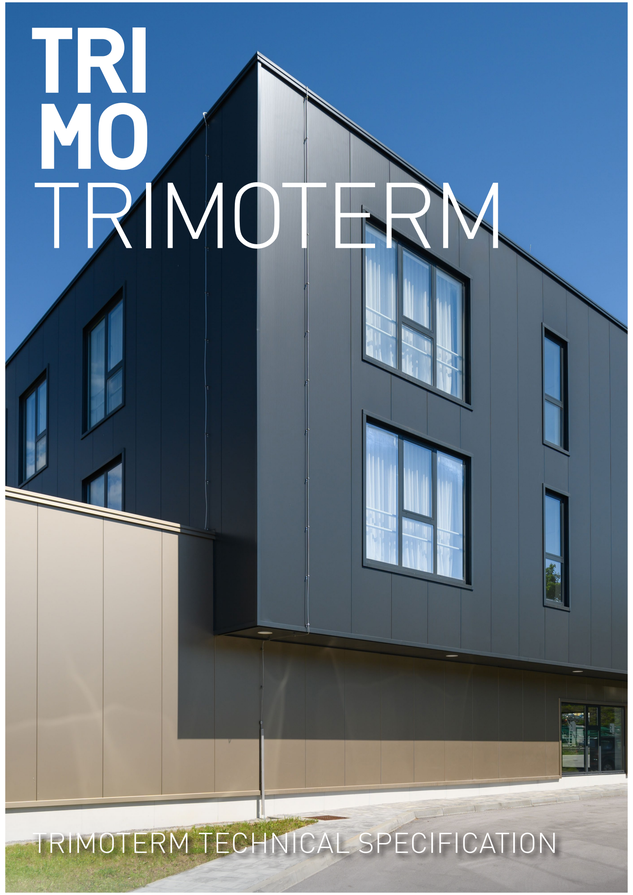


Vertical
Convex panel



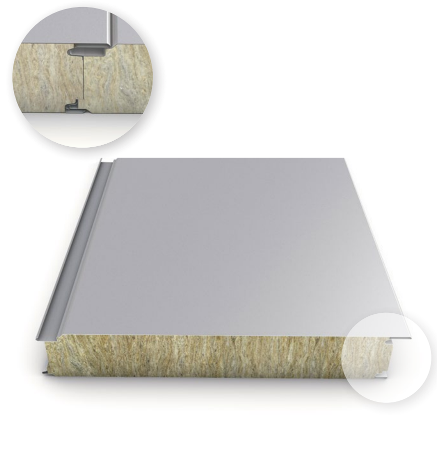
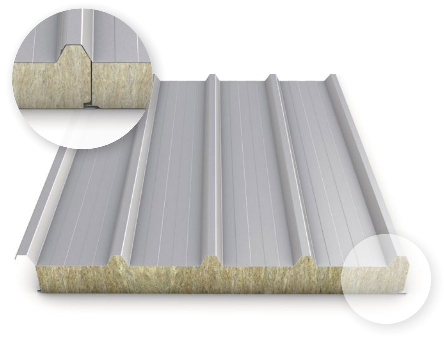
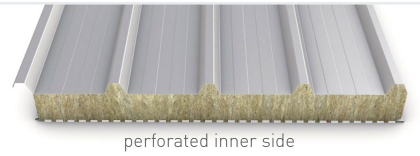
Vertical
Concave panel





TRIMOTERM

Max. achiavable fire resistance (EN 14509)** — panel thickness [mm]

Product family, product type	Render	Core type	60	80	100	120	133	150	172	200	220	240	250*
FTV (façade panel with standard fixing)		POWER T	-	-	up to EI90	up to EI120	up to EI120	up to EI180	up to EI180	up to EI180	**** up to EI180	up to EI180	up to EI180
FTV		POWER S	**** up to EI30	up to EI60	up to EI120	up to EI120	up to EI120	up to EI180	up to EI180	up to EI180	n/a	up to EI180	n/a
FTV		PERFORM R	-	up to EI30	up to EI120	up to EI120	up to EI120	up to EI180	up to EI180	up to EI240	n/a	up to EI240	n/a
FTV		PERFORM C	**** up to EI30	up to EI60	up to EI120	up to EI120	up to EI120	up to EI180	up to EI180	up to EI240	n/a	up to EI240	n/a
FTV HL (façade panel with hidden fixing)		POWER T	-	up to EI30	up to EI60	up to EI120	up to EI120	up to EI180	up to EI240	up to EI240	**** up to EI240	up to EI240	up to EI240
FTV HL		POWER S	**** up to EI30	up to EI60	up to EI120	up to EI120	up to EI120	up to EI180	up to EI240	up to EI240	n/a	up to EI240	n/a
FTV HL		PERFORM R	-	up to EI60	up to EI120	up to EI120	up to EI120	up to EI180	up to EI240	up to EI240	n/a	up to EI240	n/a
FTV HL		PERFORM C	**** up to EI30	up to EI60	up to EI120	up to EI120	up to EI120	up to EI180	up to EI240	up to EI240	n/a	up to EI240	n/a
SNV (roof panel)		POWER T	-	up to EI30	up to EI120	up to EI120	n/a	up to EI120	up to EI120	up to EI120	**** up to EI120	**** up to EI120	n/a
SNV		PERFORM R	-	up to EI30	up to EI120	up to EI120	n/a	up to EI120	up to EI120	up to EI120	n/a	n/a	n/a
SNV		PERFORM C	-	up to EI60	up to EI120	up to EI120	n/a	up to EI180	up to EI180	up to EI180	n/a	n/a	n/a
FTV SOUND	 perforated inner side	POWER T	-	-	-	up to EI90	up to EI90	up to EI90	up to EI90	up to EI90	n/a	up to EI90	n/a
FTV HL SOUND	 perforated inner side	POWER T	-	-	-	-	-	-	-	-	n/a	-	n/a
SNV SOUND	 perforated inner side	POWER T	-	-	-	-	n/a	-	-	-	n/a	n/a	n/a

U thermal transmittance (W/m^2K)*** — panel thickness [mm]

Product	Core type	50	60	80	100	120	133	150	172	200	220	240	250*
FTV	POWER T	n/a	0,60	0,46	0,37	0,31	0,28	0,25	0,22	0,19	**** 0,17	0,16	0,15
FTV	POWER S	0,77	0,65	0,50	0,41	0,34	0,31	0,28	0,24	0,21	n/a	0,17	n/a
FTV	PERFORM R	n/a	0,63	0,48	0,39	0,33	0,30	0,26	0,23	0,20	n/a	0,17	n/a
FTV	PERFORM C	0,75	0,64	0,49	0,40	0,33	0,30	0,27	0,24	0,20	n/a	0,17	n/a
FTV HL	POWER T	n/a	0,60	0,46	0,37	0,31	0,28	0,25	0,22	0,19	**** 0,17	0,16	0,15
FTV HL	POWER S	0,77	0,65	0,50	0,41	0,34	0,31	0,28	0,24	0,21	n/a	0,17	n/a
FTV HL	PERFORM R	n/a	0,63	0,48	0,39	0,33	0,30	0,26	0,23	0,20	n/a	0,17	n/a
FTV HL	PERFORM C	0,75	0,64	0,49	0,40	0,33	0,30	0,27	0,24	0,20	n/a	0,17	n/a
SNV	POWER T	n/a	0,59	0,45	0,37	0,31	n/a	0,25	0,22	0,19	**** 0,17	**** 0,16	n/a
SNV	PERFORM R	n/a	0,62	0,47	0,39	0,32	n/a	0,26	0,23	0,20	n/a	n/a	n/a
SNV	PERFORM C	n/a	0,63	0,48	0,40	0,33	n/a	0,27	0,24	0,20	n/a	n/a	n/a
FTV SOUND	POWER T	n/a	0,60	0,46	0,37	0,31	0,28	0,25	0,22	0,19	n/a	0,16	n/a
FTV HL SOUND	POWER T	n/a	0,60	0,46	0,37	0,31	0,28	0,25	0,22	0,19	n/a	0,16	n/a
SNV SOUND	POWER T	n/a	0,59	0,45	0,37	0,31	n/a	0,25	0,22	0,19	n/a	n/a	n/a

Airborne sound insulation Rw (C;Ctr) dB (EN 14509) — panel thickness [mm]

Product	Core type	60	80	100	120	133	150	172	200	220	240	250*
FTV	POWER T	30 (-2;-4)	30 (-2;-4)	31 (-3;-4)	31 (-3;-4)	31 (-3;-4)	31 (-3;-4)	31 (-3;-4)	31 (-3;-4)	**** 31 (-3;-4)	31 (-3;-4)	31 (-3;-4)
FTV	POWER S	31 (-2;-3)	31 (-2;-3)	32 (-2;-4)	32 (-2;-4)	32 (-2;-4)	32 (-2;-4)	32 (-2;-4)	32 (-2;-4)	n/a	32 (-2;-4)	n/a
FTV	PERFORM R	30 (-2;-4)	30 (-2;-4)	31 (-3;-4)	31 (-3;-4)	31 (-3;-4)	31 (-3;-4)	31 (-3;-4)	31 (-3;-4)	n/a	31 (-3;-4)	n/a
FTV	PERFORM C	31 (-2;-3)	31 (-2;-3)	32 (-2;-4)	32 (-2;-4)	32 (-2;-4)	32 (-2;-4)	32 (-2;-4)	32 (-2;-4)	n/a	32 (-2;-4)	n/a
FTV HL	POWER T	30 (-1;-3)	30 (-1;-3)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	**** 31 (-2;-4)	31 (-2;-4)	31 (-2;-4)
FTV HL	POWER S	31 (-1;-3)	31 (-1;-3)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	n/a	31 (-2;-4)	n/a
FTV HL	PERFORM R	30 (-1;-3)	30 (-1;-3)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	n/a	31 (-2;-4)	n/a
FTV HL	PERFORM C	31 (-1;-3)	31 (-1;-3)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	31 (-2;-4)	n/a	31 (-2;-4)	n/a
SNV	POWER T	31 (-1;-3)	31 (-1;-3)	31 (-1;-3)	31 (-1;-3)	n/a	31 (-1;-3)	31 (-1;-3)	31 (-1;-3)	**** 31 (-1;-3)	**** 31 (-1;-3)	n/a
SNV	PERFORM R	31 (-1;-3)	31 (-1;-3)	31 (-1;-3)	31 (-1;-3)	n/a	31 (-1;-3)	31 (-1;-3)	31 (-1;-3)	n/a	n/a	n/a
SNV	PERFORM C	31 (-1;-3)	31 (-1;-3)	31 (-1;-3)	31 (-1;-3)	n/a	31 (-1;-3)	31 (-1;-3)	31 (-1;-3)	n/a	n/a	n/a
FTV SOUND	POWER T	32 (-1;-4) 0,85	32 (-1;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	n/a n/a	33 (-2;-4) 0,9	n/a n/a
FTV HL SOUND	POWER T	32 (-1;-4) 0,85	32 (-1;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	n/a n/a	33 (-2;-4) 0,9	n/a n/a
SNV SOUND	POWER T	32 (-1;-4) 0,85	32 (-1;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	n/a n/a	33 (-2;-4) 0,9	33 (-2;-4) 0,9	33 (-2;-4) 0,9	n/a n/a	n/a n/a	n/a n/a

Water permeability (EN 14509) — panel thickness [mm]

Product	Core type	50	60	80	100	120	133	150	172	200	220	240	250*
FTV	POWER T	n/a	A	A	A	A	A	A	A	A	**** A	A	A
FTV	POWER S	A	A	A	A	A	A	A	A	A	n/a	A	n/a
FTV	PERFORM R	n/a	A	A	A	A	A	A	A	A	n/a	A	n/a
FTV	PERFORM C	A	A	A	A	A	A	A	A	A	n/a	A	n/a
FTV HL	POWER T	n/a	A	A	A	A	A	A	A	A	**** A	A	A
FTV HL	POWER S	A	A	A	A	A	A	A	A	A	n/a	A	n/a
FTV HL	PERFORM R	n/a	A	A	A	A	A	A	A	A	n/a	A	n/a
FTV HL	PERFORM C	A	A	A	A	A	A	A	A	A	n/a	A	n/a
SNV	POWER T	n/a	B	B	B	B	n/a	B	B	B	**** B	**** B	n/a
SNV	PERFORM R	n/a	B	B	B	B	n/a	B	B	B	n/a	n/a	n/a
SNV	PERFORM C	n/a	B	B	B	B	n/a	B	B	B	n/a	n/a	n/a
FTV SOUND	POWER T	n/a	-	-	-	-	-	-	-	-	n/a	-	n/a
FTV HL SOUND	POWER T	n/a	-	-	-	-	-	-	-	-	n/a	-	n/a
SNV SOUND	POWER T	n/a	-	-	-	-	n/a	-	-	-	n/a	n/a	n/a

Weight (Fe 0,55/0,5) [kg/m^2] — panel thickness [mm]

Product	Core type	50	60	80	100	120	133	150	172	200	220	240	250*	Reaction to fire (EN 13501-1)	Combustibility of material core (EN 13501-1)	Width (mm)	Length (m)
FTV	POWER T	n/a	15.3	17.1	18.9	20.7	21.9	23.4	25.4	27.9	**** 29.7	31.5	32.4	A2-s1, d0 (not valid for PVC and PVCF coating)	Mineral wool non-combustible Class A1	600-1200	up to 14 m (< 2 m on request)
FTV	POWER S	15.8	17	19.4	21.8	24.2	25.8	27.8	30.5	33.8	n/a	38.6	n/a			600-1200	
FTV	PERFORM R	n/a	15.9	17.9	19.9	21.9	23.2	24.9	27.1	29.9	n/a	33.9	n/a			600-1200	
FTV	PERFORM C	15.8	17	19.4	21.8	24.2	25.8	27.8	30.5	33.8	n/a	38.6	n/a			600-1200	
FTV HL	POWER T	n/a	15.3	17.1	18.9	20.7	21.9	23.4	25.4	27.9	**** 29.7	31.5	32.4	A2-s1, d0 (not valid for PVC and PVCF coating)	Mineral wool non-combustible Class A1	600-1100	up to 14 m (< 2 m on request)
FTV HL	POWER S	15.8	17	19.4	21.8	24.2	25.8	27.8	30.5	33.8	n/a	38.6	n/a			600-1100	
FTV HL	PERFORM R	n/a	15.9	17.9	19.9	21.9	23.2	24.9	27.1	29.9	n/a	33.9	n/a			600-1100	
FTV HL	PERFORM C	15.8	17	19.4	21.8	24.2	25.8	27.8	30.5	33.8	n/a	38.6	n/a			600-1100	
SNV	POWER T	n/a	16.7	18.5	20.3	22.1	n/a	24.8	26.8	29.3	**** 31.1	32.9	n/a	A2-s1, d0 (not valid for PVC and PVCF coating)	Mineral wool non-combustible Class A1	1000	up to 14 m (< 2 m on request)
SNV	PERFORM R	n/a	17.3	19.3	21.3	23.3	n/a	26.3	28.5	31.3	n/a	n/a	n/a			1000	
SNV	PERFORM C	n/a	18.4	20.8	23.2	25.6	n/a	29.2	31.9	35.2	n/a	n/a	n/a			1000	
FTV SOUND	POWER T	n/a	14.4	16.2	18.0	19.8	21.0	22.5	24.5	27.0	n/a	30.6	n/a	B-s1, d0	Mineral wool non-combustible Class A1	1000	up to 14 m (< 2 m on request)
FTV HL SOUND	POWER T	n/a	14.4	16.2	18.0	19.8	21.0	22.5	24.5	27.0	n/a	30.6	n/a			1000	
SNV SOUND	POWER T	n/a	15.8	17.6	19.4	21.2	n/a	23.9	25.9	28.4	n/a	n/a	n/a			100	

Certificates

Product family, product type	Core type	Certificates
FTV (façade panel with standard fixing)	POWER T	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650b to LPS 1181, Cert. No. 650d to LPS 1181, Cert. No. 650e to LPS 1175; FM APPROVED; Deutsches Institut für Bautechnik Z-19.52-2457 Z-10.49-625; DTA DOCUMENT TECHNIQUE D'APPLICATION
FTV	POWER S	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650b to LPS 1181, Cert. No. 650d to LPS 1181, Cert. No. 650e to LPS 1175; FM APPROVED; SBSC CERTIFIED PRODUCT Klass 2 SSF 1047; Deutsches Institut für Bautechnik Z-19.52-2457 Z-10.49-624; DTA DOCUMENT TECHNIQUE D'APPLICATION
FTV	PERFORM R	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650b to LPS 1181, Cert. No. 650d to LPS 1181, Cert. No. 650e to LPS 1175
FTV	PERFORM C	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650b to LPS 1181, Cert. No. 650d to LPS 1181, Cert. No. 650e to LPS 1175; FM APPROVED; SBSC CERTIFIED PRODUCT Klass 2 SSF 1047; Deutsches Institut für Bautechnik Z-10.49-550; DTA DOCUMENT TECHNIQUE D'APPLICATION
FTV HL (façade panel with hidden fixing)	POWER T	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650d to LPS 1181, Cert. No. 650e to LPS 1175; FM APPROVED; Deutsches Institut für Bautechnik Z-19.52-2457 Z-10.49-625; DTA DOCUMENT TECHNIQUE D'APPLICATION
FTV HL	POWER S	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650d to LPS 1181, Cert. No. 650e to LPS 1175; FM APPROVED; SBSC CERTIFIED PRODUCT Klass 2 SSF 1047; Deutsches Institut für Bautechnik Z-19.52-2457 Z-10.49-624; DTA DOCUMENT TECHNIQUE D'APPLICATION
FTV HL	PERFORM R	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650d to LPS 1181, Cert. No. 650e to LPS 1175
FTV HL	PERFORM C	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650d to LPS 1181, Cert. No. 650e to LPS 1175; FM APPROVED; SBSC CERTIFIED PRODUCT Klass 2 SSF 1047; Deutsches Institut für Bautechnik Z-10.49-550
SNV (roof panel)	POWER T	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650b to LPS 1181; FM APPROVED; Deutsches Institut für Bautechnik Z-10.49-625
SNV	PERFORM R	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650b to LPS 1181
SNV	PERFORM C	EN 14509; Cert. No. 650a to LPS 1208, Cert. No. 650b to LPS 1181; FM APPROVED; SBSC CERTIFIED PRODUCT Klass 2 SSF 1047; Deutsches Institut für Bautechnik Z-10.49-550
FTV SOUND	POWER T	-
FTV HL SOUND	PERFORM R	-
SNV SOUND	PERFORM C	-

<u>* FOR FRENCH OR GERMAN MARKET CONSULT TRIMO'S TECHNICAL SUPPORT TO COMPLY WITH REGIONAL LEGISLATION.</u>
<u> REQUEST FOR FIRE RESISTANCE MUST BE CLEARLY SPECIFIED BY CUSTOMER.</u>**
EXACT FIRE RATING WITH REGARDS TO SYSTEM, ORIENTATION AND SPAN CAN BE FOUND UNDER THE CERTIFICATION SUBPAGE ON TRIMO WEB PAGE:
https://www.trimo-group.com/en/downloads/certificates-and-data-sheets/certificates

*** VALUES VALID ONLY FOR FEATURED APPLICATION IN THE CENTRE OF PANEL
**** PLEASE CHECK FOR AVAILABILITY OF PRODUCT

SOUND ABSORPTION VALUES (αw) (shaded cells)

A WATER PERMEABILITY CLASS (EN 14509): CLASS A 1200 Pa (wall)
B WATER PERMEABILITY CLASS (EN 14509): CLASS B 900 Pa (roof)
n/a PRODUCT NOT AVAILABLE
\- DATA NOT AVAILABLE

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