Deutsches Institut für Bautechnik

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Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment

ETA-20/0716 of 28 March 2024

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT
Product family to which the construction product belongs	Self supporting translucent roof kits
Manufacturer	ESSERTEC GmbH Heinrich-Hertz-Straße 13 41516 Grevenbroich DEUTSCHLAND
Manufacturing plant	ESSERTEC GmbH Heinrich-Hertz-Straße 13 41516 Grevenbroich DEUTSCHLAND Bluetek Route de Saulon 21220 GEVERY-CHAMBERTIN FRANKREICH
This European Technical Assessment contains	61 pages including 53 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	220089-00-0401

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Specific part

1 Technical description of the product

1.1 Kit description and setup

The continuous rooflight systems "Gewölbtes Lichtband esserlux/ Voute Bluelux therm"/ "Gewölbtes Lichtband esserlux therm/ Voute Bluelux RPT" are self-supporting translucent roof kits made up of components which are factory-made and assembled on site.

The structural system of the roof kit complies with the category "Curved roof systems with additional bearing profiles" as listed in section 2.2.5.1 a) of the EAD 22089-00-0401[1].

The roof kit comprises up to 1.05 m-wide arched translucent PC multi-wall sheets which are positioned on curved bearing profiles and protected against uplift loads by covering profiles. The sheets are mounted on the eaves side in an impost profile, which can also be thermally separated. The multi-wall sheets are abutted along their longitudinal edges via a bearing profile.

The self-supporting curved translucent roof kit consists of the following components:

- translucent polycarbonate (PC) multi-wall sheets with thicknesses of 10 mm, 16 mm and 20 mm, including combinations of sheets (PC 10 + 10, PC 16 + 16),
- 1,1 mm glass fibre-reinforced unsaturated polyester resin (GF-UP) sheet (optionally arranged under the or between two multi-wall sheets),
- bearing and covering profiles made of aluminium,
- impost profiles (partially with thermal barrier), fixing bracket and load distribution plate made of aluminium,
- sealing profiles,
- connecting devices.

The components and the system setup of the product are given in Annexes A 1 to A 4.

The material values, dimensions and tolerances of the roof kit not indicated in the annexes shall correspond to the values laid down in the technical documentation[2] of this European technical assessment. In the following, the trade names "esserlux" (system without thermal separation) and "esserlux therm" (system with thermal separation) are used in part for simplification.

[1] EAD 22089 00-0401 Self supporting translucent roof kits with covering made of plastic sheets; edition march 2019

[2] The technical documentation comprises all information of the holder of this ETA necessary for the production, installation and maintenance of the roof kit; these are in particular the structural analysis, design drawings and the manufacturer's installation instructions. The part to be treated confidentially is deposited with Deutsches Institut für Bautechnik

1.1.1 Multi-wall sheets

The following multi-wall sheets made from polycarbonate (PC) in accordance with the harmonised European standard EN 16153[3] may be used.

Table 1: PC-sheets

Manufacturer	Trade name	Sheet height [mm]	Annex
CORPLEX, F – Kaysersberg	AkyVer Sun Type 10/4W-7	10	A 4.1
	AkyVer Sun Type 10	10	A 4.2
Exolon Group S.p.A. I – Nera Montoro	Exolon multi UV 4/10-6	10	A 4.3
	Exolon multi UV 2/10-10.5	10	A 4.4
Stabilit Suisse S.A. CH – Stabio	Makrolux Multiwall LL 4W-10	10	A 4.5
dott.gallina s.r.l. IT – La Loggia	Policarb 10 mm 4W	10	A 4.6
	Policarb 10 mm 5W	10	A 4.7
Sabic innovative plastics B.V. NL – Nera Montoro	Lexan Thermoclear LT2UV105R175	10	A 4.8
CORPLEX, F – Kaysersberg	AkyVer Sun Type 16/7w-12-2600 *	16	A 4.9
	AkyVer Sun Type 16/7w-12-3000 *	16	A 4.10
Exolon Group S.p.A. I – Nera Montoro	Exolon multi UV 7/16-14	16	A 4.11
dott.gallina s.r.l. IT – La Loggia	Policarb 16mm 6W	16	A 4.12
	Policarb 16mm 7W	16	A 4.13
Stabilit Suisse S.A. CH – Stabio	Makrolux Multiwall LL 7W-16-2,6kg/m²	16	A 4.14
	Makrolux Multiwall LL 7W-16-2,7kg/m²	16	A 4.15
CORPLEX, F – Kaysersberg	AkyVer Sun Type 20/7w-12 **	20	A 4.16
Exolon Group S.p.A. I – Nera Montoro	Exolon multi UV 7/20-14	20	A 4.17
Stabilit Suisse S.A. CH – Stabio	Makrolux Multiwall LL 7W-20	20	A 4.18

The multi-wall sheets have unfilled hollow chambers and weatherproofing on the outer surfaces which are unmistakably identified.

1.1.2 "AkyVer Pearl Inside"-sheet

For "AkyVer Sun Type 16/7W-12-2600" (A 4.9), "AkyVer Sun Type 16/7W-12-3000" (A 4.10) and "AkyVer Sun Type 20/7W-12" (A 4.16) multiwall sheets, the top/outside chambers of the sheets may be factory filled with glass beads. The following basis weight for the filled sheets shall not be exceeded:

- "AkyVer Pearl Inside PC 16" (based on: "AkyVer Sun Type 16/7W-12"): 6,7 kg/m²;
- "AkyVer Pearl Inside PC 20" (based on: "AkyVer Sun Type 20/7W-12"): 7,9 kg/m².

1.1.3 Optional (full-surface) covering supplement: GF-UP sheet

A sheet made from glass fibre-reinforced unsaturated polyester resin with a thickness of 1.1 mm and with a glass content of at least 20 % by mass may be applied on the inside of the covering. It corresponds to the specifications deposited with Deutsches Institut für Bautechnik.

[3] EN 16153:2015-05 Light **transmitting** flat multiwall polycarbonate (PC) sheets for internal and external use in roofs, walls and ceilings - Requirements and test methods

1.1.4 Bearing profiles and covering profiles

The bearing profile type A60+ and the covering profile type FT (see Annex A 2.1.1 and A 2.1.2) are made from the aluminium alloy EN AW-6060 T6 in accordance with EN 755-2[4] and have the dimensions given in Annex A 3.1 of the ETA. They are pre-bent in the corresponding radius.

1.1.5 Impost profiles

The impost profiles type PC 10, PC 16, PC 16+16 and PC 20 (see Annex A 2.2 and A 2.4) for the roofkit "esserlux" at the eaves are made from the aluminium alloy EN AW-6060 T6 in accordance with EN 755-2 and have the dimensions given in Annex A 3.2 to A 3.5 of the ETA.

1.1.6 Impost bearing profiles with thermal barrier

The impost bearing profiles with thermal barrier (see Annex A 2.3 and A 2.5), for the "esserlux therm" roofkit consist of two aluminium parts connected with two bars of polyamide as thermal break. The aluminium parts are manufactured by extrusion and are made of aluminium EN AW 6060, condition T6 according to EN 755-2:2016. The two identical insulating bars are made of glass fibre reinforced polyamide PA66 with 25 % glass content according to EN ISO 16396-1[5]. This corresponds to the deposit at the Deutsches Institut für Bautechnik and have the dimensions given in Annex A 3.6 of the ETA.

1.1.7 Impost covering profile

The impost covering profile (see Annex A 2.3 and A 2.5) is used for "esserlux therm" only and is made from the aluminium alloy EN AW-6060 T5 in accordance with EN 755-2 and has the dimensions given in Annex A 3.7 of the ETA.

1.1.8 Fixing bracket

The fixing bracket (see Annex A 2.5.1 and A 2.5.2) which is used for "esserlux therm" is made from the aluminium alloy EN AC 42100 in accordance with EN 1706-2[6] and has the dimensions given in Annex A 3.8 of the ETA.

1.1.9 Load distribution plate

For load distribution at the connection of the impost profile with the covering profile in the system "esserlux", an aluminium plate (60 mm x 50 mm x 5 mm) is used in the single arrangement of the covering. In the double arrangement, an M6 washer according to EN ISO 7093-1[7] is used instead of the aluminium plate, which may optionally also be used in the PC 10 and PC 16 systems.

1.1.10 Sealing profiles

The sealing profiles I are used in the cover profiles and the sealing profiles II on the impost profile for the system "esserlux" (see Annex 2.1.1 to 2.5.2) are made from Ethylen/ Propylen-Terpolymer EPDM in accordance with DIN 7863-1[8] with Shore hardness of 67° ± 5 Shore A in accordance with ISO 7619-1[9]. The sealing profiles have the dimensions given in Annex A 3.9 of the ETA.

4	EN 755-2:2016-10	Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties
5	EN ISO 16396-1:2015	Plastics - Polyamide (PA) moulding and extrusion materials - Part 1: Designation system, marking of products and basis for specifications
6	EN 1706:2021	Aluminium and aluminium alloys - Castings - Chemical composition and mechanical properties
7	EN ISO 7093-1:2000	Plain washers - Large series - Part 1: Product grade A
8	DIN 7863-1:2022	Elastomor glazing and panel gaskets for windows and claddings - Technical delivery conditions - Part 1: Non celluar elastomer glazing and panel gaskets
9	DIN ISO 7619-1:2012-02	Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part 1: Durometer method (Shore hardness)

1.1.11 Connecting devices

The connection between the covering profile and impost profile for "esserlux" (see Annex 2.4.1 and 2.4.2) as well the connection between the covering profile and the fixing bracket for "esserlux therm" (see Annex 2.5.1 and 2.5.2). is made with self-tapping screws Type SFS TDB-S-S16-6.3x51 in accordance with ETA-10/0198 or equivalent. The screws are made of stainless steel with the material number 1.4301 according to DIN EN 10088-2[10].

To connect the bearing and impost profiles to the substructure, self-drilling screws with hexagonal head without washer Zebra Pias 6.3 x 25 according to ETA 10/0184 are used. The connection between the impost profile and the fixing bracket for "esserlux therm" (see Annex 2.5.1 and 2.5.2). is made with fasting screws Type JT3-6-5,5x26 without washer in accordance with ETA-10/0200 or equivalent. The screw connection is made through the impost covering profile. In addition, the impost covering profile and the impost profile in the system "esserlux therm" are screwed symmetrically on both sides of the fixing brackets with a total of four flat-head screws without washer 4.8 x 19 at a distance of 50 mm from each other. The connection between the covering profile and the bearing profile in the center of the profile about one third of the sheet length from the edge of the sheet (see Annex 2.4.1 to 2.5.2) is used for fixing the position.

1.1.12 "Gewölbtes Lichtband esserlux/ Voute Bluelux therm" "Gewölbtes Lichtband esserlux therm/ Voute Bluelux RPT"

The roof kit consists of the factory prefabricated components as described in the previous sections. The components according to section 1.1.2 and 1.1.3 are to be used optionally. The components according to section 1.1.5 and 1.1.9 are only used in the "esserlux" system. The components according to section 1.1.6 to 1.1.8 are only used in the "esserlux therm" system. The support system is a single-span-system for single and double identical covering sheets.

Table 2: Reaction to fire of the components

Component	Reaction to fire
Multi-wall sheets/ coverings	Class in accordance with the DoP of EN 16153/ s. Annex A 4
GF-UP sheet/ "AkyVer Pearl Inside"	Class E in accordance with EN 13501-1[11]
Sealing profile/ Plastic insulating bars of aluminium covering profiles	No contribution to fire spread in accordance with EOTA TR 021 (Version June 2005)
Bearing and covering profiles	Class A1 as per EN 13501-1 (without further testing as per Commission Decision 96/603/EC, as amended by Commission Decisions 2000/605/EC and 2003/424/EC)
Fixing bracket and impost profiles	
Connecting devices	

2 Specification of the intended use in accordance with the applicable European Assessment Document

The self-supporting translucent roof kit may be used in the roof area for open or closed building structures. The multi-wall sheets may be combined to form continuous rooflights of any length with rectangular plane view.

[10] DIN EN 10088-2:2014-12 Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes

[11] EN 13501-1:2010-02 Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

When installed, the roof kit is not walkable and it may not be used for bracing of the roof support structure.

The performance data given in Section 3 are only valid if the roof kit is used in compliance with the specifications and the conditions given in Annex A, B, C and D.

The verifications and assessment methods on which this European Technical Assessment (hereinafter referred to as 'ETA') is based lead to the assumption of a working life of the roof kit of at least ten years. The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer, but are to be regarded only as means for choosing the right products in relation to the expected economically reasonable working life of the structure.

3 Performance of the product and references to the methods used for its assessment

3.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Fire performance in case of external fire exposure: PC-sheets in accordance with Annex A 4.1, A 4.2, A 4.3 with GRP sheet as underlying inner layer and roof slope ≤ 20°	Broof (t1) in accordance with EN 13501-5[12]
Fire performance in case of external fire exposure except for the above mentioned	No performance assessed
Reaction to fire	Class E in accordance with EN 13501-1[11]

3.2 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Watertightness and	Category 1 (no leaks with no differential air pressure) up to inclination of the substructure from the horizontal: 20°
condensation	Design details as per information deposited with DIBt

3.3 Safety and accessibility (BWR 4)

Essential characteristic	Performance
Characteristic structural resistance of the multi-wall sheets to forces (actions) resulting from downward loads and uplift loads [kN/m²]	See Annex B 2
Characteristic load bearing capacity of the impost with thermal barrier and of the fasteners	See Annex B 3
Consideration of the effect of load duration	See Annex B 1
Consideration of ageing and environmental effects	See Annex B 1
Consideration of thermal effects	See Annex B 1
Values for characteristic structural resistance of aluminium bearing and covering profiles	European harmonized specifications apply.

[12] DIN EN 13501-5:2016-12 Fire classification of construction products and building elements - Part 5: Classification using data from external fire exposure to roofs tests; German version EN 13501-5:2016

Essential characteristic	Performance
Resistance to damage by impact loads with a soft object (50 kg)	SB 0 (no requirement)
Resistance to impact loads from a hard object (250 g)	See declaration of performance according to EN 16153

3.4 Protection against noise (BWR 5)

No performance assessed

3.5 Energy economy and heat retention (BWR 6)

Essential characteristic	Performance
Thermal resistance	See Annex C
Air permeability	Class C according to Delegated Regulation (EU) 2019/1342
Radiation Properties* – Light transmission – Total solar energy transmittance	No performance assessed for the PC-sheets (Declaration of performance as per EN 16153) Design details as per information deposited with DIBt

* in the form of fine droplets can form in the hollow chambers of the multi-wall sheets. The droplets scatter the light and make the fogged areas appear white. Hereby the light transmission reduces; all other properties of the covering are not affected.

3.6 Other essential characteristics

Essential characteristic	Performance
Aspects of durablility	See Annex A 4

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

According to the European Assessment Document (EAD) 220072-00-0401, the legal basis is as follows: 98/600/EC

The system to be applied is: 3

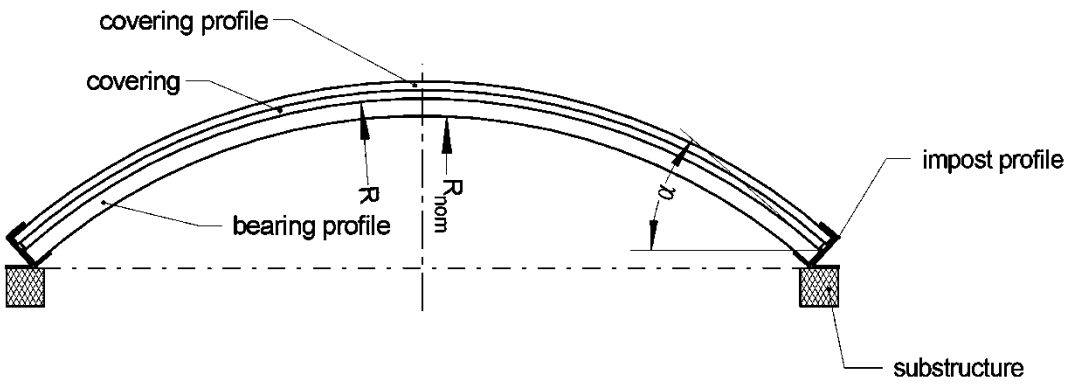
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

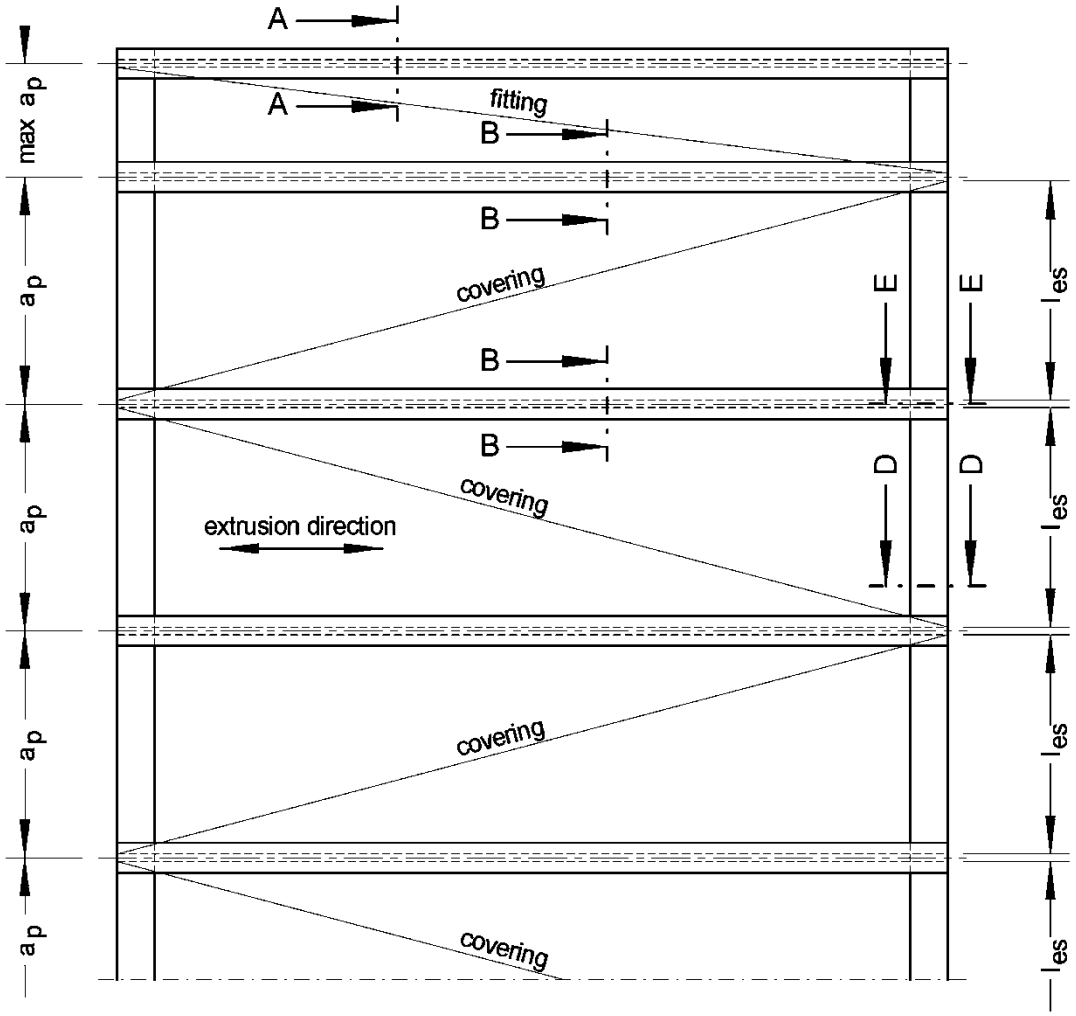
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 28 March 2024 by Deutsches Institut für Bautechnik

Renée Kamanzi-Fechner
Head of Section

beglaubigt:
Wachner





a_p : spacing of the bearing profiles

a_p = max 533 mm, max 710 mm or max 1065 mm

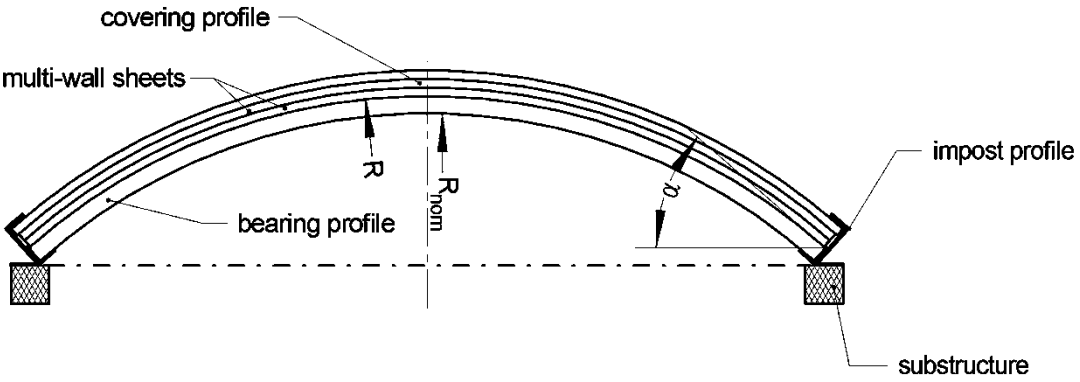
l_{es} : width of covering

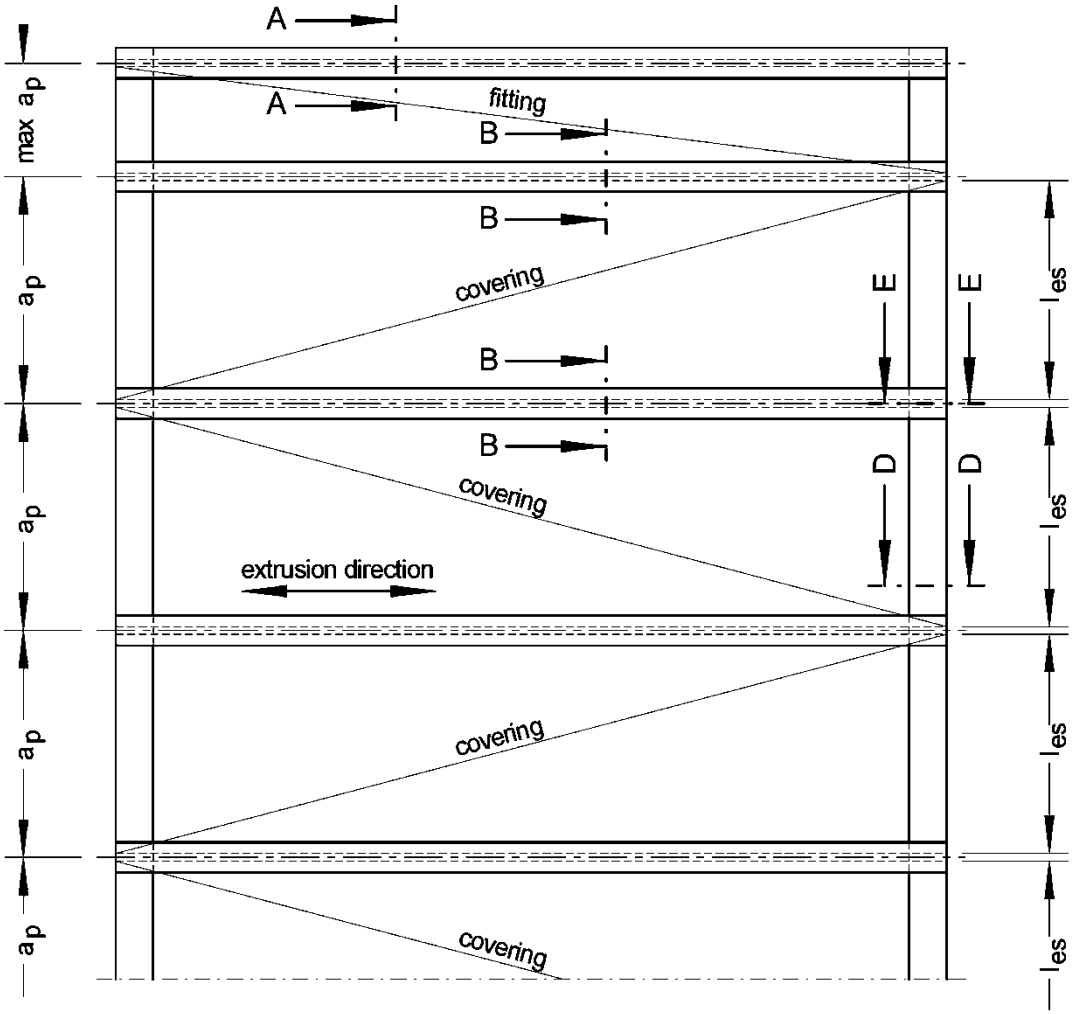
$l_{es} = a_p - 16$ mm

a* = without thermal break
b* = with thermal break

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 1.1
a*: PC 10, PC 16 and PC 20; b*: PC 16 and PC 20; 1-span-system, system overview	





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l_{es} : width of covering

$l_{es} = a_p - 16$ mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 1.2
PC 10+10 and PC 16+16; 1-span-system, system overview	

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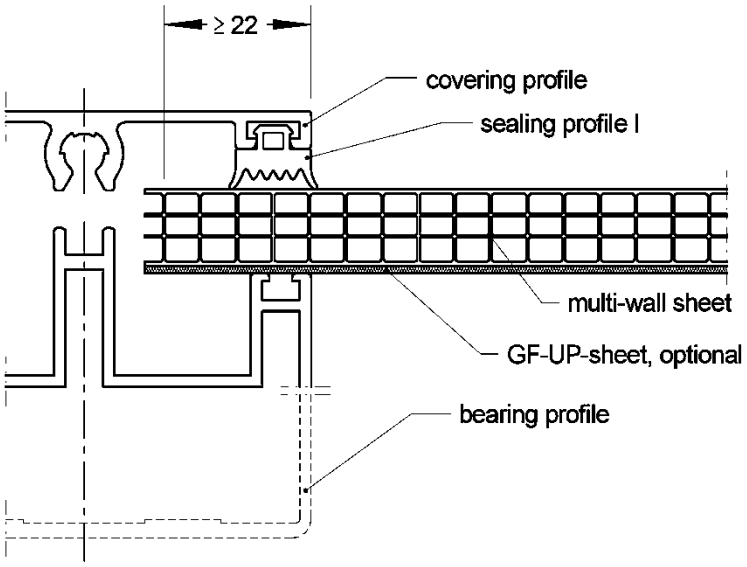
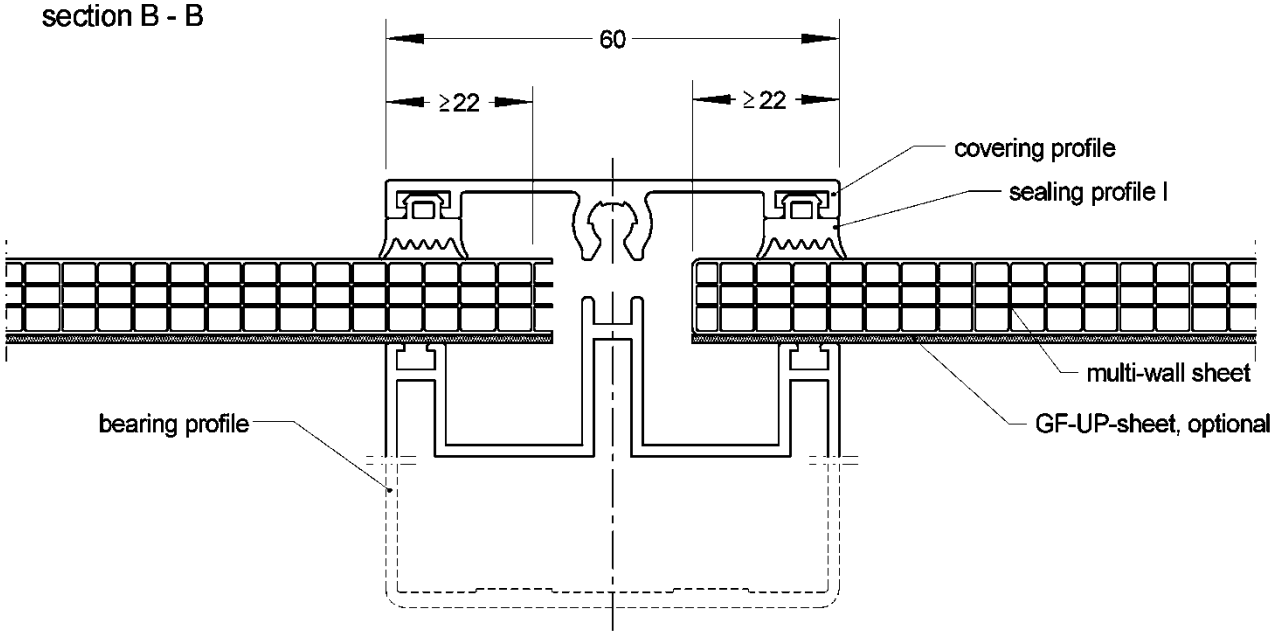
section A - A



section B - B



schematic drawing of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

a* = without thermal break
b* = with thermal break

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.1.1
a*: PC 10, PC 16 and PC 20; b*: PC 16 and PC 20; Combination of bearing profiles, sections A - A and B - B	

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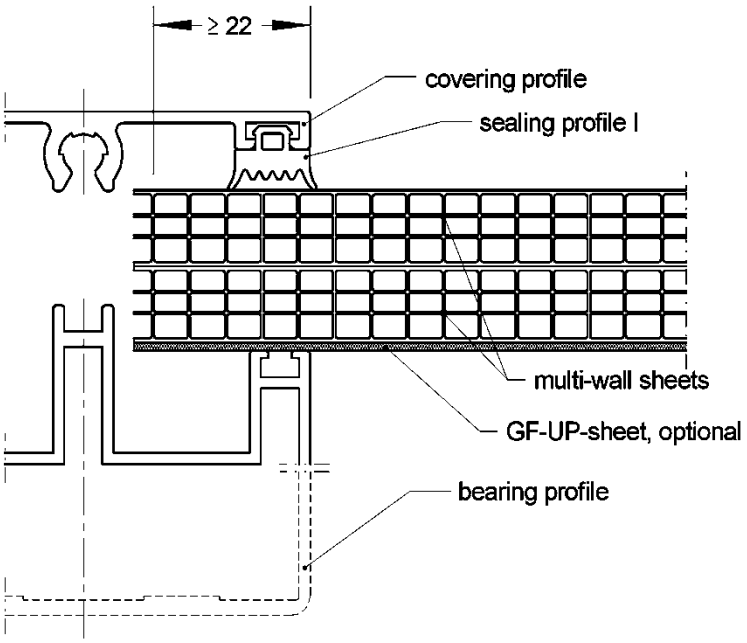
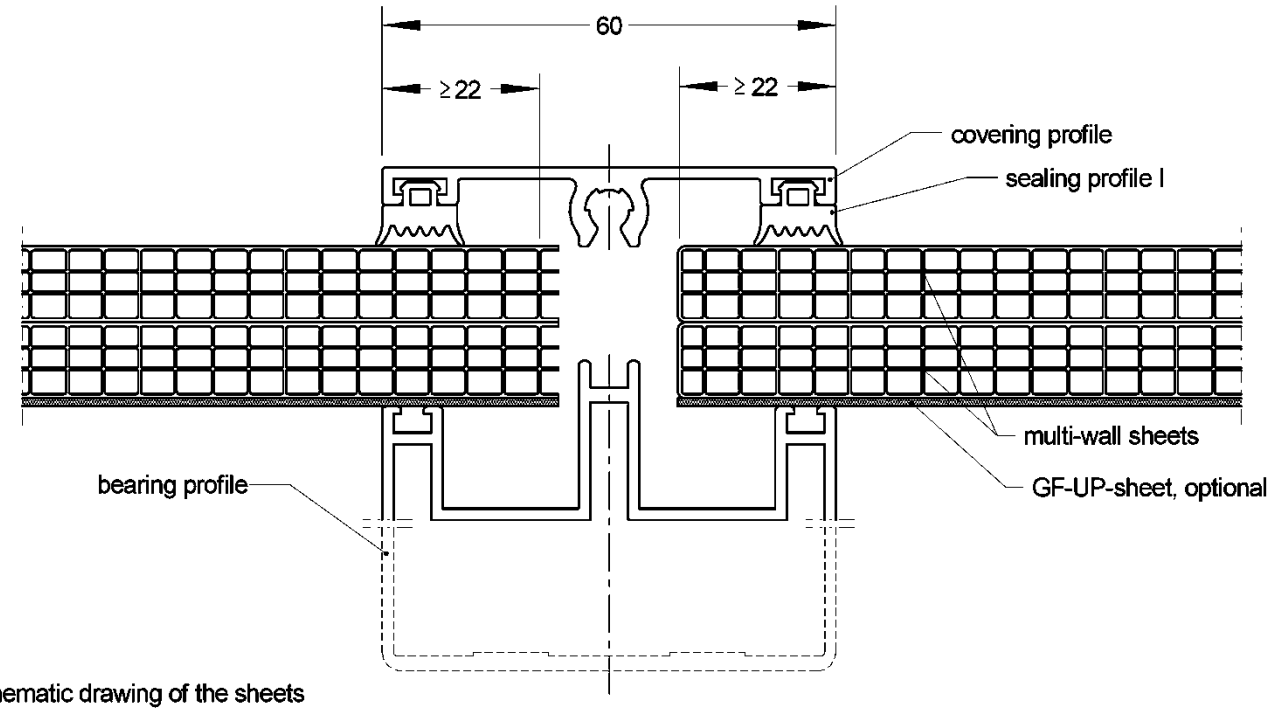
section A - A



section B - B



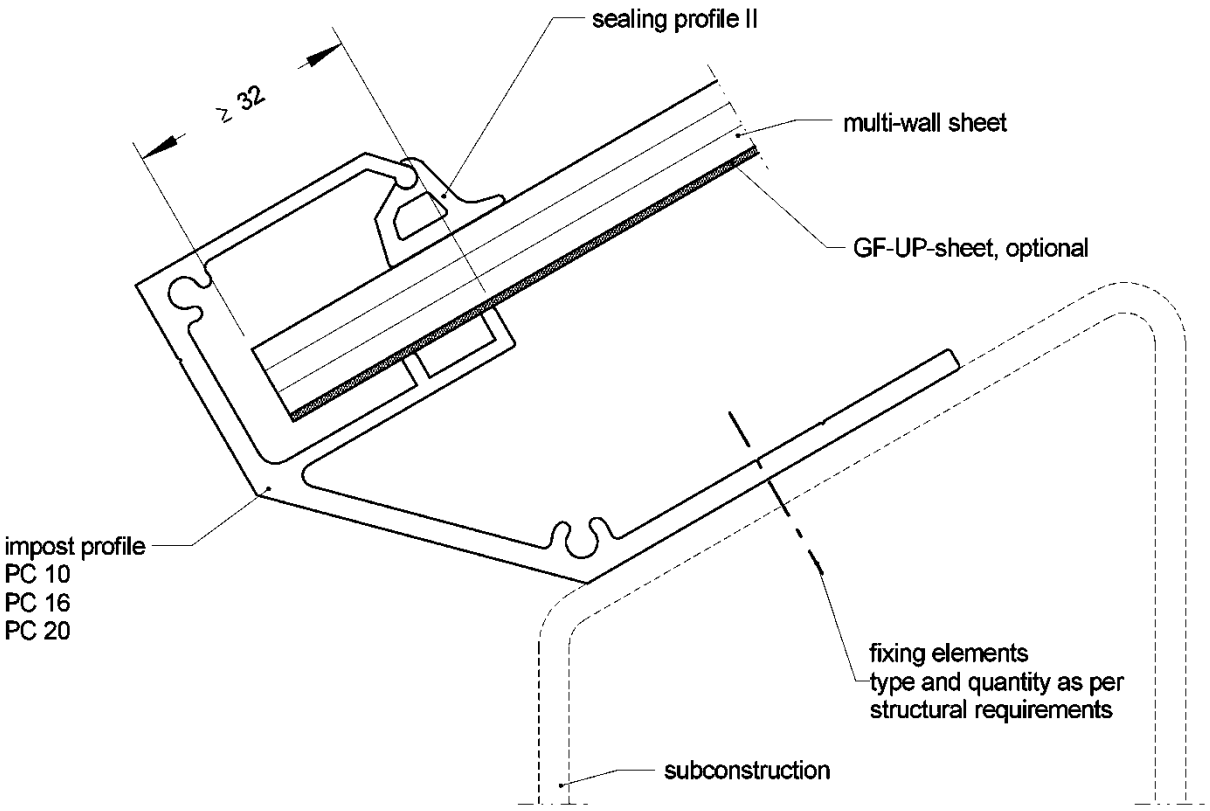
schematic drawing of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.1.2
PC 10+10 and PC 16+16; Combination of bearing profiles, sections A - A and B - B	



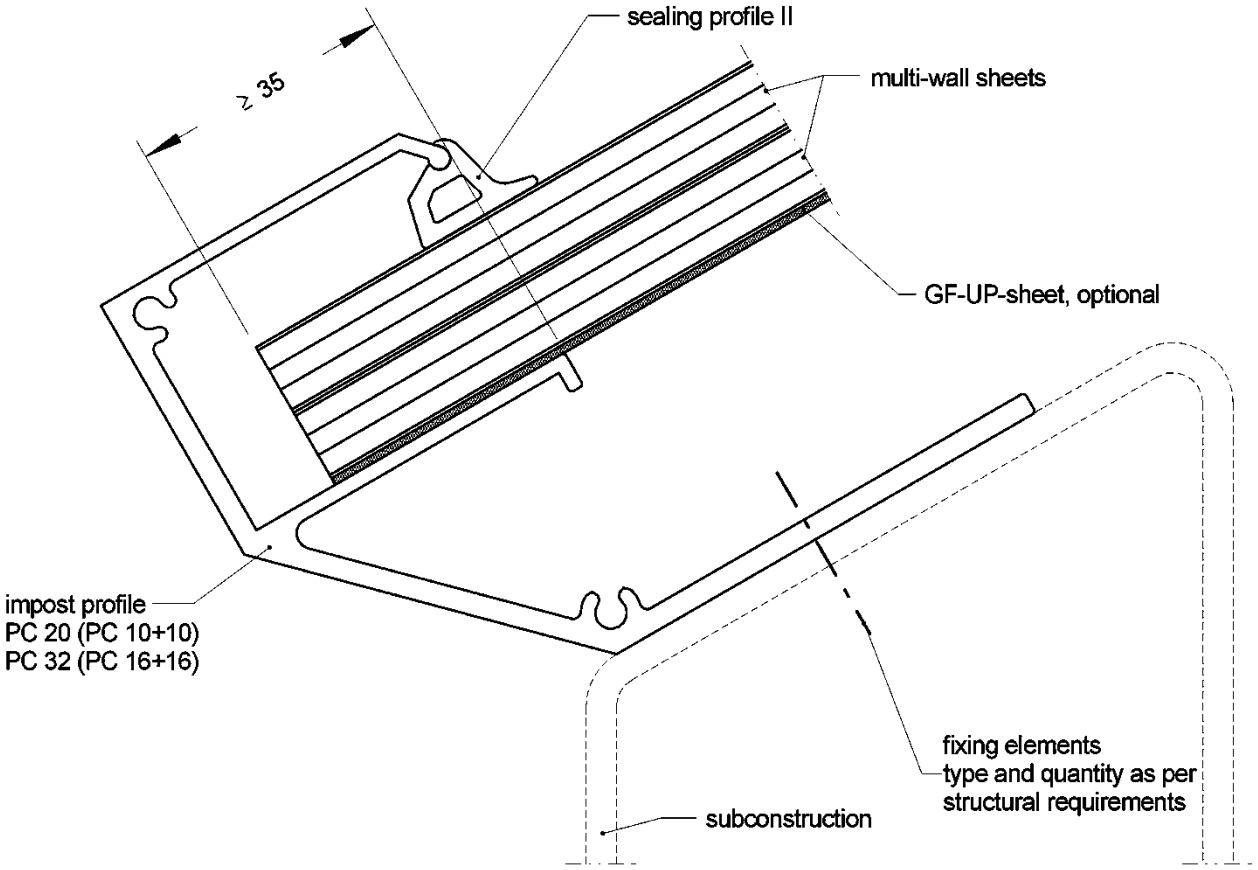
schematic drawing of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.2.1
PC 10, PC 16 and PC 20; Combination of impost profiles, section D - D	



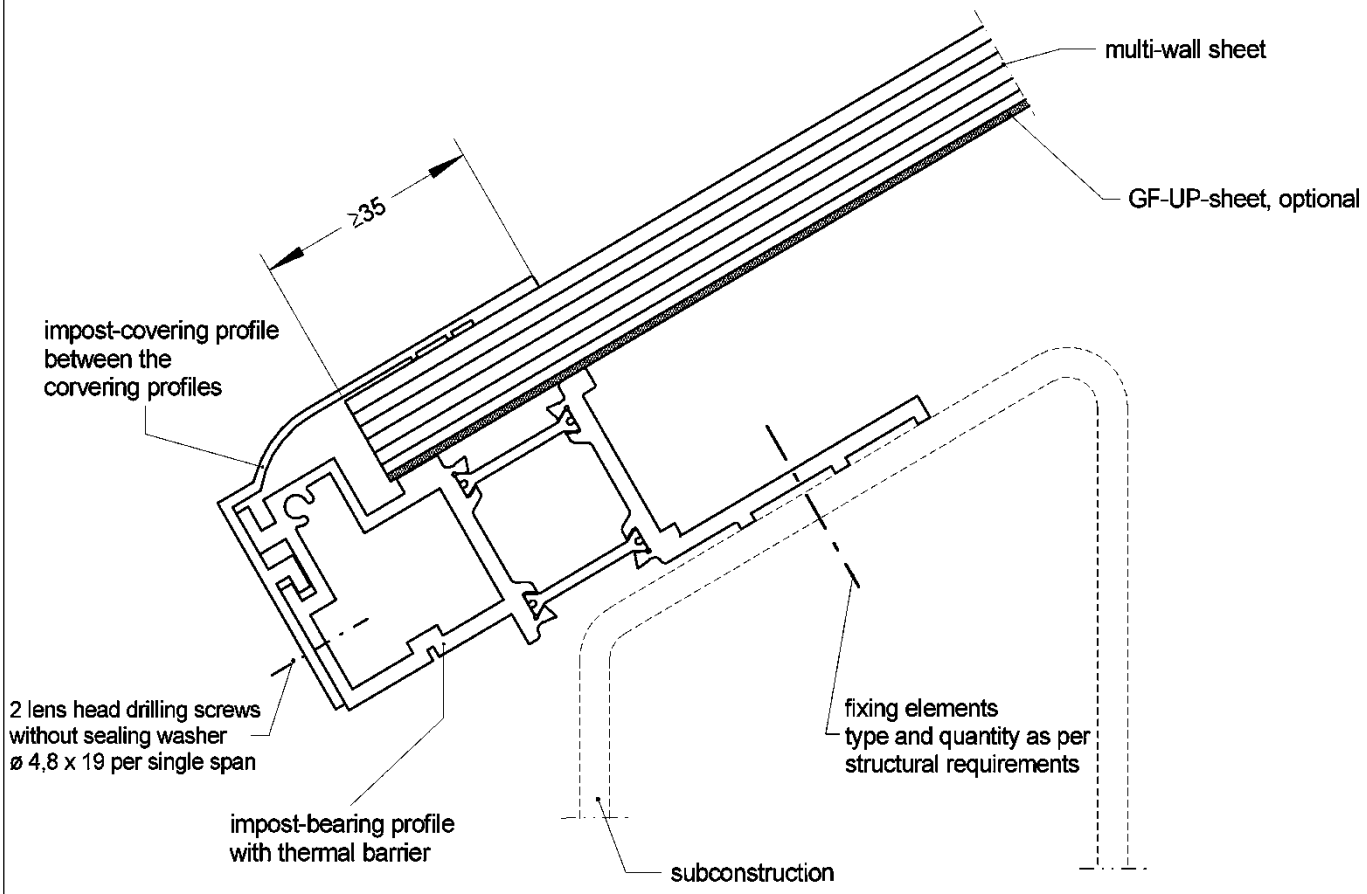
schematic drawing of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.2.2
PC 10+10 and PC 16+16; Combination of impost profiles, section D - D	



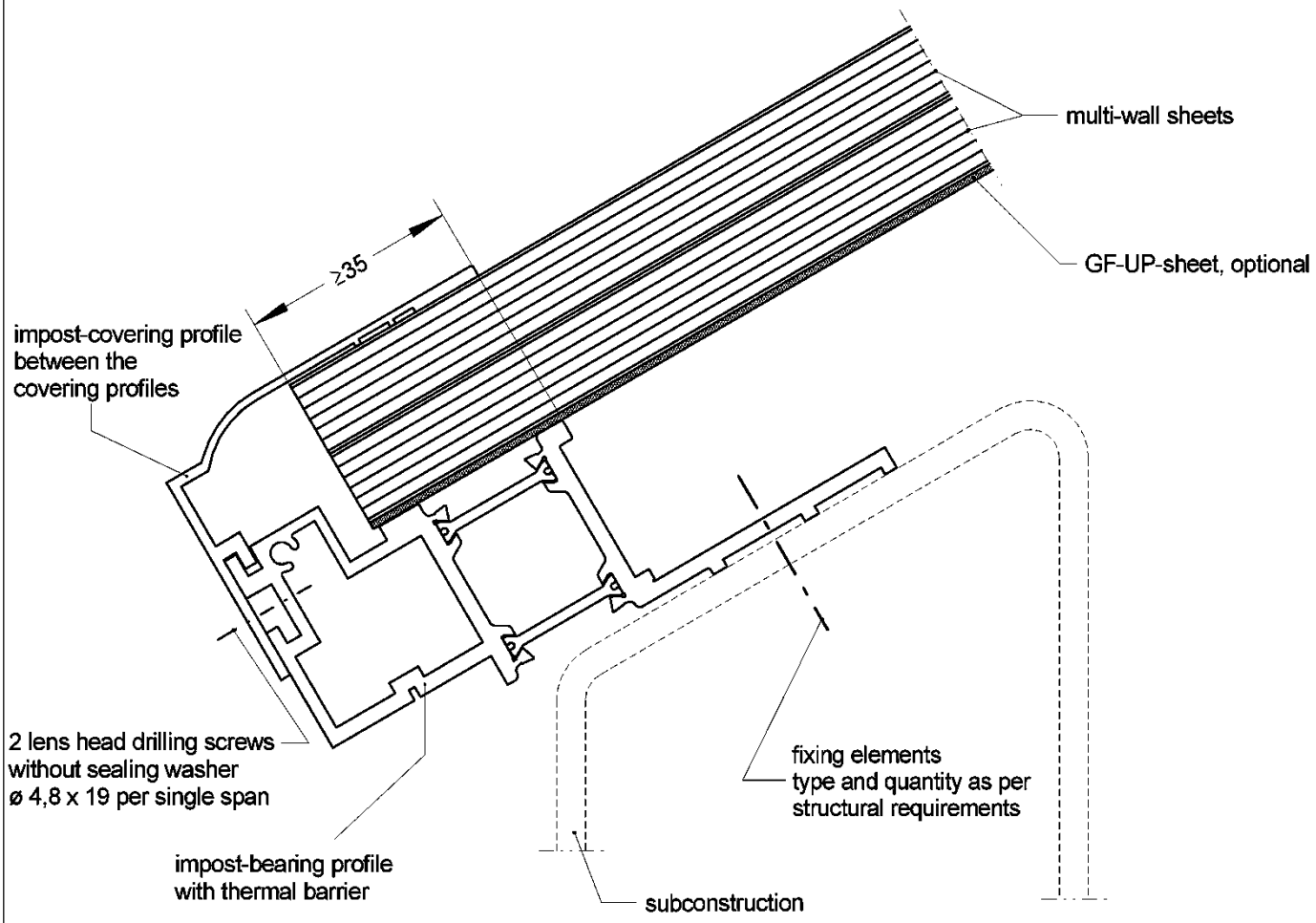
schematic drawing of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.3.1
PC 16 and PC 20; Combination of impost profiles, section D - D	



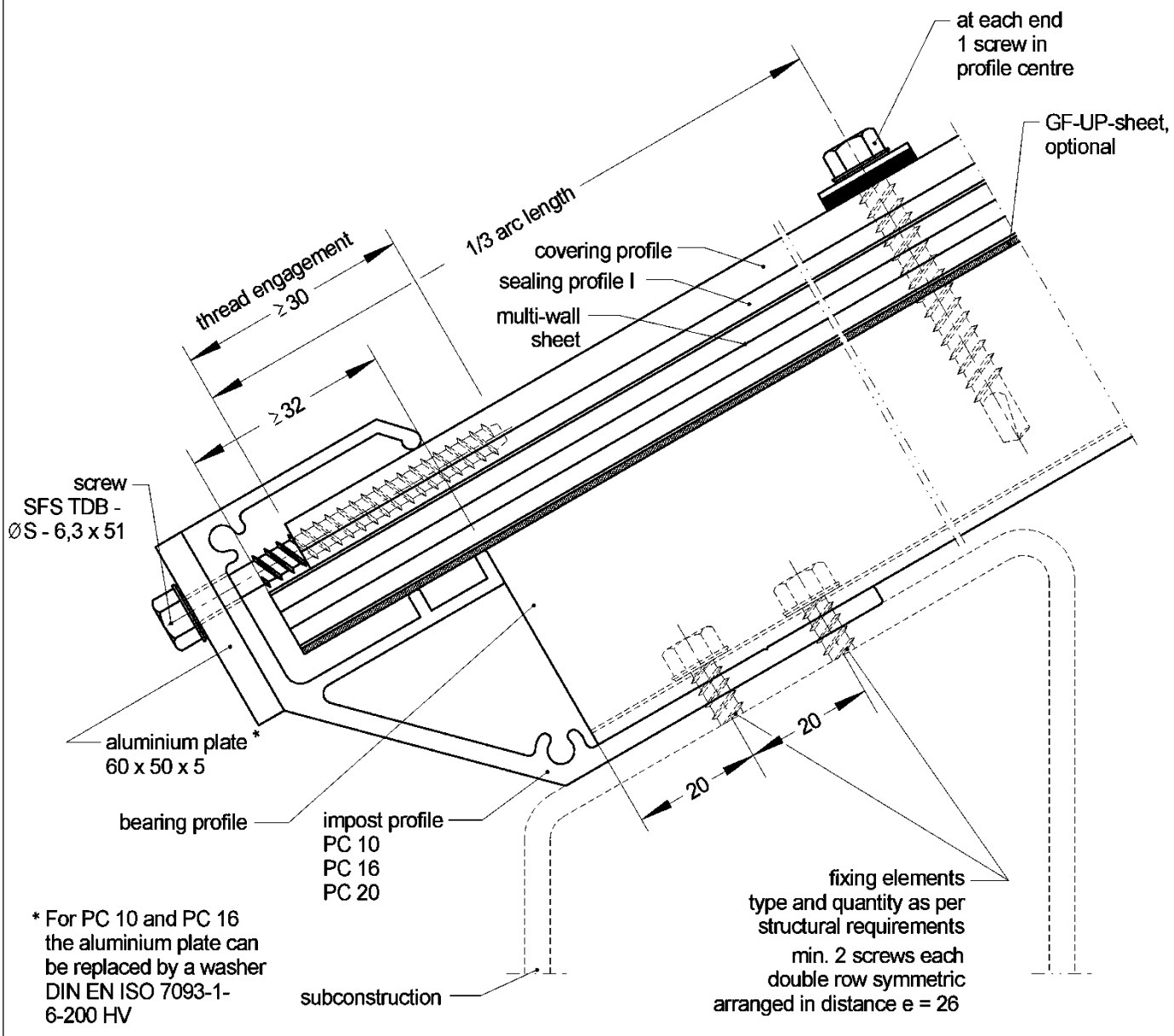
schematic drawing of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.3.2
PC 10+10 and PC 16+16; Combination of impost profiles, section D - D	



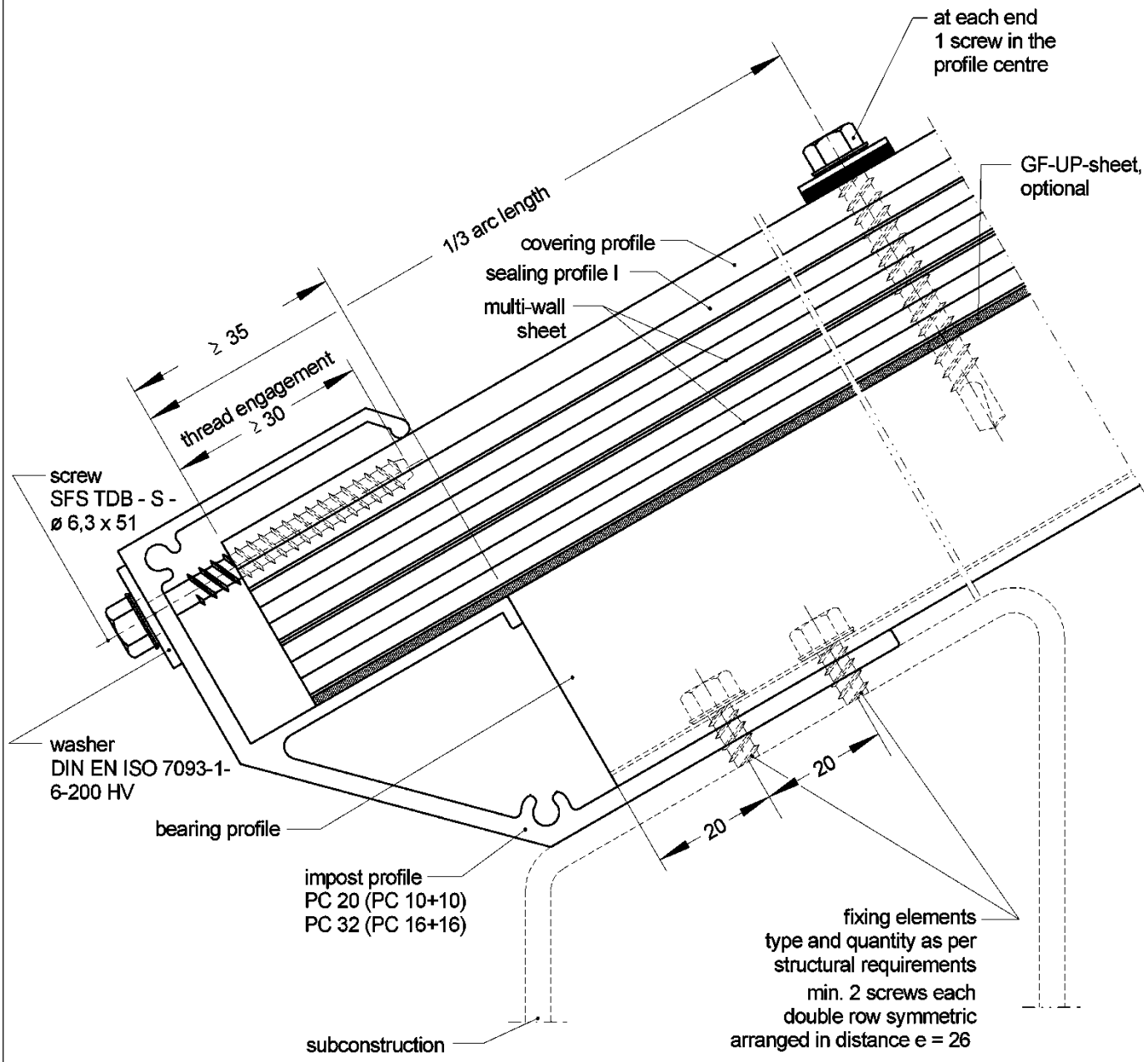
schematic drawing of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.4.1
PC 10, PC 16 and PC 20 Combination of impost profiles, section E - E	



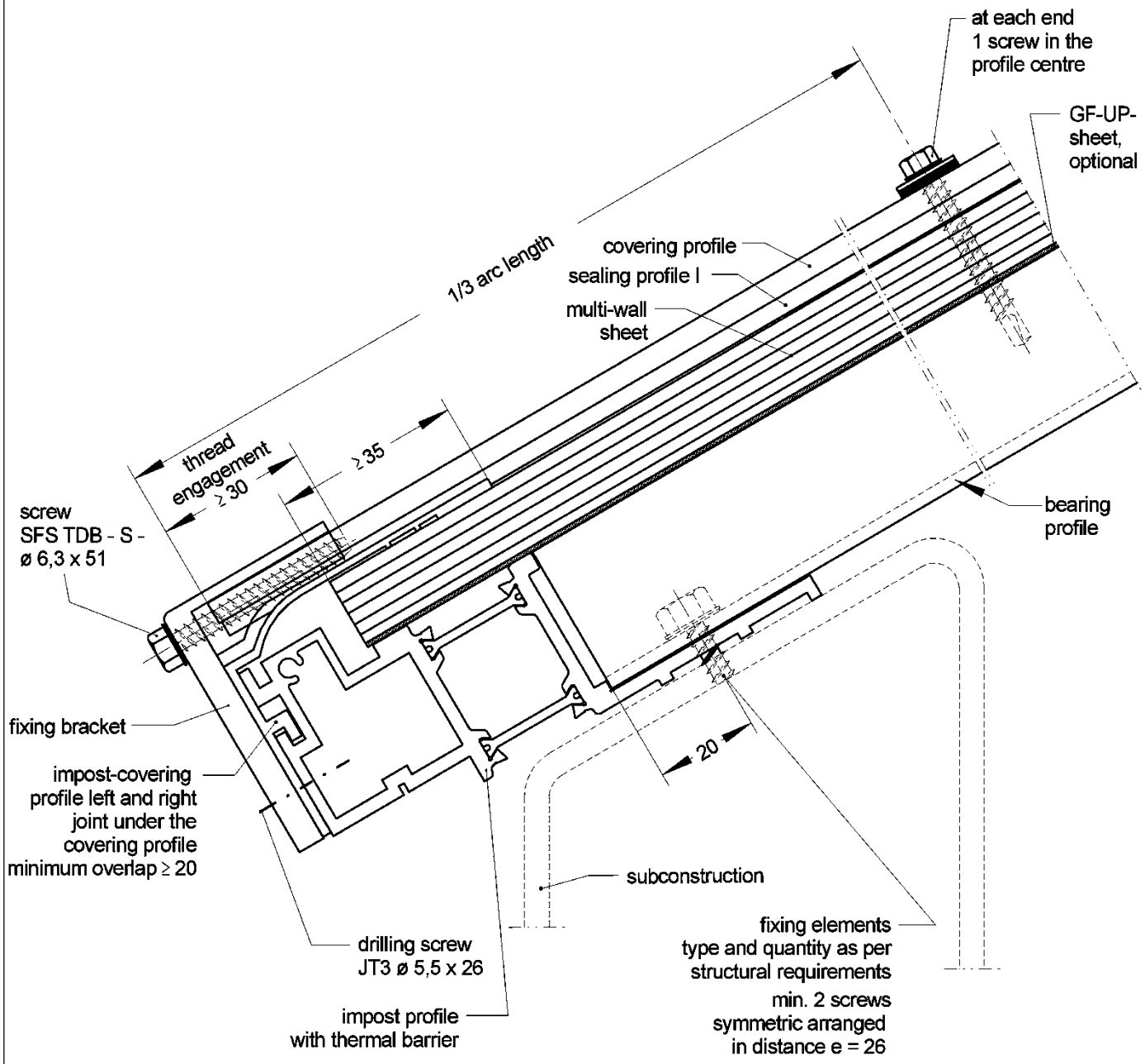
schematic drawing of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.4.2
PC 10+10 and PC 16+16 Combination of impost profiles, section E - E	



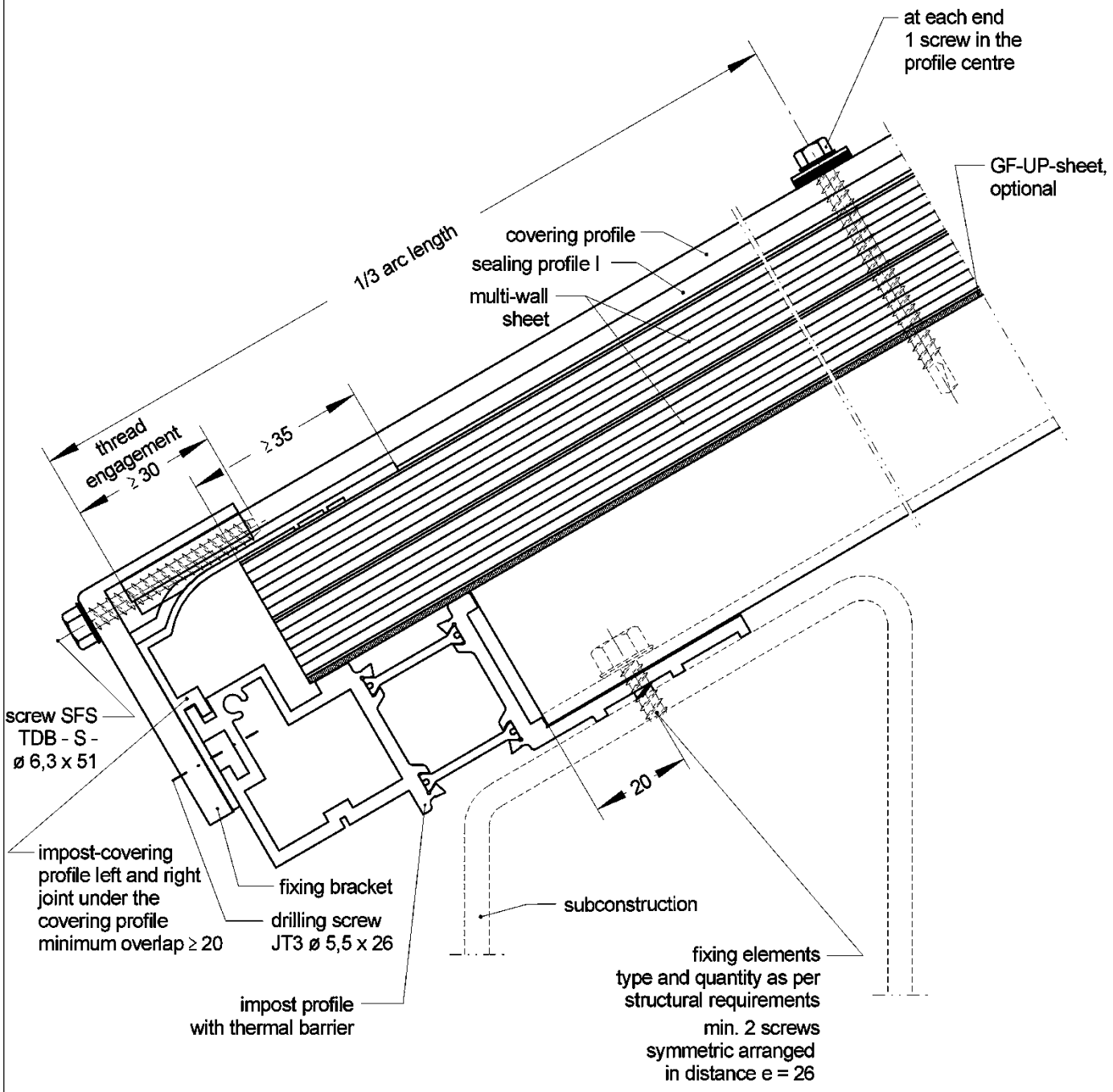
schematic drawings of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.5.1
PC 16 and PC 20 Combination of impost profiles, section E - E	



schematic drawing of the sheets

dimensions without tolerances:
tolerances according to EN 755-9

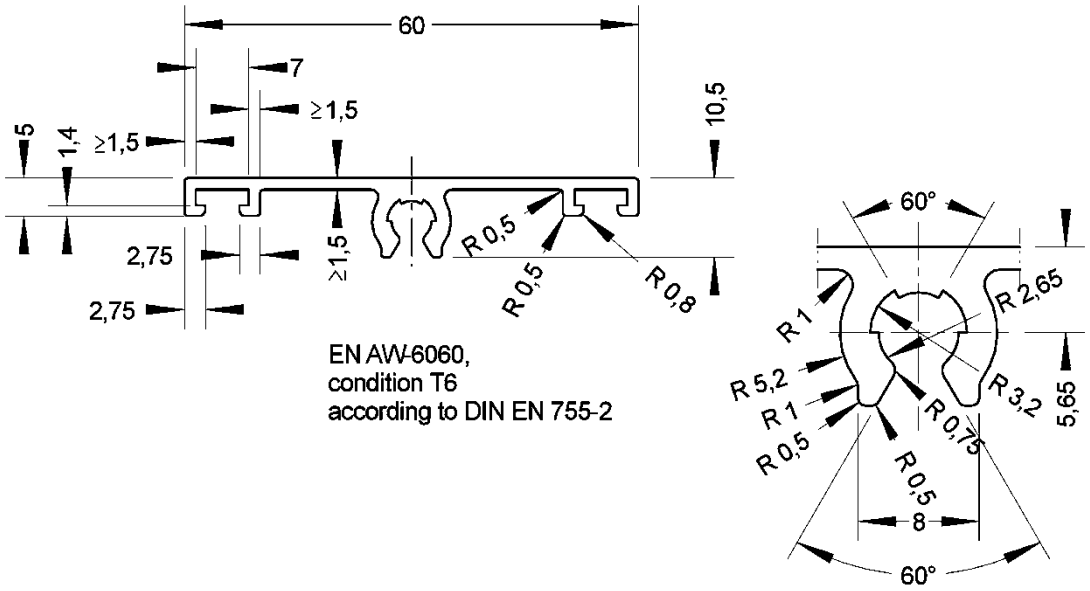
all dimensions in mm

all coverings optional + GF-UP

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 2.5.2
PC 10+10 and PC 16+16 Combination of impost profiles, section E - E	

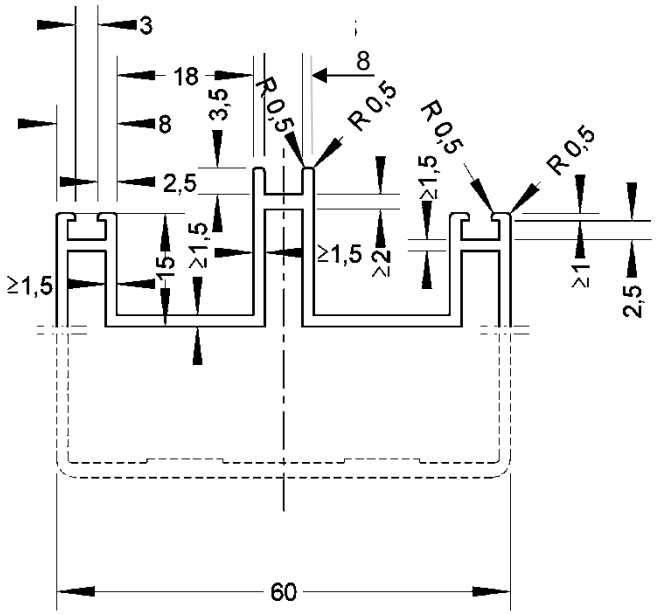
Deutsches Institut für Bautechnik DIBt

covering profile FT



EN AW-6060,
condition T6
according to DIN EN 755-2

bearing profile A60+

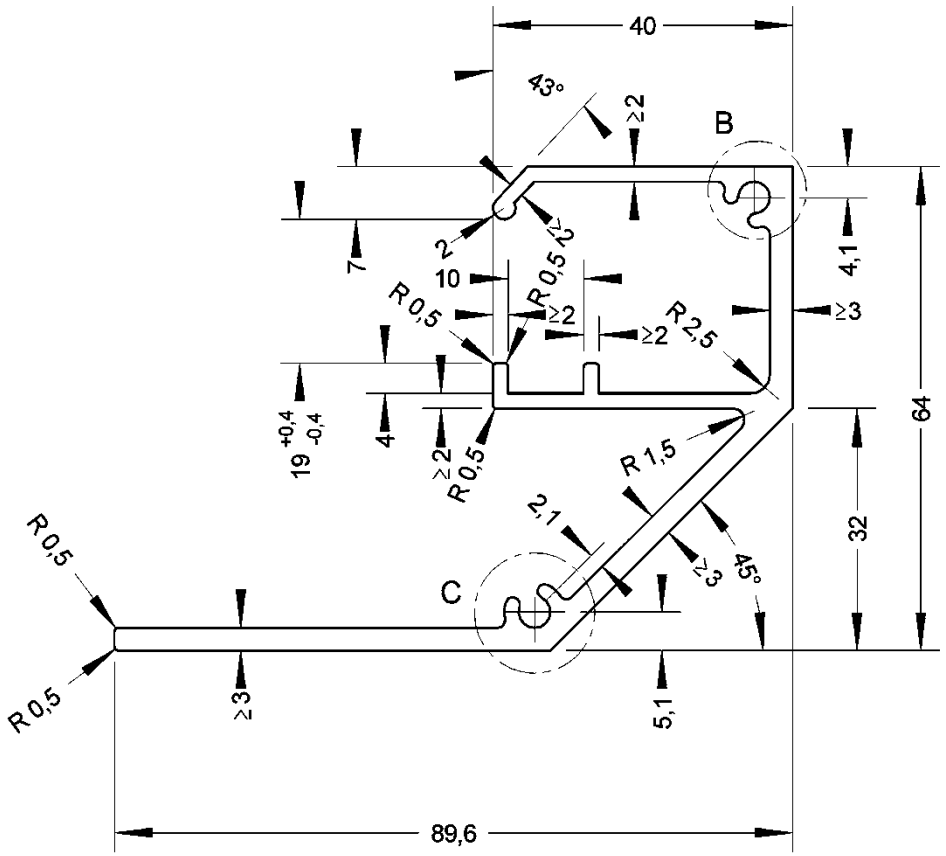


EN AW-6060,
condition T6
according to DIN EN 755-2

dimensions without tolerances:
tolerances according to EN 755-9

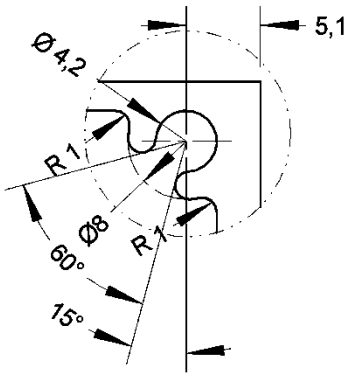
All dimensions in mm

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 3.1
Bearing and covering profile	

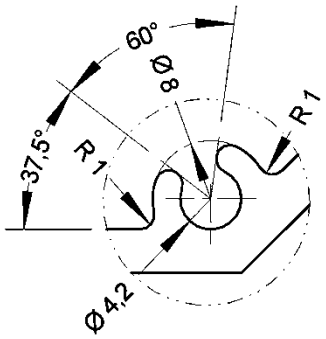


EN AW-6060,
condition T6
according to DIN EN 755-2

detail B



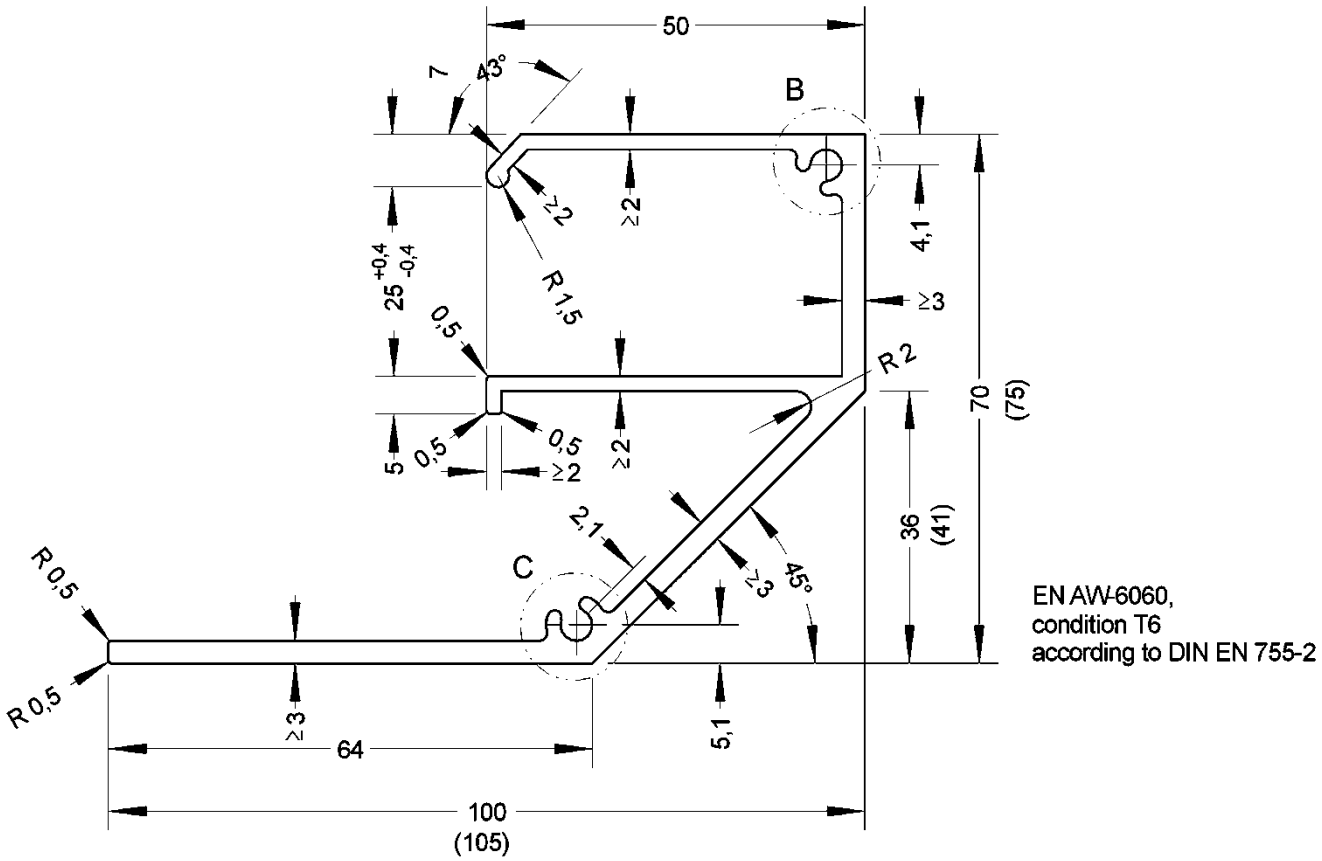
detail C



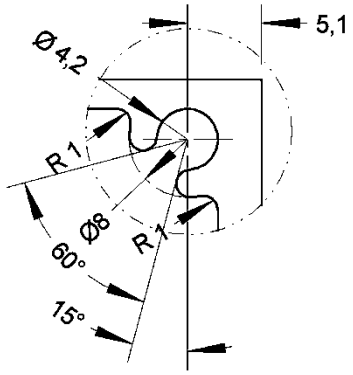
dimensions without tolerances:
tolerances according to EN 755-9

All dimensions in mm

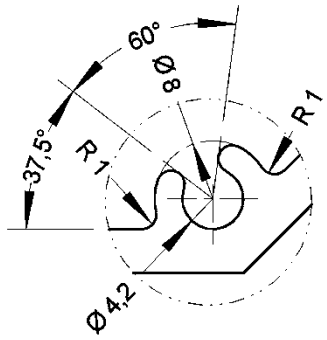
Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 3.2
PC 10 Impost profile	



detail B



detail C

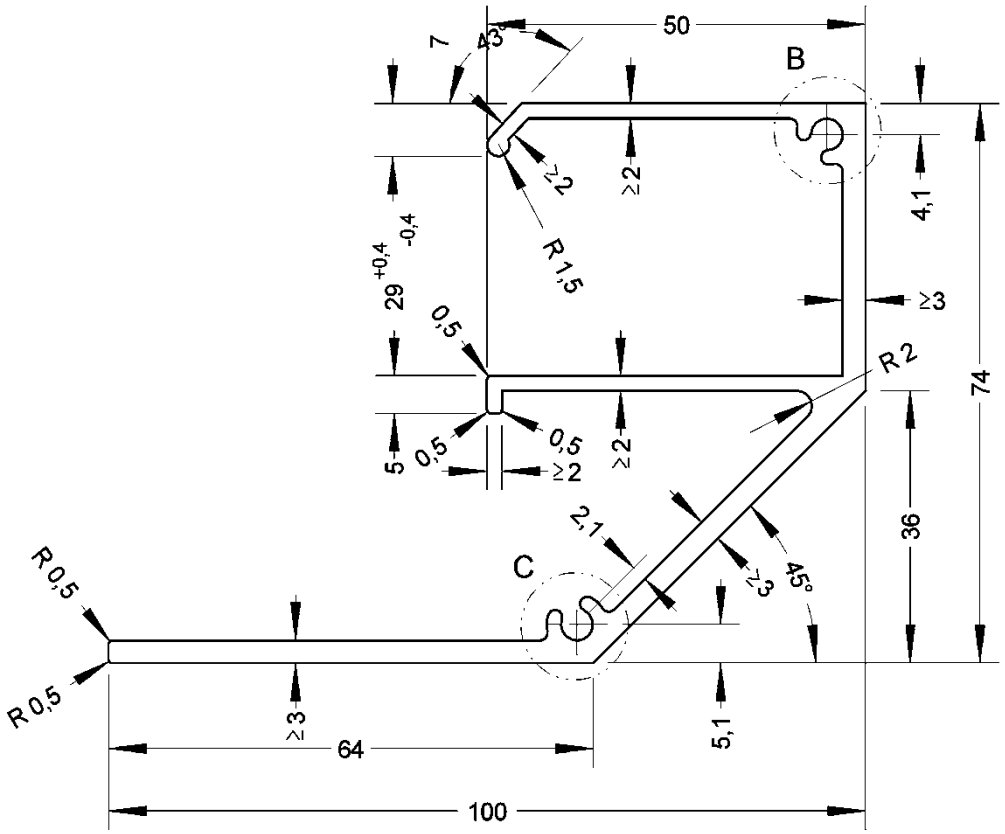


radii without dimensions R = 0,3

dimensions without tolerances:
tolerances according to EN 755-9

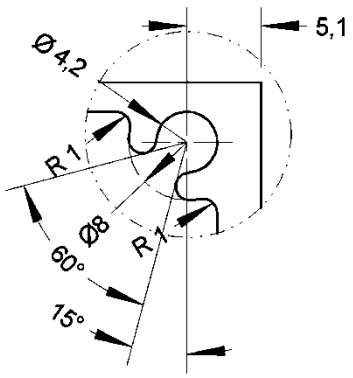
All dimensions in mm

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 3.3
PC 16 A or PC 16 B Impost profile	

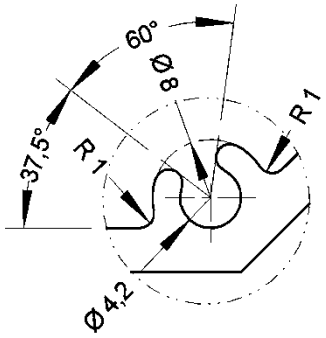


EN AW-6060,
condition T6
according to DIN EN 755-2

detail B



detail C

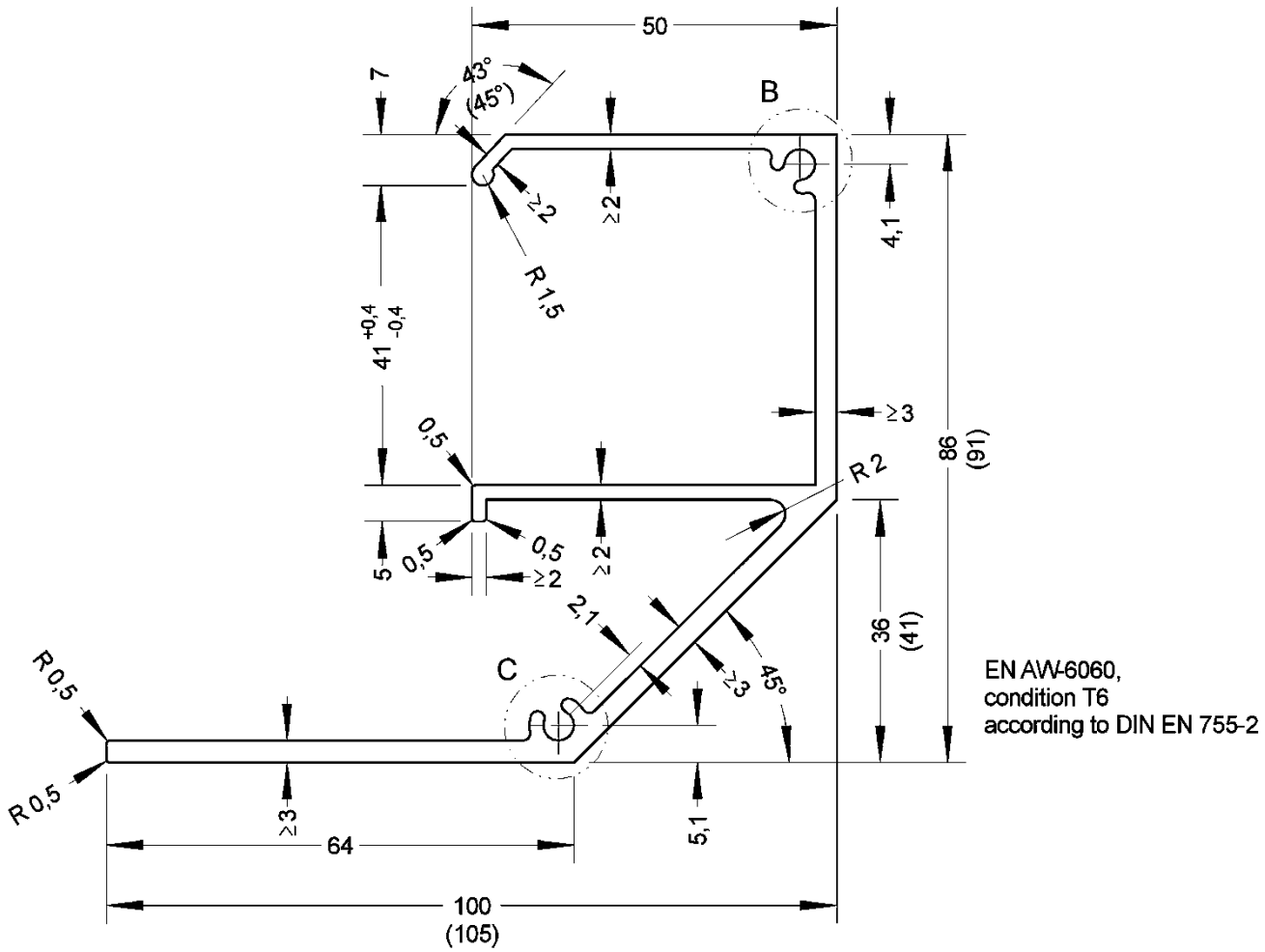


radii without dimensions R = 0,3

dimensions without tolerances:
tolerances according to EN 755-9

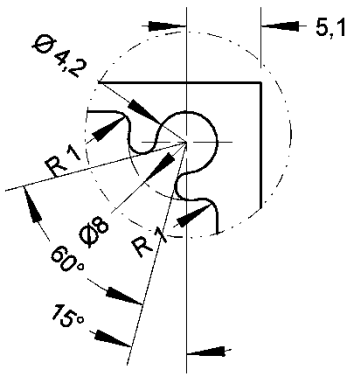
All dimensions in mm

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 3.4
PC 20 or PC 10+10 Impost profile	

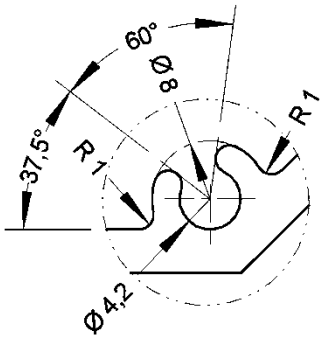


EN AW-6060,
condition T6
according to DIN EN 755-2

detail B



detail C



radii without dimensions R = 0,3

dimensions without tolerances:
tolerances according to EN 755-9

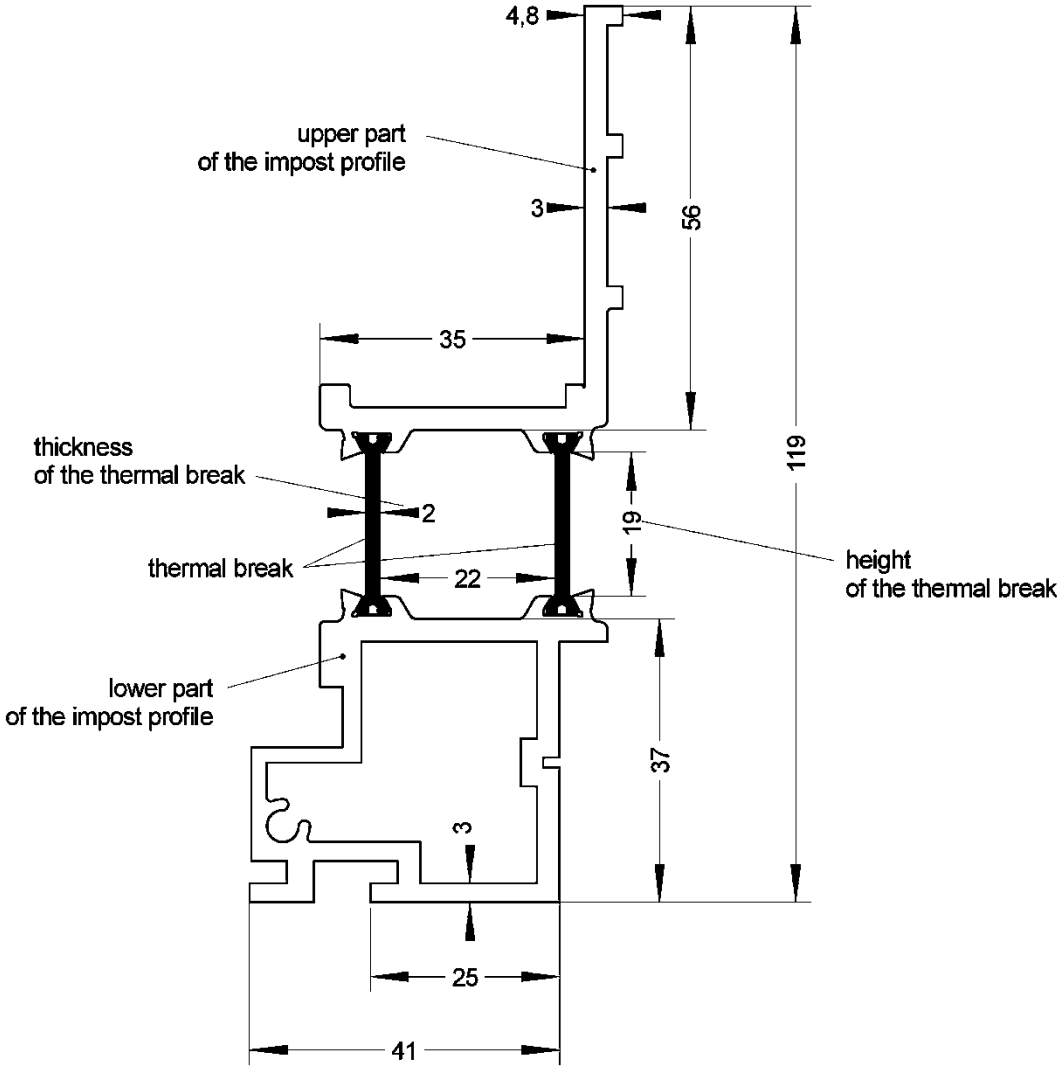
All dimensions in mm

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 3.5
PC 16+16 A or PC 16+16 B Impost profile	

Deutsches Institut für Bautechnik DIBt

Upper and lower part made of aluminium
EN AW-6060, condition T6 according to DIN EN 755-2

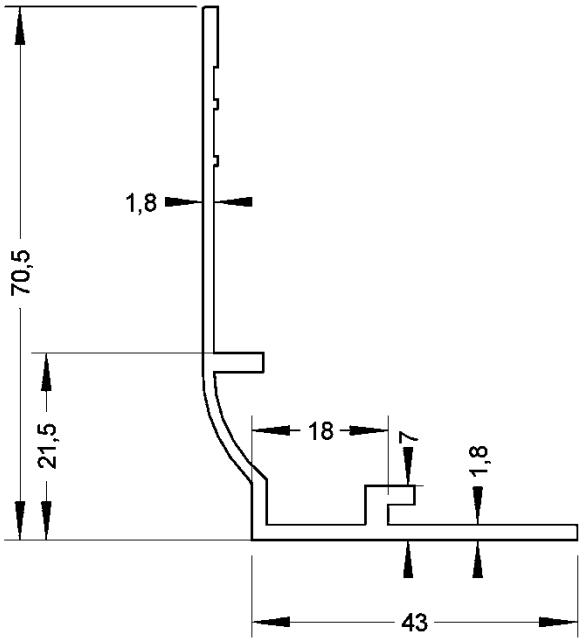
Thermal break made of glass fiber reinforced polyamid PA66, GF 25,
article-no. 961759 / 933100 of the Technoform Bautec Kunststoffprodukte GmbH



dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 3.6
Impost-bearing profile with thermal break, cross-section geometry	

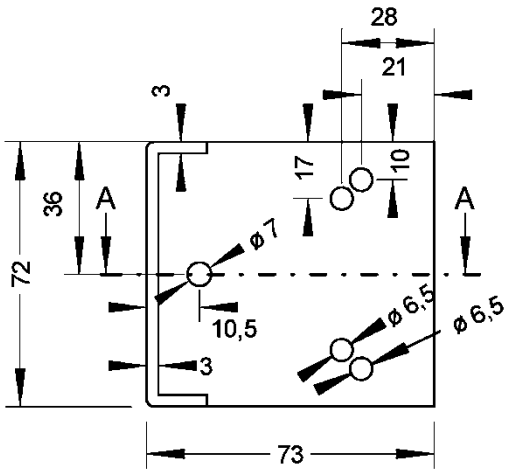


EN AW-6060,
condition T5
according to DIN EN 755-2

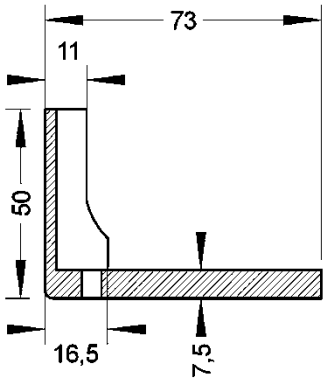
dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 3.7
Impost-covering profile, cross-section geometry	



section A-A



EN AC 42100
according to DIN EN 1706

schematic drawing

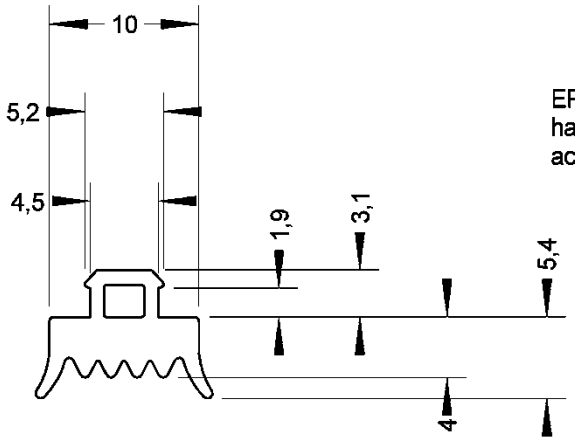
dimensions without tolerances:
tolerances according to EN 755-9

all dimensions in mm

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 3.8
fixing bracket, cross-section geometry	

sealing profile I
(covering profile)

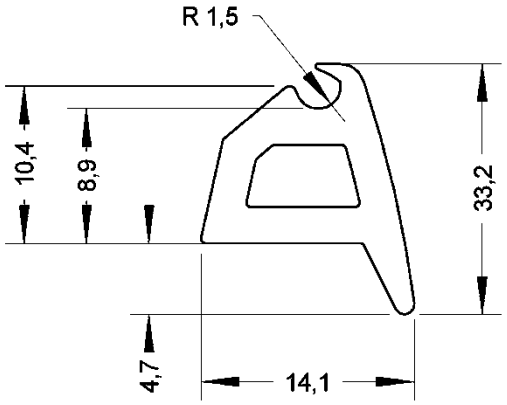
scale 2:1



EPDM according to DIN 7863
hardness (67±5) Shore A
according to EN ISO 868

sealing profile II
(impost profile)

scale 2:1



EPDM according to DIN 7863
hardness (67±5) Shore A
according to EN ISO 868

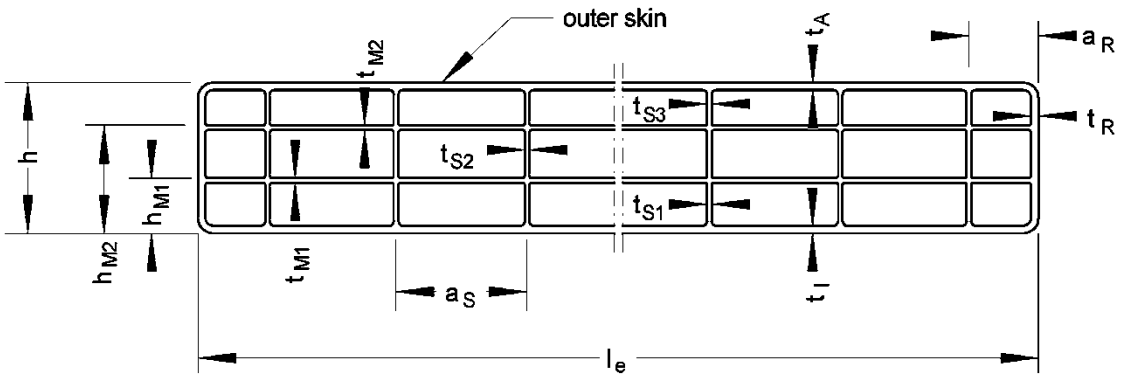
(only continuous rooflight system esserlux)

all dimensions in mm

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 3.9
Sealing profiles, cross-section geometry	

Deutsches Institut für Bautechnik DIBt

Sheet: AkyVer Sun Type 10/4W-7
Manufacturer: CORPLEX, Kaysersberg
Resin: ISO 21305-PC,X,EGL,03-09



l_e mm	h mm	h_{M1} mm	h_{M2} mm	a_S mm	a_R mm	t_A mm	t_I mm	t_{S1} mm	t_{S2} mm	t_{S3} mm
2100	10,1	3,8	7,1	7,3	4,6	0,44	0,43	0,31	0,21	0,22
+ 6 - 2	+ 0,5 - 0,5	+ 0,1 - 0,1	+ 0,1 - 0,1	+ 0,1	+ 0,2	- 0,04	- 0,05	- 0,02	- 0,02	- 0,01

t_{M1} mm	t_{M2} mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,08	0,05	0,48	1,72	
- 0,01	- 0,01	- 0,05	+0,10 - 0,01	≤6°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
54,9 Nm²/m	40,2 Nm²/m	1858 N/m	39,6 Nm/m	39,6 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

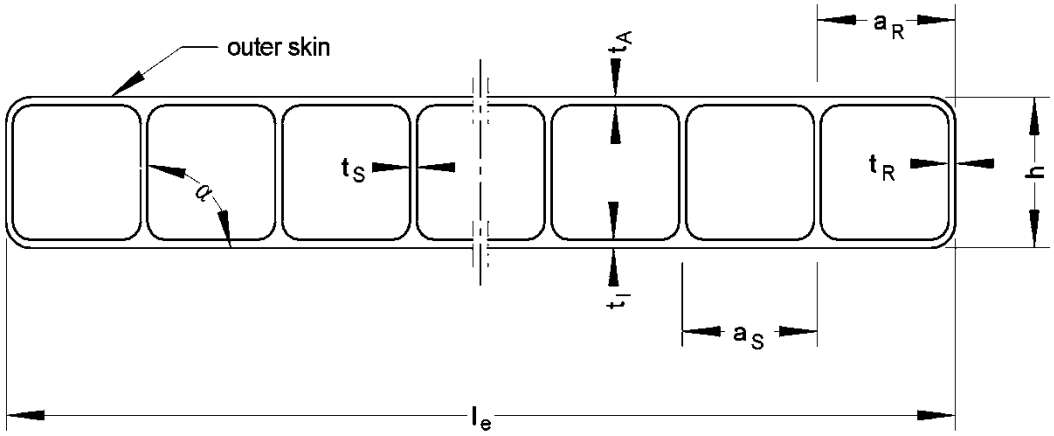
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strength
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.1
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Akyver Sun Type 10/4W-7"	

Deutsches Institut für Bautechnik DIBt

Sheet: AkyVer Sun Type 10
Manufacturer: CORPLEX, Kaysersberg
Resin: ISO 21305-PC,X,EGL,03-09



l_e mm	h mm	a_S mm	a_R mm	t_A mm	t_I mm	t_S mm	t_R mm	weight per area kg/m²	difference $\|\Delta\alpha\|$ to 90°
2100	10,3	10,9	10,1	0,46	0,46	0,47	0,37	1,70	
+ 6 - 2	± 0,5	+ 0,75	+ 1,9	- 0,06	- 0,04	- 0,12	- 0,08	+ 0,10 - 0,07	≤ 7°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
58,1 Nm²/m	35,1 Nm²/m	2756 N/m	35,2 Nm/m	36,1 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

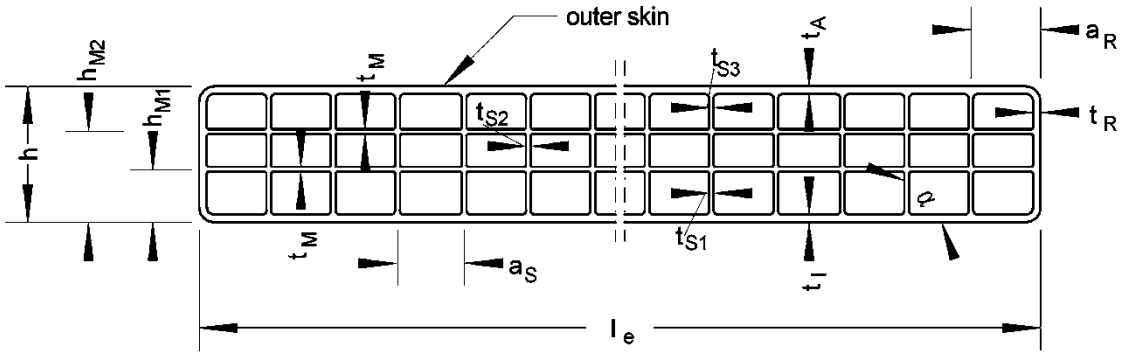
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.2
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Akyver Sun Type 10"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Exolon multi UV 4/10-6**
Manufacturer: **Exolon Group, Nera Montoro**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	a_S mm	a_R mm	t_A mm	t_I mm	t_{S1} mm	t_{S2} mm	t_{S3} mm
2100	10,0	3,4	6,8	6,0	3,2	0,44	0,44	0,23	0,16	0,20
+ 6 - 2	+ 0,5 - 0,5	+ 0,4 - 0,3	+ 0,35 - 0,45	+ 0,25	+ 0,3	- 0,04	- 0,05	- 0,04	- 0,05	- 0,03

t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,08	0,26	1,73	
- 0,02	- 0,08	+0,10 - 0,02	≤ 8°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
49,0 Nm²/m	23,1 Nm²/m	2152 N/m	47,4 Nm/m	39,6 Nm/m

$M_{b,pos}$: outer skin under pressure

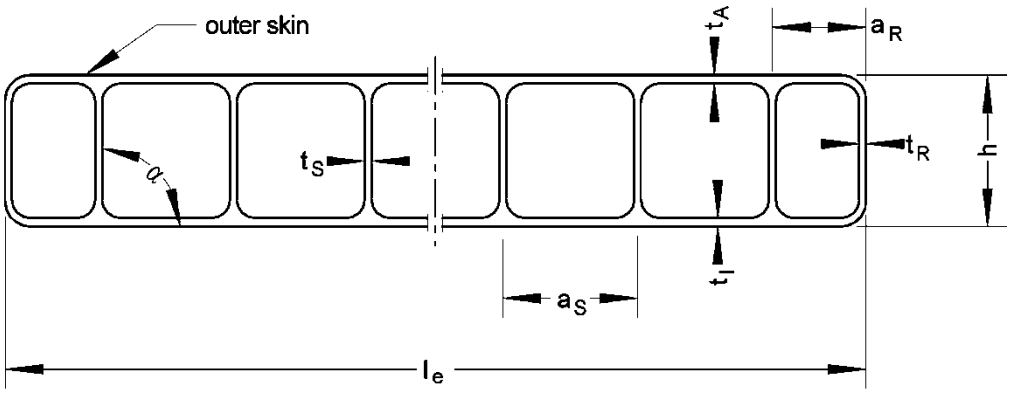
$M_{b,neg}$: inner skin under pressure

durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.3
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Exolon multi UV 4/10-6"	

Sheet: **Exolon multi UV 2/10-10,5**
Manufacturer: **Exolon Group, Nera Montoro**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	a_S mm	a_R mm	t_A mm	t_I mm	t_S mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$
2100	10,3	10,9	4,5	0,49	0,54	0,37	0,27	1,76	to 90°
+ 6 - 2	± 0,5	+ 0,2	+ 1,8	- 0,06	- 0,04	- 0,08	- 0,08	+ 0,11 - 0,03	≤ 7°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
64,0 Nm²/m	30,9 Nm²/m	2362 N/m	36,8 Nm/m	43,9 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

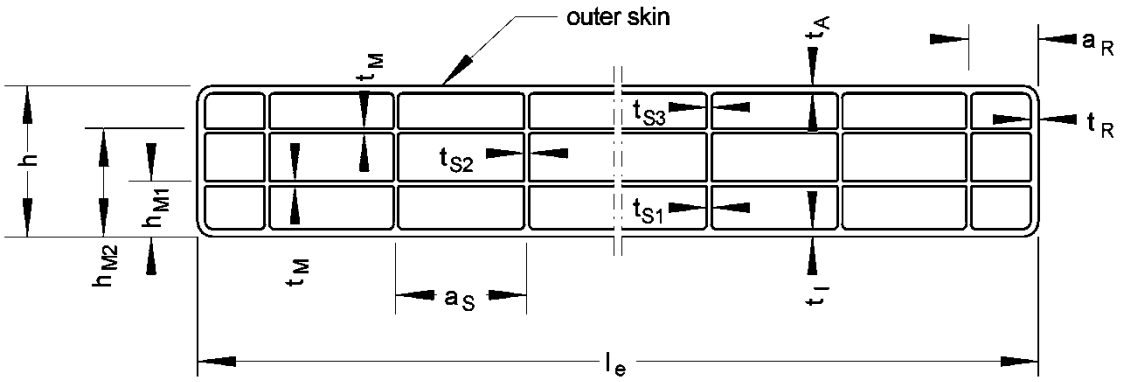
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.4
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Exolon multi UV 2/10-10,5"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Macrolux Multiwall LL 4W - 10 mm**
Manufacturer: **Stabilit Suisse S.A., Stabio**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	a_S mm	a_R mm	t_A mm	t_I mm	t_{S1} mm	t_{S2} mm	t_{S3} mm
2100	9,9	2,9	7,8	9,1	7,5	0,41	0,49	0,33	0,25	0,36
+ 6 - 2	± 0,5	+ 0,15 - 0,3	+ 0,3 - 0,3	+ 0,6	+ 1,7	- 0,08	- 0,12	- 0,04	- 0,07	- 0,07

t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,04	0,56	1,69	
- 0,01	- 0,20	+ 0,16 - 0,10	≤ 8°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
49,7 Nm²/m	17,3 Nm²/m	2129 N/m	41,2 Nm/m	44,0 Nm/m

$M_{b,pos}$: outer skin under pressure

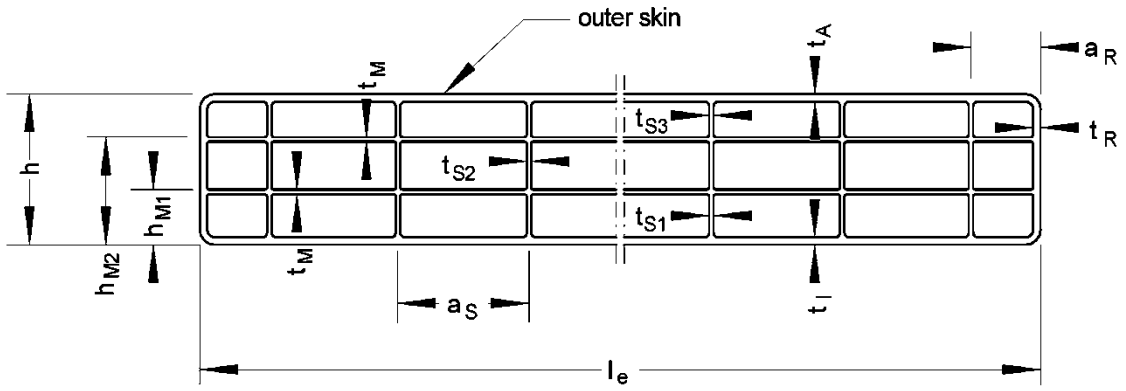
$M_{b,neg}$: inner skin under pressure

durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.5
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Macrolux Multiwall LL 4W - 10 mm"	

Sheet: **Policarb 10 mm 4W**
Manufacturer: **dott.gallina s.r.l., La Loggia**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	a_S mm	a_R mm	t_A mm	t_I mm	t_{S1} mm	t_{S2} mm	t_{S3} mm
2100	10,0	3,0	7,1	7,9	3,7	0,44	0,40	0,37	0,32	0,35
+6 -2	± 0,5	+ 0,35 - 0,15	+ 0,2 - 0,3	+ 0,25	+ 2,05	- 0,06	- 0,04	- 0,06	- 0,05	- 0,06

t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,07	0,30	1,76	≤ 6°
- 0,02	- 0,22	+ 0,11 - 0,07	

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
44,4 Nm²/m	19,0 Nm²/m	3135 N/m	46,7 Nm/m	35,7 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

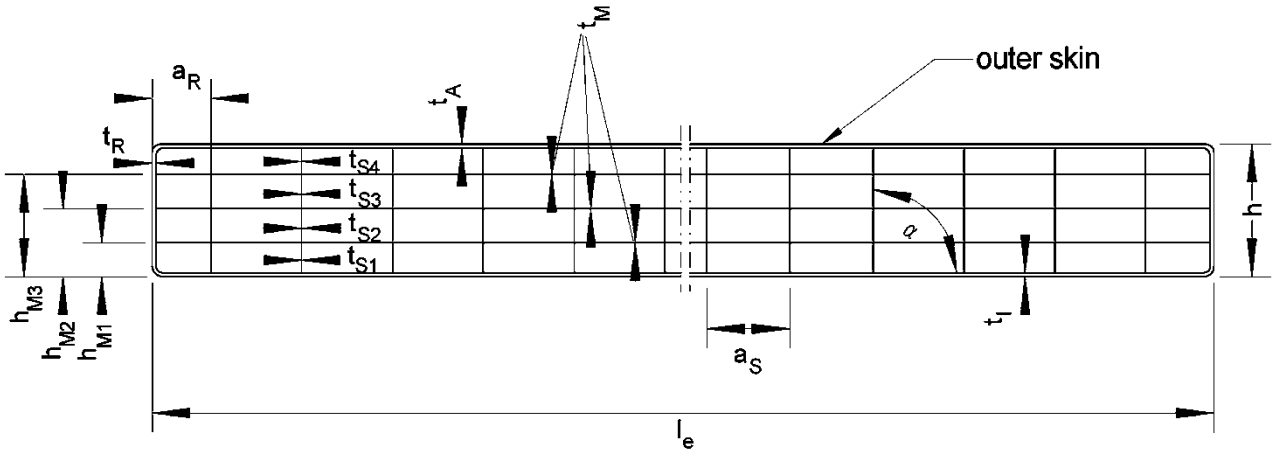
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1 for clear, uncolored sheets
Reaction to fire: Class B-s2, d0 in accordance with EN13501-1 for clear, uncolored sheets

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.6
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Policarb 10 mm 4W"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Policarb 10 mm 5W**
Manufacturer: **dott.gallina s.r.l., La Loggia**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	a_S mm	a_R mm	t_A mm	t_I mm
2100	9,8	2,8	4,9	7,2	7,9	4,9	0,45	0,40
+ 6 - 2	+ 0,5 - 0,5	+ 0,2 - 0,1	+ 0,3 - 0,1	+ 0,5 - 0,1	+ 0,3	+ 1,0	- 0,04	- 0,04

t_{S1} mm	t_{S2} mm	t_{S3} mm	t_{S4} mm	t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,44	0,40	0,36	0,41	0,07	0,31	1,83	
- 0,06	- 0,04	- 0,08	- 0,06	- 0,01	- 0,11	- 0,12	≤8°

Minimum performance levels or classes for the sheets
(as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
53,2 Nm²/m	22,9 Nm²/m	2448 N/m	57,5 Nm/m	43,8 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

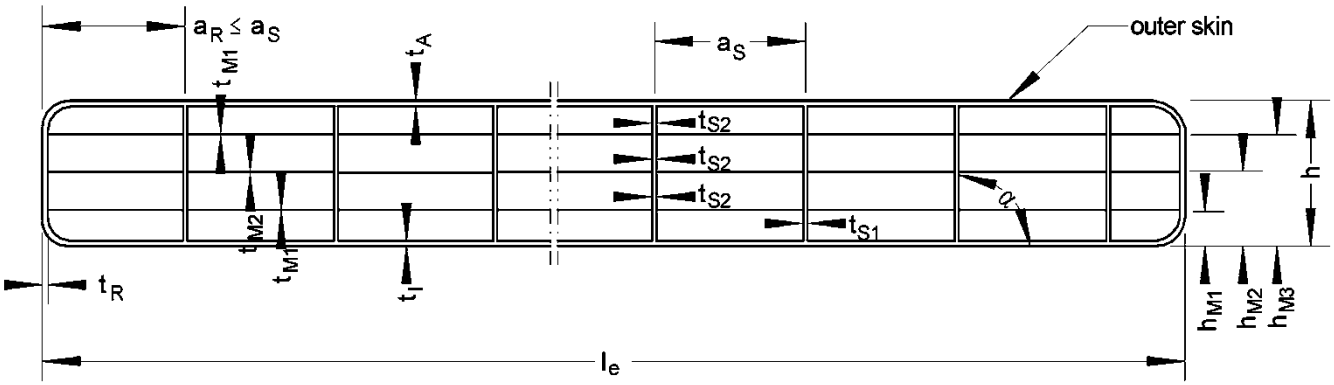
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strength
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.7
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Policarb 10 mm 5W"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Lexan Thermoclear Sheet LT2UV105R175**
Manufacturer: **SABIC Innovative Plastics B.V., Bergen op Zoom**
Resin: **ISO 21305-PC,X,EGL,05-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	a_S mm	t_A mm	t_I mm	t_{S1} mm	t_{S2} mm	t_R mm
2100	10,0	3,10	5,30	7,50	7,70	0,46	0,42	0,30	0,24	0,44
+ 6 - 2	± 0,5	+ 0,25 - 0,4	+ 0,4 - 0,4	+ 0,35 - 0,5	+ 0,35	- 0,06	- 0,06	- 0,02	- 0,04	- 0,14

t_{M1} mm	t_{M2} mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$
0,06	0,06	1,80	zu 90°
- 0,02	- 0,02	+ 0,09 - 0,08	≤ 3°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
48,8 Nm²/m	21,9 Nm²/m	2713 N/m	55,0 Nm/m	41,9 Nm/m

$M_{b,pos}$: outer skin under pressure

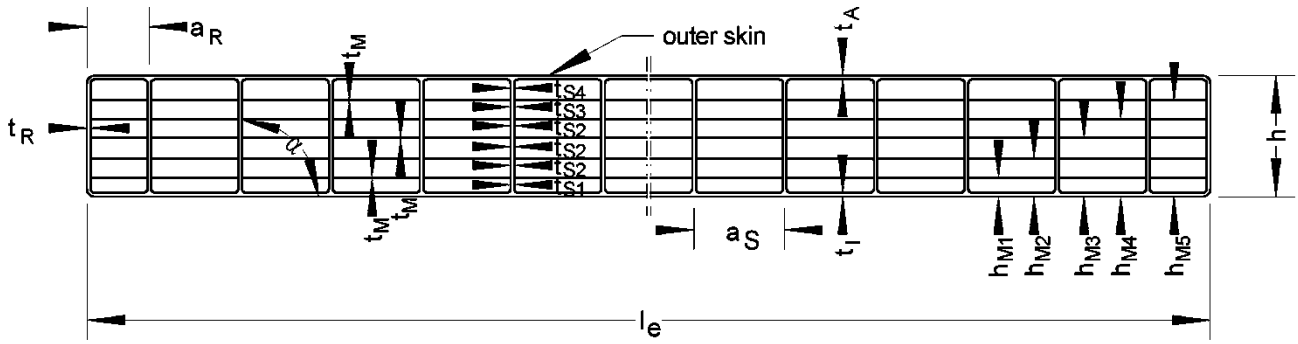
$M_{b,neg}$: inner skin under pressure

durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.8
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Lexan Thermoclear Sheet LT2UV105R175"	

Sheet: AkyVer Sun Type 16/7w-12 2600
Manufacturer: CORPLEX, Kaysersberg
Resin: ISO 21305-PC,X,EGL,03-09



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	h_{M5} mm	a_S mm	a_R mm	t_A mm	t_I mm
2100	16,0	2,4	4,9	7,7	10,4	12,9	12,0	6,5	0,56	0,52
+6 -2	± 0,5	+ 0,5 - 0,25	+ 0,45 - 0,4	+ 0,4 - 0,55	+ 0,25 - 0,3	+ 0,3 - 0,3	+ 0,40	+ 2,5	- 0,10	- 0,08

t_{S1} mm	t_{S2} mm	t_{S3} mm	t_{S4} mm	t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,41	0,39	0,44	0,44	0,06	0,58	2,56	
- 0,10	- 0,12	- 0,09	- 0,10	- 0,02	- 0,27	+ 0,15 - 0,09	≤ 4°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
176,5 Nm²/m	58,8 Nm²/m	2703 N/m	68,8 Nm/m	59,1 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

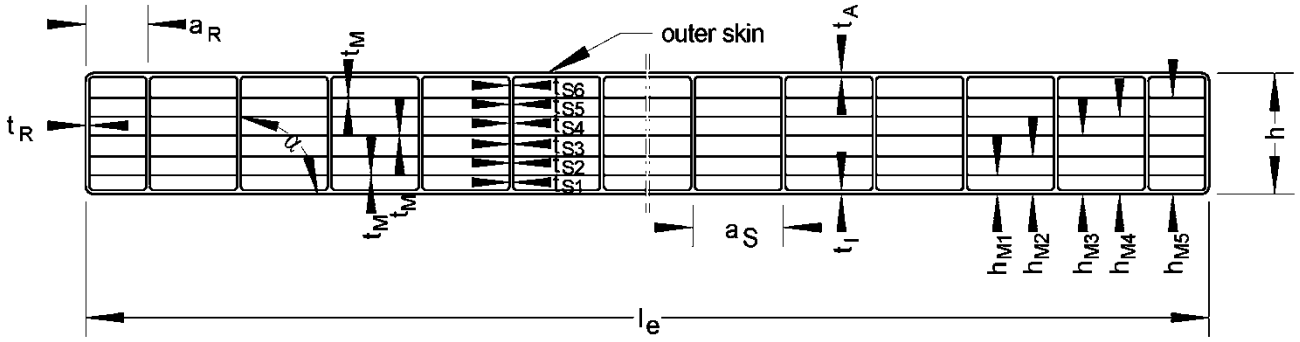
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.9
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Akyver Sun Type 16/7w-12 2600"	

Deutsches Institut für Bautechnik DIBt

Sheet: **AkyVer Sun Type 16/7w-12 3000**
Manufacturer: **CORPLEX, Kaysersberg**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	h_{M5} mm	a_S mm	a_R mm	t_A mm	t_I mm
2100	16,0	3,3	5,6	8,0	10,9	13,4	12,0	6,2	0,70	0,70
+6 -2	± 0,5	+ 0,5 - 0,2	+ 0,2 - 0,2	+ 0,3 - 0,4	+ 0,4 - 0,3	+ 0,4 - 0,4	+ 0,20	+ 1,0	- 0,07	- 0,10

t_{S1} mm	t_{S2} mm	t_{S3} mm	t_{S4} mm	t_{S5} mm	t_{S6} mm	t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,53	0,57	0,46	0,48	0,51	0,47	0,07	0,83	3,04	
- 0,07	- 0,07	- 0,07	- 0,05	- 0,06	- 0,09	- 0,02	- 0,43	+ 0,15 - 0,01	≤ 5°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
219,5 Nm²/m	76,4 Nm²/m	3201 N/m	110,2 Nm/m	115,1 Nm/m

$M_{b,pos}$: outer skin under pressure

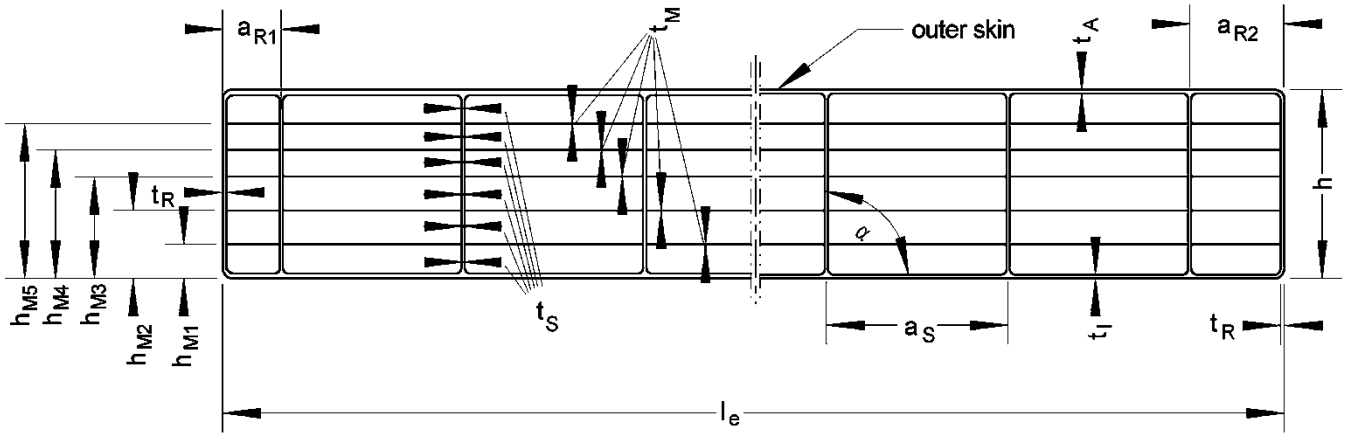
$M_{b,neg}$: inner skin under pressure

durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.10
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Akyver Sun Type 16/7w-12 3000"	

Sheet: **Exolon multi UV 7/16-14**
Manufacturer: **Exolon Group, Nera Montoro**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	h_{M5} mm	a_S mm	a_{R1} mm	a_{R2} mm
2100	16,0	3,2	5,7	8,2	10,7	13,2	13,9	7,4	9,6
+6 -2	± 0,5	+ 0,5 - 0,4	+ 0,5 - 0,6	+ 0,6 - 0,6	+ 0,6 - 0,5	+ 0,5 - 0,3	+ 0,2	+ 1,7	+ 1,5

t_A mm	t_I mm	t_S mm	t_M mm	t_R mm	weight per area kg/m²	difference $\|\Delta\alpha\|$ to 90°
0,59	0,61	0,39	0,08	0,67	2,63	
- 0,07	- 0,10	- 0,14	- 0,02	- 0,30	+ 0,13 - 0,05	≤ 8°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
176,9 Nm²/m	45,7 Nm²/m	2254 N/m	64,6 Nm/m	62,9 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

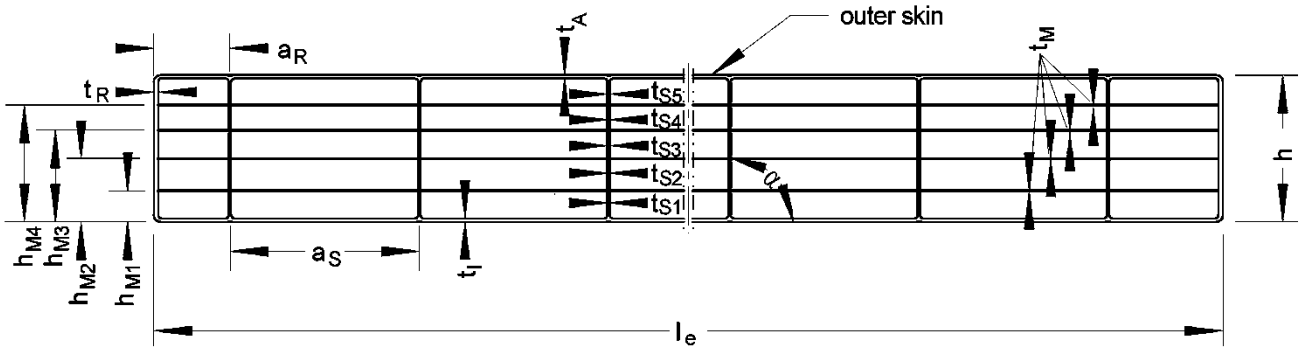
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1.d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.11
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Exolon multi UV 7/16-14"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Policarb 16 mm 6W**
Manufacturer: **dott.gallina s.r.l., La Loggia**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	a_S mm	a_R mm	t_A mm	t_I mm
2100	15,9	3,6	6,5	9,5	12,2	19,5	14,0	0,80	0,75
+6 -2	± 0,5	+ 0,4 - 0,3	+ 0,3 - 0,35	+ 0,35 - 0,4	+ 0,45 - 0,65	+ 0,5	+ 1,4	- 0,07	- 0,07

t_{S1} mm	t_{S2} mm	t_{S3} mm	t_{S4} mm	t_{S5} mm	t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,52	0,40	0,38	0,51	0,64	0,09	0,67	2,86	
- 0,08	- 0,07	- 0,08	- 0,11	- 0,12	- 0,02	- 0,16	+ 0,24 - 0,17	≤ 5°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
191,0 Nm²/m	43,7 Nm²/m	2683 N/m	84,0 Nm/m	80,3 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

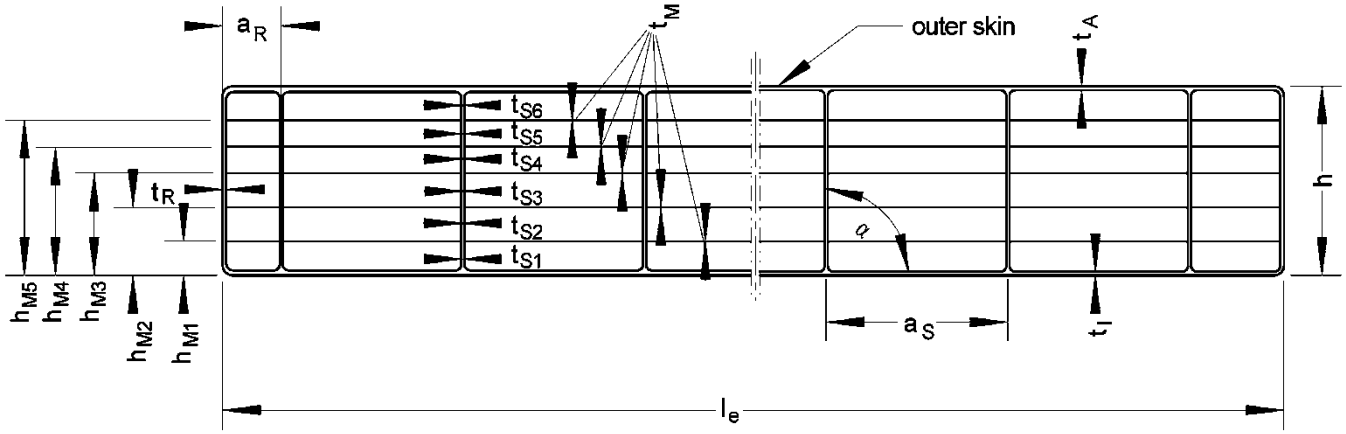
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.12
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Policarb 16 mm 6W"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Policarb 16 mm 7W**
Manufacturer: **dott.gallina s.r.l., La Loggia**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	h_{M5} mm	a_S mm	a_R mm	t_A mm	t_I mm
2100	15,9	2,7	5,5	8,0	10,7	13,4	13,8	10,8	0,63	0,61
+6 -2	+ 0,6 - 0,4	+ 0,4 - 0,5	+ 0,6 - 0,3	+ 0,2 - 0,4	+ 0,3 - 0,2	+ 0,2 - 0,3	+ 0,2	+ 1,1	- 0,04	- 0,03

t_{S1} mm	t_{S2} mm	t_{S3} mm	t_{S4} mm	t_{S5} mm	t_{S6} mm	t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,39	0,41	0,34	0,29	0,30	0,36	0,09	0,46	2,64	
- 0,06	- 0,05	- 0,03	- 0,04	- 0,03	- 0,05	- 0,01	- 0,11	+ 0,09 - 0,17	≤ 9°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
169,9 Nm²/m	48,4 Nm²/m	2195 N/m	69,7 Nm/m	58,7 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

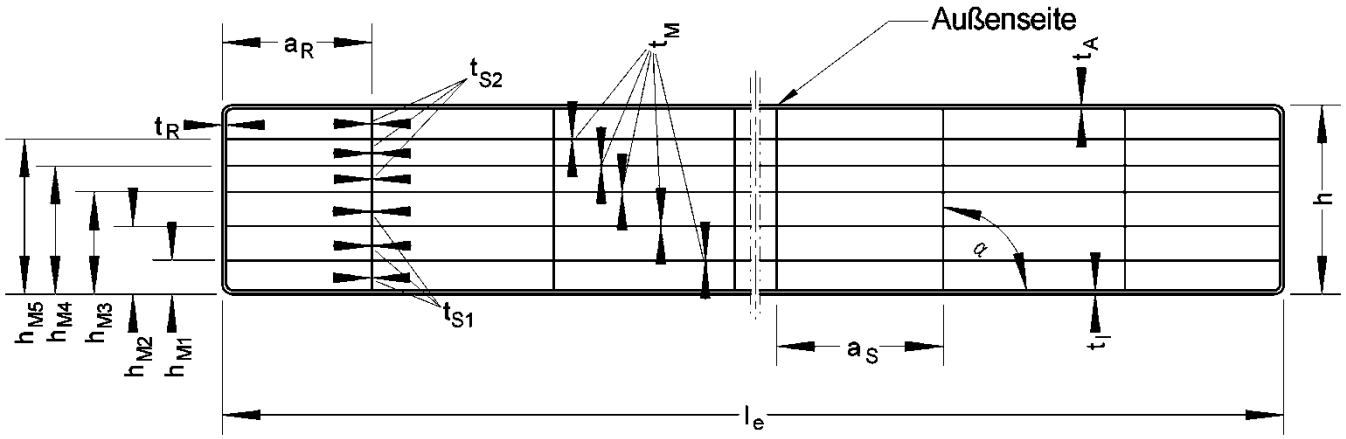
durabillty as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strength
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.13
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Policarb 16 mm 7W"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Macrolux Multiwall LL 7W - 16 mm - 2,6 kg/m²**
Manufacturer: **Stabilit Suisse S.A., Stabio**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	h_{M5} mm	a_S mm	a_R mm	t_A mm	t_I mm
2100	15,9	2,9	5,1	7,6	10,8	13,2	15,8	11,9	0,67	0,69
+6 -2	± 0,5	+ 0,35 - 0,3	+ 0,45 - 0,55	+ 0,65 - 0,65	+ 0,7 - 0,65	+ 0,25 - 0,4	+ 0,3	+ 2,0	- 0,16	- 0,13

t_{S1} mm	t_{S2} mm	t_{S3} mm	t_{S4} mm	t_{S5} mm	t_{S6} mm	t_M mm	t_R mm	weight per area kg/m²	difference $\|\Delta\alpha\|$ to 90°
0,46	0,47	0,40	0,33	0,39	0,38	0,06	0,54	2,58	
- 0,08	- 0,10	- 0,07	- 0,06	- 0,06	- 0,05	- 0,02	- 0,21	- 0,13	≤ 9°

Minimum performance levels or classes for the sheets
(as declared in the DoP in accordance with EN 16153)

mechanical resitance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
170,3 Nm²/m	36,0 Nm²/m	2404 N/m	70,8 Nm/m	63,1 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

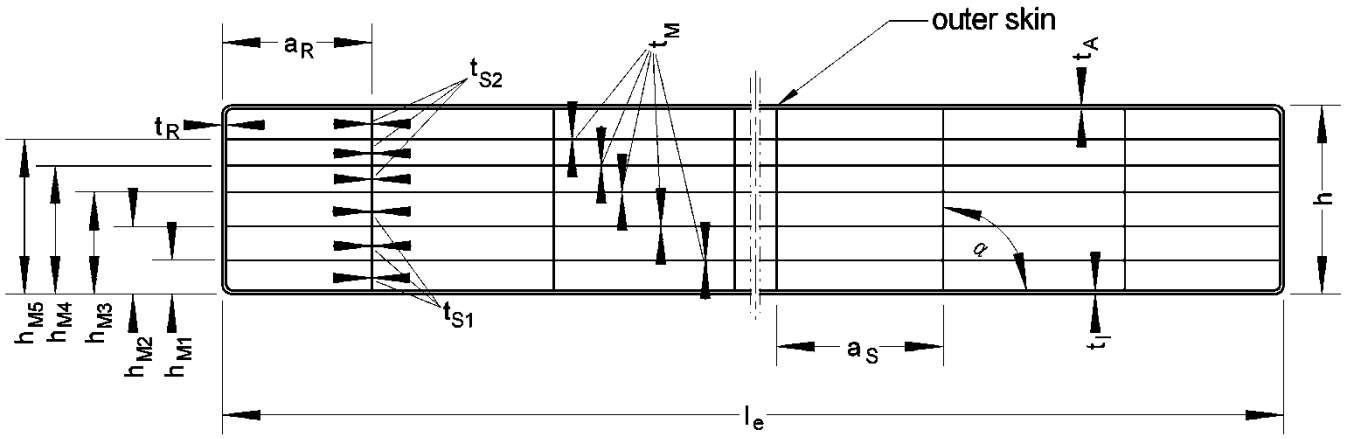
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strength
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.14
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Macrolux Multiwall LL 7W - 16 mm - 2,6 kg/m²"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Macrolux Multiwall LL 7W - 16 mm - 2,7 kg/m²**
Manufacturer: **Stabilit Suisse S.A., Stabio**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	h_{M5} mm	a_S mm	a_R mm	t_A mm	t_I mm
2100	16,2	2,8	5,0	7,4	10,3	13,0	15,8	13,7	0,56	0,60
+6 -2	± 0,5	+ 0,35 - 0,2	+ 0,4 - 0,3	+ 0,4 - 0,25	+ 0,3 - 0,4	+ 0,35 - 0,25	+ 0,55	+ 2,30	- 0,05	- 0,08

t_{S1} mm	t_{S2} mm	t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,59	0,43	0,08	0,56	2,70	
- 0,18	- 0,10	- 0,03	- 0,07	+ 0,16 - 0,08	≤ 5°

Minimum performance levels or classes for the sheets
(as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
158,6 Nm²/m	74,8 Nm²/m	2761 N/m	60,7 Nm/m	63,1 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

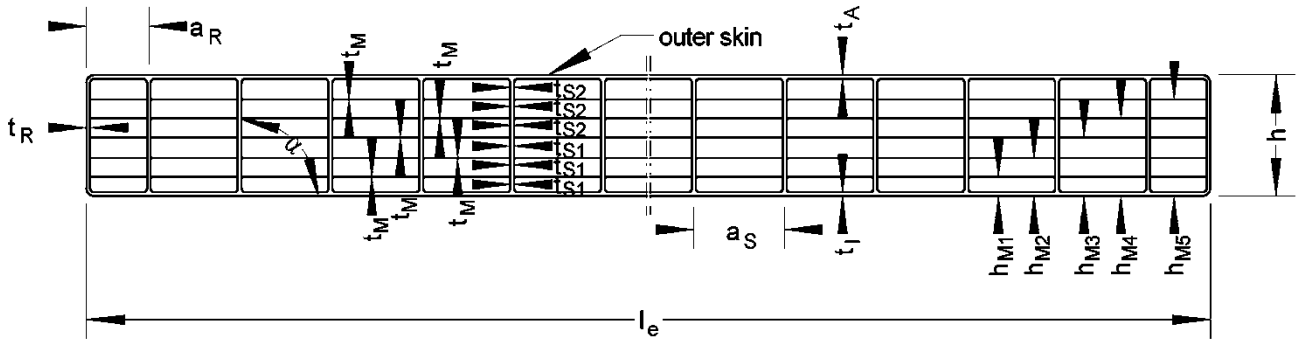
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strength
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.15
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Macrolux Multiwall LL 7W - 16 mm - 2,7 kg/m²"	

Deutsches Institut für Bautechnik DIBt

Sheet: AkyVer Sun Type 20/7w-12
Manufacturer: CORPLEX, Kaysersberg
Resin: ISO 21305-PC,X,EGL,03-09



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	h_{M5} mm	a_S mm	a_R mm	t_A mm	t_I mm
2100	20,0	3,9	7,0	9,9	12,4	16,3	12,3	8,9	0,65	0,63
+ 6 - 2	± 0,5	+ 0,15 - 0,15	+ 0,25 - 0,25	+ 0,25 - 0,25	+ 0,3 - 0,3	+ 0,15 - 0,15	+ 0,1	+ 0,35	- 0,05	- 0,05

t_{S1} mm	t_{S2} mm	t_M mm	t_R mm	weight per area kg/m²	difference $\lvert\Delta\alpha\rvert$ to 90°
0,41	0,37	0,07	0,79	2,85	
- 0,02	- 0,04	- 0,01	- 0,04	+ 0,17 - 0,04	≤ 3°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
317,7 Nm²/m	100,1 Nm²/m	2401 N/m	68,4 Nm/m	68,4 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

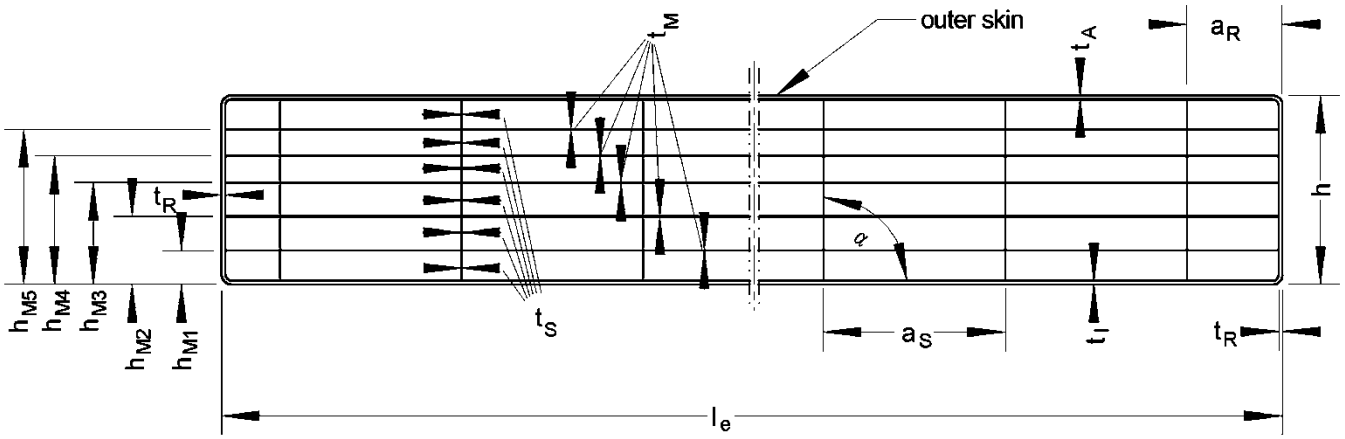
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strength
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1,d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.16
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Akyver Sun Type 20/7w-12"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Exolon multi UV 7/20-14**
Manufacturer: **Exolon Group, Nera Montoro**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	h_{M5} mm	a_S mm	a_R mm	weight per area kg/m²
2100	19,6	3,6	6,6	9,6	12,7	16,0	13,9	8,2	2,85
+ 6 - 2	± 0,5	+ 0,4 - 0,3	+ 0,3 - 0,3	+ 0,3 - 0,4	+ 0,25 - 0,3	+ 0,35 - 0,4	+ 0,95	+ 2,2	+ 0,17 - 0,15

t_A mm	t_I mm	t_S mm	t_M mm	t_R mm	difference $\|\Delta\alpha\|$ to 90°
0,64	0,65	0,34	0,08	0,85	
- 0,08	- 0,10	- 0,09	- 0,03	- 0,39	≤ 7°

Minimum performance levels or classes for the sheets
(as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
317 Nm²/m	56,8 Nm²/m	1824 N/m	57,6 Nm/m	64,5 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

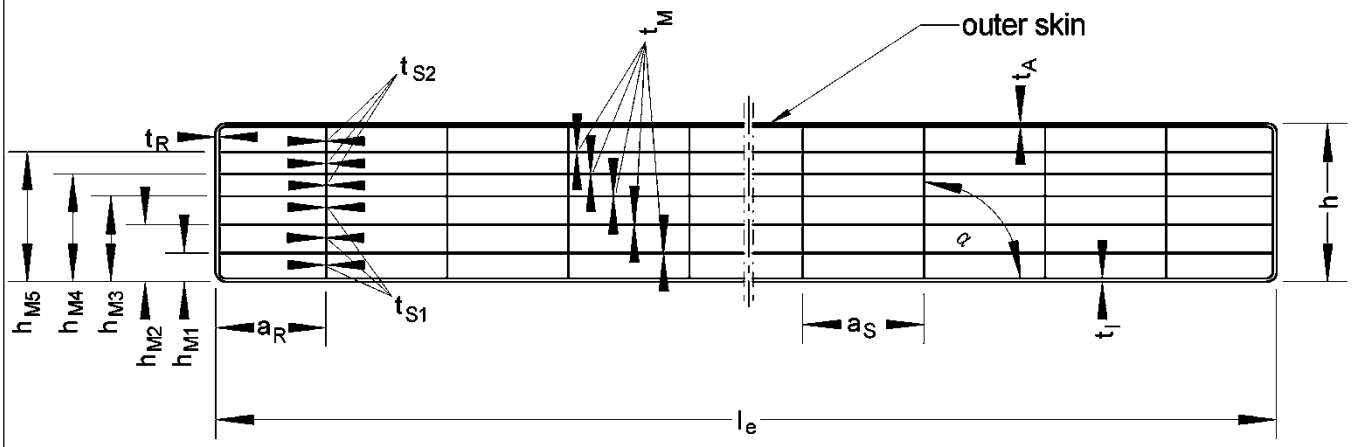
durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strenght
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.17
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Exolon multi UV 7/20-14"	

Deutsches Institut für Bautechnik DIBt

Sheet: **Macrolux Multiwall LL 7W - 20 mm**
Manufacturer: **Stabilit Suisse S.A., Stabio**
Resin: **ISO 21305-PC,X,EGL,03-09**



l_e mm	h mm	h_{M1} mm	h_{M2} mm	h_{M3} mm	h_{M4} mm	h_{M5} mm	a_S mm	a_R mm	t_A mm	t_I mm
2100	20,2	3,3	6,0	8,7	12,3	16,2	15,8	13,8	0,67	0,71
+6 -2	± 0,5	+ 0,55 - 0,3	+ 0,7 - 0,6	+ 0,75 - 0,6	+ 0,7 - 0,8	+ 0,3 - 0,4	+ 0,35	+ 2,9	- 0,07	- 0,11

t_{S1} mm	t_{S2} mm	t_M mm	t_R mm	weight per area kg/m²	difference $\|\Delta\alpha\|$ to 90°
0,52	0,36	0,09	0,60	3,08	
- 0,14	- 0,09	- 0,03	- 0,10	+ 0,18 - 0,11	≤ 3°

Minimum performance levels or classes for the sheets (as declared in the DoP in accordance with EN 16153)

mechanical resistance (deformation behavior)				
B_x	B_y	S_y	$M_{b,pos}$	$M_{b,neg}$
292,7 Nm²/m	75,1 Nm²/m	2843 N/m	81,9 Nm/m	76,5 Nm/m

$M_{b,pos}$: outer skin under pressure

$M_{b,neg}$: inner skin under pressure

durabillity as variation (after ageing)			
of yellowness index	of the light transmittance	of deformation flexural modulus	of tensile strength
10 (ΔA)	5 % (ΔA)	Cu 1	Ku 1

Reaction to fire: Class B-s1, d0 in accordance with EN13501-1

Curved rooflight system esserlux/ Voute Bluelux therm Curved rooflight system esserlux therm/ Voute Bluelux RPT	Annex A 4.18
Cross section geometry, weight per area, mechanical performance requirements Minimum performance levels or classes in accordance with EN 16153 of the "Macrolux Multiwall LL 7W - 20 mm"	

Curved rooflight system esserlux/ Voute Bluelux therm **Annex B**
Curved rooflight system esserlux therm/ Voute Bluelux RPT

Provisions for design and dimensioning

Dimensioning, installation and execution of the roof kit shall be in compliance with the national technical specifications. These differ in terms of their content as well as their status within the legal frameworks of the member states.

If no national provisions exist, dimensioning can be carried out in accordance with Annexes B 1 and B 2. In case the roof system, in particular the multi-wall sheets are systematically in contact with chemicals, the resistance to these substances shall be checked. Thereby, high concentrations of chemicals in the surrounding air shall be also considered.

Installation, packaging, transport, storage as well as use, maintenance and repair shall be carried out in accordance with the manufacturer's instructions (extract see Annex C).

B 1 Load-bearing capacity and serviceability of the covering

B 1.1 General

The design and arrangement of the multi-wall sheets as described in Section 1.1.1 in the translucent roof kit shall correspond to the specifications given in Annexes A 1 to A 4. The specifications given in Section 2 shall be complied with.

The stability shall be verified for the ultimate limit state (ULS)

$E_d \leq R_d$

and for the serviceability limit state (SLS)

$E_d \leq C_d$.

E_d: design value of the action

R_d: design value of the structural resistance for verification of the ultimate limit state

C_d: design value of the structural resistance for verification of the serviceability limit state

The multi-wall sheets shall not be used for bracing the aluminium structure.

The multi-wall sheets shall not be walked on.

Assessment pertaining to fall-through protection is not included in this ETA.

B 1.2 Design values for actions, E_d

The action resulting from the dead weight of the multi-wall sheets may be neglected in the roof kit verifications. Live loads are not permitted.

The design values for the actions shall be determined in accordance with the applicable European specifications.

The actions E_k shall be increased through multiplication by the factors C_t in consideration of the action duration and based on load.

Load action	Duration of load action	C_t
Wind	very short	1.00
Snow as an extraordinary snow load (e.g. in the low-lying plains of northern Germany)	short: up to one week	1.15
Snow	medium: up to three months	1.20

For the wind and temperature effects to be considered in the load case 'summer' the ψ coefficient defined in EN 1990[1] may be applied. In design situations where the wind is applied as the dominant variable action, the ψ coefficient may be considered in the design value of the structural resistance R_d (see Section B.1.3).

If the roof kit is installed with a substructure angle $\alpha \leq 45°$ in roofs with pitches $\leq 20°$ the negative wind pressure loads (wind suction loads) may be applied in simplified form as acting on the transluscent roof kit area with a constant aerodynamic coefficient c_p.

$$w_e = q_p(z_e) \cdot c_p$$

The gust velocity pressure $q_p(z_e)$ shall be taken from EN 1991-1-4[2].

The coefficient c_p shall be selected in accordance with the roof position and type. For enclosed buildings in which the translucent roof kit is installed in the region H, I or N in accordance with Sections 7.2.3 to 7.2.7 of EN 1991-1-4:2010-12 the external pressure coefficient is $c_{pe} = -0.7$.

If the roof kit is installed on the ridge of a mono-gable roof or a hipped end roof in the region J or K in accordance with Section 7.2.5 or 7.2.6 of EN 1991-1-4:2010-12 with a roof pitch $> 10°$ the factor $c_{pe} = -1.2$ applies for enclosed buildings and $c_{p,net} = -2.0$ for freestanding roofs.

In case of conditions deviating from the specified conditions or use of translucent roof kit in region F, G, L or M in accordance with Sections 7.2.3 to 7.2.7 of EN 1991-1-4:2010-12 the verifications shall be done applying special loads (see Section 1.5 of EN 1991-1-4).

B 1.3 Design values for structural resistance R_d and C_d

The design values for structural resistance R_d and C_d result from the characteristic value of structural resistance R_k in consideration of the material safety factor γ_M, the factor taking into account the effects of media C_u and the temperature factor C_θ as follows:

$$R_d = \frac{R_k}{\gamma_{MR} \cdot C_u \cdot C_\theta} \qquad C_d = \frac{C_k}{\gamma_{MC} \cdot C_u \cdot C_\theta}$$

The following factors shall be applied:

Factor taking into account the effects of media and ageing C_u		1.10
Temperature factor C_θ	Summer (reduction for the temperature effect up to 70°)	1.20
	winter	1.00

The following material safety factors shall be applied as a function of the consequence class (CC) in accordance with EN 1990:

Consequence class	Material safety factor γ_{MR}	Material safety factor γ_{MC}
CC 1	1.25	1.09
CC 2	1.30	1.13

In design situations where wind is considered to be the dominant variable action, the reduction in structural resistance due to temperature may be reduced by means of the ψ coefficient for the summer load case. For this design situation a reduction factor for temperature of $C'_\theta = 1 + \psi \cdot (C_\theta - 1.0)$ may be applied.

The characteristic values for structural resistance R_k and C_k shall be taken from the tables in Annex B 3.1 for the given multi-wall sheets and direction of loading.

[1] EN 1990:2010-12 Eurocode: Basis of structural design; German version EN 1990 A1:2005 + A1:2005/AC:2010

[2] EN 1991-1-4:2010-12 Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions

B 2 Load-bearing capacity and serviceability of the impost

B 2.1 General

The installation and positioning of the impost with the impost profiles in accordance with Section 1.1.5 and Section 1.1.6 must be carried out in accordance with Annexes A 2.2 to A 2.5. The installation details (see Annex D) must be observed.

The imposts are used to take up tensile forces. The tensile forces from wind suction loads are introduced into the imposts via the roof kit covering profiles.

The verification is done on the plane of the acting tensile force F_Z. For each application case the stability verification shall be done for the ultimate limit state;

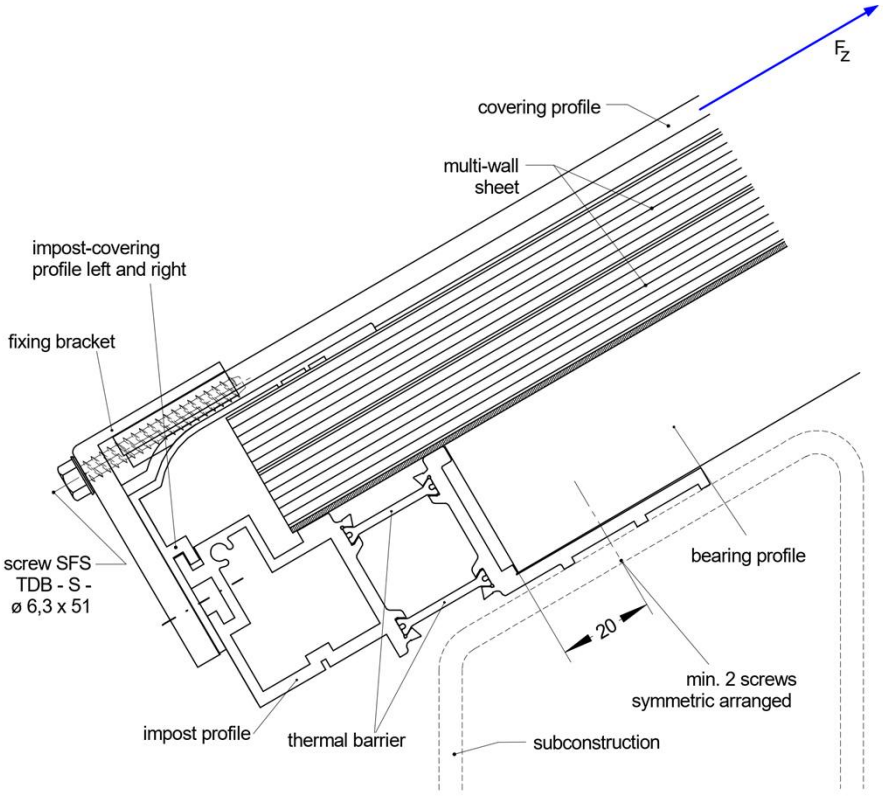
$$\frac{F_{Z,E,d}}{F_{Z,R,d}} \leq 1{,}0$$

$F_{Z,E,d}$: design value of the action

$F_{Z,R,d}$: design value for structural resistance

shall be adhered to.

The verification of the serviceability limit state shall be deemed provided with the verification of the ultimate limit state for load-bearing capacity.



Example: impost with thermal break

B 2.2 Design value of the action, $F_{Z,E,d}$

The design values for the action shall be determined in accordance with the applicable European specifications.

The design value of the action $F_{Z,E,d}$ results from the characteristic value of the wind suction load in consideration of the partial safety factor γ_F, the coefficient ψ and a factor taking into account the duration of the action K_t.

The characteristic action shall be multiplied by the factor K_t. K_t shall be assumed to be 1.0 for the load action resulting from wind loads (very short duration).

B 2.3 Design value of the structural resistance, $F_{Z,R,d}$

B 2.3.1 Roof kit "esserlux" with the impost profiles in accordance with Section 1.1.5

The design value for structural resistance $F_{Z,R,d}$ results from the characteristic value of structural resistance $F_{Z,R,k}$ in consideration of the material safety factor γ_M as follows:

$$F_{Z,R,d} = \frac{F_{Z,R,k}}{\gamma_M}$$

with $\gamma_M = 1{,}1$

The characteristic values for structural resistance $F_{Z,R,k}$ shall be taken from the table in section B 3.2.1 for the given covering.

B 2.3.2 Roof kit "esserlux therm" with the impost profiles in accordance with Section 1.1.6

The design value for structural resistance $F_{Z,R,d}$ results from the characteristic value of structural resistance $F_{Z,R,k}$ in consideration of the material safety factor γ_M, the factor taking into account the effects of media K_u and the temperature factor K_θ as follows:

$$F_{Z,R,d} = \frac{F_{Z,R,k}}{\gamma_M \cdot K_u \cdot K_\theta}$$

Material safety factors and influencing factors

The following material safety factors and influencing factors shall be applied:

Material safety factor γ_M	CC 1	1.25
	CC 2	1.30
Factor taking into account the effects of media and ageing K_u		1.25
Temperature factor K_θ	Summer (70°C)	1.64
	Winter	1.00

The characteristic values for structural resistance $F_{Z,R,k}$ shall be taken from the table in section B 3.2.2 for the given covering.

B 3 Characteristic structural resistances

B 3.1 Characteristic structural resistances of the covering

Covering "PC 10" – Annexes A 4.1" – A 4.8

Multi-wall sheet in accordance with Annex	Radius R ≥ 1,50m R [m]	System	a_p [m]	Characteristic values of structural resistance [kN/m²]			
				downward load		uplift load	
				R_k	C_k	R_k	C_k
A 4.1 Akyver Sun Type 10/4W-7	≤ 2,35	1-span	1,065	1,92	1,92	1,99	1,94
	≤ 4,15		0,710	2,10	1,90	1,47	1,47
			0,533	3,95	3,95	3,34	3,34
A 4.2 Akyver Sun Type 10	≤ 2,35	1-span	1,065	1,67	1,66	1,81	1,77
	≤ 4,15		0,710	1,90	1,74	1,26	1,26
			0,533	3,62	3,62	3,09	3,09
A 4.3 Exolon Multi UV 4/10-6	≤ 2,35	1-span	1,065	1,97	1,96	1,90	1,85
	≤ 4,15		0,710	2,10	1,92	1,44	1,44
			0,533	4,64	4,64	3,23	3,23
A 4.4 Macrolux Multiwall LL 4W 10	≤ 2,35	1-span	1,065	1,77	1,76	1,99	1,94
	≤ 4,15		0,710	2,02	1,85	1,64	1,64
			0,533	3,72	3,72	3,39	3,39
A 4.5 Akyver Sun Type 10/4W-7	≤ 2,35	1-span	1,065	1,93	1,93	1,99	1,94
	≤ 4,15		0,710	2,10	1,92	1,45	1,45
			0,533	3,93	3,93	3,26	3,26
A 4.6 Policarb 10 mm 4W	≤ 2,35	1-span	1,065	2,03	2,02	1,75	1,71
	≤ 4,15		0,710	2,10	1,92	1,31	1,31
			0,533	4,71	4,71	2,99	2,99
A 4.7 Policarb 10 mm 5W	≤ 2,35	1-span	1,065	2,03	2,02	1,99	1,94
	≤ 4,15		0,710	2,10	1,92	1,59	1,59
			0,533	4,38	4,38	3,39	3,39
A 4.8 Lexan Thermoclear LT2UV 10/5R 175	≤ 2,35	1-span	1,065	2,03	2,02	1,91	1,87
	≤ 4,15		0,710	2,10	1,92	1,61	1,61
			0,533	4,74	4,74	3,26	3,26

Covering "PC 10+10" – Annexes A 4.1" – A 4.8

Multi-wall sheet in accordance with Annex	Radius R ≥ 1,50m R [m]	System	a_p [m]	Characteristic values of structural resistance [kN/m²]			
				downward load		uplift load	
				R_k	C_k	R_k	C_k
2 x A 4.1 Akyver Sun Type 10/4W-7	≤ 4,15	1-span	1,065	1,73	1,56	2,22	2,22
2 x A 4.2 Akyver Sun Type 10	≤ 4,15	1-span	1,065	1,73	1,56	1,97	1,97
2 x A 4.3 Exolon Multi UV 4/10-6	≤ 4,15	1-span	1,065	1,73	1,56	2,06	2,06
2 x A 4.4 Macrolux Multiwall LL 4W 10	≤ 4,15	1-span	1,065	1,73	1,56	2,28	2,28
2 x A 4.5 Akyver Sun Type 10/4W-7	≤ 4,15	1-span	1,065	1,73	1,56	2,43	2,43
2 x A 4.6 Policarb 10 mm 4W	≤ 4,15	1-span	1,065	1,73	1,56	1,91	1,91
2 x A 4.7 Policarb 10 mm 5W	≤ 4,15	1-span	1,065	1,73	1,56	2,18	2,18
2 x A 4.8 Lexan Thermoclear LT2UV 10/5R 175	≤ 4,15	1-span	1,065	1,73	1,56	2,08	2,08

Covering "PC 16" – Annexes 4.9 - 4.14

Multi-wall sheet in accordance with Annex	Radius R ≥ 2,40m R [m]	System	a_p [m]	Characteristic values of structural resistance [kN/m²]			
				downward load		uplift load	
				R_k	C_k	R_k	C_k
A 4.9 Akyver Sun Type 16/7W-12 2600	≤ 2,35	1-span	1,065	3,38	3,38	1,50	1,50
	≤ 4,15			1,28	1,28		
A 4.10 Akyver Sun Type 16/7W-12 3000	≤ 2,35	1-span	1,065	3,41	3,41	1,54	1,54
	≤ 4,15			1,35	1,35		
A 4.11 Exolon Multi UV 7/16-14	≤ 2,35	1-span	1,065	2,99	2,99	1,38	1,38
	≤ 4,15			1,19	1,19		
A 4.12 Policarb 16 mm 6W	≤ 2,35	1-span	1,065	3,41	3,41	1,54	1,54
	≤ 4,15			1,35	1,35		
A 4.13 Policarb 16 mm 7W	≤ 2,35	1-span	1,065	2,80	2,80	1,30	1,30
	≤ 4,15			1,14	1,14		
A 4.14 Macrolux Multiwall LL 7W 16 2,6	≤ 2,35	1-span	1,065	2,82	2,82	1,31	1,31
	≤ 4,15			1,15	1,15		
A 4.15 Macrolux Multiwall LL 7W 16 2,7	≤ 2,35	1-span	1,065	3,14	3,14	1,49	1,49
	≤ 4,15			1,05	1,05		

Covering " PC 16+16" – Annexes 4.9 - 4.14

Multi-wall sheet in accordance with Annex	Radius R ≥ 2,40m R [m]	System	a_p [m]	Characteristic values of structural resistance [kN/m²]			
				downward load		uplift load	
				R_k	C_k	R_k	C_k
2 x A 4.9 Akyver Sun Type 16/7W-12 2600	≤ 4,15	1-span	0,710	11,20	10,82	1,77	1,77
			1,065	2,48	2,34		
2 x A 4.10 Akyver Sun Type 16/7W-12 3000	≤ 4,15	1-span	0,710	11,29	10,91	1,82	1,82
			1,065	2,61	2,46		
2 x A 4.11 Exolon Multi UV 7/16-14	≤ 4,15	1-span	0,710	9,89	9,56	1,63	1,63
			1,065	2,30	2,17		
2 x A 4.12 Policarb 16 mm 6W	≤ 4,15	1-span	0,710	11,29	10,91	1,82	1,82
			1,065	2,55	2,44		
2 x A 4.13 Policarb 16 mm 7W	≤ 4,15	1-span	0,710	9,27	8,96	1,53	1,53
			1,065	2,20	2,07		

Multi-wall sheet in accordance with Annex	Radius R ≥ 2,40m R [m]	System	a_p [m]	Characteristic values of structural resistance [kN/m²]			
				downward load		uplift load	
				R_k	C_k	R_k	C_k
2 x A 4.14 Macrolux Multiwall LL 7W 16 2,6	≤ 4,15	1-span	0,710	9,34	9,02	1,55	1,55
			1,065	2,22	2,09		
2 x A 4.15 Macrolux Multiwall LL 7W 16 2,7	≤ 4,15	1-span	0,710	10,40	10,05	1,77	1,77
			1,065	2,07	1,95		

Covering "PC 20" – Annexes 4.15 - 4.17

Multi-wall sheet in accordance with Annex	Radius R ≥ 3,00m R [m]	System	a_p [m]	Characteristic values of structural resistance [kN/m²]			
				downward load		uplift load	
				R_k	C_k	R_k	C_k
A 4.16 Akyver Sun Type 20/7W-12	≤ 4,15	1-span	1,065	1,16	1,16	1,26	1,26
A 4.17 Exolon Multi UV 7/20-14	≤ 4,15	1-span	1,065	1,13	1,13	1,36	1,36
A 4.18 Macrolux Multiwall LL 7W 20	≤ 4,15	1-span	1,065	1,35	1,35	1,54	1,54

B 3.2 Characteristic structural resistances of the impost

B 3.2.1 Roof kit "esserlux" with the impost profiles in accordance with Section 1.1.5

The characteristic values of the structural resistance $F_{Z,R,k}$ shall be taken from the following table depending on the covering:

covering	$F_{Z,R,k}$ [kN]
PC 16+16; PC 20	3,45
PC 16; PC 10	5,18

B 3.2.2 Roof kit "esserlux therm" with the impost profiles in accordance with Section 1.1.6

The characteristic values of the structural resistance $F_{Z,R,k}$ shall be taken from the following table depending on the covering:

covering *	Hight of the profiles [mm]	$F_{Z,R,k}$ [kN]
PC 16+16	72	2,88
PC 20	60	3,45
PC 16	56	3,70

* the “PC 10” covering is not intended for the “esserlux therm” system

Curved rooflight system esserlux/ Voute Bluelux therm **Annex C**
Curved rooflight system esserlux therm/ Voute Bluelux RPT

Thermal resistance

If requirements as to the thermal resistance of the roof kit are imposed, the thermal transmittance U_{CW} shall be determined in accordance with EN ISO 10077-1[1] as the resultant of the thermal transmittance coefficients of the covering, weighted on the basis of the area as well as the length-weighted values of linear thermal transmittance coefficients ψ of the connecting profiles.

The respective area fractions shall be calculated for the translucent roof kit. For the calculation of the design value of the thermal transmittance coefficient U_{CW} of the translucent roof kit, the following equation shall be used:

$$U_{cw} = \frac{\sum(U_p \cdot A_p) + \sum(\Psi_f \cdot l_f)}{A_{ges}} \quad \text{in W/(m²·K)}$$

If the substructure (frame) is to be taken into account, the following formula shall be used:

$$U_{cw} = \frac{\sum(U_p \cdot A_p) + \sum(U_z \cdot A_z) + \sum(\Psi_f \cdot l_f)}{A_{ges}} \quad \text{in W/(m²·K)}$$

where:

- U_P: = thermal transmittance coefficient of the PC multi-wall sheets in W/(m²K)
- A_P: = area of the PC multi-wall sheets in m²
- U_Z: = thermal transmittance coefficient of the frame in W/(m²K)
- A_Z: = area of the frame in m²
- ψ_f: = linear thermal transmittance coefficient at the level of the connecting profiles in W/(m K)
- l_f: = connecting profile length in m
- A_{ges}: = total area of the roof kit including overhang in m²

The values of thermal transmittance U_P of the coverings and ψ_f of the connections shall be taken from Annex C.

In case the substructure is taken into account, the thermal transmittance U_Z shall be determined in accordance with the applicable European specifications e.g. EN ISO 6946[2].

[1] DIN EN ISO 10077-1:2020-10 Thermal performance of windows, doors and shutters - Calculation of thermal transmittance - Part 1: General (ISO 10077-1:2017, Corrected version 2020-02); German version EN ISO 10077-1:2017

[2] DIN EN ISO 6946:2018-03 Building components and building elements - Thermal resistance and thermal transmittance - Calculation method (ISO 6946:2007); German version EN ISO 6946:2017

C 1 Thermal transmittance coefficients of the coverings

Table C 1

Covering	Multi-wall sheet(s) as described in Annex	Vertical installation U_P [W/(m²·K)]	Horizontal installation U_P [W/(m²·K)]
PC 16	A 4.9 – A 4.15	1.9	2,0
PC 16 Pearl	A 4.9 – A 4.10	2.0	2,1
PC 20	A 4.16 – A.4.18	1,6	1,7
PC 20 Pearl	A 4.16	1,8	1,9
PC 10 / PC 10	A 4.1; A 4.3; A 4.5 – A 4.8	1.6	1.7
PC 16 / PC16	A 4.9 – A 4.15	1.1	1.2

The thermal transmittance coefficients U_P depend on the selected covering as well as in part on the multi-wall sheet used and the installation position. Differentiation is made between vertical installations (horizontal heat flow) and horizontal installations (upwards heat flow).

For the purposes of comparing the coverings in terms of EN 673[3] the U_P value for vertical installations shall be used.

[3] DIN EN 673:2011-04 Glass in building - Determination of thermal transmittance (U value) - Calculation method; German version EN 673:2011

C 2 Linear thermal transmittance coefficients at the level of the bearing profiles

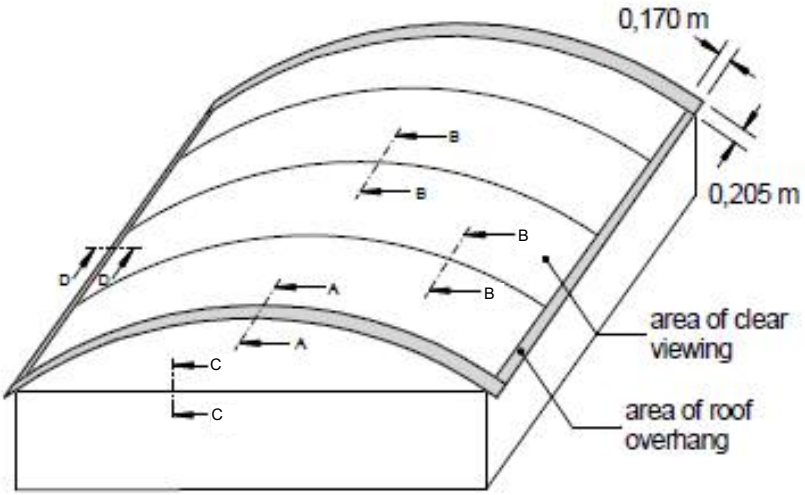


Table C 2: Linear thermal transmittance coefficients at the level of the bearing profiles

Covering	**Multi-wall sheet(s) as described in Annex**	**$\Psi_{B\text{-}B}$ [W/(m·K)]**	**$\Psi_{A\text{-}A}$ [W/(m·K)]**
PC 16	A 4.9 – A 4.15	0.0452	-0.0250
PC 16 Pearl	A 4.9 – A 4.10	0.0418	-0.0350
PC 20	A 4.16 – A.4.18	0.0395	-0.0115
PC 20 Pearl	A 4.16	0.0335	-0.0356
PC 10 / PC 10	A 4.1; A 4.3; A 4.5 – A 4.8	0.0393	-0.0135
PC 16 / PC16	A 4.9 – A 4.15	0.0342	0,0048

The thermal transmittance coefficients ψ_f at the level of the bearing profiles depend on the selected covering as well as in part on the multi-wall sheet used.

For section B–B (sheet butt joint) and for section A-A (gable side) the thermal transmittance coefficients shall be taken from Table C 2. The thermal effect of the fasteners may be neglected. For deviating executions additional verifications are required.

C 3 Linear thermal transmittance at the level of the impost

The execution of the system esserlux/ Voute Bluelux therm or esserlux therm/ Voute Bluelux RPT in terms of thermal performance is differently. Therefor it must be differentiated in those systems.

The thermal transmittance coefficients ψ_f for section D-D as well as for section E-E depend also on the selected covering and can be taken from the tables below. For execution of the gable-side connection with use of the impost profiles as described in Annex A 3.5.1 or A 3.5.2 the ψ values for section D-D can be used on the safe side. For deviating executions additional verifications are required.

Table C 3.1: Linear thermal transmittance coefficients **esserlux/ Voute Bluelux therm** (without thermal barrier profiles)

Covering	**Multi-wall sheet(s) as described in Annex**	**Ψ_{D-D} [W/(m·K)]**	**Ψ_{C-C} [W/(m·K)]**
PC 16	A 4.9 – A 4.15	1.142	0.605
PC 16 Pearl	A 4.9 – A 4.10	1.142	0.590
PC 20	A 4.16 – A.4.18	1.143	0.631
PC 20 Pearl	A 4.16	1.143	0.610
PC 10 / PC 10	A 4.1; A 4.3; A 4.5 – A 4.8	1.141	0.631
PC 16 / PC16	A 4.9 – A 4.15	1.160	0.648

Table C 3.2: Linear thermal transmittance coefficients **esserlux therm/ Voute Bluelux RPT** (with thermal barrier profiles)

Covering	**Multi-wall sheet(s) as described in Annex**	**Ψ_{D-D} [W/(m·K)]**	**Ψ_{C-C} [W/(m·K)]**
PC 16	A 4.9 – A 4.15	0,450	0.605
PC 16 Pearl	A 4.9 – A 4.10	0,450	0.590
PC 20	A 4.16 – A.4.18	0,450	0.631
PC 20 Pearl	A 4.16	0,449	0.610
PC 10 / PC 10	A 4.1; A 4.3; A 4.5 – A 4.8	0,448	0.631
PC 16 / PC16	A 4.9 – A 4.15	0,461	0.648

Curved rooflight system esserlux/ Voute Bluelux therm **Annex D**
Curved rooflight system esserlux therm/ Voute Bluelux RPT

Provisions for installation, packaging, transport, storage, use, maintenance and repair

D 1 Installation

The fixing of the roof kit on the substructure is not the subject of this ETA. The stability shall be verified for the respective substructure in accordance with the valid European specifications.

Before the roof kit is installed, the dimensional stability of the substructure shall be checked. Particular care shall be taken to ensure that the substructure exhibits a rectangular footprint. The compliance of the existing substructure with the substructure applied during the planning and verification of its load-bearing capacity shall be checked visually (the existing substructure and the one receiving the roof kit must be flush).

The installation of the roof kit may only be performed by specialists who are specially trained for this purpose. The installation guidelines of the manufacturer shall be respected. The manufacturer of the roof kit shall inform the specialists that they may only carry out assembly and installation of the roof kit in accordance with his instructions and the provisions of the ETA either through training or through installation instructions published by the manufacturer.

If the translucent roof kit can systematically come into contact with chemical substances, the resistance to these substances of the multi-wall sheets in particular shall be checked. The multi-wall sheets are sealed by the manufacturer. This adhesive must remain in place during assembly of the roof kit.

The position of the impost profiles on the substructure, as well as the spacing between the impost profile fixing screws, are given in a document delivered with the roof kit. The bearing profiles are placed in the impost profiles and are fixed in the substructure with the same screws that are used to fix the impost profiles in the substructure. Their number is determined by static calculation.

"esserlux" and "Voute Bluelux therm" roof kits

During installation, the multi-wall sheets are placed on the pre-installed bearing profiles and pushed into the impost profiles. The covering profile is then inserted into the impost profile at both ends. It is tensioned by two tension screws inserted into the impost profiles and screwed into the cavity of the said profile. When the thickness of the multi-wall sheets is strictly less than 20mm, a washer is placed between the screw head and the impost profile, otherwise a 5mm thick aluminium spacer is placed. Once stretched, the covering profile is fixed in the bearing profile by self-drilling screws. Their number per covering profile is given by the number of holes in the profile. The last assembly step is the installation of the seal II between the impost profile and the multi-wall sheet.

"esserlux therm" and "Voute Bluelux RPT" roof kits

During installation, the multi-wall sheets are placed on the pre-installed bearing profiles and laid in the impost profiles. The multi-wall sheets are held on the impost profiles by covering profiles screwed into the impost profiles. The fixing brackets of the covering profile are fixed on the impost profiles by screws provided or this purpose at the junction between the multi-wall plates. The covering profile is then inserted into the two fixing brackets at both ends. It is tensioned by two tension screws inserted into the impost profiles and screwed into the cavity of the said profile. Once stretched, the covering profile is fixed in the bearing profile by self-drilling screws. Their number per covering profile is given by the number of holes in the profile.

Every translucent roof kit shall be installed and connected to the adjacent structure in a manner ensuring that no moisture can penetrate into it and avoiding thermal bridges. These details shall be evaluated on a case-by-case basis.

D 2 Packaging, transport and storage

The components of the roof kit shall be stored and transported in accordance with the manufacturer's specifications such that the components cannot be damaged. In particular, for multi-wall sheets made from polycarbonate it shall be ensured that only those surfaces with UV protective coatings are exposed to UV radiation. The packaging shall protect the material from moisture and weather effects whilst avoiding heat build-up inside the packaging. It is the responsibility of the manufacturer to ensure that this information is passed on to the people in charge.

D 3 Use, maintenance, repair

The roof kit in installed condition is not a walk-on system. For installation purposes, the roof kit may be walked on by a single person using boards laid across the substructure (at least two bearing profiles) for support; the boards shall run perpendicular to the tensioning direction of the bearing profiles.

Within the scope of maintenance, the installed roof kit shall be visually inspected by a qualified expert once a year. The manufacturer shall be consulted if the PC multi-wall sheets exhibit surface cracks or damage or if they are strongly discoloured. The aluminium components of the roof kit shall be examined for pronounced corrosion within the scope of a visual inspection. Repair shall be arranged where necessary.

Only the components listed in the ETA may be used for replacement of components.

Cleaning agents shall be free of solvents and abrasives. Chemical and biological cleaning additives may only be used if they have been proven to be compatible with polycarbonate, otherwise only water and a soft cloth shall be used to clean the multi-wall sheets.