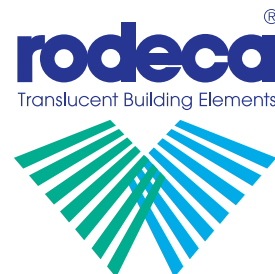




Rodeca GmbH

Declaration of Performance

DoP-No. 2630-25-6-U-HD-000



1. Unique identification code of the product-type:

Light transmitting flat multiwall polycarbonate sheet PC 2630-25-6-U-HD

2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11 (4) of the CPR:

Rodeca PC 2630-25-6-U HD coloured

3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:

For internal and external use in roofs, walls and ceilings

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11 (5):

Rodeca GmbH, Phone: +49 (0)208 765 02 0
Freiherr-vom-Stein-Str.165 Fax: +49 (0)208 765 02 11
45473 Mülheim a.d. Ruhr E-Mail: info@rodeca.de
Germany

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

-

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:

System 3

7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

EN 16153 : 2013 +A1:2015

8. Declared performance

Essential characteristics	Performance	Harmonised technical specification
Reaction to fire ⁽¹⁾	B - s1, d0	EN 16153:2013+A1:2015
Resistance to fire	NPD	
External fire performance	F-Roof	
Water vapour permeability	3.8×10^{-5} mg/m ² ·h·Pa	
Water-/air permeability	pass	
Release of dangerous substances	NPD	
Dimensional tolerances	pass	
Small hard body impact resistance	pass	
Large soft body impact resistance	NPD	
Mechanical resistance	NPD	
Thermal transmittance	NPD	
Light transmittance	NPD	
Total solar energy transmittance	NPD	
Direct airborne sound insulation	NPD	
Resistance to fixings	Method of fixing (see manufacturer's datasheet)	
Durability, as variation after ageing		
- of yellowness index	Δ D	
- of light transmission	Δ D	
- of deformation flexural modulus	Cu 1	
- of tensile strength	Ku 1	
(1) Notified Body 1168 / NPD = No performance determined		

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

RODECA GmbH
Freiherr-vom-Stein-Str. 165
45473 Mülheim a. d. Ruhr
Tel: 0208/76502-0
Fax: 0208/76502-11
E-Mail: info@rodeca.de

Nikolas Jansen
Mülheim an der Ruhr, 07.09.2017



Rodeca GmbH

Leistungserklärung

DoP-No. 2630-25-6-U-HD-000



1. Eindeutiger Kenncode des Produkttyps:

Lichtdurchlässige, flache Stegmehrfachplatte aus Polycarbonat PC 2630-25-6-U-HD

2. Typen-, Chargen- oder Seriennummer oder ein anderes Kennzeichen zur Identifikation des Bauprodukts gemäß Artikel 11 Absatz 4:

Rodeca PC 2630-25-6-U-HD gefärbt

3. Vom Hersteller vorgesehener Verwendungszweck oder vorgesehene Verwendungszwecke des Bauprodukts gemäß der anwendbaren harmonisierten technischen Spezifikation:

Für Innen- und Außenanwendungen an Dächern, Wänden und Decken

4. Name, eingetragener Handelsname oder eingetragene Marke und Kontaktanschrift des Herstellers gemäß Artikel 11 Absatz 5:

Rodeca GmbH,	Phone:	+49 (0)208 765 02 0
Freiherr-vom-Stein-Str.165	Fax:	+49 (0)208 765 02 11
45473 Mülheim a.d. Ruhr	E-Mail:	info@rodeca.de
Germany		

5. Gegebenenfalls Name und Kontaktanschrift des Bevollmächtigten, der mit den Aufgaben gemäß Artikel 12 Absatz 2 beauftragt ist:

-

6. System oder Systeme zur Bewertung und Überprüfung der Leistungsbeständigkeit des Bauprodukts gemäß Anhang V:

System 3

7. Im Falle der Leistungserklärung, die ein Bauprodukt betrifft, das von einer harmonisierten Norm erfasst wird:

EN 16153 : 2013 +A1:2015

8. Erklärte Leistung

Wesentliche Merkmale	Leistung	Europäische Norm
Brandverhalten ⁽¹⁾	B - s1, d0	EN 16153:2013+A1:2015
Feuerwiderstand	NPD	
Verhalten bei Beanspruchung durch Feuer von außen	F-Roof	
Wasserdampfdurchlässigkeit	$3,8 \times 10^{-5}$ mg/m ² ·h·Pa	
Wasser-/Luftdurchlässigkeit	Bestanden	
Freisetzung gefährlicher Stoffe	NPD	
Maßtoleranzen	Bestanden	
Schlagbeanspruchung bei Auftreffen eines kleinen harten Körpers	Bestanden	
Schlagbeanspruchung bei Auftreffen eines großen weichen Körpers (Zusammenbau)	NPD	
Mechanische Festigkeit	NPD	
Wärmedurchgangskoeffizient	NPD	
Lichttransmissionsgrad	NPD	
Gesamtenergiedurchlassgrad / Strahlungstransmissionsgrad	NPD	
Luftschalldämmung	NPD	
Festigkeit an den Befestigungsstellen	Befestigungsmethode (siehe Datenblatt des Herstellers)	
Dauerhaftigkeit, als Veränderung nach der Alterung		
- des Gelbwertes	Δ D	
- des Lichttransmissionsgrades	Δ D	
- des Verformungsverhaltens	Cu 1	
- der Zugfestigkeit	Ku 1	
(1) Notified Body 1168 / NPD = No performance determined		

9. Die Leistung des Produkts gemäß den Nummern 1 und 2 entspricht der erklärten Leistung nach Nummer 8.

Verantwortlich für die Erstellung dieser Leistungserklärung ist allein der Hersteller gemäß Nummer 4.

Unterzeichnet für den Hersteller und im Namen des Herstellers von:

RODECA GmbH
 Freiherr-vom-Stein-Str. 165
 45473 Mülheim a. d. Ruhr
 Tel.: 0208 / 765 02-0
 Fax: 0208 / 765 02-11
 E-Mail: info@rodeca.de

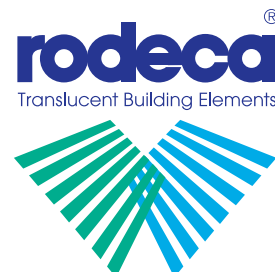
Nikolas Jansen
 Mülheim an der Ruhr, 07.09.2017



Rodeca GmbH

Declaration of Performance

DoP-No. 2630-25-6-U-HD-185



1. Unique identification code of the product-type:

Light transmitting flat multiwall polycarbonate sheet PC 2630-25-6-U-HD

2. Type, batch or serial number or any other element allowing identification of the construction product as required under Article 11 (4) of the CPR:

Rodeca PC 2630-25-6-U HD coloured Duocolor

3. Intended use or uses of the construction product, in accordance with the applicable harmonised technical specification, as foreseen by the manufacturer:

For internal and external use in roofs, walls and ceilings

4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required under Article 11 (5):

Rodeca GmbH,	Phone:	+49 (0)208 765 02 0
Freiherr-vom-Stein-Str.165	Fax:	+49 (0)208 765 02 11
45473 Mülheim a.d. Ruhr	E-Mail:	info@rodeca.de
Germany		

5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):

-

6. System or systems of assessment and verification of constancy of performance of the construction product as set out in CPR, Annex V:

System 3

7. In case of the declaration of performance concerning a construction product covered by a harmonised standard:

EN 16153 : 2013 +A1:2015

8. Declared performance

Essential characteristics	Performance	Harmonised technical specification
Reaction to fire ⁽¹⁾	B - s1, d0	EN 16153:2013+A1:2015
Resistance to fire	NPD	
External fire performance	F-Roof	
Water vapour permeability	3.8×10^{-5} mg/m ² ·h·Pa	
Water-/air permeability	pass	
Release of dangerous substances	NPD	
Dimensional tolerances	pass	
Small hard body impact resistance	pass	
Large soft body impact resistance	NPD	
Mechanical resistance	NPD	
Thermal transmittance	NPD	
Light transmittance	NPD	
Total solar energy transmittance	NPD	
Direct airborne sound insulation	NPD	
Resistance to fixings	Method of fixing (see manufacturer's datasheet)	
Durability, as variation after ageing		
- of yellowness index	Δ D	
- of light transmission	Δ D	
- of deformation flexural modulus	Cu 1	
- of tensile strength	Ku 1	
(1) Notified Body 1168 / NPD = No performance determined		

9. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 8. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.

Signed for and on behalf of the manufacturer by:

RODECA GmbH
 Freiherr-vom-Stein-Str. 165
 45473 Mülheim a. d. Ruhr
 Tel: 0208/76502-0
 Fax: 0208/76502-11
 E-Mail: info@rodeca.de

Nikolas Jansen
 Mülheim an der Ruhr, 07.09.2017



Rodeca GmbH

Leistungserklärung

DoP-No. 2630-25-6-U-HD-185



1. Eindeutiger Kenncode des Produkttyps:

Lichtdurchlässige, flache Stegmehrfachplatte aus Polycarbonat PC 2630-25-6-U-HD

2. Typen-, Chargen- oder Seriennummer oder ein anderes Kennzeichen zur Identifikation des Bauprodukts gemäß Artikel 11 Absatz 4:

Artikel 11 Absatz 4:

Rodeca PC 2630-25-6-U-HD gefärbt Duocolor

3. Vom Hersteller vorgesehener Verwendungszweck oder vorgesehene Verwendungszwecke des Bauprodukts gemäß der anwendbaren harmonisierten technischen Spezifikation:

Für Innen- und Außenanwendungen an Dächern, Wänden und Decken

4. Name, eingetragener Handelsname oder eingetragene Marke und Kontaktanschrift des Herstellers gemäß Artikel 11 Absatz 5:

Rodeca GmbH,	Phone:	+49 (0)208 765 02 0
Freiherr-vom-Stein-Str.165	Fax:	+49 (0)208 765 02 11
45473 Mülheim a.d. Ruhr	E-Mail:	info@rodeca.de
Germany		

5. Gegebenenfalls Name und Kontaktanschrift des Bevollmächtigten, der mit den Aufgaben gemäß Artikel 12 Absatz 2 beauftragt ist:

-

6. System oder Systeme zur Bewertung und Überprüfung der Leistungsbeständigkeit des Bauprodukts gemäß Anhang V:

System 3

7. Im Falle der Leistungserklärung, die ein Bauprodukt betrifft, das von einer harmonisierten Norm erfasst wird:

EN 16153 : 2013 +A1:2015

8. Erklärte Leistung

Wesentliche Merkmale	Leistung	Europäische Norm
Brandverhalten ⁽¹⁾	B - s1, d0	EN 16153:2013+A1:2015
Feuerwiderstand	NPD	
Verhalten bei Beanspruchung durch Feuer von außen	F-Roof	
Wasserdampfdurchlässigkeit	$3,8 \times 10^{-5}$ mg/m ² ·h·Pa	
Wasser-/Luftdurchlässigkeit	Bestanden	
Freisetzung gefährlicher Stoffe	NPD	
Maßtoleranzen	Bestanden	
Schlagbeanspruchung bei Auftreffen eines kleinen harten Körpers	Bestanden	
Schlagbeanspruchung bei Auftreffen eines großen weichen Körpers (Zusammenbau)	NPD	
Mechanische Festigkeit	NPD	
Wärmedurchgangskoeffizient	NPD	
Lichttransmissionsgrad	NPD	
Gesamtenergiedurchlassgrad / Strahlungstransmissionsgrad	NPD	
Luftschalldämmung	NPD	
Festigkeit an den Befestigungsstellen	Befestigungsmethode (siehe Datenblatt des Herstellers)	
Dauerhaftigkeit, als Veränderung nach der Alterung		
- des Gelbwertes	ΔD	
- des Lichttransmissionsgrades	ΔD	
- des Verformungsverhaltens	Cu 1	
- der Zugfestigkeit	Ku 1	
(1) Notified Body 1168 / NPD = No performance determined		

9. Die Leistung des Produkts gemäß den Nummern 1 und 2 entspricht der erklärten Leistung nach Nummer 8.

Verantwortlich für die Erstellung dieser Leistungserklärung ist allein der Hersteller gemäß Nummer 4.

Unterzeichnet für den Hersteller und im Namen des Herstellers von:

RODECA GmbH
Freiherr-vom-Stein-Str. 165
45473 Mülheim a. d. Ruhr
Tel: 0208 / 765 02-0
Fax: 0208 / 765 02-11
E-Mail: info@rodeca.de

Nikolas Jansen
Mülheim an der Ruhr, 07.09.2017

Environmental Product Declaration (EPD)



Declaration Code: EPD-RLE-33.0



Rodeca GmbH

Transparent building elements

Translucent building elements



Basis:

DIN EN ISO 14025
EN15804

Company EPD
Environmental
Product Declaration

Publication date:
22.02.2019

Next revision:
22.02.2024



[www.ift-rosenheim.de/
published EPDs](http://www.ift-rosenheim.de/published-EPDs)

Environmental Product Declaration (EPD)



Declaration Code: EPD-RLE-33.0

Programme operator	ift Rosenheim GmbH Theodor Gietl Straße 7-9 D-83026 Rosenheim		
Practitioner of the LCA	brands & values GmbH Vagtstr. 48/49 28203 Bremen		
Declaration holder	Rodeca GmbH Freiherr-vom-Stein-Straße 165 45473 Mülheim an der Ruhr		
Declaration code	EPD-RLE-33.0		
Designation of declared product	Translucent building elements		
Scope	Rodeca translucent building elements made of polycarbonate are suitable for use in façades and roofs and can also be used as internal partitions in exhibition stand construction and as room dividers in large offices. They are translucent and thermally insulating and are dimensionally and colour-resistant to hail and solar radiation. The translucent building elements are available in 30 mm, 40 mm, 50 mm and 60 mm thicknesses.		
Basis	This EPD was prepared on the basis of EN ISO 14025:2011 and EN 15804:2012+A1:2013. In addition, the "Allgemeiner Leitfaden zur Erstellung von Typ II Umweltproduktdeklarationen" (Guidance on preparing Type III Environmental Product Declarations) applies. The declaration is based on the PCR documents "PCR Part A" PCR-A-0.1:2018 and "Façades and roofs made of glass and plastic" PCR-FA-3.1:2018.		
Validity	Publication date: 22.02.2019	Last revision: 22.02.2019	Next revision: 22.02.2024
	This verified Company Environmental Product Declaration (company EPD) applies solely to the specified products and is valid for a period of 5 years from the date of publication in accordance with DIN EN 15804.		
LCA basis	The LCA was prepared in accordance with DIN EN ISO 14040 and DIN EN ISO 14044. The base data includes both the data collected at the production site of Rodeca GmbH and the generic data derived from the "GaBi 8" database. LCA calculations were carried out for the included "cradle to gate life cycle with options" (cradle to gate with options) including all upstream processes (e.g. raw material extraction, etc.).		
Notes	The "Conditions and Guidance on the Use of ift Test Documents" apply. The declaration holder assumes full liability for the underlying data, certificates and verifications.		

Prof. Ulrich Sieberath
Director of Institute

Susanne Volz
External Verifier

1 General product information

Product definition

The EPD relates to the product group “Transparent building elements” and applies to:

1 m² of **Translucent building elements**
made by Rodeca GmbH.

Four thicknesses of the translucent building elements made by Rodeca GmbH are available:

- 30 mm
- 40 mm
- 50 mm
- 60 mm

Only one version each of thicknesses 30 mm, 50 mm and 60 mm is available, therefore there is no worst case. However, a worst case is developed for translucent building elements of 40 mm thickness. Rodeca offers the following versions of 40 mm translucent building elements:

No.	Panel	Weight kg/m ² .*
1	2540-4	4.0
2	2540-4 MC	4.0
3	2540-6	4.2
4	2540-7	4.3
5	2540-10	4.2

* (excl. frame system and packaging)

Due to the fact that the models do not differ in the composition of the input materials but only in mass, the worst case is based on the heaviest model (2540-7 with a weight of 4.3 kg/ m²).

The reference period is the year 2017.

Product description

LBE 30mm (PC 2530-4)

The 30 mm thick panels have a building width of 333 mm. Due to the thickness and the building width, they are used mainly for smaller continuous wall lights and cold halls, e.g. agricultural halls.

LBE 40 mm (PC 2540-XX)

The 40 mm thick panels with reliable tongue and groove connection are 500 mm wide. The panels differ in structure due to the different number of insulating air cavities which has a significant influence on the U-value.



The U-values of these panels range from 1.4 to approx. 1.0 W/m²K (according to DIN EN ISO 10077-2) depending on the chosen product and the installation location.

The perimeter frame profiles of the panels are available as thermal break and non-thermal break versions. The panels are not only optimally suited for integration in façades but also provide optimal and long lasting solutions for sloped roof glazing.

LBE 50 mm (PC 2550-10)

The 50 mm thick panels with a building width of 495 mm have 10 layers and achieve an U_{cw}-value of approx. 1.0 W/m²K (according to DIN EN ISO 10077-2), depending on installation location. The translucent façade system has also been granted a German national technical approval including thermal break frame profiles.

The panel is available in the standard colours crystal and opal. From a clearly defined minimum quantity the panel can also be produced body tinted in one colour or in the two-colour “duocolor” version.

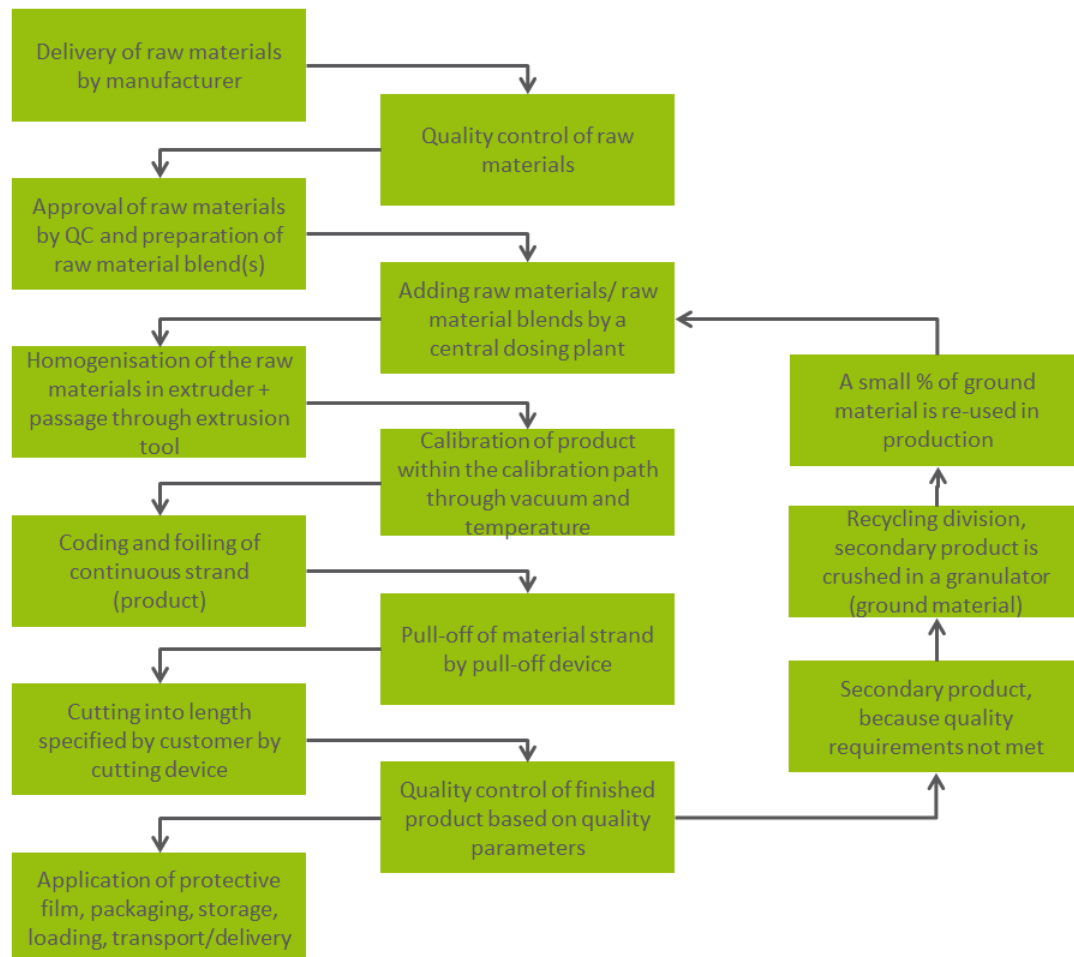
LBE 60 mm (PC 2560-12)

The 60 mm thick panels with a building width of 500 mm have 10 air cavities and achieve an U_{cw}-value of approx. 0.87 W/m²K (according to DIN EN ISO 10077-2). This system is particularly suitable for premium industrial glazing and roof glazing with the required minimum pitch, as well as for any applications with high requirements for thermal insulation. Verification of stability compliant with the German general technical approval guarantees product safety even under extreme weather conditions. Depending on the project brief you can choose between different versions of UV protection, promoting a long service life of the product. The classification as a fire-rated construction product with reaction to fire class B-s1, d0 in accordance with DIN EN 13501 guarantees a wide range of applications and ensures active building protection.

The panel is available in the standard colours crystal and opal. From a minimum quantity of 300 m² it can also be produced body tinted in one colour.

For a detailed product description refer to the manufacturer specifications at www.rodeca.de or the product specifications of the respective offer/quotation.

Product manufacture



Application

Rodeca translucent building elements made of polycarbonate are suitable for use in façades and roofs and can also be used as internal partitions in exhibition stand construction and as room dividers in large offices. They are translucent and thermally insulating and are dimensionally and colour-resistant to solar radiation and hail. The translucent building elements are available in 30 mm, 40 mm, 50 mm and 60 mm thicknesses.

Evidence (optional)

The following national technical approvals are held:

- Z-10.1-327
"PC 2540", "PC 2540 AF 50", "PC 2540 AF100" and "PC2600-40-7-U AF 49404000" as well as "PC 1540", "PC1540 AF 50", "PC 1540 AF100" and "PC 1600-40-7-U AF 49404000"
- Z-10.1-466
"PC 2550-10", "PC 2550-10 AF 60" and "PC 2550-10 AF 120"
- Z-10.1-656
"PC 2560-12", "PC 2560-12 AF 60" and "PC 2560-12 AF 120"

Additional information

For further information refer to the website www.rodeca.de.

2 Materials used

Primary materials

The primary materials used are listed in the LCA (see Section 7).

Declarable substances

The polycarbonate products used do not contain any any substances from the REACH candidate list (declaration dated 10.01.2019).

All relevant safety data sheets are available from Rodeca GmbH .

3 Construction process stage

Processing recommendations, installation

Observe the instructions for assembly/installation, operation, service/maintenance and disassembly. See www.rodeca.de

4 Use stage

Emissions to the environment

No emissions to indoor air, water and soil are known (if applicable, VOC emissions).

Reference service life (RSL)

The RSL information was provided by the manufacturer. The RSL shall refer to the declared technical and functional performance of the product within the building. It shall be established in accordance with specific rules set out in the European product standards and shall also take into account ISO 15686-1, -2, -7 and -8. Where European product standards provide guidance on determining RSL, such guidance shall have priority. If it is not possible to determine the service life as the RSL in accordance with ISO 15686, the table "Nutzungsdauern von Bauteilen zur Lebenszyklusanalyse nach BNB" (Service life of building components for life cycle analysis in accordance with the Sustainable Construction evaluation system) of the German Federal Institute for Research on Building, Urban Affairs and Spatial Development) can be used. For further information and explanations refer to www.nachhaltigesbauen.de.

For this EPD the following applies:

The reference service life (RSL) can be determined for a "cradle to gate - with options" EPD only if all of the modules A1- A3 and B1-B5 are specified.

The manufacturer states that the Translucent building elements manufactured by Rodeca GmbH can be specified for a service life of 30 years.

The service life is dependent on the characteristics of the product and the in-use conditions. The characteristics described in the EPD are applicable, in particular the characteristics listed below:

- Outdoor environment: climatic influences may have a negative impact on the reference service life
- Indoor environment: no influences known that have a negative impact on the reference service life

The service life solely applies to the characteristics specified in this EPD or the corresponding references.

The reference service life (RSL) does not reflect the actual life span, which is usually determined by the service life and the refurbishment of a building. It does not give any information on the useful life, warranty referring to performance characteristics or guarantee.

5 End-of-life stage

Possible end-of-life stages

At the end of their service life the translucent building elements are separated into polycarbonate and aluminium as well as nylon, polypropylene and thermoplastic elastomers. Aluminium is recycled in line with standard practice. Nylon, polypropylene and thermoplastic elastomers are disposed of separately in a waste incineration plant. The amount of energy recovered should be considered as a by-product of the disposal process. The end-of-waste status is reached with the disposal of slag and ash as residual waste. Two scenarios are considered for the disposal of polycarbonate. In scenario 1 the polycarbonate fractions of the translucent building elements are regranulated into polycarbonate granules. In scenario 2 polycarbonate is incinerated at the end of its service life in a waste incineration plant.

Disposal routes

The LCA includes the average disposal routes.

All life cycle scenarios are detailed in the Annex.

6 Life Cycle Assessment (LCA)

Environmental product declarations are based on life cycle assessments (LCAs) which use material and energy flows for the calculation and subsequent representation of environmental impacts.

Such a life cycle assessment was developed as the basis for Translucent building elements. The LCA is in conformity with EN 15804 and the international standards DIN EN ISO 14040, DIN EN ISO 14044, ISO 21930 and EN ISO 14025.

The LCA is representative of the products presented in the declaration and the specified reference period.

6.1 Definition of goal and scope

Goal

The goal of the LCA is to demonstrate the environmental impacts of Translucent building elements. In accordance with EN 15804, the environmental impacts covered by this Environmental Product Declaration are presented for the entire product life cycle in the form of basic information. Apart from these, no other environmental impacts have been specified/presented.

Data quality, data availability and geographical and time-related system boundaries

The specific data originate exclusively from the fiscal year 2017. They were collected on-site at the plant located in Mülheim and originate in parts from company records and partly from values directly obtained by measurement.

The generic data originate from various data bases of the GaBi 8.7 software. The current versions of the data bases were used. More ancient data originate also from this database and are partly more than 10 years old. No other generic data were used for the calculation.

Data gaps were either filled with comparable data or conservative assumptions, or the data were cut off in compliance with the 1% rule.

The life cycle was modelled using the sustainability software tool "GaBi 8" for the development of Life Cycle Assessments.

Scope / system boundaries

The system boundaries refer to the supply of raw materials and purchased parts, manufacture/production and end-of-life stage of Translucent building elements (cradle to gate with options).

The product stage covers the production of the necessary raw materials including all upstream processes (A1) as well as the necessary transport for procurement (A2). The production of the declared unit includes also the necessary ancillary materials and consumables and their upstream processes (A3).

The system boundaries of module A1-3 cover all raw material extraction processes, both for material and energy flows, from cradle to gate, their further processing into pre- and intermediate products up to manufacture.

Transport is covered by generic data sets: the input-related system boundary of truck transport is the upstream processes of the fuels while the output-related system boundary is the emissions generated (exhaust gases).

Cut-off criteria

All data collected from the parts list were taken into account where possible. This meant that material flows with a mass ratio of less than 1% could also be included in the calculation. The tables below show the substances that could not be taken into account: The cut off criteria (< 1%, total <5%) were complied with. This LCA does not include the plants/facilities and infrastructure required for manufacture.

The wooden pallets used for packaging were cut off because they are reused. Only the weight is taken into account for transport, the remainder is cut off.

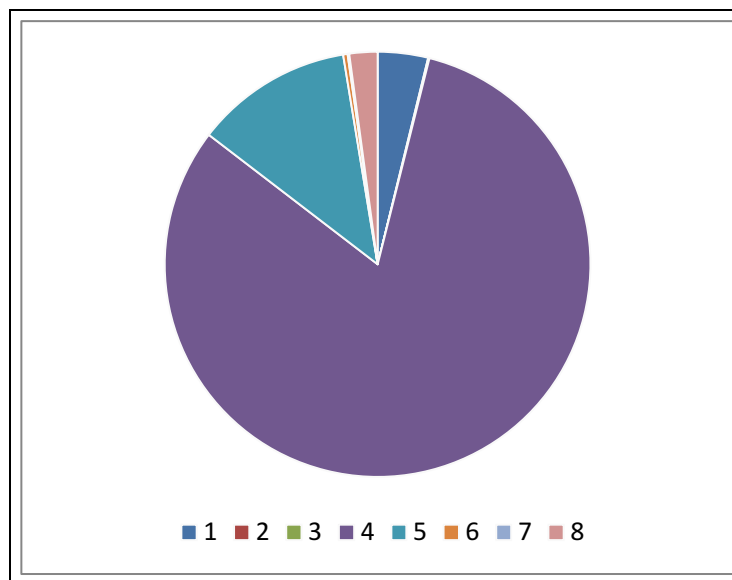
The aluminium frames are supplied by an external company. There is no information on the manufacturing process (offcuts, energy demand, etc.). For the frame, the model uses the aluminium extrusion profile (AlMgSi) data set at the quantity of frame purchased and used without losses.

6.2 Inventory analysis

Goal	All material and energy flows are described below. The processes covered are presented as input and output parameters and refer to the declared/functional units.
Life cycle stages	The Annex shows the entire life cycle of Translucent building elements. The product stage "A1 – A3", construction process stage "A4 – A5", end-of-life stage "C2 – C3" and the benefits and loads beyond the system boundaries "D" were taken into consideration.
Benefits	The below benefits have been defined as per EN 15804: • Benefits from recycling • Benefits (thermal and electrical) from incineration
Allocation procedures Allocation of co-products	The manufacture of Translucent building elements does not produce any allocations.
Allocations for re-use, recycling and recovery	If the Translucent building elements are reused/recycled and recovered during the product stage (rejects), the components are shredded and then sorted into their original pure components, if necessary. The system boundaries of the Translucent building elements were set following their disposal with reaching their end-of-waste status.
Allocations beyond life cycle boundaries	Manufacture of the translucent building elements uses secondary material in the form of polycarbonate regranulate (13%) and secondary aluminium (54%). The system boundary set for the recycled material refers to collection.
Secondary material	The use of secondary material in module A3 by the company Rodeca GmbH was considered. Secondary material is used.
Inputs	The LCA includes the following production-relevant inputs: Energy The electricity mix is based on "Strommix Ökostrom" (ecological electricity mix), the recycle production is based on the electricity mix of the local electricity supplier. Part of the process heat is used for space heating at the production site. However this cannot be quantified, so a "worst case" figure was used for the product. Water The individual process steps for the manufacture of Translucent building elements consume only a small amount of water which was allocated to the products. The consumption of fresh water specified in Section 6.3 originates among others from the upstream processes of the pre-products.

Raw material/pre-products

The chart below shows the share of raw materials/pre-products in %.



No.	Material	Mass in %
1	Aluminium	3.83%
2	Polycarbonate ground material	0.08%
3	PA66	0.02%
4	Polycarbonate granules	81.49%
5	Polycarbonate regrgranulate	11.99%
6	Polypropylene, silicone neutrally cross-linked	0.33%
7	Water	0.13%
8	Other	2.13%

Ancillary materials and consumables

The ancillary materials and consumables required for the manufacture of Translucent building elementss are included in the life cycle assessment.

Product packaging

The amounts used for product packaging are as follows:

No.	Material	Mass in kg			
		30mm	40mm	50mm	60mm
1	Protective film	0.004	0.004	0.004	0.004
2	Wooden palette	0.091	0.091	0.091	0.091
3	PP-sheets	0.007	0.007	0.007	0.007
4	Shrink wrap	0.005	0.005	0.005	0.005
3	Edge protection	0.003	0.003	0.003	0.003
4	Other small parts	0.001	0.001	0.001	0.001

Outputs

The LCA includes the production-relevant outputs per 1 m² of Translucent building elements:

No.	Material	Mass in kg			
		30mm	40mm	50mm	60mm
1	Product incl. packaging	3.746	4.646	5.346	6.146
2	Waste	0.649	0.822	0.955	1.108
3	PC offcuts	0.622	0.787	0.915	1.061
4	Ground material	0.003	0.004	0.005	0.006
3	Packaging	0.007	0.009	0.010	0.012
4	Waste water	0.017	0.022	0.025	0.029

6.3 Impact assessment**Goal**

The impact assessment covers both inputs and outputs. The impact categories applied are named below:

Impact categories

The models for impact assessment were applied as described in EN 15804-A1.

The impact categories presented in the EPD are as follows:

- Depletion of abiotic resources (fossil fuels);
- Depletion of abiotic resources (elements);
- Acidification of soil and water;
- Ozone depletion;
- Global warming;
- Eutrophication;
- Photochemical ozone creation.

Waste

The waste generated during the production of 1 m² of Translucent building elements is evaluated and shown separately for the fractions trade wastes, special wastes and radioactive wastes. Since waste handling is modelled within the system boundaries, the amounts shown refer to the deposited wastes. A portion of the waste indicated is generated during the manufacture of the pre-products.

Results per 1 m ² of Translucent building elements - 30mm										
Environmental impacts	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Global warming potential	kg CO ₂ -equiv.	14.0	0.028	0.054	0.15	0.028	1.74	9.58	-13.10	-4.41
Depletion potential of stratospheric ozone layer	kg R11-equiv.	6.77E-10	7.62E-16	7.01E-16	4.10E-15	7.43E-16	1.43E-09	1.42E-09	-2.32E-10	-2.33E-10
Acidification potential of soil and water	kg SO ₂ -equiv.	0.023	2.43E-05	4.04E-06	1.18E-04	2.37E-05	4.63E-03	7.56E-04	-0.02	-9.90E-03
Eutrophication potential	kg PO ₄ ³⁻ -equiv.	3.50E-03	5.41E-06	8.43E-07	2.54E-05	5.28E-06	4.34E-04	1.38E-04	-3.06E-03	-8.80E-04
Formation potential of tropospheric ozone	kg C ₂ H ₄ -equiv.	2.08E-03	-7.43E-07	3.80E-07	1.31E-06	-7.25E-07	2.96E-04	7.18E-05	-2.47E-03	-6.96E-04
Depletion of abiotic resources (ADP elements)	kg Sb-equiv.	4.47E-05	3.01E-09	3.74E-10	1.62E-08	2.93E-09	9.64E-07	1.92E-07	-4.25E-05	-2.03E-06
Depletion of abiotic resources (ADP fossil fuels)	MJ	283.0	0.38	6.05E-03	2.04	0.37	18.20	2.60	-270.00	-58.0
Use of resources	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Renewable primary energy as energy source	MJ	45.50	0.026	0.052	0.14	0.025	10.8	0.26	-30.7	-16.8
Renewable primary energy for material use	MJ	0.05	0.00	-0.05	0.00	0.00	0.00	0.00	0.00	0.00
Total use of renewable primary energy	MJ	45.6	0.026	1.18E-03	0.14	0.025	10.8	0.26	-30.7	-16.8
Non-renewable primary energy as energy source	MJ	214	0.38	0.69	2.04	0.37	31.3	89.7	-285.0	-73.2
Renewable primary energy for material use	MJ	87.4	0.00	-0.68	0.00	0.00	-1.07	-86.7	0.00	0.00
Total use of non-renewable primary energy	MJ	301	0.38	7.27E-03	2.04	0.37	30.3	2.94	-285.0	-73.2
Use of secondary materials	kg	0.62	0.00	0.00	0.00	0.00	0.0E+00	0.00	3.05	0.09
Renewable secondary fuels	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-renewable secondary fuels	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of fresh water resources	m ³	0.074	2.99E-05	1.21E-04	1.61E-04	2.91E-05	0.015	0.019	-0.054	-0.028
Waste categories and output material flows	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Disposed hazardous waste	kg	5.31E-07	2.42E-08	5.79E-12	1.30E-07	2.36E-08	1.34E-08	7.09E-10	-2.52E-07	-3.68E-08
Disposed non-hazardous waste	kg	0.37	2.98E-05	1.65E-04	1.60E-04	2.90E-05	0.042	0.031	-0.34	-0.26
Radioactive waste	kg	7.11E-03	5.99E-07	4.85E-07	3.22E-06	5.84E-07	4.79E-03	1.40E-04	-6.23E-03	-6.01E-03
Components for further use	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Materials for recycling	kg	0.00	0.00	0.00	0.00	0.00	3.61	0.21	0.00	0.00
Materials for energy recovery	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exported electrical energy	MJ	0.00	0.00	0.11	0.00	0.00	0.15	15.3	0.00	0.00
Exported thermal energy	MJ	0.00	0.00	0.2	0.00	0.00	0.31	27.4	0.00	0.00

Results per 1 m ² of Translucent building elements - 40mm										
Environmental impacts	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Global warming potential	kg CO ₂ -equiv.	17.4	0.035	0.054	0.19	0.035	2.16	12.10	-16.30	-5.35
Depletion potential of stratospheric ozone layer	kg R11-equiv.	6.79E-10	9.45E-16	7.01E-16	5.18E-15	9.26E-16	1.43E-09	1.42E-09	-2.34E-10	-2.35E-10
Acidification potential of soil and water	kg SO ₂ -equiv.	0.027	3.01E-05	4.04E-06	1.49E-04	2.95E-05	5.81E-03	9.06E-04	-0.025	-0.012
Eutrophication potential	kg PO ₄ ³⁻ -equiv.	4.32E-03	6.71E-06	8.43E-07	3.20E-05	6.58E-06	5.44E-04	1.70E-04	-3.81E-03	-1.05E-03
Formation potential of tropospheric ozone	kg C ₂ H ₄ -equiv.	2.56E-03	-9.22E-07	3.80E-07	1.67E-06	-9.04E-07	3.70E-04	8.60E-05	-3.06E-03	-8.20E-04
Depletion of abiotic resources (ADP elements)	kg Sb-equiv.	5.59E-05	3.73E-09	3.74E-10	2.04E-08	3.65E-09	1.18E-06	2.07E-07	-5.35E-05	-2.30E-06
Depletion of abiotic resources (ADP fossil fuels)	MJ	354.0	0.47	6.05E-03	2.57	0.46	22.60	2.87	-339.0	-71.0
Use of resources	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Renewable primary energy as energy source	MJ	56.30	0.032	0.052	0.18	0.032	13.6	0.32	-37.6	-20.0
Renewable primary energy for material use	MJ	0.05	0.00	-0.05	0.00	0.00	0.00	0.00	0.00	0.00
Total use of renewable primary energy	MJ	56.4	0.032	1.18E-03	0.18	0.032	13.6	0.32	-37.6	-20.0
Non-renewable primary energy as energy source	MJ	266.0	0.47	0.69	2.58	0.46	38.9	113.0	-358.0	-89.6
Renewable primary energy for material use	MJ	110.0	0.00	-0.68	0.00	0.00	-1.07	-109.0	0,000E+00	0.00
Total use of non-renewable primary energy	MJ	376	0.47	7.27E-03	2.58	0.46	37.8	3.28	-358.0	-89.6
Use of secondary materials	kg	0.76	0.00	0.00	0.00	0.00	0,0E+00	0.00	3.83	0.09
Renewable secondary fuels	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-renewable secondary fuels	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of fresh water resources	m ³	0.09	3.71E-05	1.21E-04	2.03E-04	3.63E-05	0.019	0.024	-0.066	-0.032
Waste categories and output material flows	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Disposed hazardous waste	kg	6.61E-07	3.00E-08	5.79E-12	1.64E-07	2.94E-08	1.70E-08	8.95E-10	-3.16E-07	-4.35E-08
Disposed non-hazardous waste	kg	0.40	3.69E-05	1.65E-04	2.02E-04	3.62E-05	0.048	0.033	-0.38	-0.26
Radioactive waste	kg	8.67E-03	7.42E-07	4.85E-07	4.07E-06	7.28E-07	6.04E-03	1.63E-04	-7.69E-03	-7.42E-03
Components for further use	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Materials for recycling	kg	0.00	0.00	0.00	0.00	0.00	4.51	0.21	0.00	0.00
Materials for energy recovery	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exported electrical energy	MJ	0.00	0.00	0.11	0.00	0.00	0.15	19.4	0.00	0.00
Exported thermal energy	MJ	0.00	0.00	0.2	0.00	0.00	0.31	34.5	0.00	0.00

Results per 1 m ² of Translucent building elements - 50mm										
Environmental impacts	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Global warming potential	kg CO ₂ -equiv.	20.0	0.041	0.054	0.22	0.04	2.48	14.0	-18.80	-6.08
Depletion potential of stratospheric ozone layer	kg R11-equiv.	6.80E-10	1.09E-15	7.01E-16	6.01E-15	1.07E-15	1.43E-09	1.42E-09	-2.35E-10	-2.37E-10
Acidification potential of soil and water	kg SO ₂ -equiv.	0.03	3.47E-05	4.04E-06	1.73E-04	3.41E-05	6.72E-03	1.02E-03	-0.028	-0.013
Eutrophication potential	kg PO ₄ ³⁻ -equiv.	4.97E-03	7.72E-06	8.43E-07	3.72E-05	7.59E-06	6.30E-04	1.95E-04	-4.39E-03	-1.18E-03
Formation potential of tropospheric ozone	kg C ₂ H ₄ -equiv.	2.93E-03	-1.06E-06	3.80E-07	1.95E-06	-1.04E-06	4.27E-04	9.71E-05	-3.52E-03	-9.17E-04
Depletion of abiotic resources (ADP elements)	kg Sb-equiv.	6.46E-05	4.29E-09	3.74E-10	2.37E-08	4.22E-09	1.36E-06	2.19E-07	-6.21E-05	-2.51E-06
Depletion of abiotic resources (ADP fossil fuels)	MJ	409.0	0.54	6.05E-03	2.98	0.53	26.0	3.09	-392.0	-81.0
Use of resources	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Renewable primary energy as energy source	MJ	64.70	0.037	0.052	0.21	0.037	15.8	0.36	-43.0	-22.4
Renewable primary energy for material use	MJ	0.05	0.00	-0.05	0.00	0.00	0.00	0.00	0.00	0.00
Total use of renewable primary energy	MJ	64.8	0.037	1.18E-03	0.21	0.037	15.8	0.36	-43.0	-22.4
Non-renewable primary energy as energy source	MJ	306.0	0.54	0.69	3.0	0.53	44.8	131.0	-414.0	-102.0
Renewable primary energy for material use	MJ	128.0	0.00	-0.68	0.00	0.00	-1.07	-127.0	0.00	0.00
Total use of non-renewable primary energy	MJ	434.0	0.54	7.27E-03	3.0	0.53	43.7	3.54	-414.0	-102.0
Use of secondary materials	kg	0.87	0.00	0.00	0.00	0.00	0.00	0.00	4.44	0.09
Renewable secondary fuels	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-renewable secondary fuels	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of fresh water resources	m ³	0.10	4.26E-05	1.21E-04	2.36E-04	4.19E-05	0.022	0.028	-0.074	-0.035
Waste categories and output material flows	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Disposed hazardous waste	kg	7.62E-07	3.45E-08	5.79E-12	1.91E-07	3.40E-08	1.97E-08	1.04E-09	-3.66E-07	-4.87E-08
Disposed non-hazardous waste	kg	0.42	4.25E-05	1.65E-04	2.35E-04	4.18E-05	0.052	0.035	-0.40	-0.27
Radioactive waste	kg	9.89E-03	8.54E-07	4.85E-07	4.72E-06	8.40E-07	7.01E-03	1.80E-04	-8.83E-03	-8.51E-03
Components for further use	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Materials for recycling	kg	0.00	0.00	0.00	0.00	0.00	5.21	0.21	0.00	0.00
Materials for energy recovery	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exported electrical energy	MJ	0.00	0.00	0.11	0.00	0.00	0.15	22.5	0.00	0.00
Exported thermal energy	MJ	0.00	0.00	0.2	0.00	0.00	0.31	40.2	0.00	0.00

Results per 1 m ² of Translucent building elements - 60mm										
Environmental impacts	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Global warming potential	kg CO ₂ -equiv.	23.0	0.047	0.054	0.26	0.046	2.85	16.2	-21.70	-6.91
Depletion potential of stratospheric ozone layer	kg R11-equiv.	6.82E-10	1.25E-15	7.01E-16	6.96E-15	1.23E-15	1.43E-09	1.42E-09	-2.36E-10	-2.39E-10
Acidification potential of soil and water	kg SO ₂ -equiv.	0.035	3.99E-05	4.04E-06	2.00E-04	3.93E-05	7.77E-03	1.16E-03	-0.032	-0.014
Eutrophication potential	kg PO ₄ ³⁻ -equiv.	5.71E-03	8.87E-06	8.43E-07	4.31E-05	8.74E-06	7.27E-04	2.23E-04	-5.06E-03	-1.34E-03
Formation potential of tropospheric ozone	kg C ₂ H ₄ -equiv.	3.36E-03	-1.22E-06	3.80E-07	2.27E-06	-1.20E-06	4.92E-04	1.10E-04	-4.05E-03	-1.03E-03
Depletion of abiotic resources (ADP elements)	kg Sb-equiv.	7.45E-05	4.93E-09	3.74E-10	2.75E-08	4.86E-09	1.55E-06	2.33E-07	-7.18E-05	-2.74E-06
Depletion of abiotic resources (ADP fossil fuels)	MJ	471.0	0.62	6.05E-03	3.46	0.61	30.0	3.33	-453.0	-92.50
Use of resources	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Renewable primary energy as energy source	MJ	74.30	0.043	0.052	0.24	0.042	18.4	0.41	-49.1	-25.3
Renewable primary energy for material use	MJ	0.05	0.00	-0.05	0.00	0.00	0.00	0.00	0.00	0.00
Total use of renewable primary energy	MJ	74.4	0.043	1.18E-03	0.24	0.042	18.4	0.41	-49.1	-25.3
Non-renewable primary energy as energy source	MJ	352.0	0.62	0.69	3.47	0.61	51.5	151.0	-479.0	-117.0
Renewable primary energy for material use	MJ	148.0	0.00	-0.68	0.00	0.00	-1.07	-147.0	0.00	0.00
Total use of non-renewable primary energy	MJ	500.0	0.62	7.27E-03	3.47	0.61	50.4	3.83	-479.0	-117.0
Use of secondary materials	kg	0.99	0.00	0.00	0.00	0.00	0.00	0.00	5.14	0.09
Renewable secondary fuels	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Non-renewable secondary fuels	MJ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use of fresh water resources	m ³	0.12	4.90E-05	1.21E-04	2.73E-04	4.83E-05	0.025	0.032	-0.085	-0.039
Waste categories and output material flows	Unit	A1-A3	A4	A5	C2/1	C2/2	C3/1	C3/2	D/1	D/2
Disposed hazardous waste	kg	8.77E-07	3.97E-08	5.79E-12	2.21E-07	3.91E-08	2.29E-08	1.21E-09	-4.22E-07	-5.47E-08
Disposed non-hazardous waste	kg	0.45	4.88E-05	1.65E-04	2.72E-04	4.81E-05	0.056	0.037	-0.43	-0.27
Radioactive waste	kg	1.13E-02	9.82E-07	4.85E-07	5.47E-06	9.67E-07	8.13E-03	2.00E-04	-1.01E-02	-9.76E-03
Components for further use	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Materials for recycling	kg	0.00	0.00	0.00	0.00	0.00	6.01	0.21	0.00	0.00
Materials for energy recovery	kg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exported electrical energy	MJ	0.00	0.00	0.11	0.00	0.00	0.15	26.1	0.00	0.00
Exported thermal energy	MJ	0.00	0.00	0.2	0.00	0.00	0.31	46.6	0.00	0.00

6.4 Interpretation, LCA presentation and critical review

Evaluation

The following dominance analyses show that modules A1-A3 are the main dominating life cycle stages in all four life cycle assessments. In addition, waste disposal (C3) mainly affects the depletion potential of the stratospheric ozone layer and the global warming potential. Distribution transport (A4) and transport to the waste disposal plants (C2) play a relatively minor role and are negligible. The possible potentials of avoided loads of downstream systems (module D) are beyond the system boundaries under consideration.

Some impact categories are explained in more detail as examples.

Due to the fact that the two scenarios differ only by end-of-life (module C3), the global warming potential is the same for the other modules. In module A1-A3, polycarbonate is the main contributor to the global warming potential. In module C3, scenario 1, recycling of polycarbonate generates a benefit. In scenario 2, however, incineration of polycarbonate components results in a much higher load for module 3. Benefits from incineration are generated in the form of electricity and heat.

The product stage (module A1-A3) and the loads resulting from disposal (C3) dominate on a pro rata basis. Polycarbonate granulate is the main driver of the loads in module A1-A3. The reason for the higher proportion of the GWP load in module C3/2 compared to C3/1 is the incineration of polycarbonate in scenario 2. Aluminium recycling is the driver of the ODP load in module C3. Transport plays a rather minor role.

The values obtained from the LCA calculation are suitable for the certification of buildings, as necessary.

Diagrams

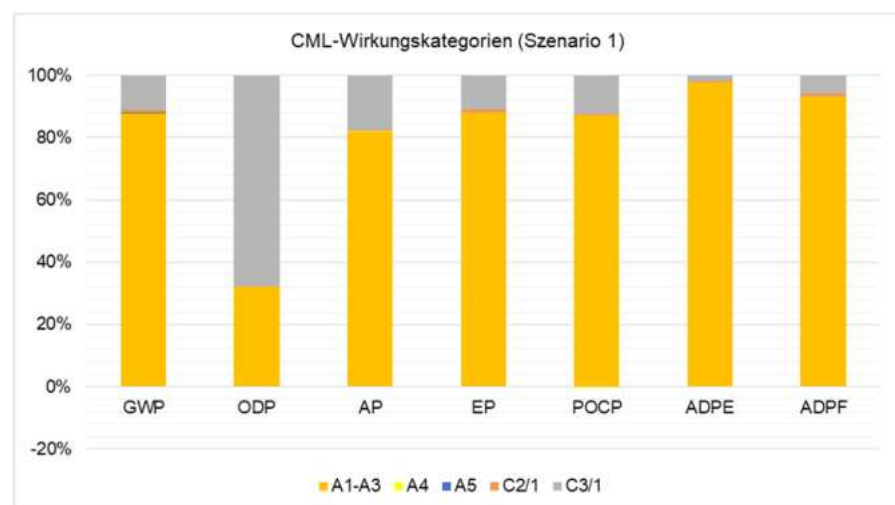


Figure 1: CML results for 1 m² of LBE 40 mm (scenario 1)

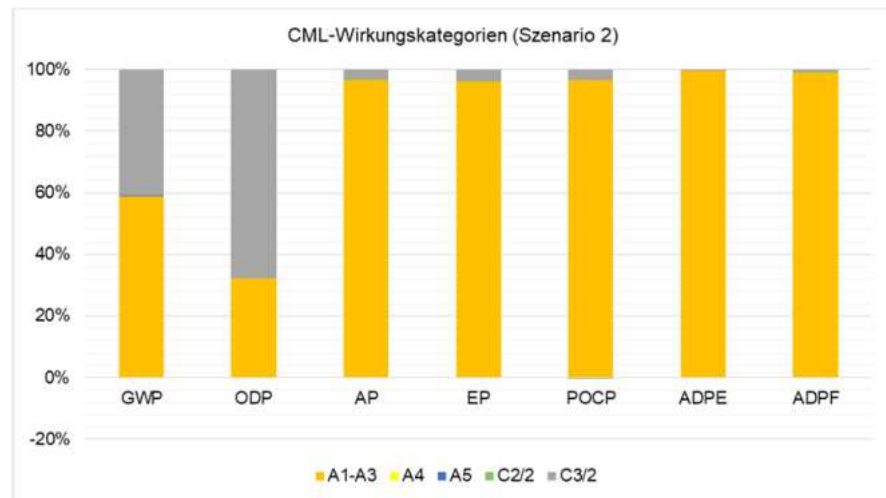


Figure 2: CML results for 1 m² of LBE 40 mm (scenario 2)

Report

The LCA underlying this EPD was developed according to the requirements set out in DIN EN ISO 14040 and DIN EN ISO 14044 as well as EN 15804 and EN ISO 14025. For reasons of confidentiality, it is not addressed to third parties. It is deposited with the ift Rosenheim. The results and conclusions reported to the target group are complete, correct, without bias and transparent. The results of the study are not designed to be used for comparative statements intended for publication.

Critical review

The critical review of the LCA took place in the course of verification of the EPD and was carried out by Susanne Volz, an external verifier (M.Sc. Environmental Science)

7 General information regarding the EPD

Comparability

This EPD was prepared in accordance with EN 15804 and is therefore only comparable to those EPDs that also comply with the requirements set out in EN 15804.

Any comparison must refer to the building context and the same boundary conditions of the various life cycle stages.

For comparing EPDs of construction products, the rules set out in EN 15804 (Clause 5.3) apply.

The detailed individual results of the products were summarised on the basis of conservative assumptions and differ from the average results. Identification of the product groups and the resulting variations are documented in the background report.

Communication

The communications format of this EPD meets the requirements of EN 15942:2011 and is therefore the basis for B2B communication. Only the nomenclature has been changed according to EN 15804.

Product group: Transparent building elements

Verification

Verification of the Environmental Product Declaration is documented in accordance with the ift "Richtlinie zur Erstellung von Typ III Umweltproduktdeklarationen" (Guidance on preparing Type III Environmental Product Declarations) in accordance with the requirements set out in EN ISO 14025.

This Declaration is based on the PCR documents "PCR Part A" PCR-A-0.1:2018 and "Façades and roofs made of glass and plastic" PCR-FA-3.1:2018.

The European standard EN 15804 serves as the core PCR ^{a)}
Independent verification of the declaration and statement according to EN ISO 14025:2010 ☐ internal ☒ external
Independent third party verifier: ^{b)} Susanne Volz, M.Sc. Environmental Science Dipl. Business Law (University of Applied Sciences)
^{a)} Product category rules ^{b)} Optional for business-to-business communication, Mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Revisions of this document

No.	Date	Note:	Practitioner of the LCA	Verifier
1	22.02.2019	External Verification	F. Stich	S. Volz

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9 Annex

Description of life cycle scenarios for Translucent building elements

Product stage			Construction stage		Use stage							End-of-life stage				Benefits and loads from beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacture	Transport	Construction/Installation	Use	Inspection, maintenance, cleaning	Repair	Exchange / Replacement	Improvement / Modernisation	Operational energy use	Operational water use	Deconstruction	Transport	Waste management	Disposal	Re-use Recovery Recycling potential
✓	✓	✓	✓	✓	—	—	—	—	—	—	—	—	✓	✓	—	✓

Calculation of the scenarios was based on a building service life of 30 years (in accordance with RSL of Section 4 Use stage).

The scenarios were based on information provided by the manufacturer. The scenarios were furthermore based on the research project "EPDs for transparent building components". (1).

Note: The standard scenarios selected are presented in bold type. They were also used for calculating the indicators in the summary table.

- ✓ Included in the LCA
- Not included in the LCA

A4 Transport to the construction site

No.	Scenario	Description										
A4	Direct shipment to construction site/branch	Transport medium: truck (EURO 6.) Transport distance: distance of 100 km with 50% capacity used Weight, incl. packaging: <table><tr><td>LBE</td><td>30 mm</td><td>40 mm</td><td>50 mm</td><td>60 mm</td></tr><tr><td>Mass in kg</td><td>3.746</td><td>4.646</td><td>5.346</td><td>6.146</td></tr></table>	LBE	30 mm	40 mm	50 mm	60 mm	Mass in kg	3.746	4.646	5.346	6.146
LBE	30 mm	40 mm	50 mm	60 mm								
Mass in kg	3.746	4.646	5.346	6.146								

A5 Construction/Installation

No.	Scenario	Description
A5	Manually	Translucent building elements are installed without the use of additional lifting devices!

The translucent building elements are installed without using any additional environmentally relevant materials: only disposal and recycling of the packaging is required. A 100% collection rate for on-site packaging waste was assumed.

Transport for waste disposal is subject to the same assumptions as in module A4.

In case of deviating consumption during installation/assembly of the products which forms part of the site management, it is covered at the building level.

Benefits from A5 are not allocated to A5.

End-of-life stage

The translucent building elements are separated at the end of their service life into polycarbonate, aluminium as well as nylon, polypropylene and thermoplastic elastomers. Aluminium is recycled according to common practice. Nylon, polypropylene and thermoplastic elastomers are disposed of separately in a waste incineration plant. The amount of energy recovered is to be considered as a by-product of the disposal process. End-of-waste status is reached with the disposal of slag and ash as residual waste (the data sets do not provide for separation of ash disposal; all emissions from the data set are therefore modelled in C3, although disposal should be in module C4). Two scenarios are considered for the disposal of polycarbonate. In scenario 1 the polycarbonate fractions of the translucent building elements are regranulated into polycarbonate regranules. In scenario 2 polycarbonate is incinerated in a waste incineration plant.

C2 Transport

No.	Scenario	Description
C2	Transport	Truck with 24.7 t net payload and EURO 6 Distance of 100 km with 50% capacity used

C3 Waste management

No.	Scenario	Description
C3.1	Scenario 1	Aluminium is recycled according to common practice. Nylon, polypropylene and thermoplastic elastomers are disposed of separately in a waste incineration plant. Scenario 1: the polycarbonate fractions are regranulated into polycarbonate regranules at the end of their life cycle.
C3.2	Scenario 2	Aluminium is recycled according to common practice. Nylon, polypropylene and thermoplastic elastomers are disposed of separately in a waste incineration plant. In scenario 2 polycarbonate is incinerated in a waste incineration plant

The below table presents the disposal processes and their percentage by mass/weight. The calculation is based on the above mentioned shares in percent related to the declared unit of the product system. For calculating the 100% scenarios, the mass proportions of the material groups can be used, as described in Section 6.2.

C3-1 Disposal		30 mm	40 mm	50 mm	60 mm
Scenario 1	Unit				
Collection process, collected separately	kg	3.64	4.54	5.24	6.04
Collection process, collected as mixed construction waste	kg	-	-	-	-
Recovery system, for re-use	kg	-	-	-	-
Recovery system, for recycling	kg	3.61	4.51	5.21	6.01
Recovery system, for energy recovery	kg	0.03	0.03	0.03	0.03
Disposal	kg	-	-	-	-
Assumptions for scenario development, e.g. for transport	Appropriate units	-	-	-	-

C3-2 Disposal		30 mm	40 mm	50 mm	60 mm
Scenario 2	Unit				
Collection process, collected separately	kg	3.64	4.54	5.24	6.04
Collection process, collected as mixed construction waste	kg	-	-	-	-
Recovery system, for re-use	kg	-	-	-	-
Recovery system, for recycling	kg	0.21	0.21	0.21	0.21
Recovery system, for energy recovery	kg	3.43	4.33	5.03	5.83
Disposal	kg	-	-	-	-
Assumptions for scenario development, e.g. for transport	Appropriate units	-	-	-	-

D Benefits and loads from beyond the system boundaries

No.	Scenario	Description
D	Recycling potential	Module D shows the possible potentials of avoided loads in the downstream systems resulting from material-dependent disposal processes of modules A5 and C3. According to the state of the art, a waste incineration plant in Europe is designed for waste destruction and not for energy recovery. The emissions from the waste incineration process are therefore allocated to the appropriate module (e.g. A5 or C3), and not to D.

Imprint

Practitioner of the LCA

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28203 Bremen

Programme operator

ift Rosenheim GmbH
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Declaration holder

Rodeca GmbH
Freiherr-vom-Stein-Straße 165
45473 Mülheim an der Ruhr

Notes

This EPD is mainly based on the work and findings of the Institut für Fenstertechnik e.V., Rosenheim (ift Rosenheim) and specifically on the ift-Richtlinie NA-01/3 Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen. (Guideline NA.01/3 - Guidance on preparing Type III Environmental Product Declarations)
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**AFITI
LICOF**

Centro de Ensayos e
Investigación del Fuego
Center for Fire Testing and Research

Nº/Nr: 2977TI6-5

Página 1 de 7

Page 1 of 7

Asociación para el Fomento de la Investigación y la Tecnología de la Seguridad contra Incendios
Association for the Promotion of Research and Fire Safety Technology

Informe de Clasificación *Classification Report*

Laboratorio de Reacción al Fuego *Reaction to Fire Laboratory*

SOLICITANTE:

APPLICANT:



RODECA, GmbH

CLASIFICACIÓN DE LA REACCIÓN AL FUEGO SEGÚN NORMA UNE-EN 13501-1:2007+ A1:2010

REACTION TO FIRE CLASSIFICATION ACCORDING TO STANDARD
UNE-EN 13501-1:2007+A1:2010.

- Producto: Panel de policarbonato celular
Product : Cellular polycarbonate panel.
- Fabricante: Rodeca, GmbH
Manufacturer :
Gama de producto:
Product family
Según información incluida en página 5 de 7 (Tabla 1)
According to information included on page 5 of 7 (table 1)

SEDE SOCIAL Y LABORATORIOS Camino del Estrechillo, 8
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CLASIFICACIÓN DE LA REACCIÓN AL FUEGO SEGÚN NORMA UNE-EN 13501-1:2007+A1:2010

REACTION TO FIRE CLASSIFICATION ACCORDING TO UNE-EN 13501-1:2007+A1:2010 STANDARD

Solicitante: <i>Applicant :</i>	RODECA, GmbH Freiherr-vom-Stein Srt. 165 45473 – MÜLHEIM Alemania / Germany
Laboratorio emisor: <i>Issuer Laboratory:</i>	AFITI-LICOF Organismo notificado nº: 1168 <i>Notified body Nr</i>
Producto: <i>Product :</i>	Panel de policarbonato celular. <i>Cellular polycarbonate panel</i> Fabricante Rodeca, GmbH. <i>Manufacturer :</i> Referencia: Según información incluida en página 5 de 7 (Tabla 1) <i>Reference : Information included on page 5 of 7 (table 1)</i>
Informe de Clasificación nº: <i>Classification Report Nr:</i>	2977T16-5 Fecha de emisión: 17-nov-17 <i>Date of issue : 17th-Nov-17</i>



Contenido del informe - Content of the report

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<i>Details of classified product</i>	Page 3
3.- Informes y resultados de ensayo en los que se basa la clasificación.	Página 3
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<i>Limitations</i>	Page 7

La información contenida en este Informe de Clasificación tiene carácter confidencial, por lo que el Laboratorio no facilitará a terceros información relativa a este Informe, salvo que lo autorice el Solicitante.

El presente Informe de Clasificación no debe reproducirse parcialmente sin la aprobación por escrito del Laboratorio.

The information held in this Classification Report is a confidential nature, meaning the Laboratory shall not provide information in relation to this report to third parties, except with the authorisation of the Applicant.

It is not allowed to reproduce partially this Classification Report without the Laboratory's written approval.



1.- OBJETO DEL INFORME – AIM OF THE REPORT

Este Informe de Clasificación define la clasificación de la Reacción al Fuego asignada a la gama de paneles de policarbonato celular, de acuerdo con los procedimientos establecidos en la norma UNE-EN 13501-1:2007+A1:2010 “Clasificación en función del comportamiento frente al Fuego de productos de construcción y elementos para edificación. Parte 1: Clasificación a partir de datos obtenidos en ensayos de Reacción al Fuego”.

This Classification report defines the Reaction to Fire classification of the product of cellular polycarbonate panel by the applicant on the basis of the procedures established in UNE-EN 13501-1:2007+A1:2010 “Fire classification of construction products and building elements-Part 1: Classification using data from reaction to fire tests”.

2.- DETALLES DEL PRODUCTO OBJETO DE CLASIFICACIÓN

DETAILS OF CLASSIFIED PRODUCT

2.1.- GENERAL – GENERAL

La gama de productos definida por el solicitante según información incluida en página 5 de 7 (Tabla 1) se define como paneles de policarbonato celular según la especificación técnica correspondiente.

The product family defined by applicant according information included in page 5 of 7 (Table 1) is defined as cellular polycarbonate panel according to the relevant technical specification.

2.2.- DESCRIPCIÓN – DESCRIPTION

La gama de productos está completamente descrita en el informe de ensayo y en el informe que incluye el campo de aplicación extendido de resultados de ensayo [Informe EXAP] en los que se basa esta clasificación. Dichos informes se identifican en el capítulo 3 del presente informe.

The product family is fully described on the test report and the extended applications report [EXAP report] classification is based on. These reports are indicated on chapter 3 of this report.

3.- INFORMES Y RESULTADOS DE ENSAYO EN LOS QUE SE BASA LA CLASIFICACIÓN.

REPORTS AND TEST RESULTS IN SUPPORT OF THIS CLASSIFICATION.

3.1.- ENSAYOS – TEST

Informes de ensayo – Test reports

Laboratorio emisor <i>Issuer laboratory</i>	Solicitante <i>Applicant</i>	Informes <i>Reports</i>	Norma de ensayo <i>Test standard</i>	Condición final de uso <i>End use application</i>
AFITI-LICOF Pol. Ind. Sta. Mª de Benquerencia C/ Río Estenilla, s/n 45007-TOLEDO Organismo notificado nº: Notified body Nr: 1168	RODECA, GmbH Freihigerr-vom-Stein Srt. 165 45473 – MÜLHEIM Alemania /Germany)	Nº/ Nr. 2977T16 F. emisión: 16-may-16 <i>Date of issue: 16th-May-16</i> F ensayo: 09-mar-16 <i>Test date: 09th-Mar-16</i>	UNE-EN 13823:2012	Paneles transmisores de luz de policarbonato celular (PC) para uso interno y externo en cubiertas, paredes y techos. <i>Light transmitting multiwall polycarbonate (PC) panels for internal and external use in roofs, walls and ceilings</i>
		F ensayo: 24-mar-16 <i>Test date: 24th-Mar-16</i>	UNE-EN ISO 11925-2:2011	

Resultados de ensayo – Test results

Informe de ensayo nº
Test report Nr

2977T16

Método de ensayo Test method	Parámetro Parameters	Número de ensayos Nr. test	Resultados Results	
			Media de parámetro continuo (m) Continuous parameter mean (m)	Parámetros que se tienen que cumplir Compliance with parameters
UNE-EN 13823:2012, S.B.I.	FIGRA _{0,2MJ} (W/s)	1	17,37	No aplicable Non applicable
	FIGRA _{0,4MJ} (W/s)		No aplicable Non applicable	No aplicable Non applicable
	LSF < borde		No aplicable Non applicable	☒ Sí ☐ No ☒ Yes ☐ No
	THR _{600s} (MJ)		1,7	No aplicable Non applicable
	SMOGR _A (m ² /s ²)		0,00	No aplicable Non applicable
	TSP _{600 s} (m ²)		0,4	No aplicable Non applicable
	Gotas/ partículas en llamas Drops / Particles flamed		No aplicable Non applicable	☐ Sí ☒ No ☐ Yes ☒ No

Método de ensayo Test method	Parámetro Parameters	Número de ensayos Nr. test	Resultados Results	
			Media de parámetro continuo (m) Continuous parameter mean (m)	Parámetros que se tienen que cumplir Compliance with parameters
UNE-EN ISO 11925-2:2011	F _s ≤ 150 mm Inflamación del papel de filtro Ignition of filter paper	1		
Exposición = 30 s Exposure = 30 s			No aplicable Non applicable	☒ Sí ☐ No ☒ Yes ☐ No
Gotas/partículas en llamas Drops / Particles flamed			No aplicable Non applicable	☐ Sí ☒ No ☐ Yes ☒ No

3.2.- CAMPO DE APLICACIÓN EXTENDIDO DE RESULTADOS
EXTEND APPLICATION FIELD

Informes – Reports

Laboratorio emisor Issue laboratory	Solicitante Applicant	Informes Reports	Norma Standard
AFITI-LICOF Pol. Ind. Sta. M ^a de Benquerencia C/ Río Estenilla, s/n 45007 – TOLEDO	RODECA, GmbH Frehigerr-vom-Stein Srt. 165 45473 – MÜLHEIM Alemania (Germany)	Nº: EXAP-2977T16 F. emisión: 16-may-16 Date of issue: 16 th -May-16	- UNE-EN 15725:2011 -UNE-EN 16153:2013+A1:2015
Organismo notificado nº: Notified body Nr: 1168			



Campo de aplicación extendido de los resultados de ensayo

Extended application field of test results

A continuación se muestra el rango permitido de variabilidad para los distintos parámetros del producto/condiciones finales de uso. El resto de parámetros deben mantenerse conforme a lo descrito en los informes de ensayo de referencia.

Hereafter it is shown the range of variation allowed for the different parameters of the product/end use conditions. Rest of parameters shall be kept as described on the referenced test reports.

-Tabla 1-

-Table 1-

Referencia comercial gama de productos Product Family
2253-2
2600-8-4-U
2250-10-4
2216-2-N
2600-10-4-U
2216-2-C
2333-16-4
2610-4
2333-20-4
2410-3
2630-16-6-U
Lamelle E
21000-30-XL
2630-20-6-U
2630-25-6-U
2625-5
2530-4
29330-XL
2540-4 MC
2540-4
2540-6
2540-10
2540-7
2600-40-7-U
2550-10
2685-3
2560-12
HKS 16-X
HKS 16-3
PLP 1000-30
PLP 1000-40
2610 – 4- M-U

4.- CLASIFICACIÓN Y CAMPO DE APLICACIÓN

CLASSIFICATION AND FIELD OF APPLICATION

4.1.- NORMA DE CLASIFICACIÓN – CLASSIFICATION STANDARD

La clasificación de la reacción al fuego se ha realizado de acuerdo con lo establecido en la norma UNE-EN 13501-1:2007+A1:2010.

Reaction to Fire classification according to UNE-EN 13501-1:2007+A1:2010 standard

4.2.- CLASIFICACIÓN – CLASSIFICATION

La gama de productos de paneles de policarbonato celular (ver Tabla 1) presenta la siguiente clasificación:

Product family of cellular polycarbonate panel (see table 1) reaches the following classification:

Clasificación de la Reacción al Fuego – Reaction to fire classification

Comportamiento al Fuego <i>Fire behaviour</i>	Producción de humo <i>Smoke production</i>	Gotas inflamadas <i>Flaming droplets</i>
B	s 1	d 0
B – s1 , d0		

4.3.- CAMPO DE APLICACIÓN – FIELD OF APPLICATION

Según lo establecido en el informe técnico EXAP nº EXAP-2977T16, la gama de productos (ver tabla 1), tiene el siguiente campo de aplicación.

According to Technical Report EXAP nr. 2977T16, the product family (see Table 1), has the following field of application.

La clasificación obtenida sigue siendo válida para las siguientes variaciones en las características de la muestra, sin que la realización de estas modificaciones suponga la ejecución de nuevos ensayos.

Classification obtained is valid for the following simple characteristic variations, without further testing needed.

Característica/Propiedad <i>Characteristic/Property</i>	Variación permitida <i>Range allowed</i>
– Tipo de producto <i>Kind of product</i>	Panel de policarbonato celular <i>Cellular polycarbonate panel</i>
– Color <i>colour</i>	Resultados válidos para colores entre el gris oscuro y el clear <i>Results valids for colours between dark grey and clear</i>
– Cámara de aire <i>Air gap</i>	Productos sin cámara de aire, autoportantes y con cámara de aire <i>Products with air gap, free standing and without air gap</i>
– Espesor/ Masa por unidad de área <i>Thickness/ Mass per unit area</i>	Espesores comprendidos entre [3 – 60] mm / [1,70 – 5,80] Kg/m ² <i>Thicknesses between [3 - 60] mm. / [1,70 – 5,80] Kg/m²</i>



5.- LIMITACIONES - LIMITATIONS

Este informe no representa ninguna aprobación de tipo ni certificación del producto.

This document does not represent type approval or certification of the product.

La clasificación asignada gama de productos incluida en el presente informe, es adecuada para la realización de una declaración de conformidad del solicitante según lo indicado en el sistema 3 de conformidad, en el contexto del marcado CE definido en la Directiva de Productos de la Construcción.

El solicitante ha realizado una declaración, la cual se encuentra archivada por el laboratorio. Esta declaración confirma que el diseño del producto no requiere procesos específicos, procedimientos o etapas (por ejemplo, no adición de retardantes de llama, limitación del contenido orgánico, o adición de rellenos) que tengan por objeto la mejora del comportamiento al fuego con el fin de obtener la clasificación deseada. Como consecuencia de esto el solicitante concluye que el sistema 3 de conformidad 3 es el apropiado.

Por consiguiente, el laboratorio de ensayo, al no haber tomado parte en la toma de muestras del producto objeto de ensayo no puede confirmar la trazabilidad de las muestras ensayadas, aún teniendo las correspondientes referencias facilitadas por el solicitante.

The classification assigned to the product in this report is appropriate to a declaration of conformity by the manufacturer within the context of system 3 attestation of conformity and CE marking under the Construction Products Directive.

The manufacturer has made a declaration, which is held on file. This confirms that the products design requires no specific processes, procedures or stages (e.g. no addition of flame-retardants, limitation of organic content, or addition of fillers) that are aimed at enhancing the fire performance in order to obtain the classification achieved. As a consequence the manufacturer has concluded that system 3 attestation is appropriate.

The test laboratory has, therefore, played no part in sampling the product for the test, although it holds appropriate references, supplied by the manufacturer, to provide for traceability of the samples tested.

Toledo, 17 de noviembre de 2017

Toledo, 17th of November of 2017



Documento Firmado Digitalmente
Digitally Signed Document

Fdo.: David Sáez García
Director Técnico del Laboratorio
de Reacción al Fuego
Technical Director of Fire Reaction Laboratory



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Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

**ETA-19/0452
of 2 August 2021**

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

Rodeca LBE

Product family
to which the construction product belongs

Self-supporting translucent roof and wall kits

Manufacturer

Rodeca GmbH
Freiherr-vom-Stein-Straße 165
45473 Mülheim-Ruhr
DEUTSCHLAND

Manufacturing plants

Rodeca GmbH
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DEUTSCHLAND
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24060 Sovere (BG)
ITALIEN

This European Technical Assessment
contains

81 pages including 73 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

EAD 220072-00-0401

This version replaces

ETA-19/0452 issued on 29 July 2019

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Specific part

1 Technical description of the product

1.1 Kit description and setup

The "Rodeca LBE" roof and wall kit is made up of components which are factory-made and assembled on site as a self-supporting translucent roof or wall kit.

The kit 'Rodeca LBE' is available in the following types: PC 2333-30-6, PC 2540-4, PC 2540-4-MC, PC 2540-6, PC 2540-7, PC 2540-10, PC 2540-10DX, PC 2540-10DX HI, PC 2600-40-U, PC 2550-10 und PC 2560-12.

An essential part of the kit are translucent PC multi-wall sheets in accordance with EN 16153, which can be connected to an area of any size by means of a joint on the long sides. The PC sheets are housed in aluminium covering profiles, which are optionally thermally separated by plastic insulating bars. The kit can be constructed as one-span system or, with additional intermediate supports transverse to the main bearing direction, as multi-span system. To withstand wind suction on continuous systems, they are held on internal supports by lift anchors.

The following components are used for the manufacture of the "Rodeca LBE" self-supporting translucent roof and wall kit

- translucent polycarbonate (PC) multi-wall sheets of thickness 30 mm (PC 2333-30-6)
- translucent polycarbonate (PC) multi-wall sheets of thickness 40 mm (PC 2540-4, PC 2540-4-MC, PC 2540-6, PC 2540-7, PC 2540-10, PC 2540-10DX, PC 2540-10DX HI, PC 2600-40-7-U)
- translucent polycarbonate (PC) multi-wall sheets of thickness 50 mm (PC 2550-10)
- translucent polycarbonate (PC) multi-wall sheets of thickness 60 mm (PC 2560-12)
- polycarbonate (PC) connection profile (for kit 2600-40-7-U only)
- aluminium covering profiles
- aluminium lift anchors
- sealing profiles

The components and the system setup of the product are given in Annexes A 1.1 to A 1.3 and A 2.1 to A 2.4.

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 documentation¹ of this European Technical Assessment.

¹ The technical documentation comprises all information of the holder of this ETA necessary for the production, installation and maintenance of the roof and wall 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 16153² are used.

Table 1:

Manufacturer	Trade name	Sheet height [mm]	Annex
Rodeca GmbH	PC 2333-30-6	30	A 4.0
Rodeca GmbH	PC 2540-4	40	A 4.1
Rodeca GmbH	PC 2540-4-MC	40	A 4.2
Rodeca GmbH	PC 2540-6	40	A 4.3
Rodeca GmbH	PC 2540-7	40	A 4.4
Rodeca GmbH	PC 2540-10	40	A 4.5
Rodeca GmbH	PC 2540-10DX	40	A 4.6
Rodeca GmbH	PC 2540-10DX HI	40	A 4.7
Rodeca GmbH	PC 2600-40-7-U	40	A 4.10
Rodeca GmbH	PC 2550-10	50	A 4.8
Rodeca GmbH	PC 2560-12	60	A 4.9

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

1.1.2 Covering Profiles

The aluminium profiles are made from the aluminium alloy EN AW-6060, T66 in accordance with EN 755-2 and have the dimensions given in Annexes A 3.0 to A 3.3.5.

For aluminium covering profiles, which are thermally separated, the plastic insulating bars consist of polyamide PA66 with a glass fiber content of about 25 % and are produced by extrusion of the molding material ISO 1874-PA66, EC2L, 14-025, GF25. This corresponds to the deposit at the Deutsches Institut für Bautechnik.

1.1.3 Lift anchors

The aluminium profiles are made from EN AW-6060 T66 in accordance with EN 755-2³ and have the dimensions given in Annexes A 3.4.1 to A 3.4.5.

1.1.4 Sealing profile

The sealing profiles are made from ethylene-propylene terpolymer (EPDM) or thermoplastic elastomer (TPE) and has the dimensions and Shore hardness in accordance with EN ISO 868⁴ given in Annex A 3.5.

1.1.5 Connection profile

The polycarbonate connection profile "380062" has the dimensions given in Annexes A 4.11. This corresponds to the deposit at the Deutsches Institut für Bautechnik.

² 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

³ EN 755-2:2016-10 Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties

⁴ EN ISO 868: 2003-10 Plastics and ebonite - Determination of indentation hardness by means of a durometer

1.6 "Rodeca LBE" roof and wall kit.

The "Rodeca LB" of the type PC 2333-30-6, PC 2540-4, PC 2540-4-MC, PC 2540-6, PC 2540-7, PC 2540-10, PC 2540-10DX, PC 2540-10DX HI, PC 2550-10 and PC 2560-12 are made up of the components described in Section 1.1.1 to 1.1.4.

The following combinations in accordance with table 2a are possible:

Table 2a:

Variation	Multi-wall sheet Annex	Covering profile Annex	Lift Anchor Annex	Support system
PC 2333-30-6	A 4.0	A 3.0	-	one-span
PC 2333-30-6 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-4	A 4.1	A 3.1	-	one-span
PC 2540-4 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-4 AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-4-MC	A 4.2	A 3.1	-	one-span
PC 2540-4-MC AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-4-MC AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-6	A 4.3	A 3.1	-	one-span
PC 2540-6 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-6 AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-7	A 4.4	A 3.1	-	one-span
PC 2540-7 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-7 AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-10	A 4.5	A 3.1	-	one-span
PC 2540-10 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-10 AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-10DX	A 4.6	A 3.1	-	one-span
PC 2540-10DX AF 60			A 3.4.2 No.4940X60	multi-span
PC 2540-10DX AF 120			A 3.4.2 No.4940X120	multi-span
PC 2540-10DX HI	A 4.7	A 3.1	-	one-span
PC 2540-10DX HI AF 60			A 3.4.2 No.4940X60	multi-span
PC 2540-10DX HI AF 120			A 3.4.2 No.4940X120	multi-span
PC 2550-10	A 4.8	A 3.2	-	one-span
PC 2550-10 AF 60			A 3.4.3 No.49405060	multi-span
PC 2550-10 AF 120			A 3.4.3 No.494050120	multi-span
PC 2560-12	A 4.9	A 3.3	-	one-span
PC 2560-12 AF 60			A 3.4.4 No.49406060	multi-span
PC 2560-12 AF 120			A 3.4.4 No.494060120	multi-span

The "Rodeca LBE" type PC 2600-40-7-U is made up of the components described in Section 1.1.1 to 1.1.5.

The following combination is possible:

Table 2b:

Variation	Multi-wall sheet Annex	Covering profile Annex	Lift Anchor Annex	Connection profile Annex	Support system
PC 2600-40-7-U AF49404000	A 4.10	A 3.1	A 3.4.5	A 4.11	multi-span

Table 3: Reaction to fire of the components

Multi-wall sheets	class Bs1-d0 in accordance with EN 13501-1 ⁵
Sealing profile/ Plastic insulating bars of aluminium covering profiles	No contribution to fire spread in accordance with EOTA TR 021 (Version June 2005)
Covering profiles, Lift anchors	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)

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

The self-supporting translucent roof and wall kit may be used in the roof or wall area for open or closed structures. The multi-wall sheets may be combined to form continuous areas of any length over a rectangular ground plan.

The pitch of a roof's covering is at least 5°. The roof and wall kit is not a walk-on system; it may not be used for bracing of the support structure.

The performance data given in Section 3 is only valid if the roof kit is used in compliance with the specifications and the conditions given in Annexes A to 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 and wall 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 a means for choosing the right products in relation to the expected economically reasonable working life of the structure.

3 Performance of the product

3.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Fire performance in case of external fire exposure	No performance assessed
Reaction to fire	Class Bs1-d0 in accordance with EN 13501-1

⁵

EN 13501-1:2010-01

Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

3.2 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Watertightness ^{a)}	Class 8A in accordance with EN 12208 ⁶
^{a)} Considered solely the tightness of tongue and groove connection	

3.3 Safety and accessibility (BWR 4)

Essential characteristic	Performance
Characteristic structural resistance resulting from downward loads and uplift loads [kN/m ²]	See Annex B 2.1
Moment and support reaction at intermediate supports for multi-span systems	See Annex B 2.2
Material-dependent influencing factor for the effect of load duration	See Annex B 1.2
Material-dependent influencing factor for ageing and environmental effects	See Annex B 1.3
Material-dependent influencing factor for thermal effects	See Annex B 1.3
Deformation behaviour	See Annex B 1.4
Transverse tensile strength capacity	See Annex B 1.5
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)	Passed in accordance with EN 16153

3.4 Protection against noise (BWR 5)

No performance assessed

3.5 Energy economy and heat retention (BWR 6)

3.5.1 Thermal resistance

Essential characteristic	Performance
Thermal transmittance coefficient	See Annex C

3.5.2 Air permeability

Essential characteristic	Performance
Air permeability ^{a)}	Class 4 in accordance with EN 12207 ⁷
^{a)} Considered solely the tightness of tongue and groove connection	

3.5.3 Spectral characteristics

No performance assessed

3.5.4 Total solar energy transmittance

No performance assessed

⁶ EN 12208:2000-06
⁷ EN 12207:2017-03

Windows and doors - Watertightness - Classification
Windows and doors - Air permeability - Classification

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

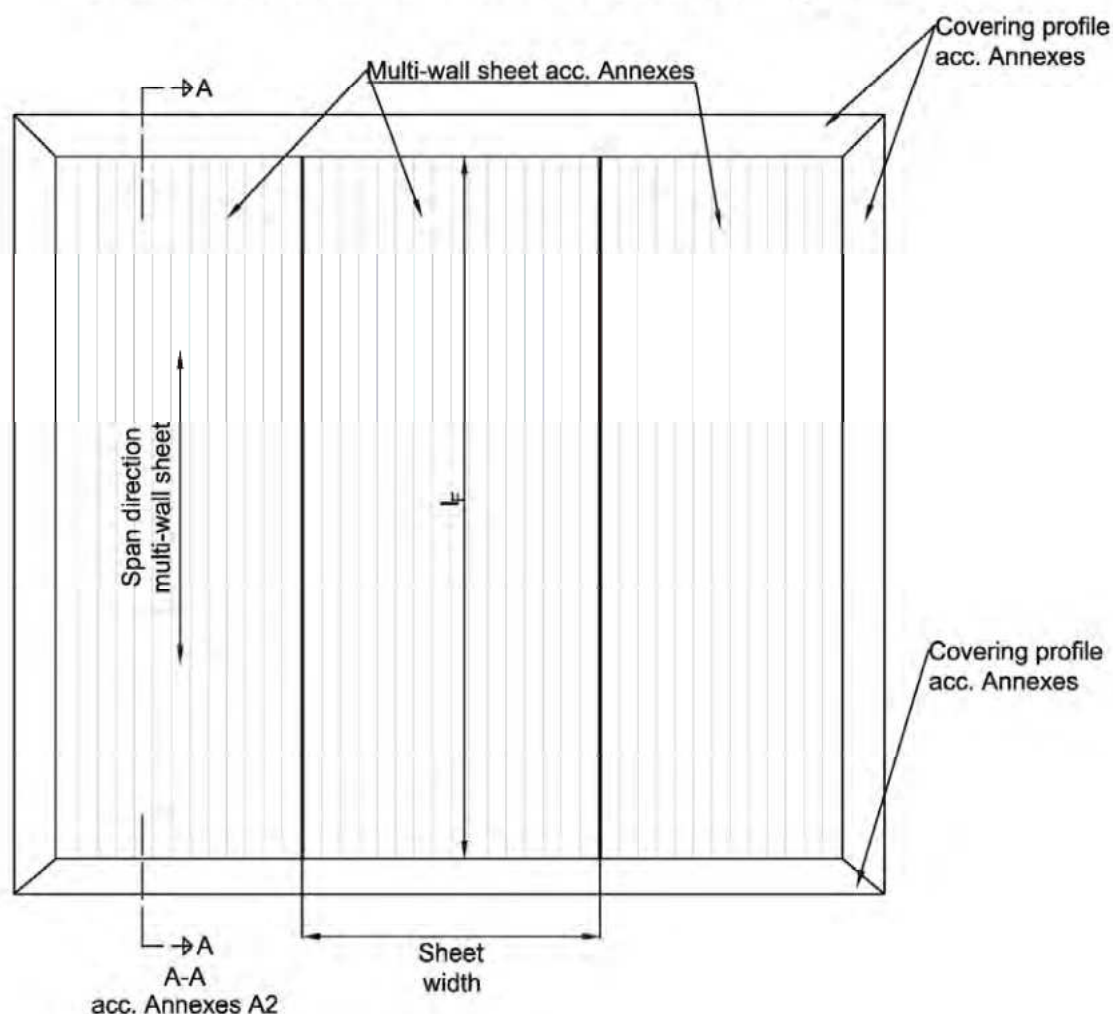
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 2 August 2021 by Deutsches Institut für Bautechnik

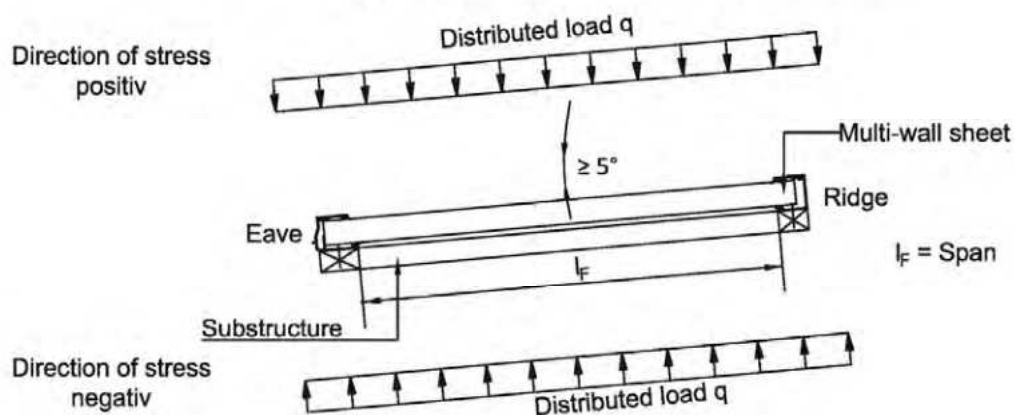
Renée Kamanzi-Fechner
Head of Section

beglaubigt:
Wachner

Front view roof and wall -single-span-system-



Schematic figure longitudinal section roof

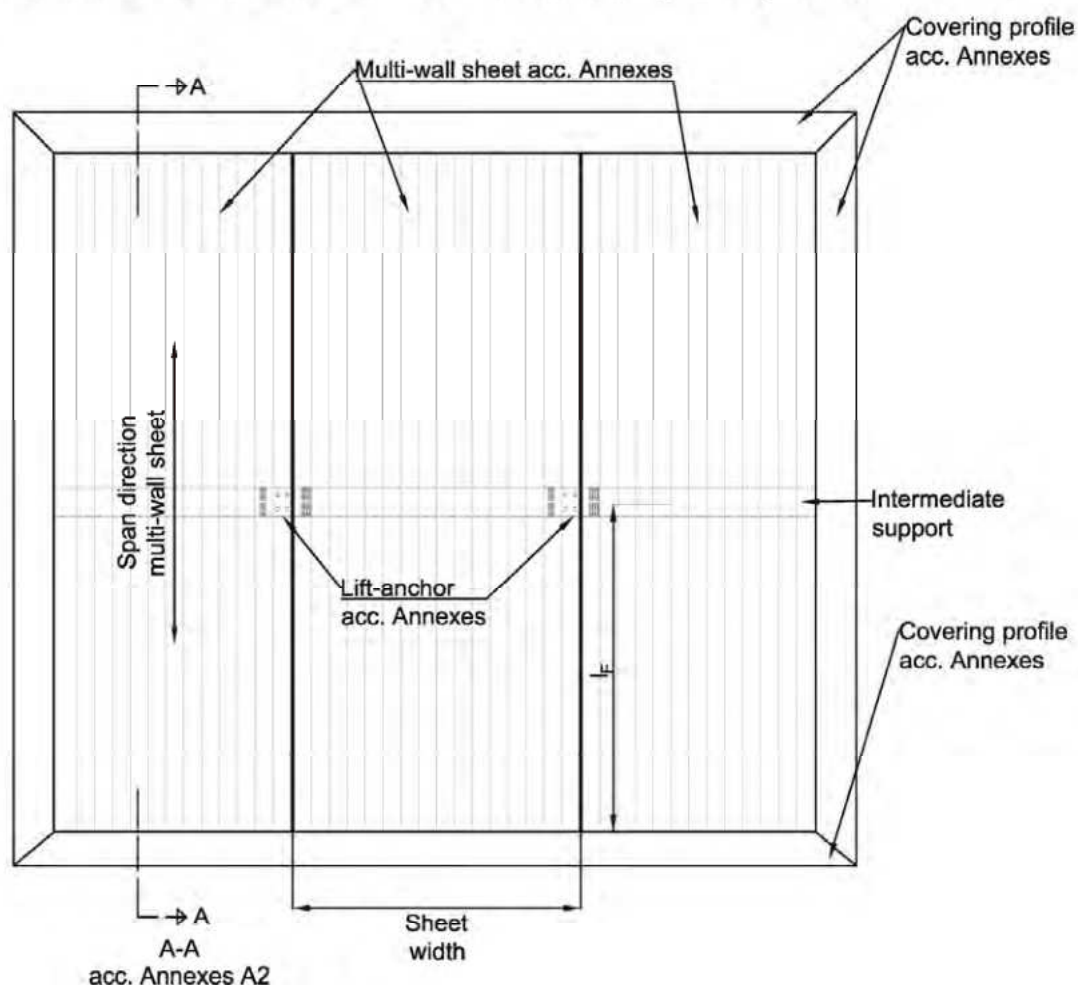


Rodeca LBE

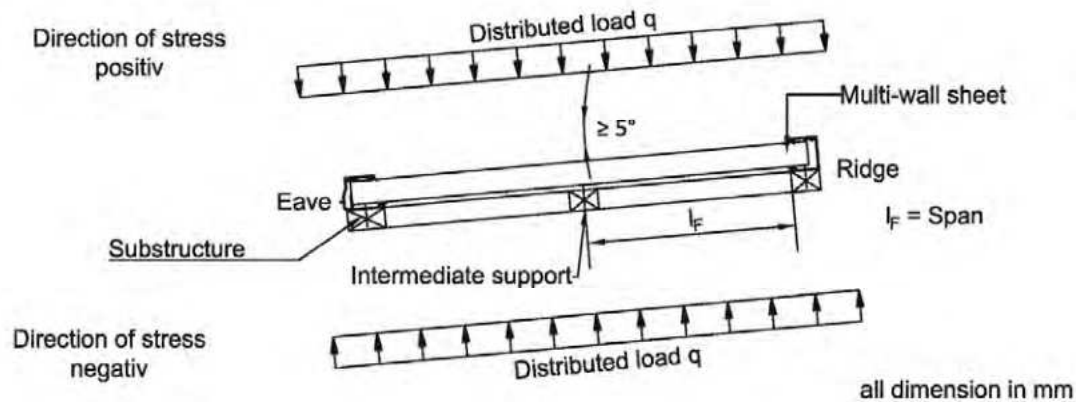
Assembly situation one-span-system

Annex A 1.1

Front view roof and wall -continuous-span-system-



Schematic figure longitudinal section roof

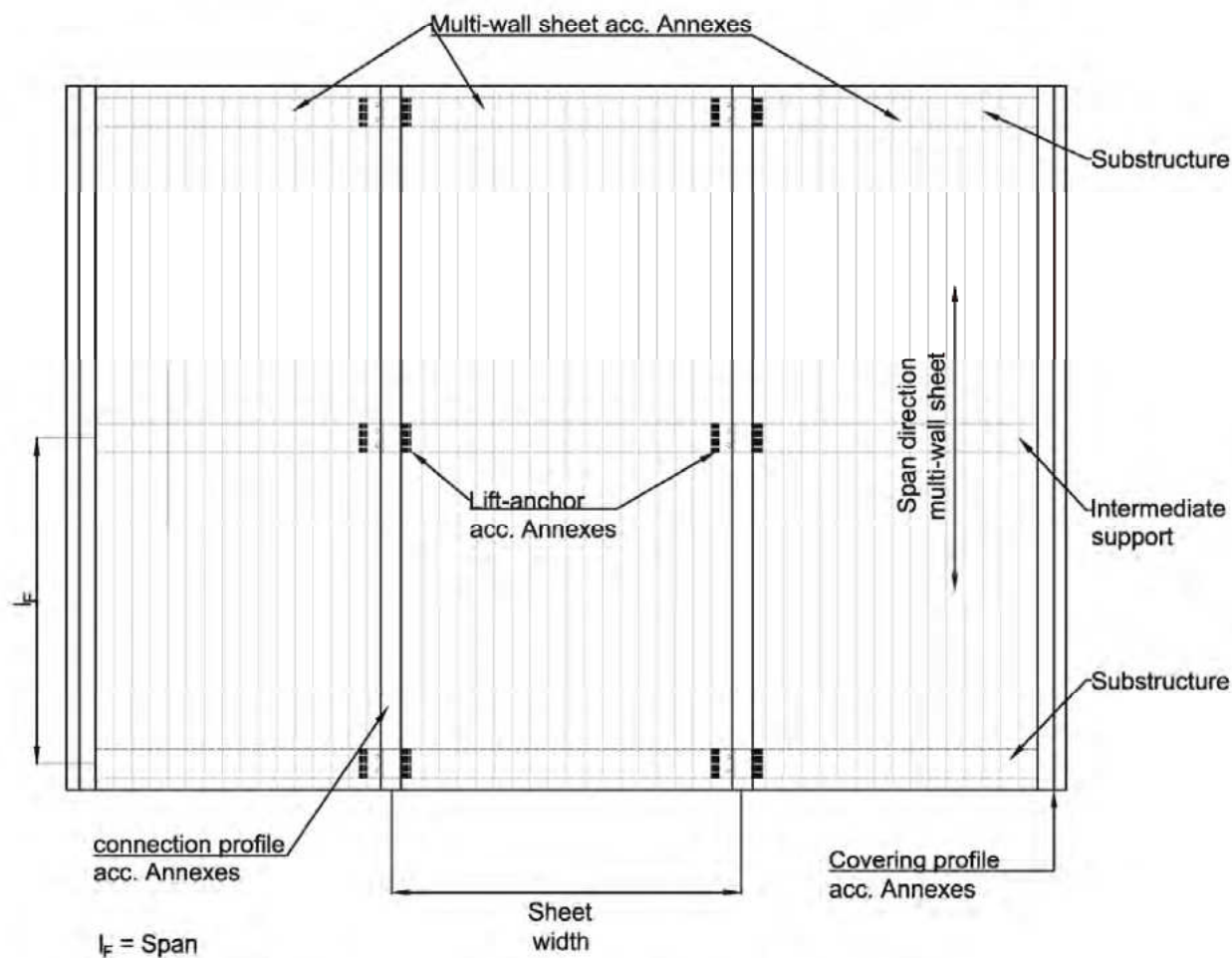


Rodeca LBE

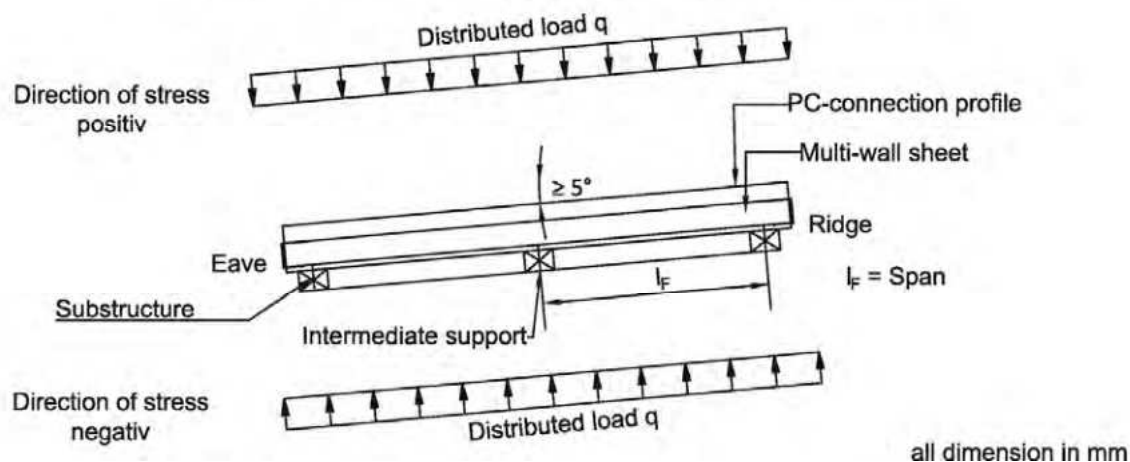
Assembly situation multi-span-system

Annex A 1.2

Front view roof and wall -continuous-span-system-



Schematic figure longitudinal section roof

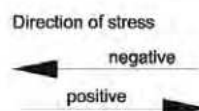


Rodeca LBE

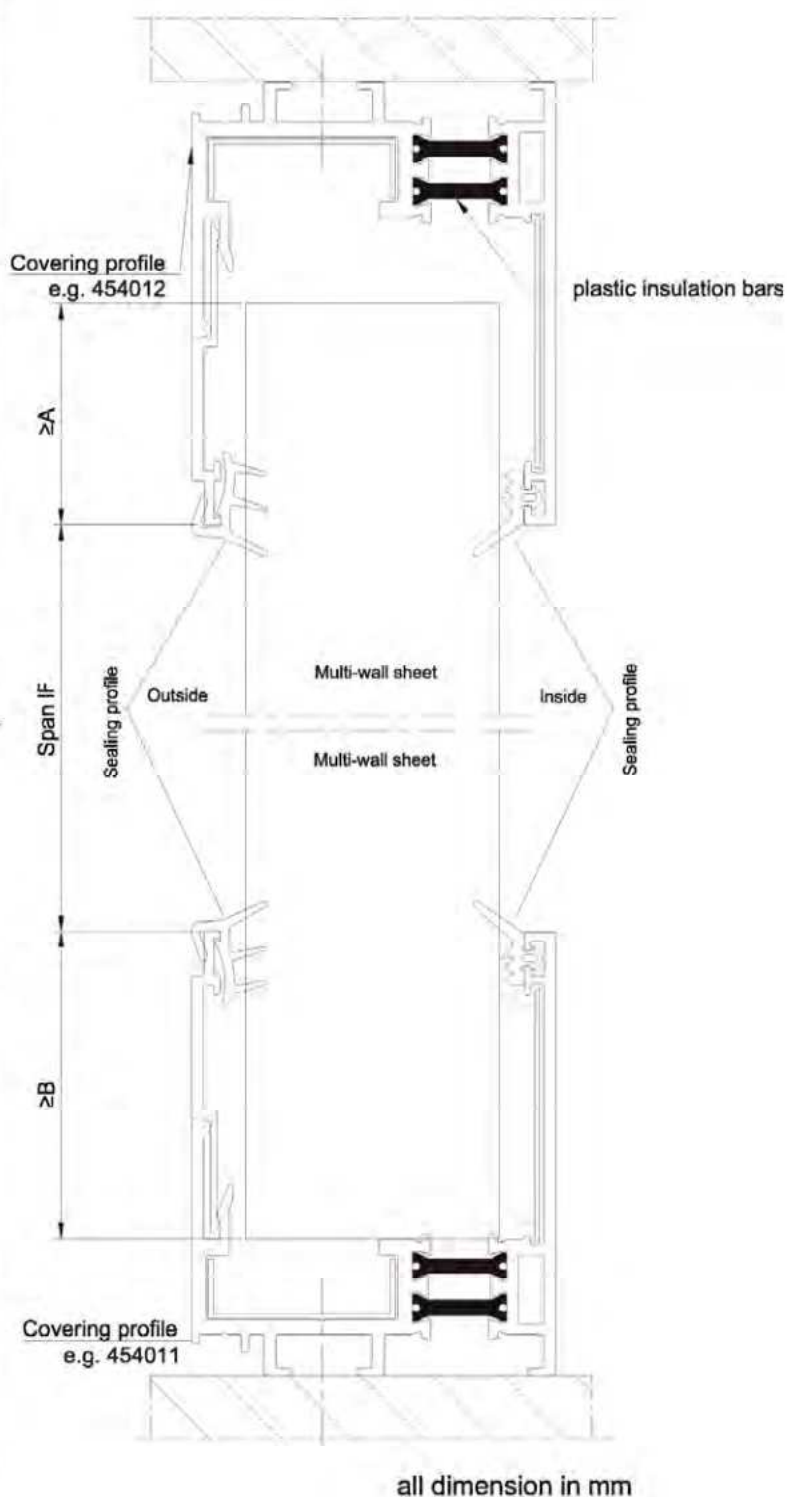
Assembly situation multi-span-system
with PC-connection profile

Annex A 1.3

Profile no.	Annex	Thickness of multi-wall sheet	Dimension "A"
423040	3.0	30 mm	≥30 mm
414002	3.1.3	40 mm	≥35 mm
414012	3.1.4	40 mm	≥35 mm
420040	3.1.6	40 mm	≥35 mm
420080	3.1.7	40 mm	≥35 mm
454002	3.1.9	40 mm	≥35 mm
454012	3.1.10	40 mm	≥35 mm
415002	3.2.3	50 mm	≥40 mm
415012	3.2.2	50 mm	≥40 mm
455002	3.2.6	50 mm	≥40 mm
455012	3.2.5	50 mm	≥40 mm
416012	3.3.2	60 mm	≥40 mm
456002	3.3.5	60 mm	≥40 mm
456012	3.3.4	60 mm	≥40 mm



Profile no.	Annex	Thickness of multi-wall sheet	Dimension "B"
423040	3.0	30 mm	≥30 mm
414001	3.1.3	40 mm	≥20 mm
414011	3.1.4	40 mm	≥20 mm
420031	3.1.5	40 mm	≥20 mm
454001	3.1.9	40 mm	≥20 mm
454011	3.1.10	40 mm	≥20 mm
415001	3.2.3	50 mm	≥40 mm
415011	3.2.2	50 mm	≥40 mm
455001	3.2.6	50 mm	≥40 mm
455011	3.2.5	50 mm	≥40 mm
416011	3.3.2	60 mm	≥40 mm
456001	3.3.5	60 mm	≥40 mm
456011	3.3.4	60 mm	≥40 mm



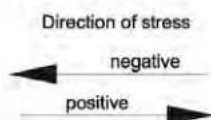
Rodeca LBE

Support condition wall installation
Example for assembly in reveal

Annex A 2.1

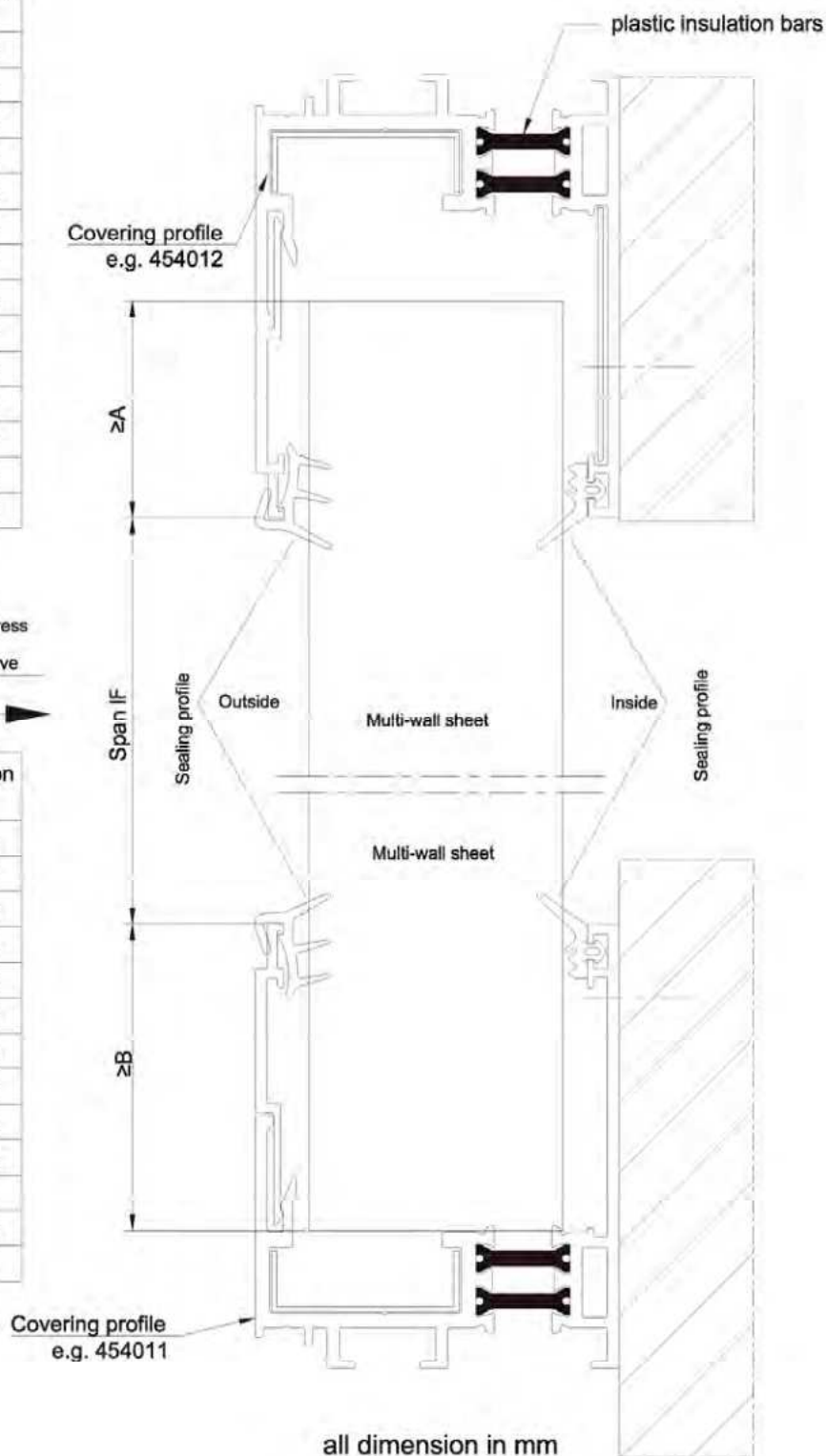
Profile no.	Annex	Thickness of multi-wall sheet	Dimension "A"
423040	3.0	30 mm	≥30 mm
414002	3.1.3	40 mm	≥35 mm
414012	3.1.4	40 mm	≥35 mm
420040	3.1.6	40 mm	≥35 mm
420080	3.1.7	40 mm	≥35 mm
454002	3.1.9	40 mm	≥35 mm
454012	3.1.10	40 mm	≥35 mm
415002	3.2.3	50 mm	≥40 mm
415012	3.2.2	50 mm	≥40 mm
455002	3.2.6	50 mm	≥40 mm
455012	3.2.5	50 mm	≥40 mm
416012	3.3.2	60 mm	≥40 mm
456002	3.3.5	60 mm	≥40 mm
456012	3.3.4	60 mm	≥40 mm

Optional support transomprofile Annex A 2.3



Profile no.	Annex	Thickness of multi-wall sheet	Dimension "B"
423040	3.0	30 mm	≥30 mm
414001	3.1.3	40 mm	≥20 mm
414011	3.1.4	40 mm	≥20 mm
420031	3.1.5	40 mm	≥20 mm
454001	3.1.9	40 mm	≥20 mm
454011	3.1.10	40 mm	≥20 mm
415001	3.2.3	50 mm	≥40 mm
415011	3.2.2	50 mm	≥40 mm
455001	3.2.6	50 mm	≥40 mm
455011	3.2.5	50 mm	≥40 mm
416011	3.3.2	60 mm	≥40 mm
456001	3.3.5	60 mm	≥40 mm
456011	3.3.4	60 mm	≥40 mm

Optional support transomprofile Annex A 2.3

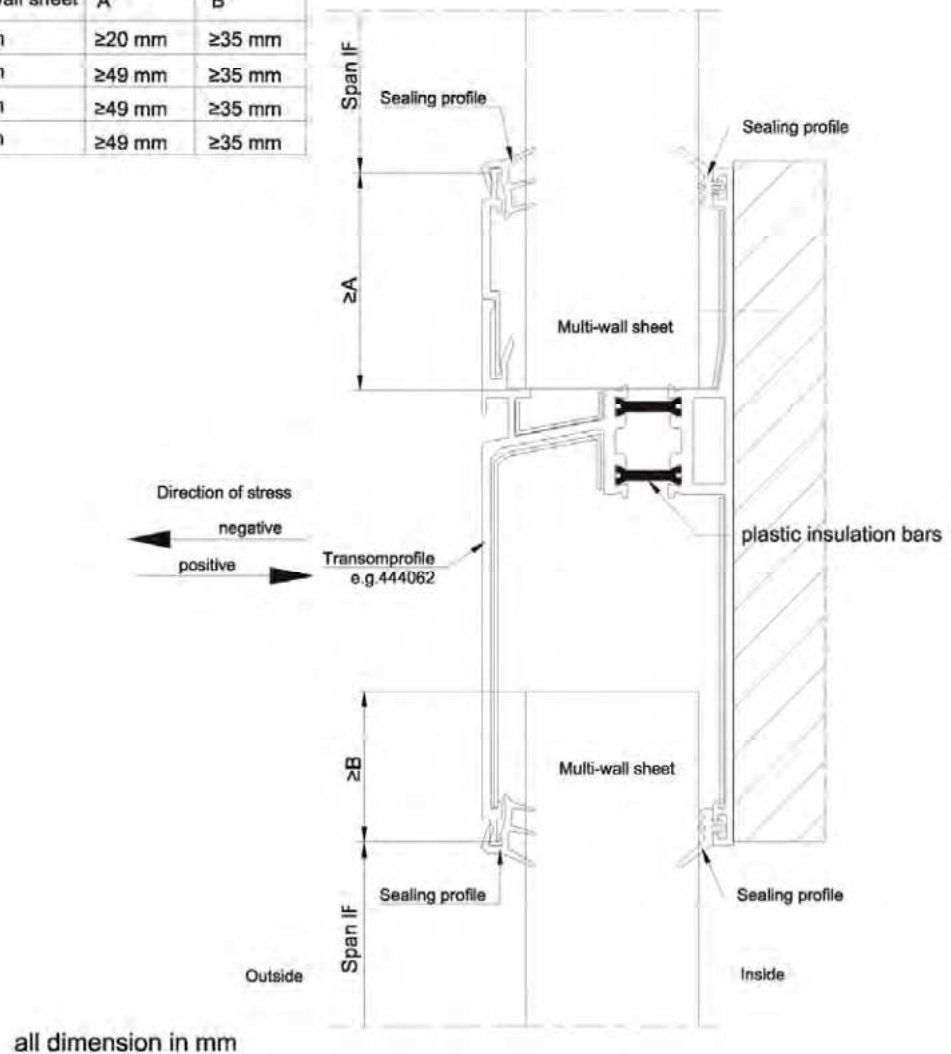


Rodeca LBE

Support condition wall and roof installation
Example curtain wall installation

Annex A 2.2

Profile no.	Annex	Thickness of multi-wall sheet	Dimension "A"	Dimension "B"
404062	3.1.2	40 mm	≥20 mm	≥35 mm
444062	3.1.8	40 mm	≥49 mm	≥35 mm
445062	3.2.4	50 mm	≥49 mm	≥35 mm
446062	3.3.2	60 mm	≥49 mm	≥35 mm

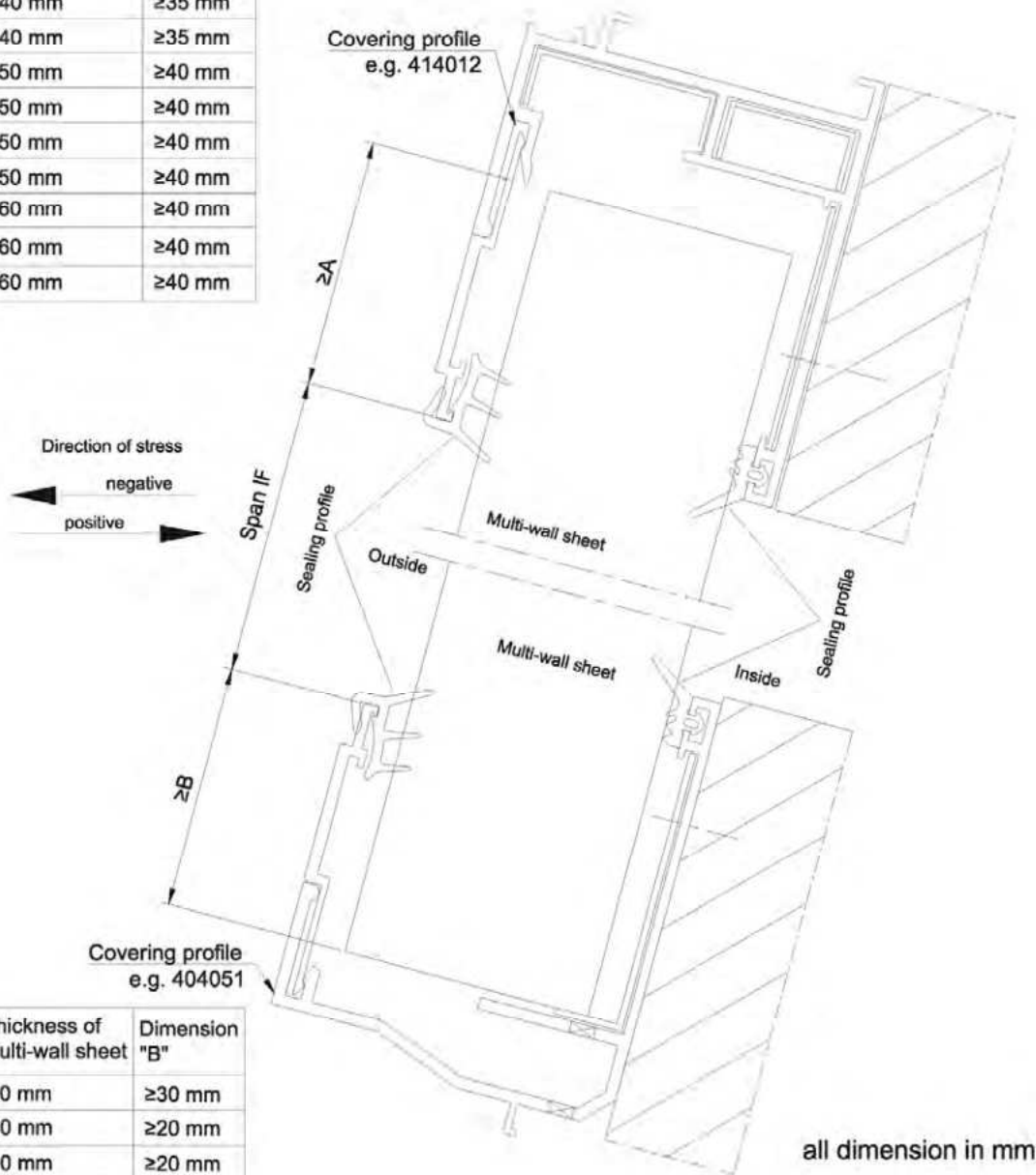


Rodeca LBE

Support condition wall installation
Example installation transomprofile

Annex A 2.3

Profile no.	Annex	Thickness of multi-wall sheet	Dimension "A"
423040	3.0	30 mm	≥30 mm
414002	3.1.3	40 mm	≥35 mm
414012	3.1.4	40 mm	≥35 mm
420040	3.1.6	40 mm	≥35 mm
420080	3.1.7	40 mm	≥35 mm
454002	3.1.9	40 mm	≥35 mm
454012	3.1.10	40 mm	≥35 mm
415002	3.2.3	50 mm	≥40 mm
415012	3.2.2	50 mm	≥40 mm
455002	3.2.6	50 mm	≥40 mm
455012	3.2.5	50 mm	≥40 mm
416012	3.3.2	60 mm	≥40 mm
456002	3.3.5	60 mm	≥40 mm
456012	3.3.4	60 mm	≥40 mm

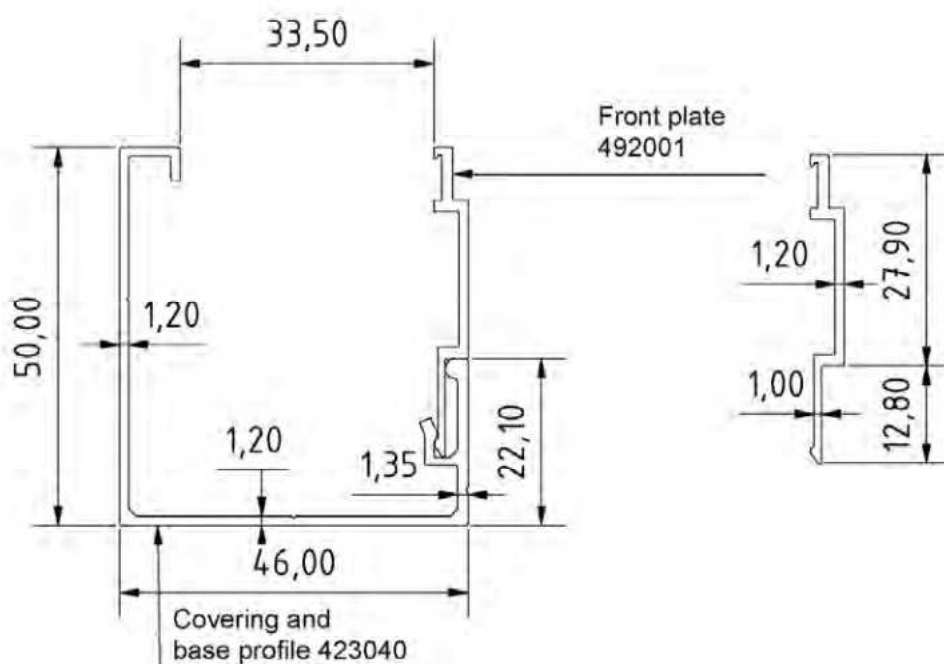


Profil no.	Annex	Thickness of multi-wall sheet	Dimension "B"
423040	3.0	30 mm	≥30 mm
404051	3.1.1	40 mm	≥20 mm
414051	3.1.4	40 mm	≥20 mm
405051	3.2.1	50 mm	≥40 mm
415051	3.2.2	50 mm	≥40 mm
406051	3.3.1	60 mm	≥40 mm
416051	3.3.2	60 mm	≥40 mm

Rodeca LBE

Support condition wall and roof installation
Example inclined wall / roof

Annex A 2.4

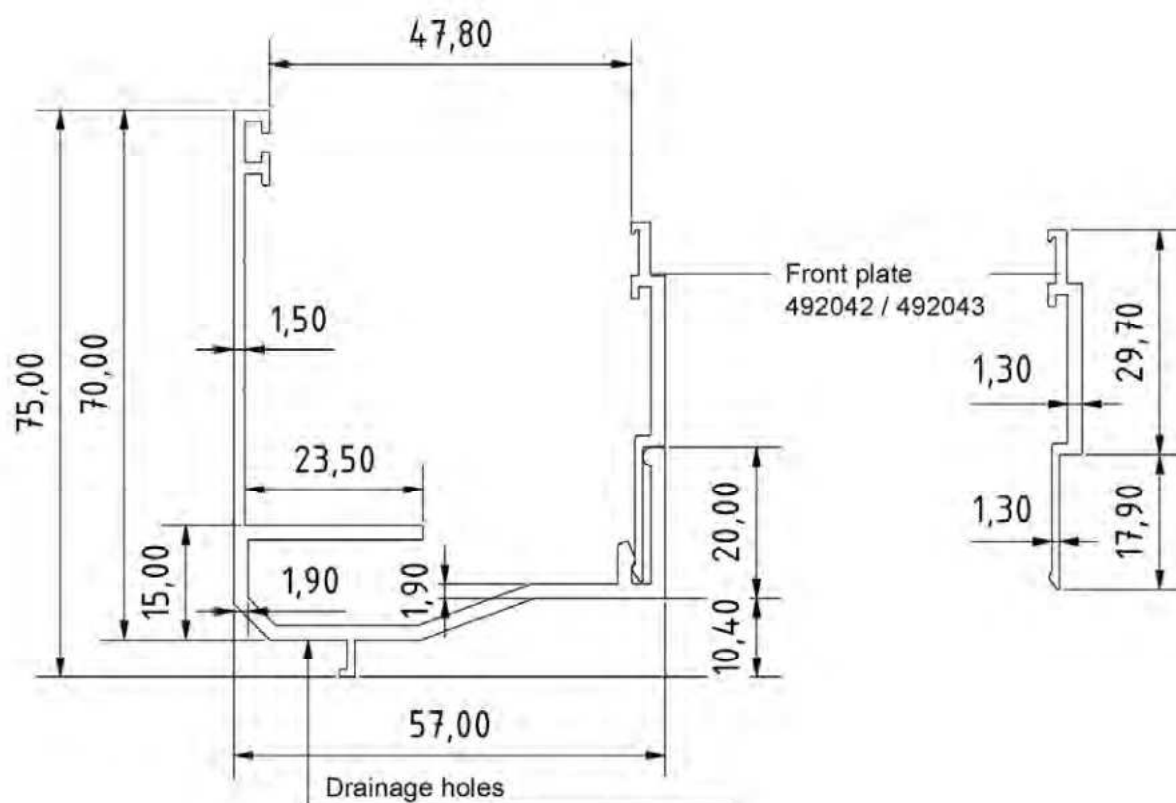


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 423040
Front plate A492001
For thickness of multi-wall sheet of 30 mm

Annex A 3.0

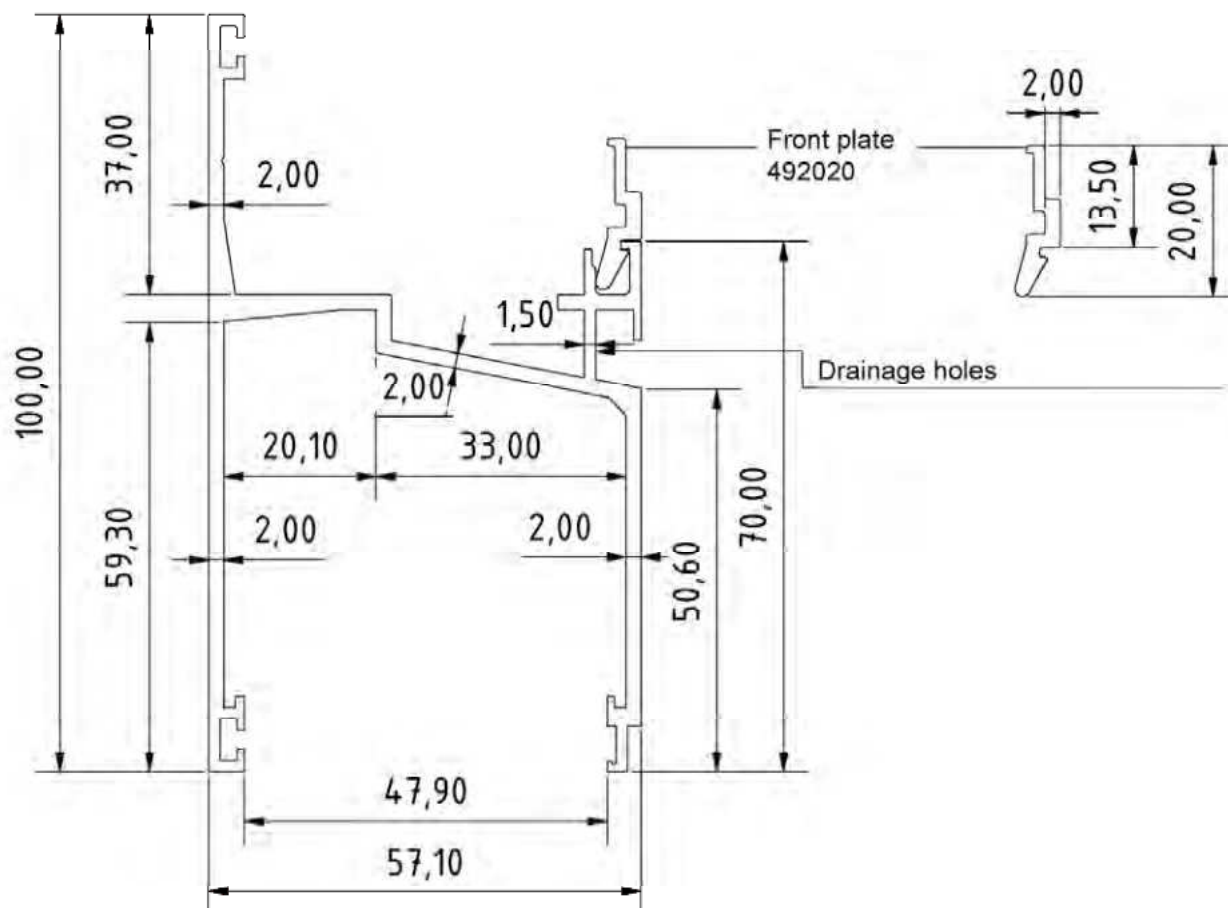


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

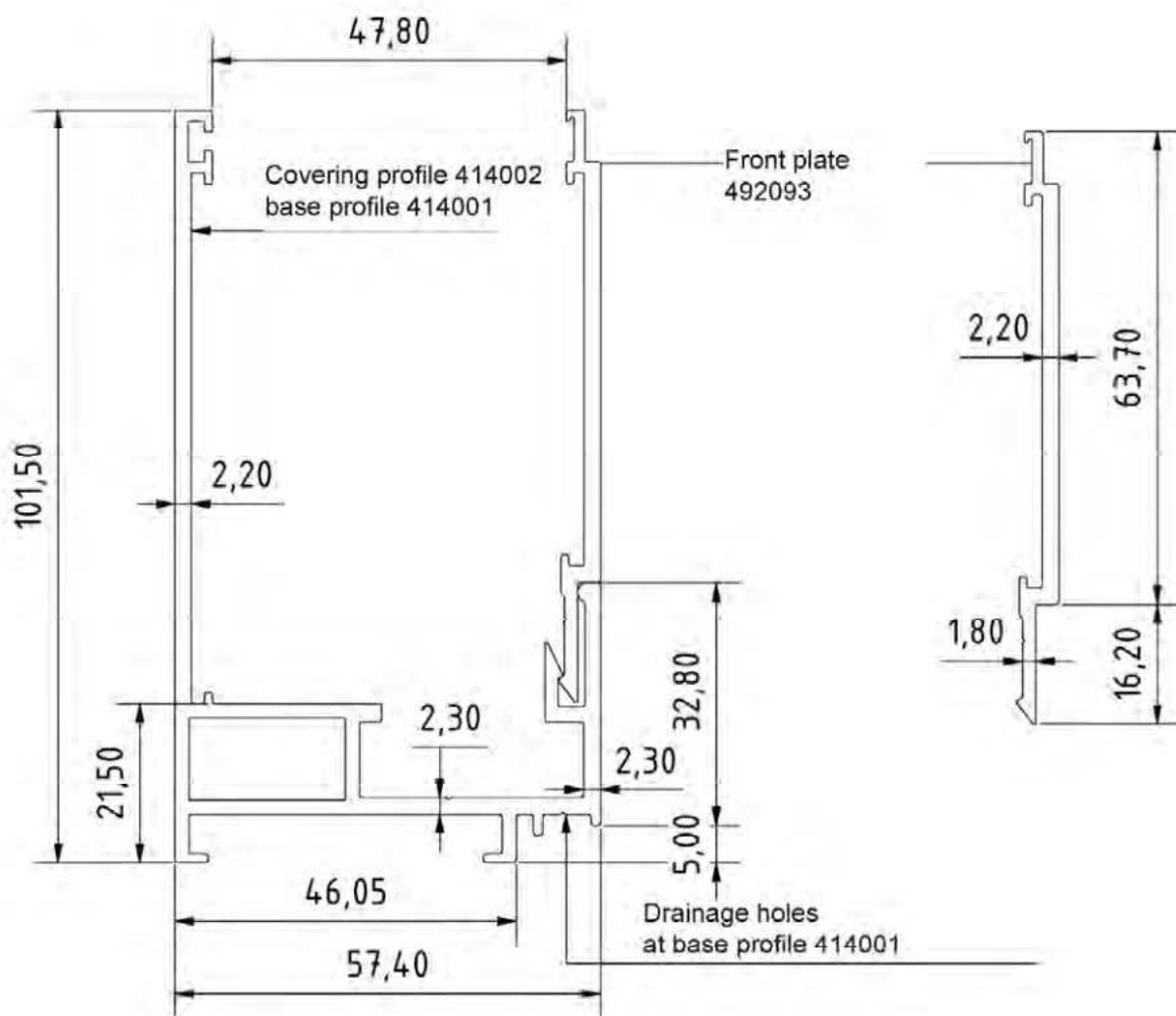
Covering base profile 404051
Front plate A492042 / 492043
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.1



All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE	Annex A 3.1.2
Transom profile 404062 Front plate 492020 For thickness of multi-wall sheet of 40 mm	

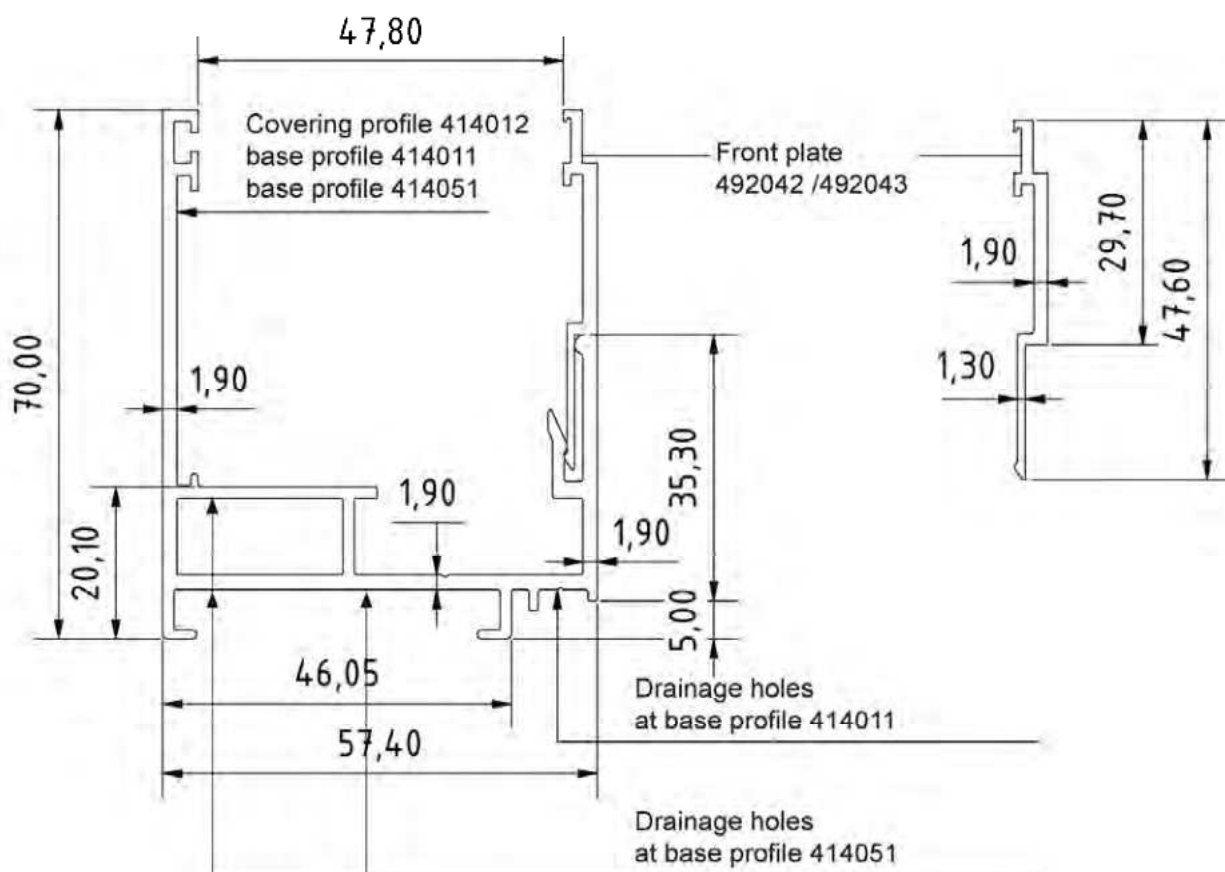


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

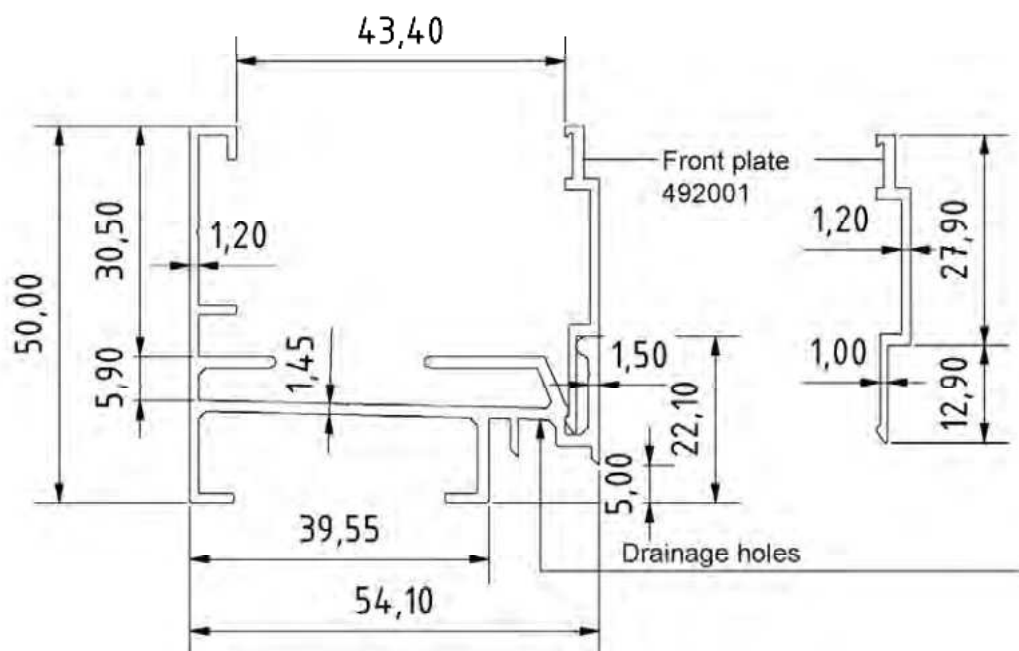
Covering base profile 414001/ covering profile 414002
Front plate 492093
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.3



All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE	Annex A 3.1.4
Coverling base profile 414011 /414051 / covering profile 414012 Front plate 492042 / 492043 For thickness of multi-wall sheet of 40 mm	

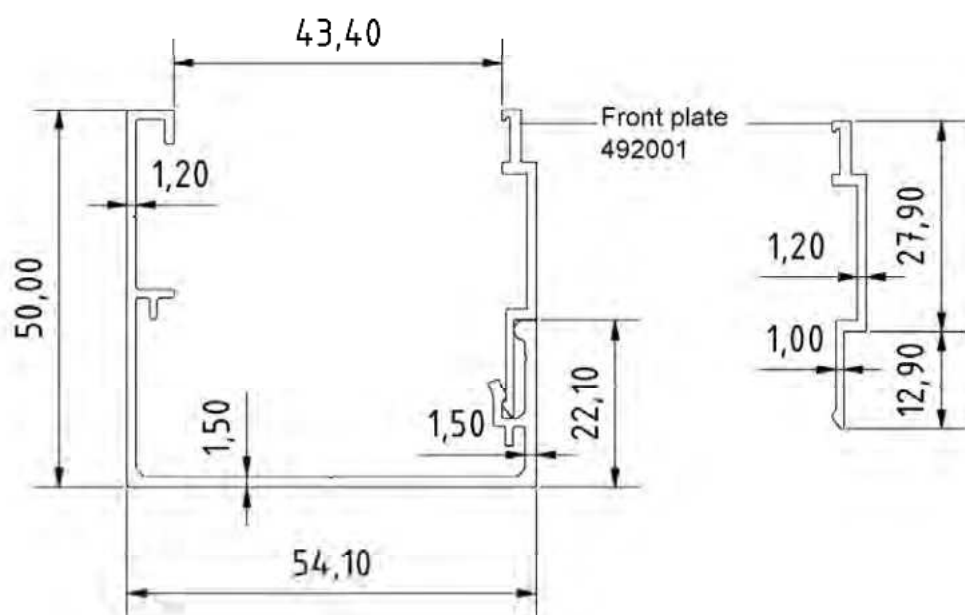


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 420031
Front plate 492001
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.5

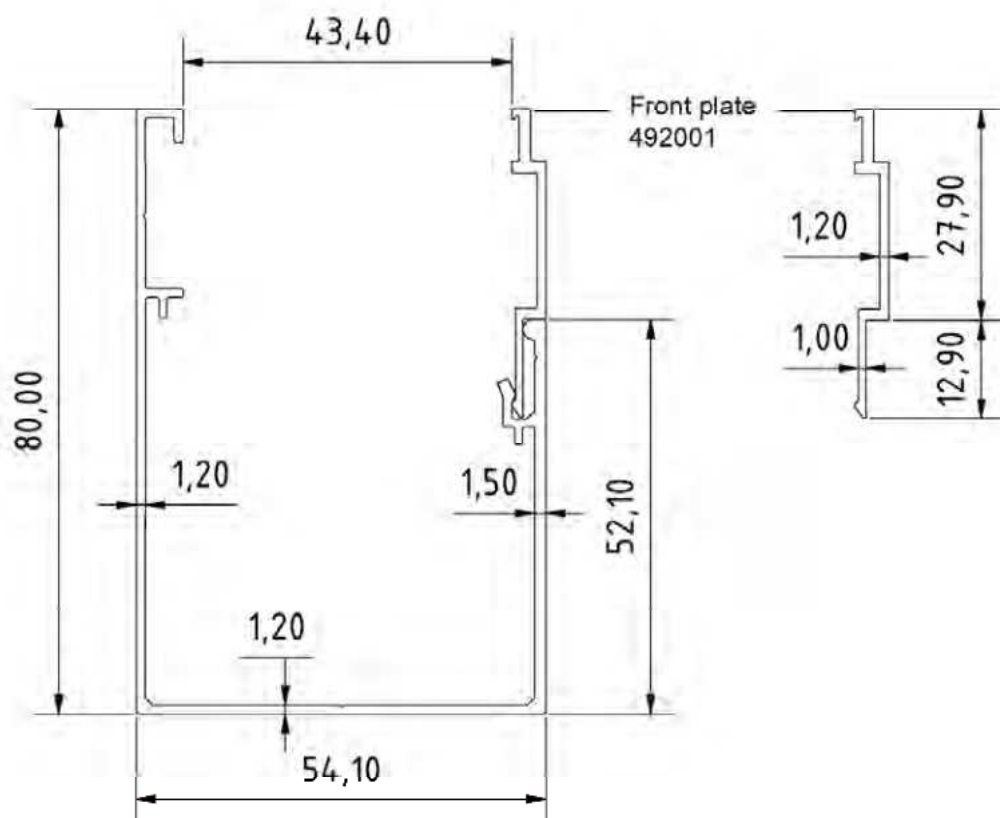


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering profile 420040
Front plate 492001
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.6

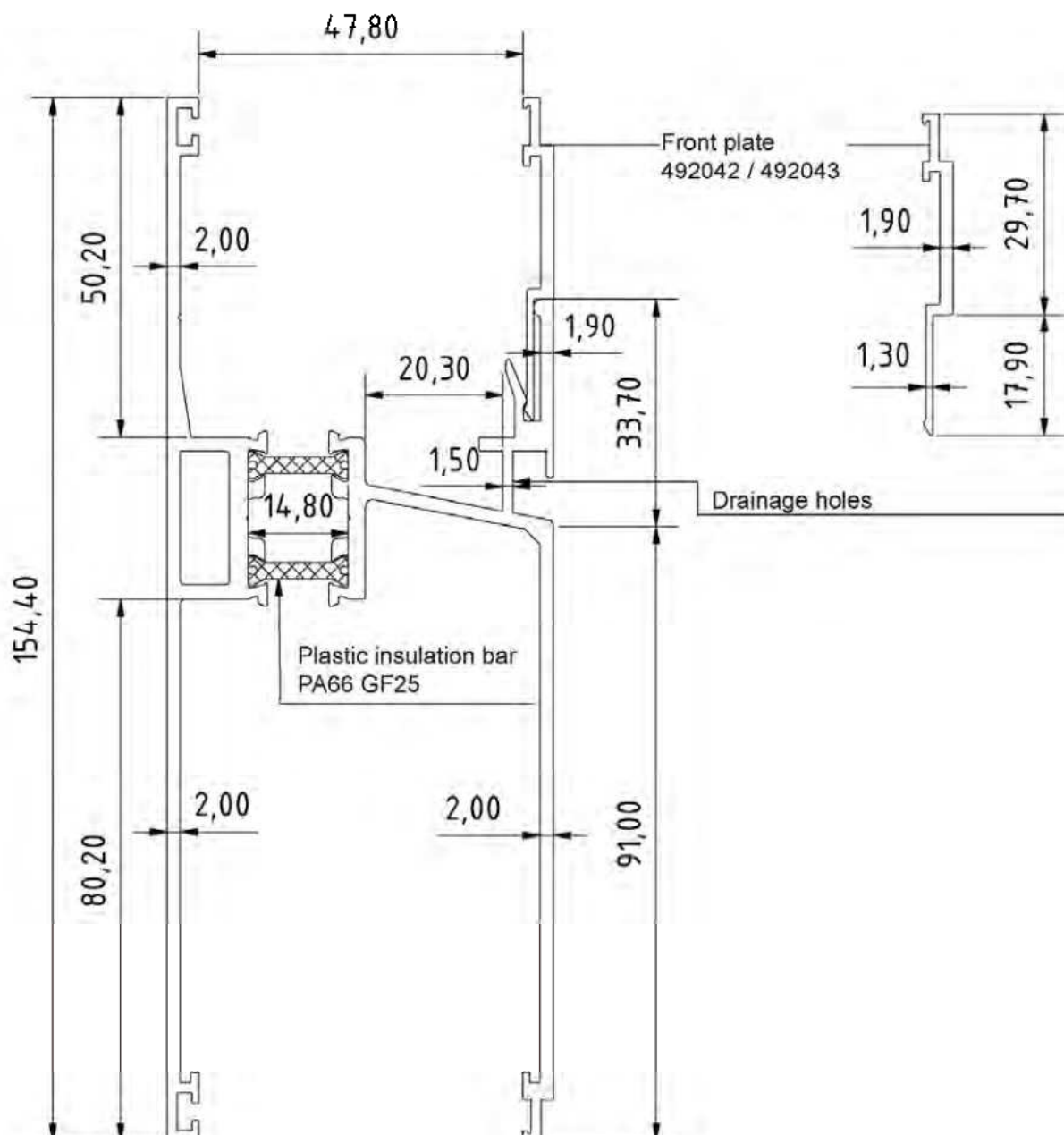


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

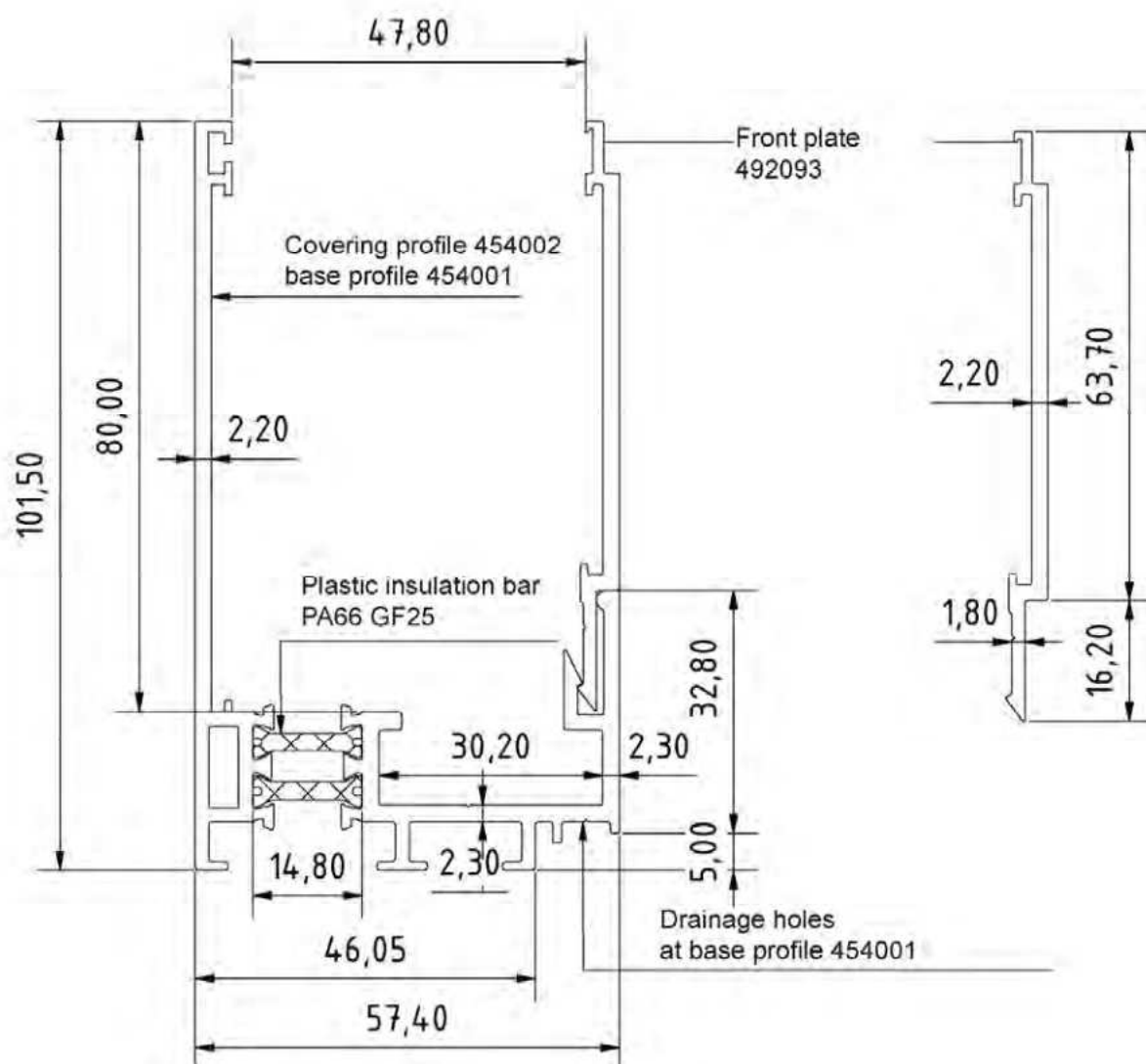
Covering profile 420080
Front plate 492001
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.7



All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE	Annex A 3.1.8
Transom profile 444062 Front plate 492042 / 492043 For thickness of multi-wall sheet of 40 mm	

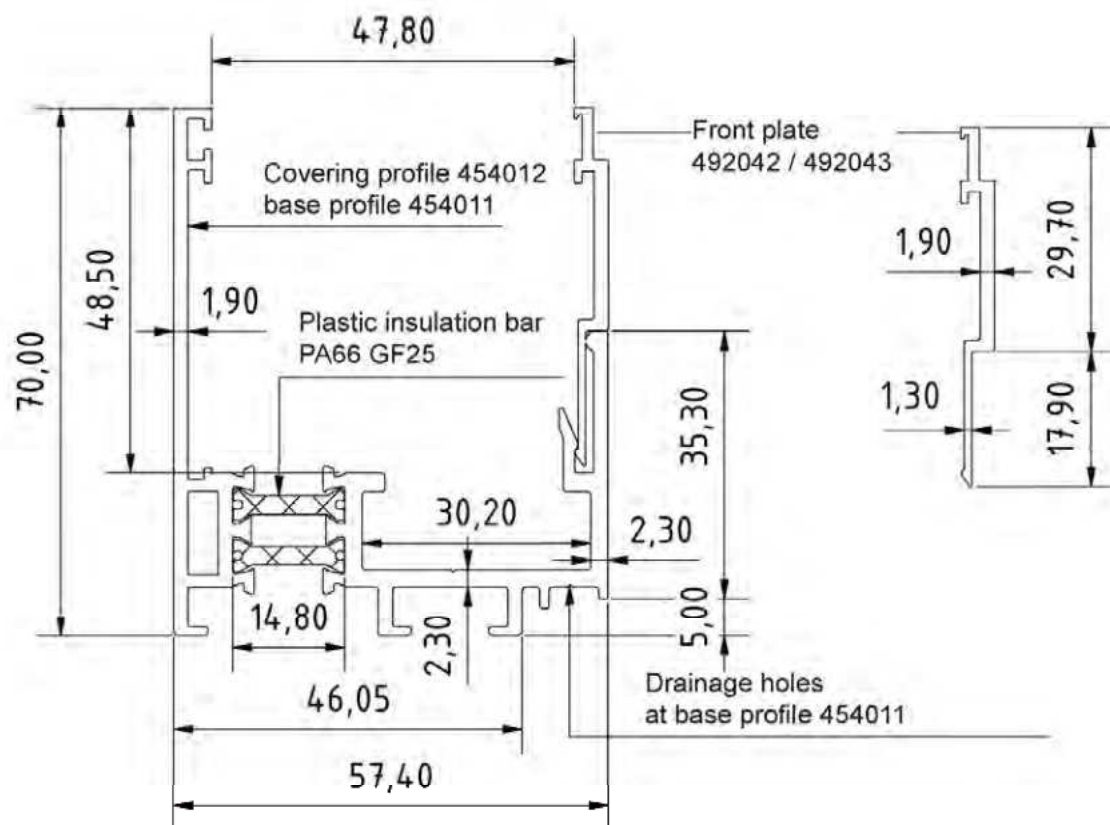


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 454001 / covering profile 454002
Front plate 492093
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.9

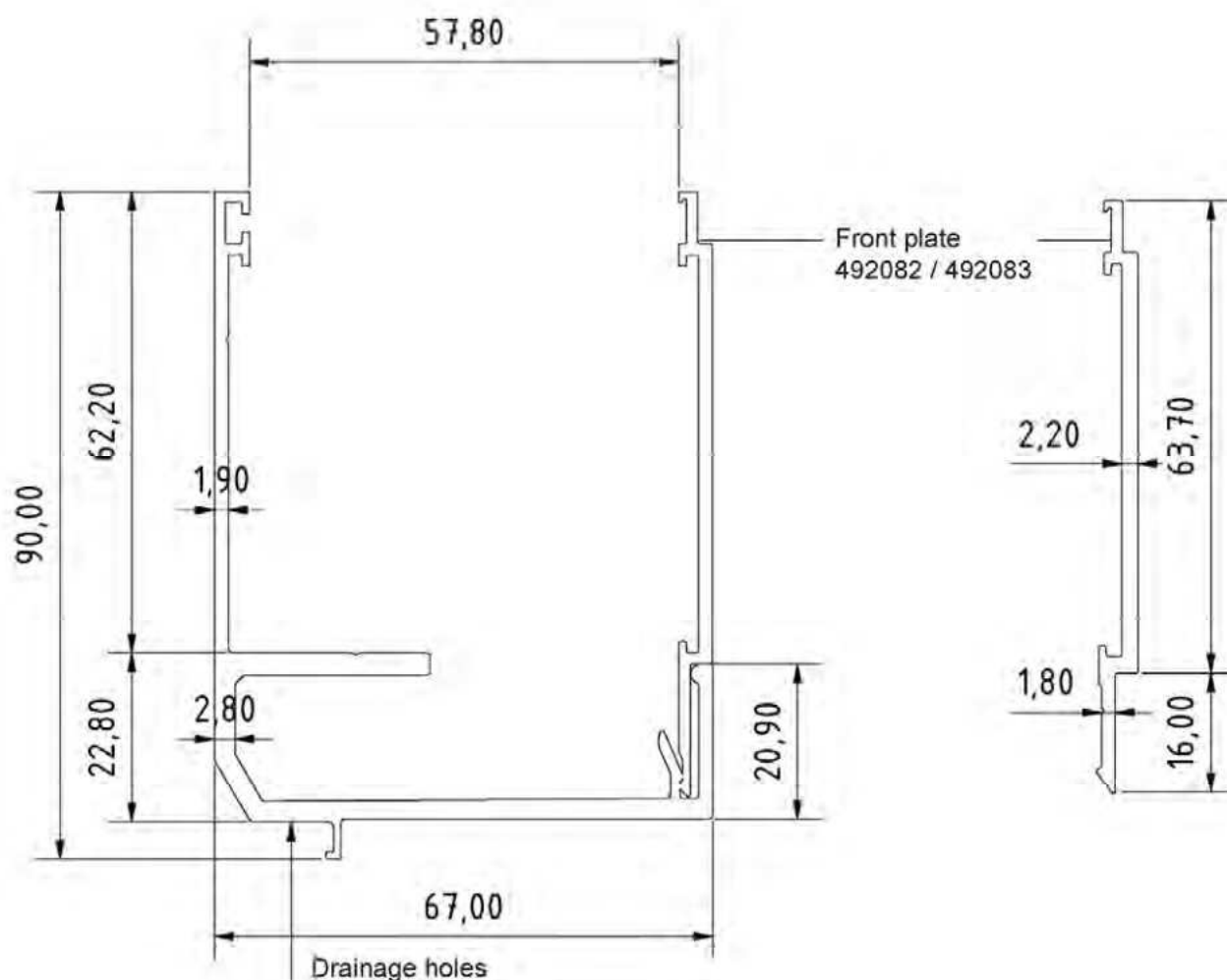


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 454011 / covering profile 454012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.10

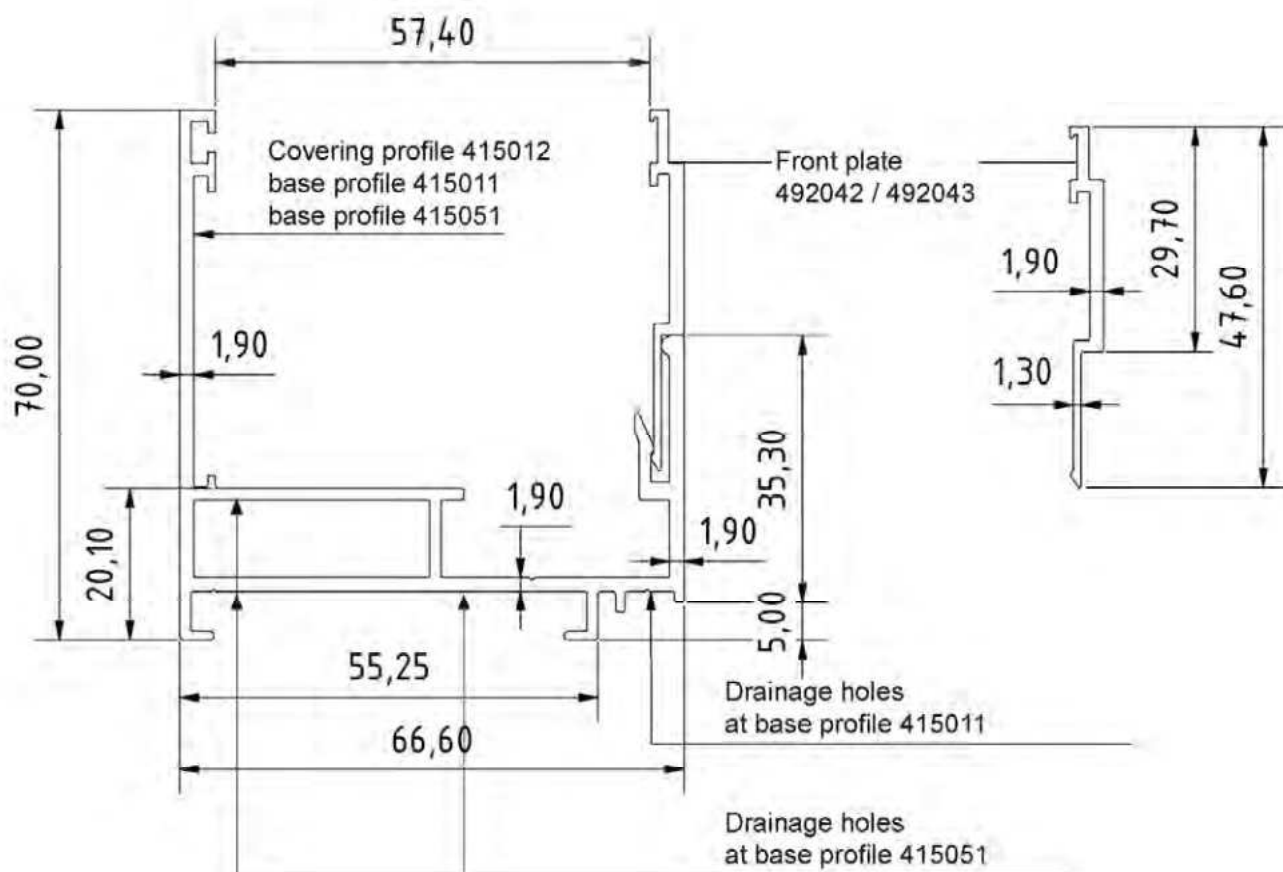


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 405051
Front plate 492082/492083
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.1

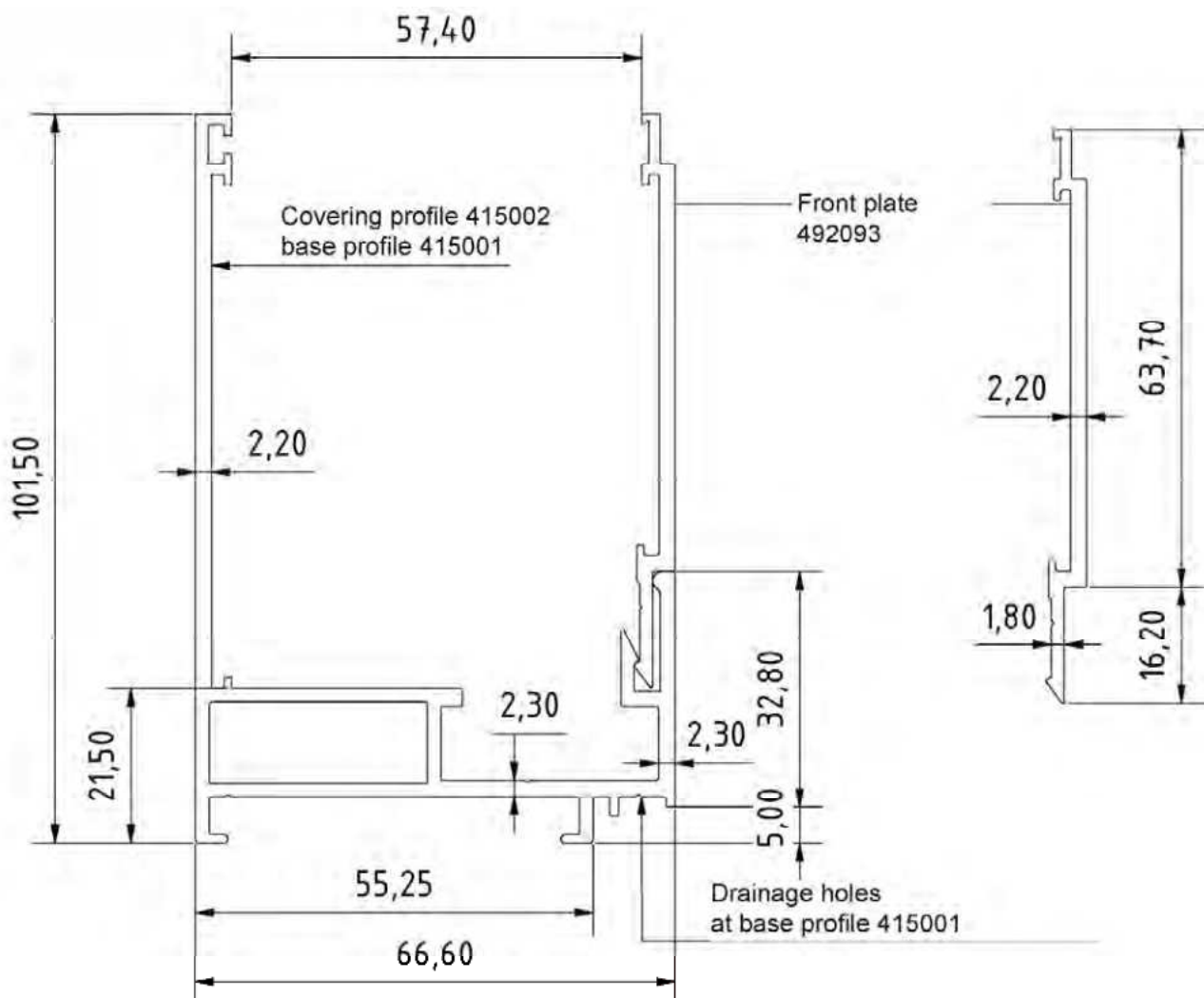


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 415011/ 415051 / covering profile 415012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.2

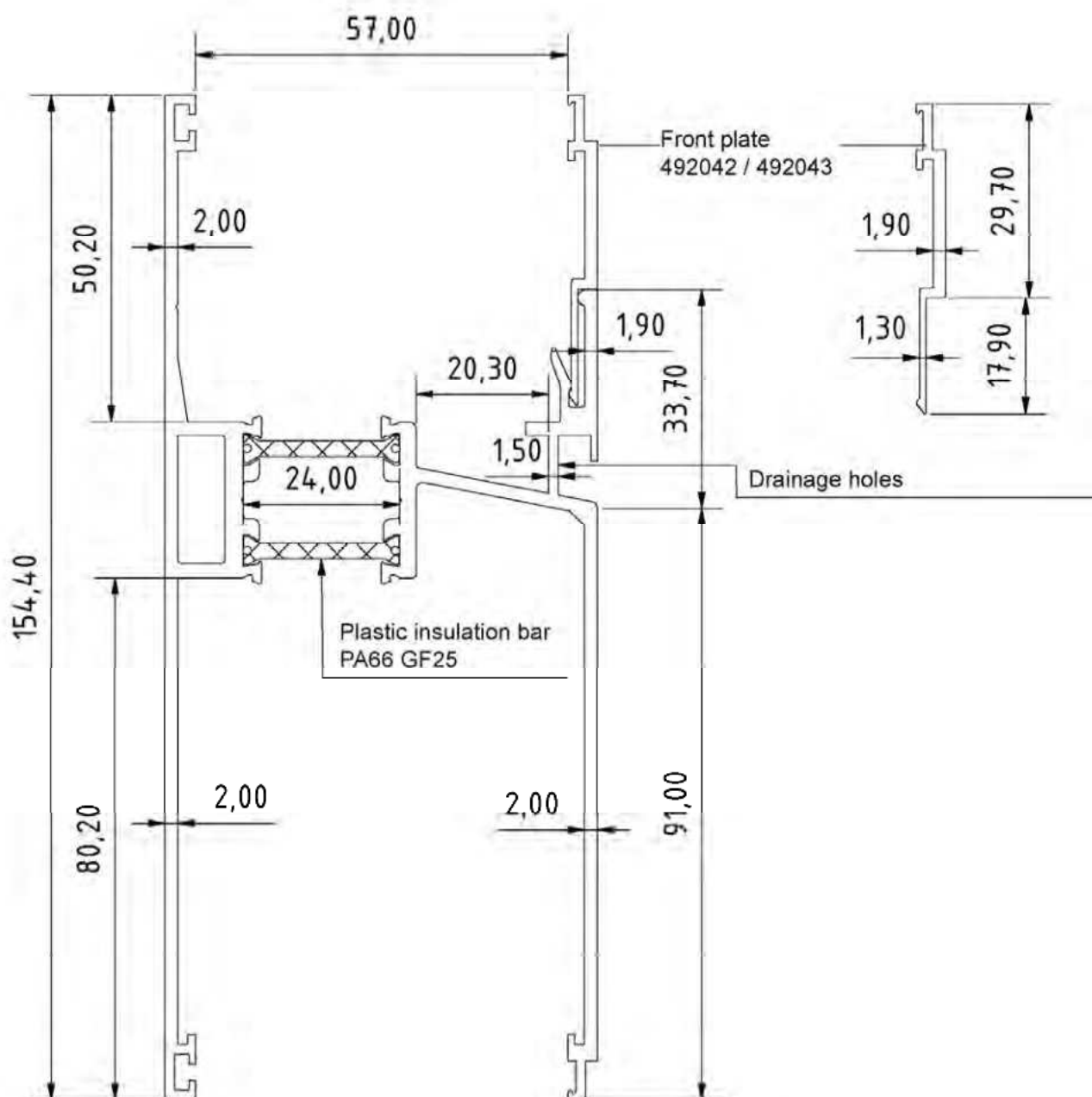


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 415001 / covering profile 415002
Front plate 492093
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.3

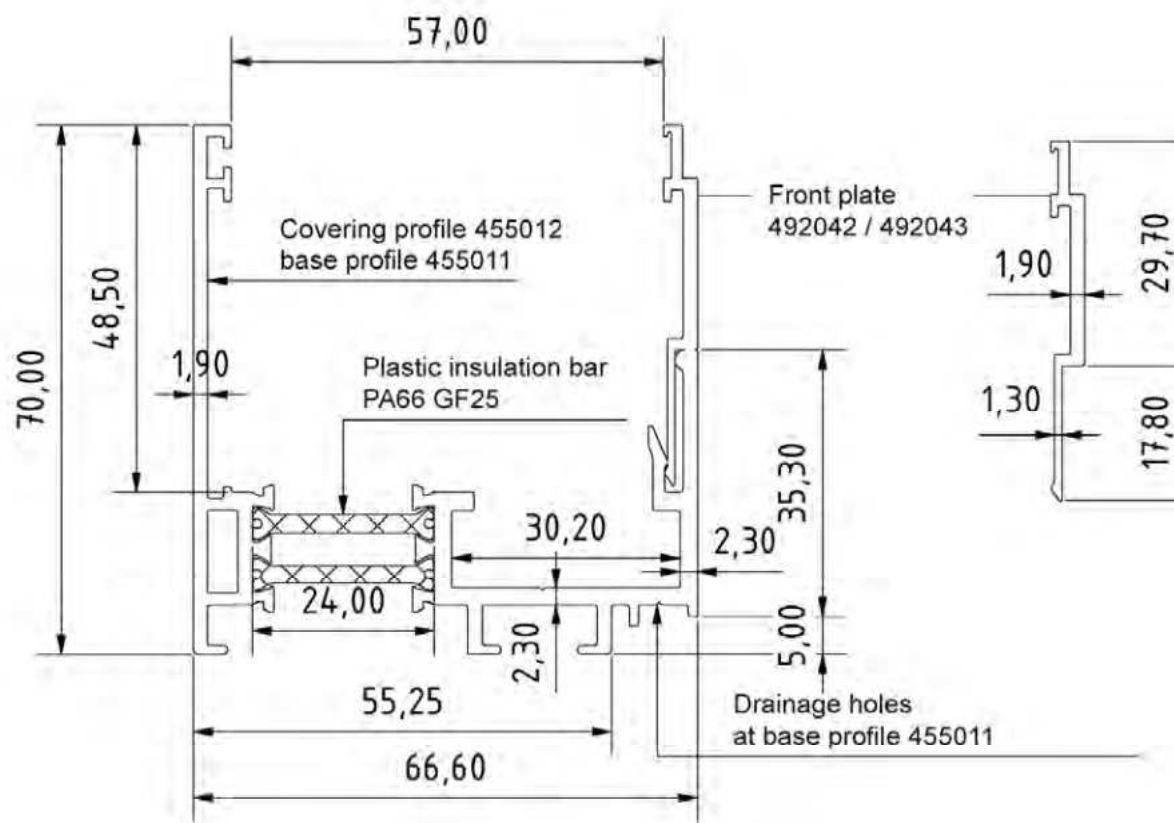


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Transom profile 445062
Front plate 492042 / 492043
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.4

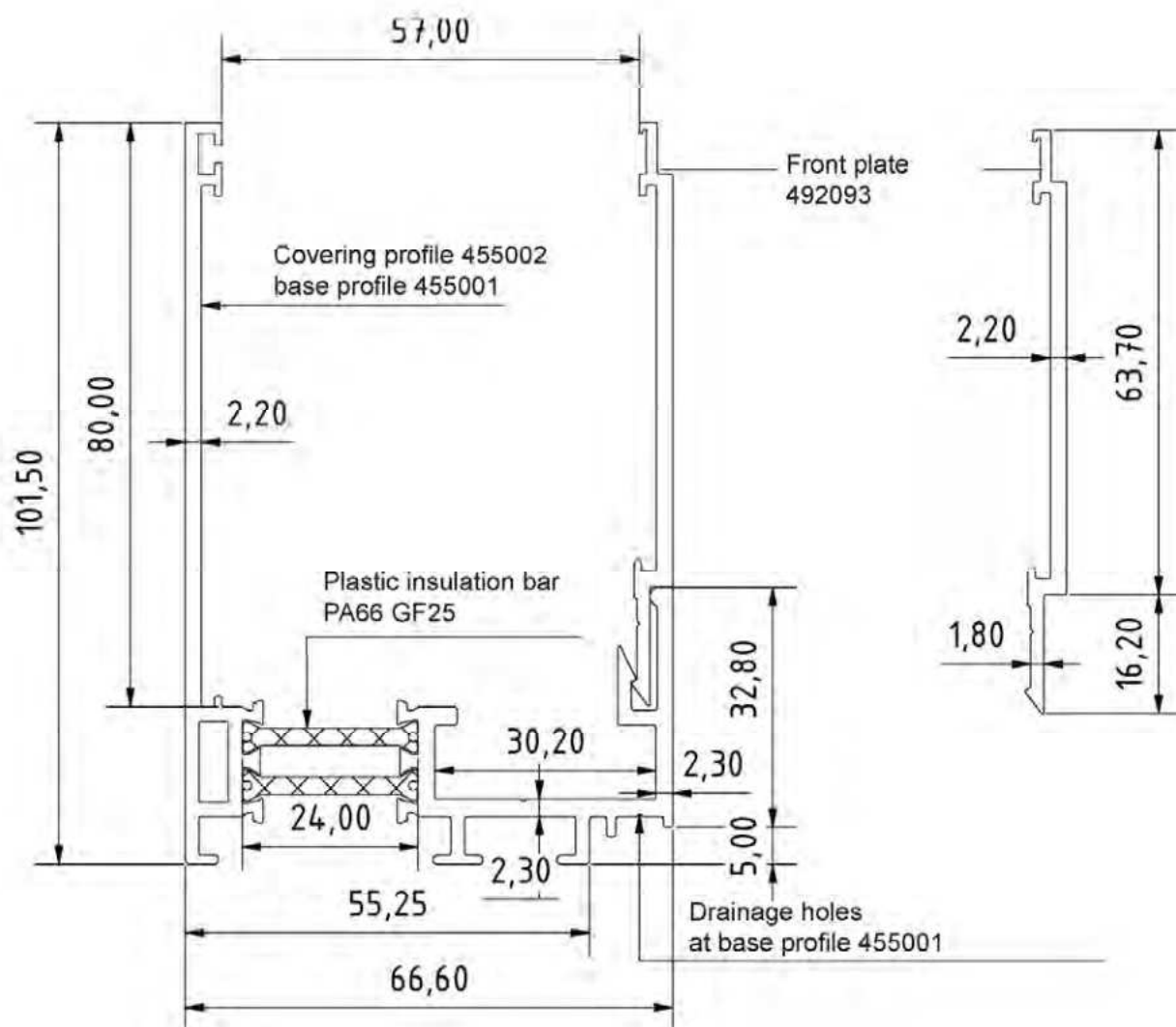


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 455011 / covering profile 455012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.5

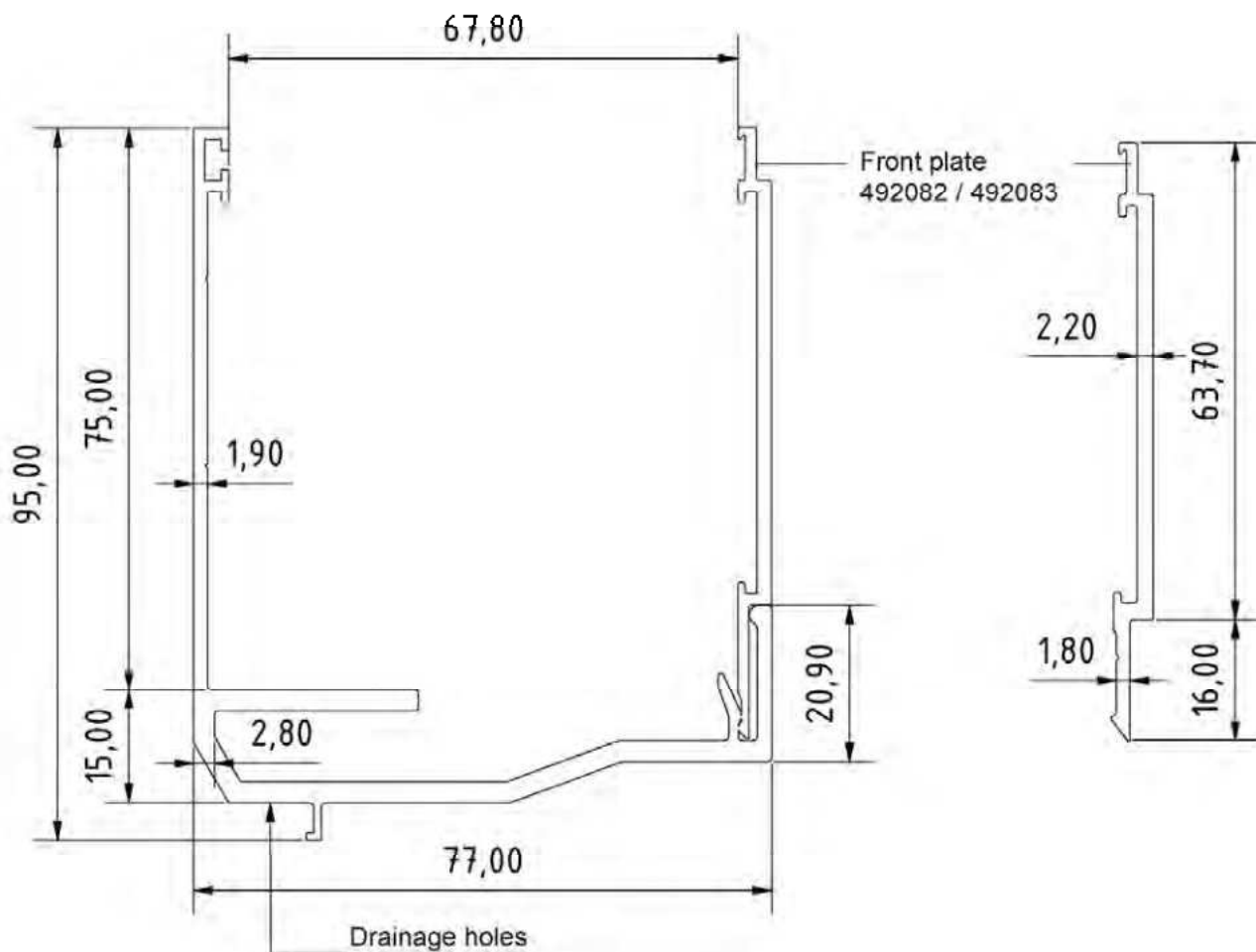


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 455001 / covering profile 455002
Front plate 492093
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.6

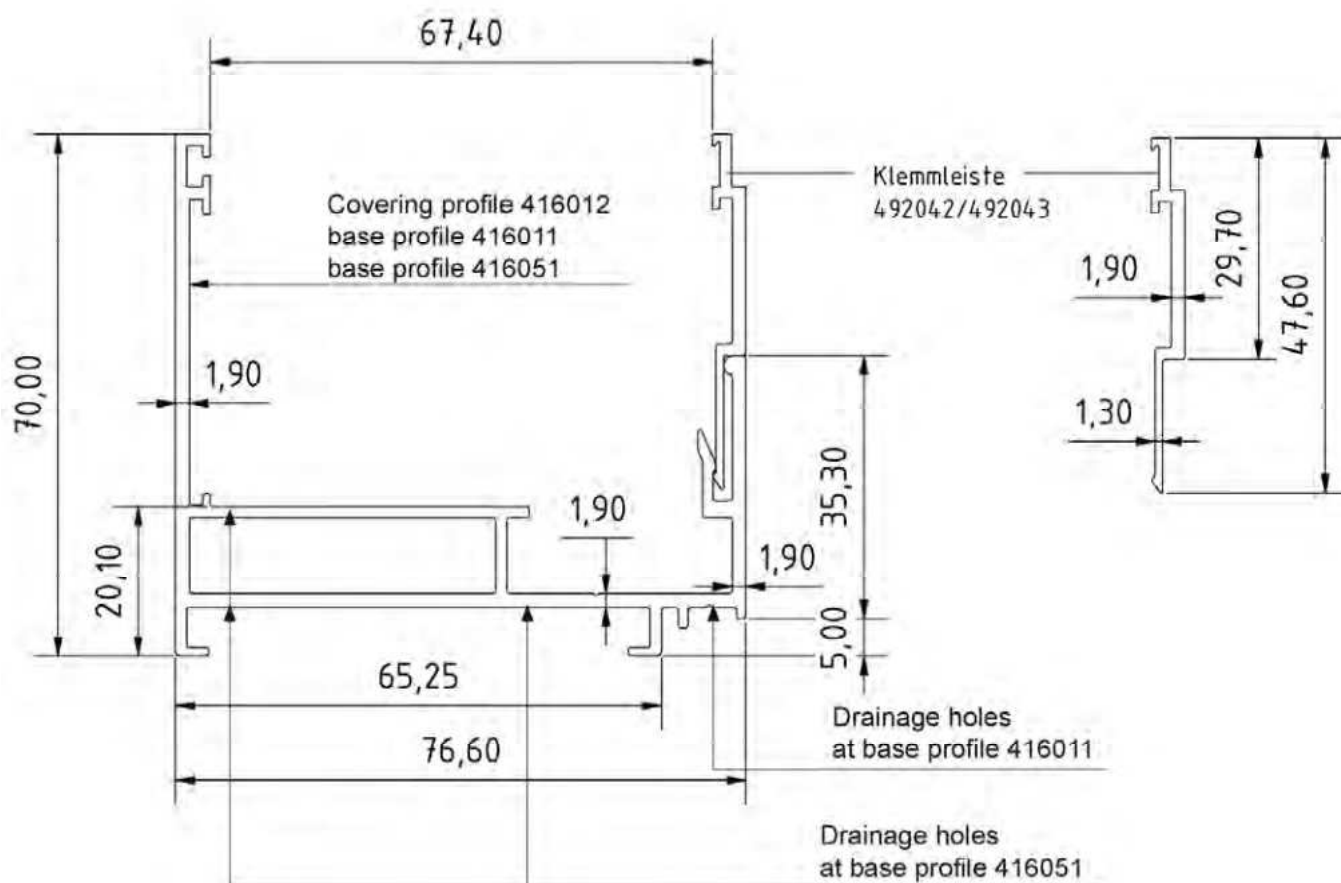


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 406051
Front plate 492082 / 492083
For thickness of multi-wall sheet of 60 mm

Annex A 3.3.1

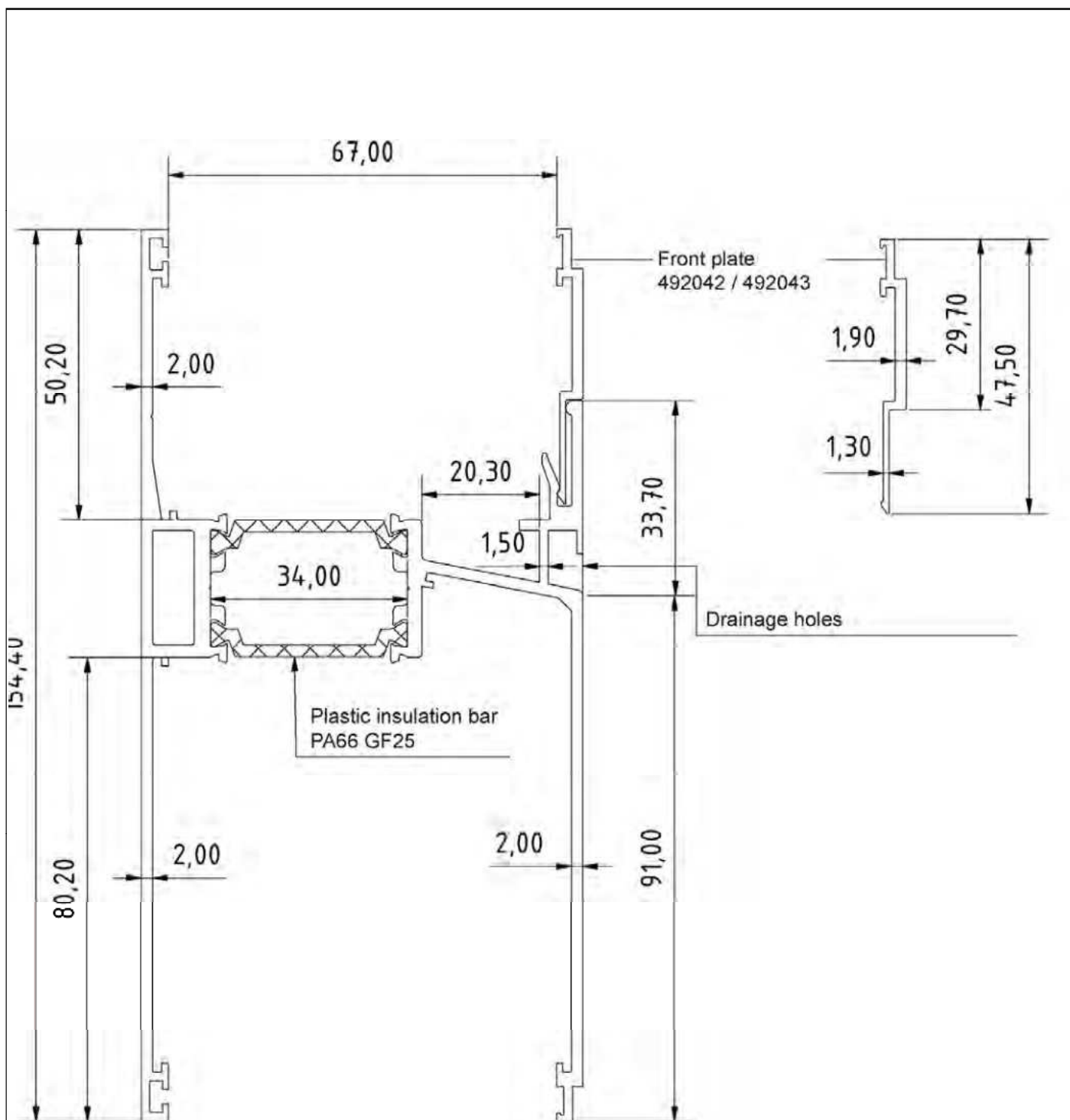


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 416011 / 416051 / covering profile 416012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 60 mm

Annex A 3.3.2

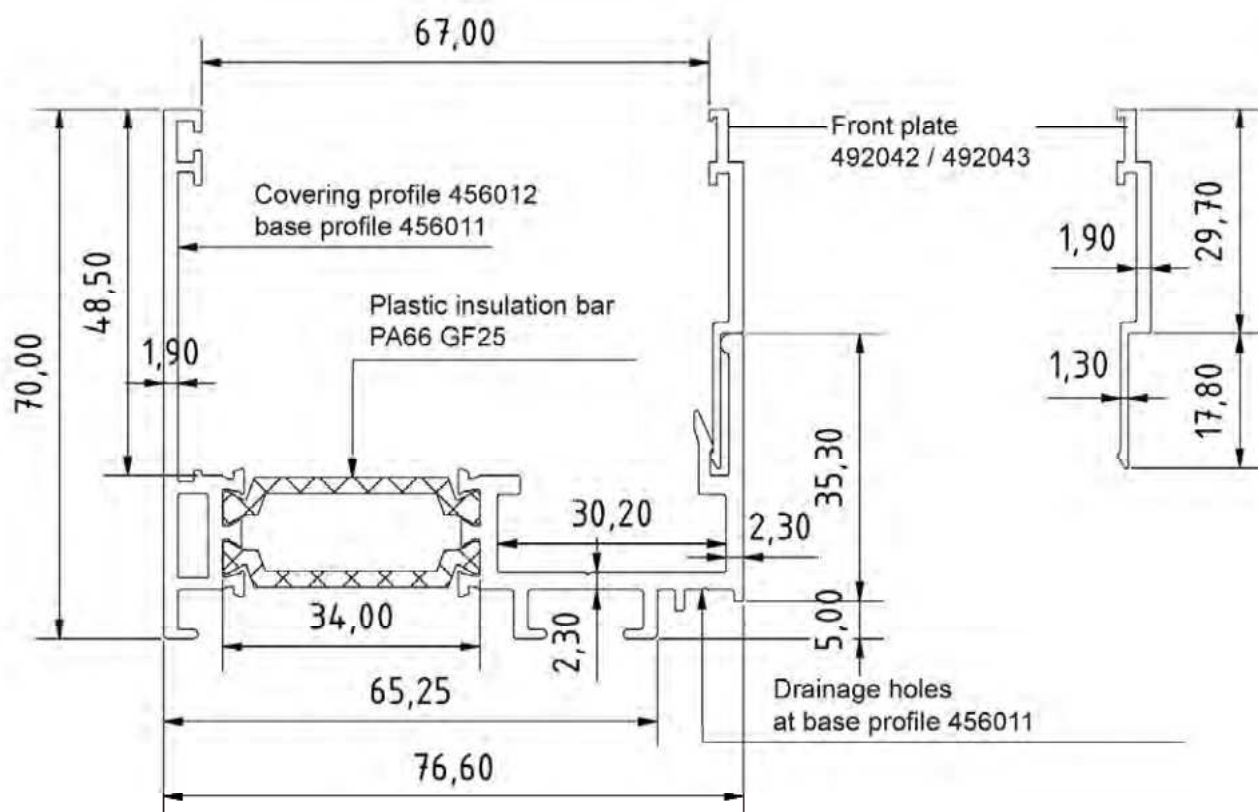


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Transom profile 446062
Front plate 492042 / 492043
For thickness of multi-wall sheet of 60 mm

Annex A 3.3.3

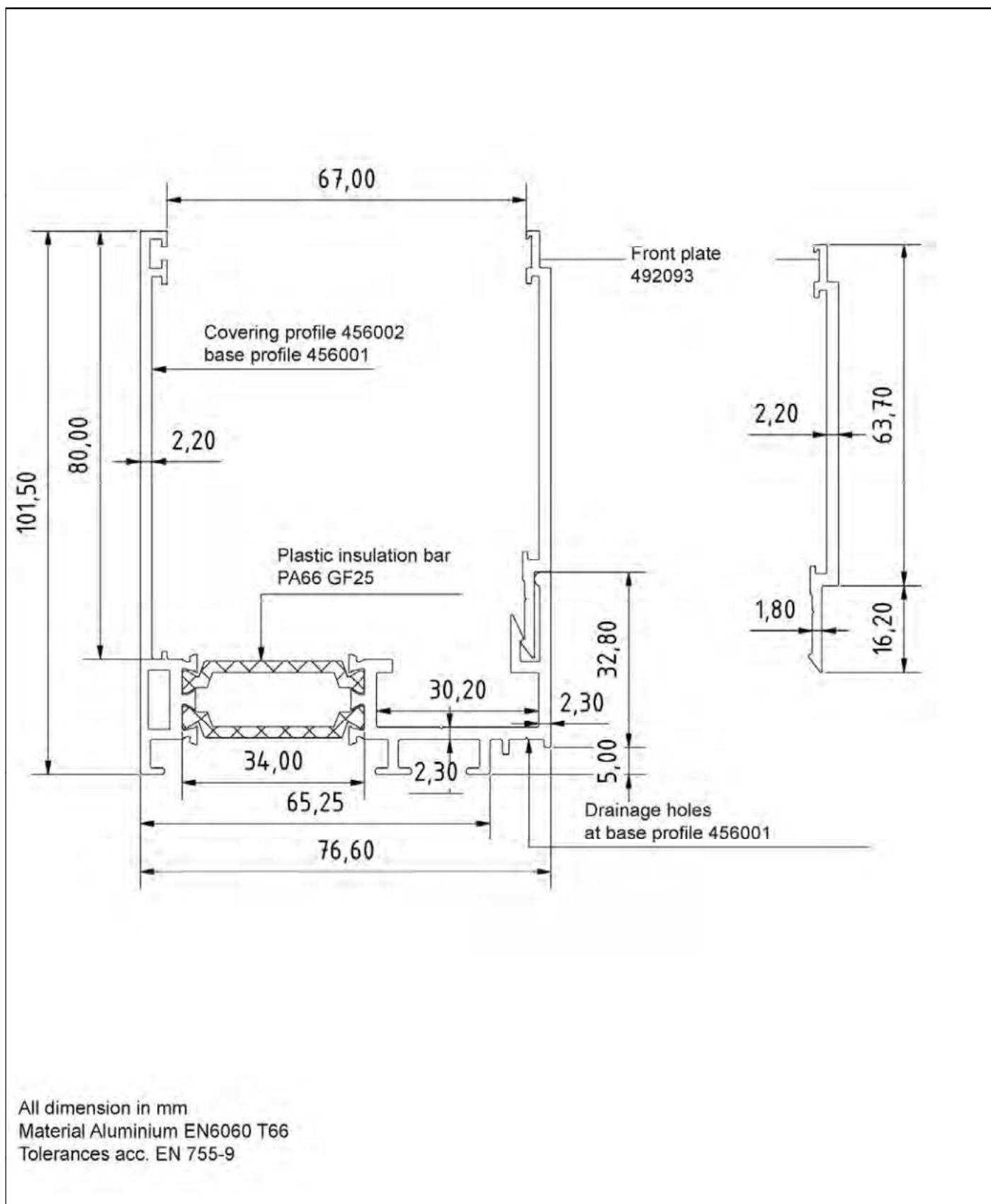


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 456011 / covering profile 456012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 60 mm

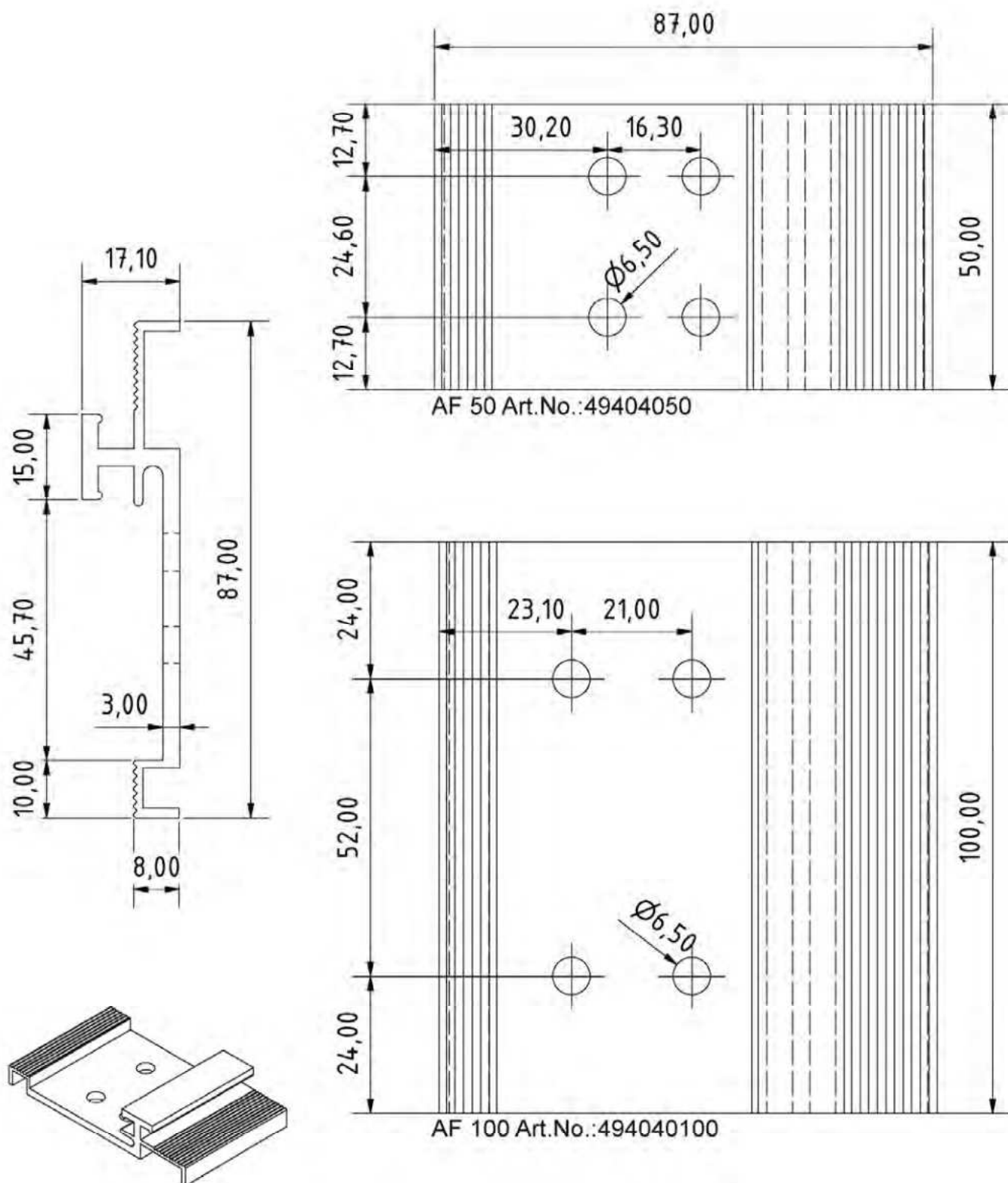
Annex A 3.3.4



Rodeca LBE

Covering base profile 456001 / covering profile 456002
Front plate 492093
For thickness of multi-wall sheet of 60 mm

Annex A 3.3.5

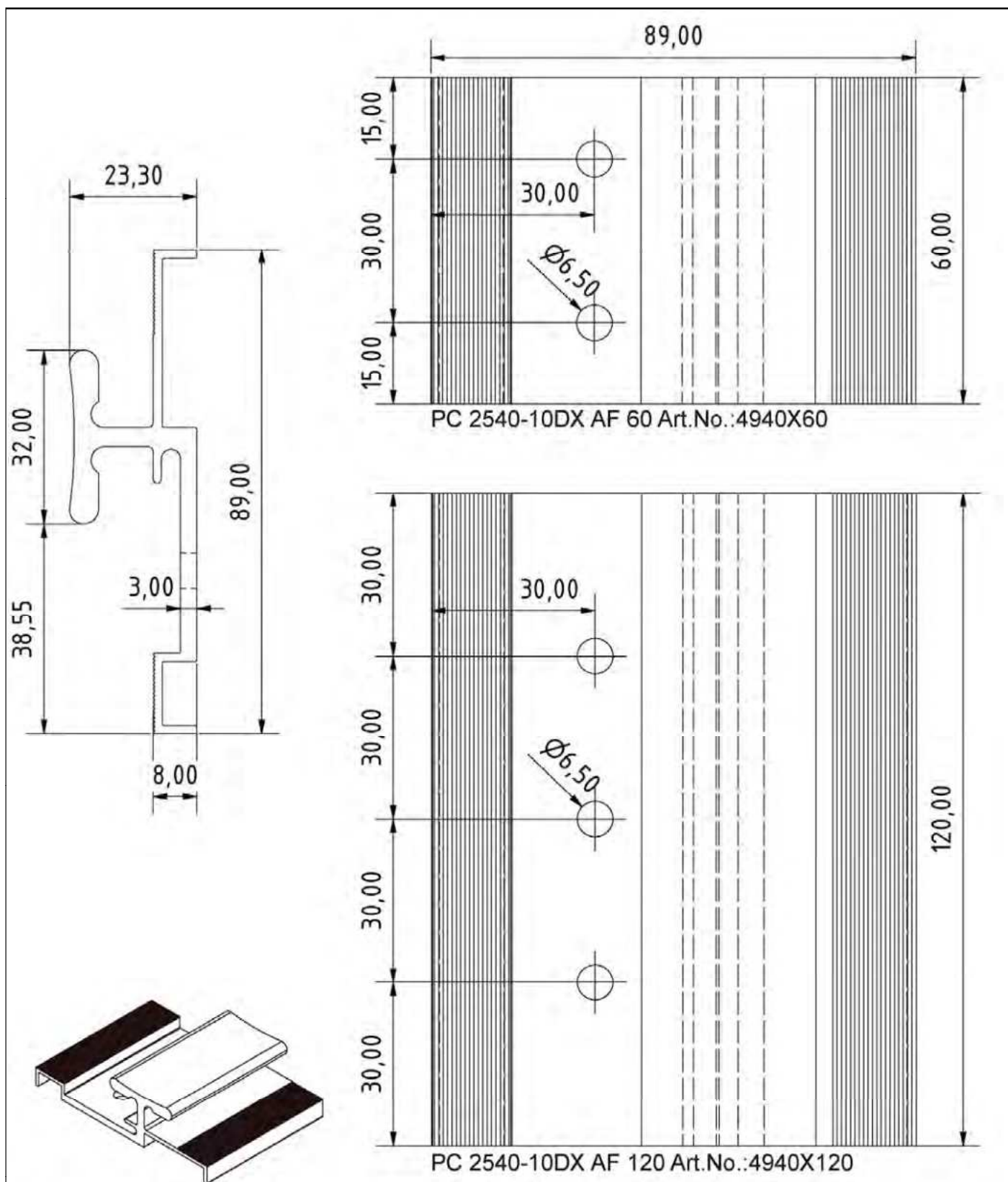


All dimension in mm / Material Aluminium EN6060 T66 / Tolerances acc. EN 755-9

Rodeca LBE

Lift anchor AF 50 / AF 100
Art.No.:49404050 / 494040100
for PC 2333-30-6 / PC 2540-4 / PC 2540-4-MC / PC 2540-6 / PC 2540-7 / PC 2540-10

Annex A 3.4.1

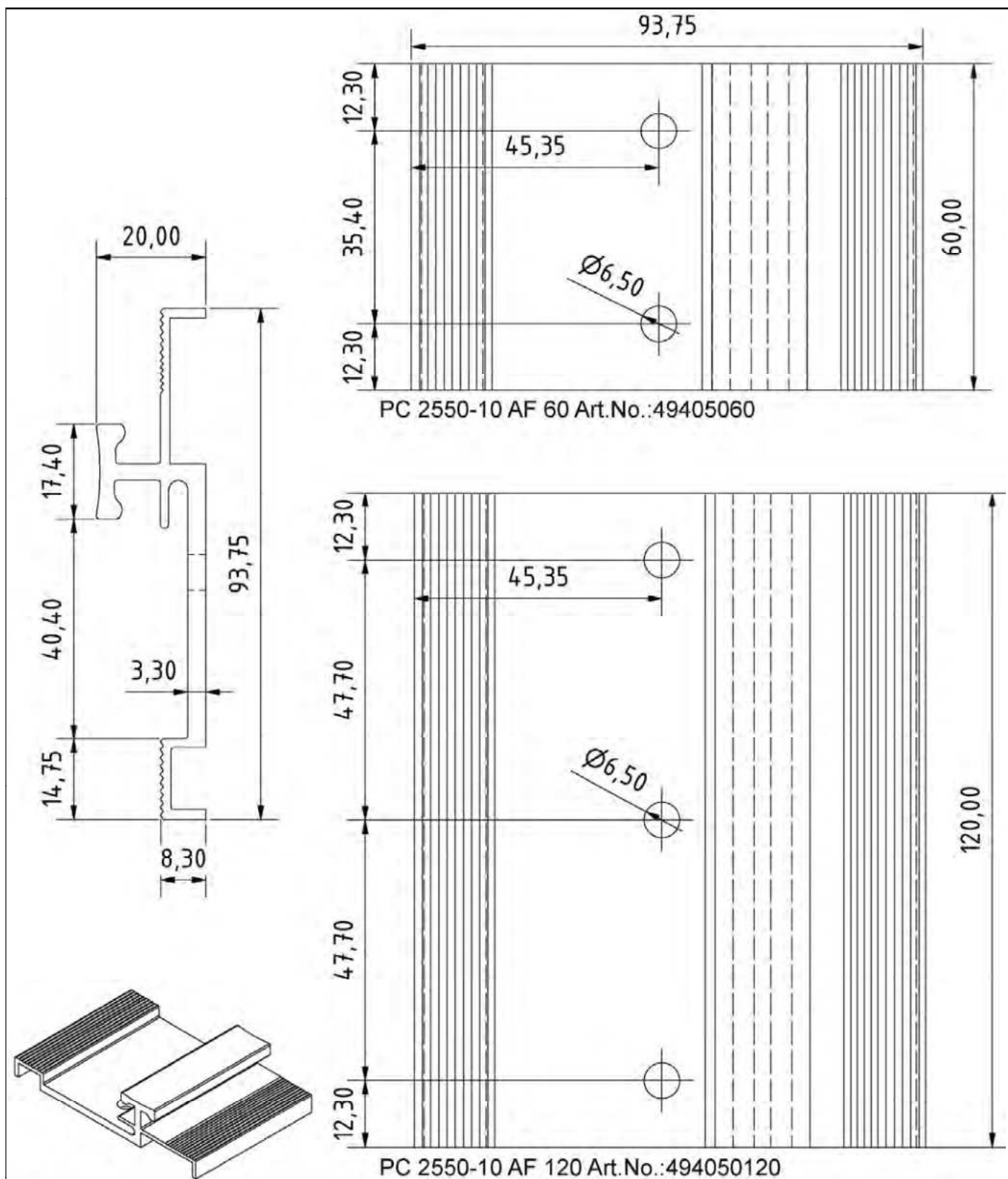


All dimension in mm / Material Aluminium EN6060 T66 / Tolerances acc. EN 755-9

Rodeca LBE

Lift anchor PC 2540-10DX AF 60 / AF 120
Art.No.:4940X60 / 4940X120
for PC 2540-10DX and PC 2540-10-DX HI

Annex A 3.4.2

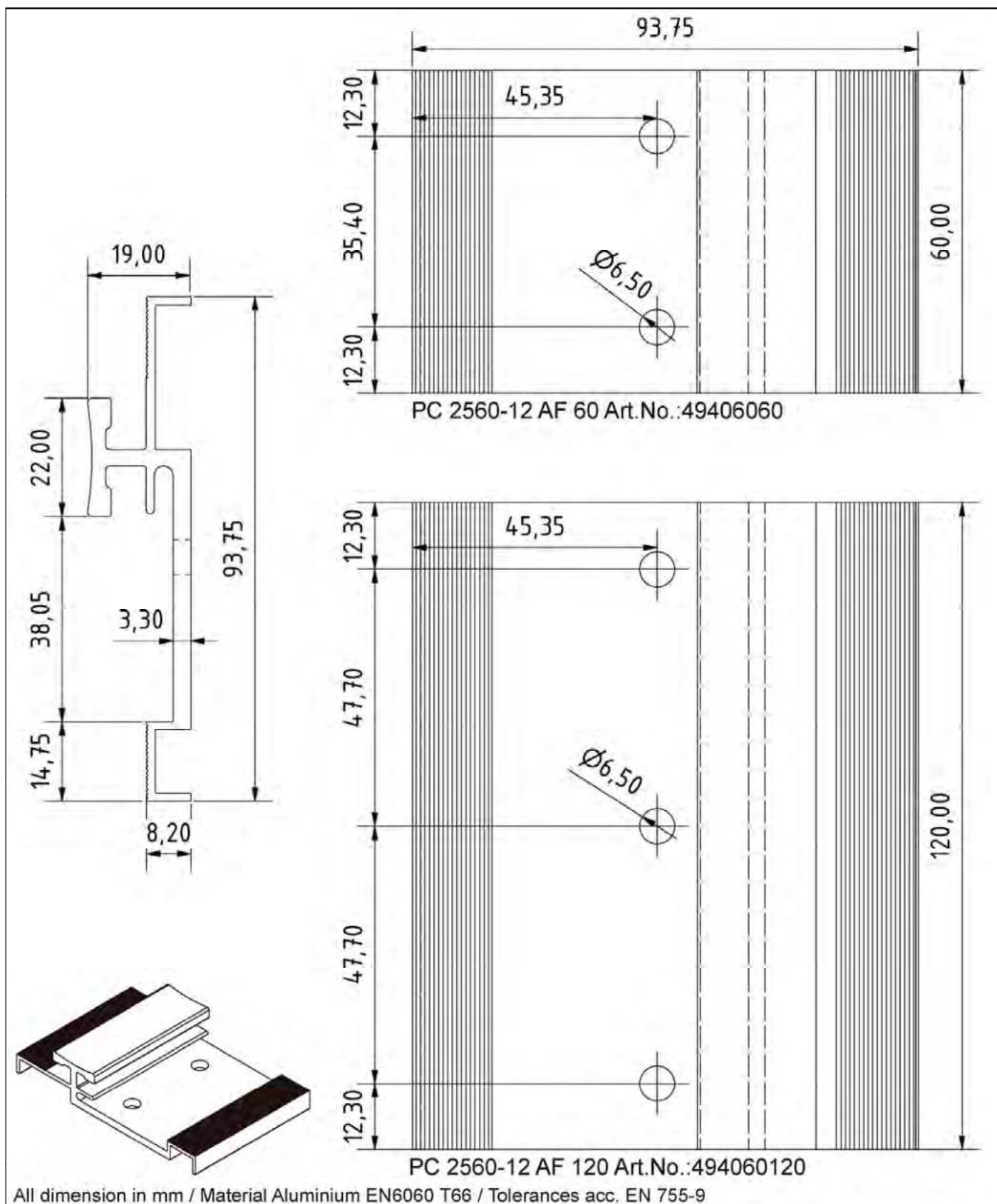


All dimension in mm / Material Aluminium EN6060 T66 / Tolerances acc. EN 755-9

Rodeca LBE

Lift anchor PC 2550-10 AF 60 / AF 120
Art.No.: 49405060 / 494050120
for PC 2550-10

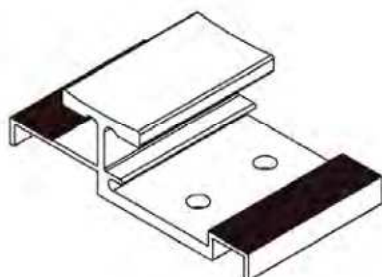
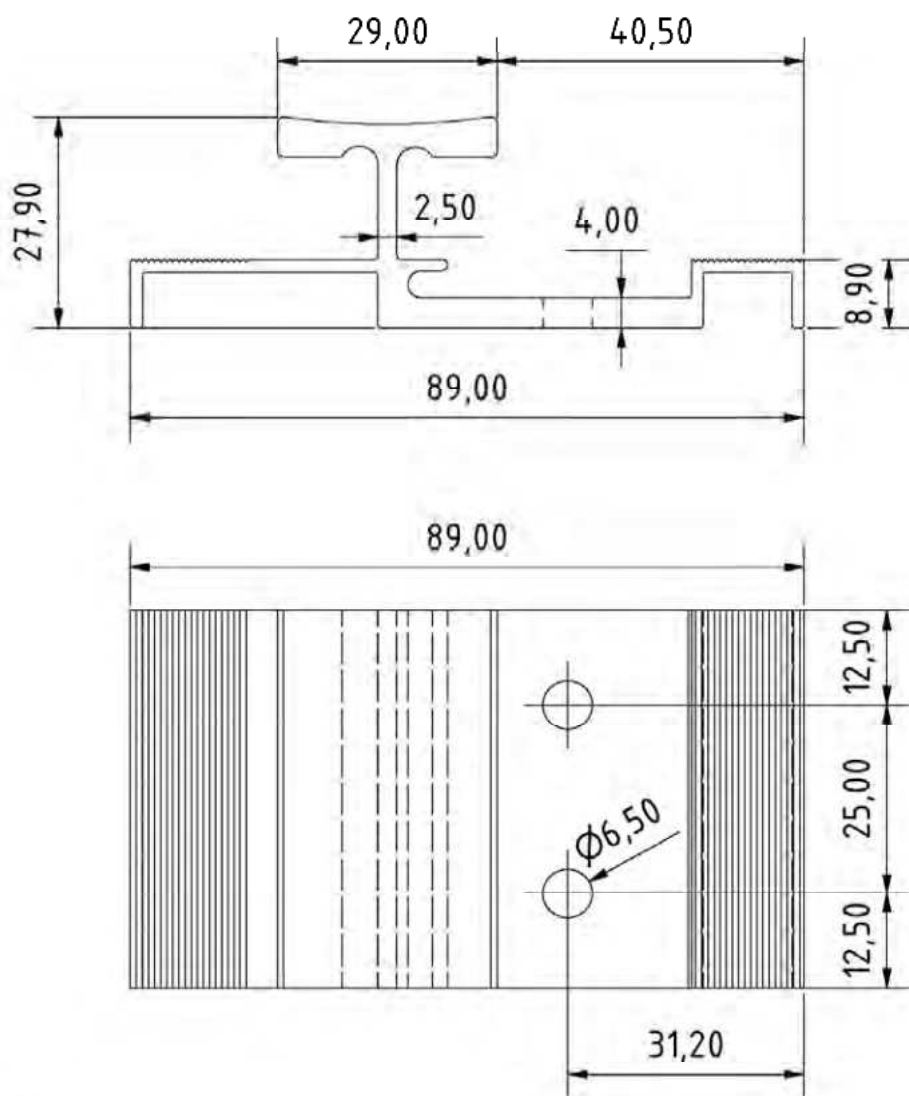
Annex A 3.4.3



Rodeca LBE

Lift anchor 2560-12 AF 60 / AF 120
Art.No.: 49406060 / 494060120
für PC 2560-12

Annex A 3.4.4



All dimension in mm / Material Aluminium EN6060 T66 / Tolerances acc. EN 755-9

Rodeca LBE

Lift anchor PC 2600-40-7-U AF 50
Art.Nr.: 49404000
for PC 2600-40-7-U

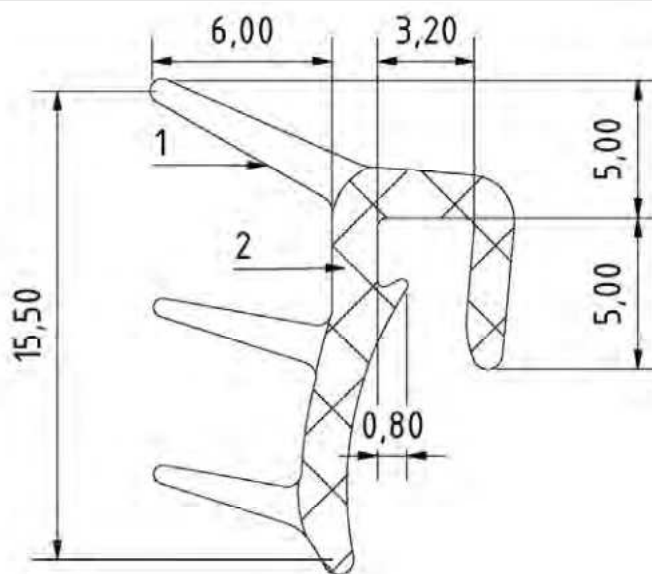
Annex A 3.4.5

Art.No.: 902801

Sealing profile, outside

1 - TPE / EPDM acc. DIN 7863
hardness 70 $\pm$ 5 Shore A
acc. DIN En ISO 868

2 - TPE / EPDM acc. DIN 7863
hardness 95 $\pm$ 5 Shore A
acc. DIN En ISO 868

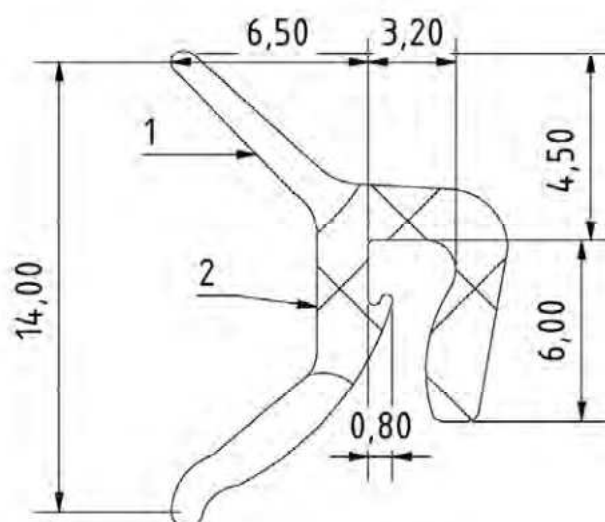


Art.Nr.: 902901

Sealing profile, outside

1 - TPE / EPDM acc. DIN 7863
hardness 70 $\pm$ 5 Shore A
acc. DIN En ISO 868

2 - TPE / EPDM acc. DIN 7863
hardness 95 $\pm$ 5 Shore A
acc. DIN En ISO 868

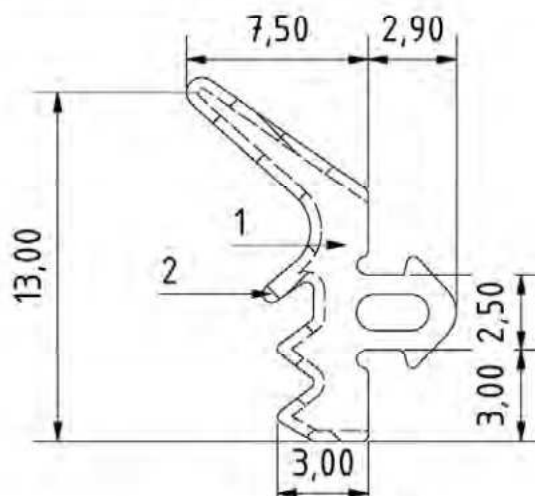


Art.Nr.: 902902

Sealing profile, inside

1 - TPE / EPDM acc. DIN 7863
hardness 70 $\pm$ 5 Shore A
acc. DIN En ISO 868

2 - TPE / EPDM acc. DIN 7863
hardness 60 $\pm$ 5 Shore A
acc. DIN En ISO 868

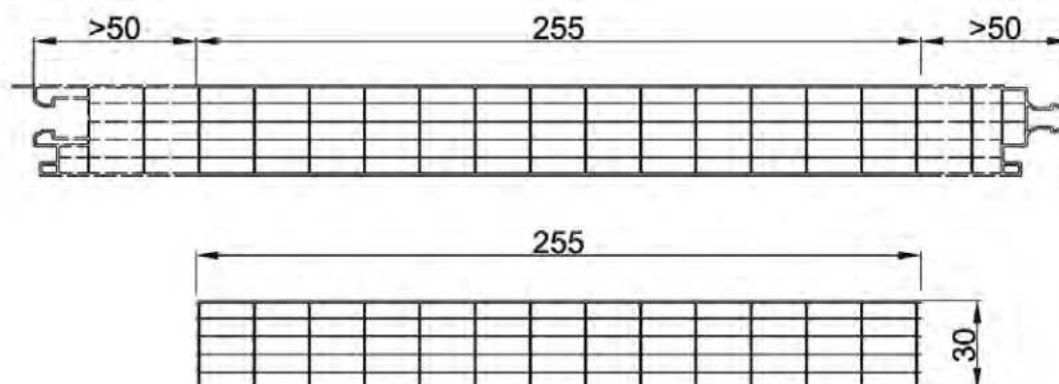


All dimension in mm

Rodeca LBE

Sealing profile
Art.No.:902801 / 902901 / 902902

Annex A 3.5



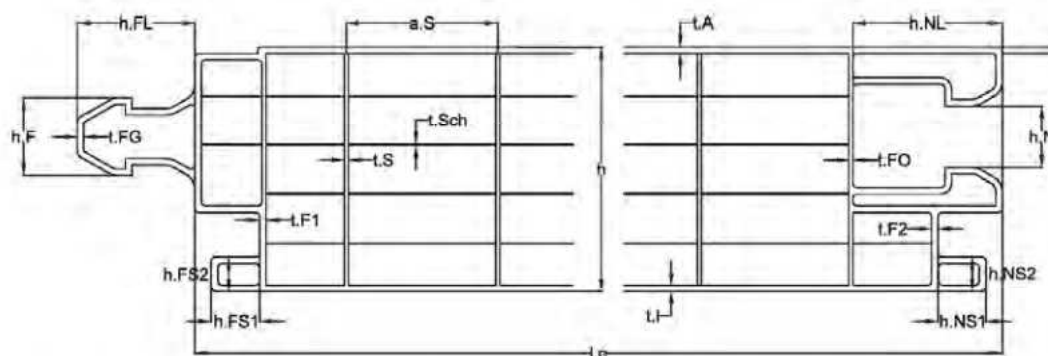
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
559	1,40	1,30	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

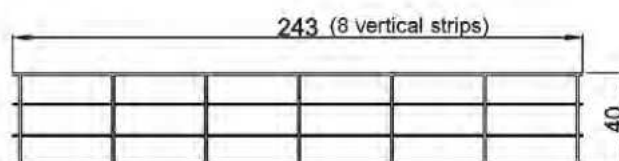
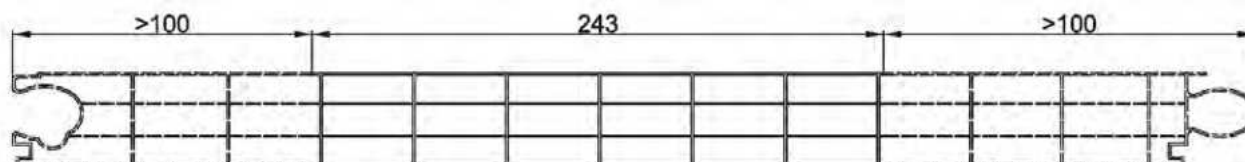


t.A	t.I	t.S	t.I	t.Sch	a.S	t.FG	h.F	t.FL	t.F1	t.F2	h.FS1	h.FS2	t.FO	h.N	h.NL	h.NS1	h.NS2	t.e	h	weight
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m
0,62	0,57	0,26	0,96	0,11	30,08	0,52	11,63	14,98	0,19	0,45	6,37	4,72	0,46	9,58	16,18	6,39	4,67	333	30	1,00
-0,15	-0,35	-0,15	-0,06	-0,08	+1,14	-0,26	-0,82	-1,00	-0,07	-0,09	-0,59	-0,31	-0,23	-0,54	-0,53	-0,67	-0,13	Tolerances acc. EN 16153:2015-05/Tab.2		

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2333-30-6

Annex A 4.0



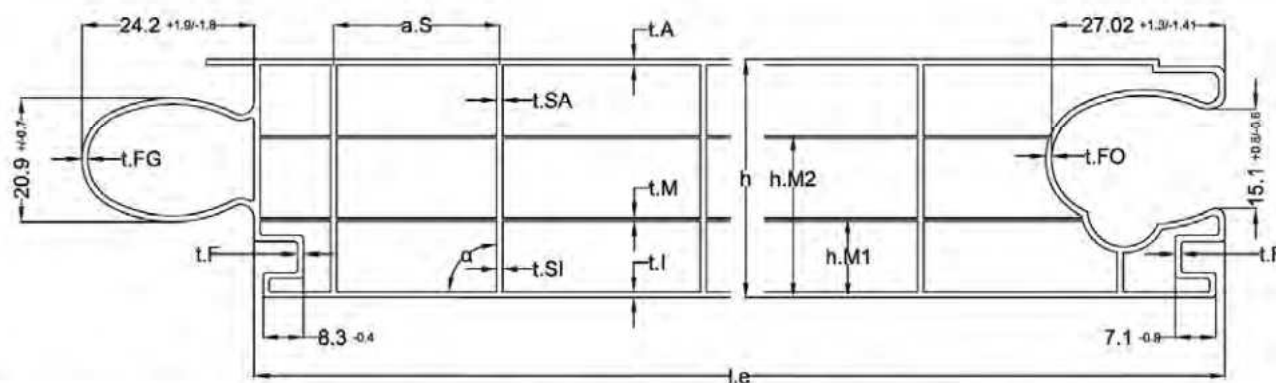
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B _x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1916	1.5	1.4	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

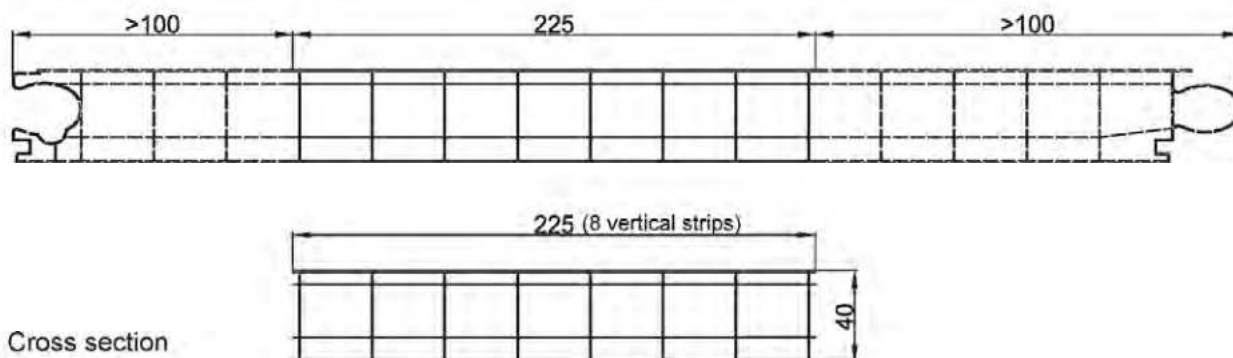


h.M1 mm	h.M2 mm	t.A mm	t.I mm	t.M mm	t.SA mm	t.SI mm	t.F mm	t.FG mm	t.FO mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δa zu 90°
12,10	24,10	0,89	0,96	0,16	0,62	0,62	0,71	0,67	0,68	33,10	500	40	2,02	
+ 0,35 - 0,30	+ 0,35 - 0,35	-0,05	- 0,06	- 0,03	- 0,10	- 0,10	- 0,13	- 0,11	- 0,11	+1,10	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 2°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-4

Annex A 4.1

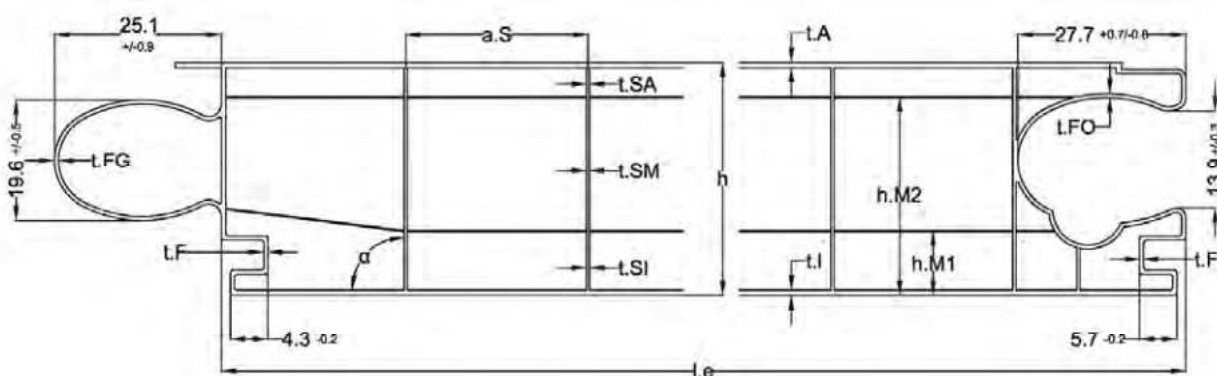


Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1786	1,6	1,5	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

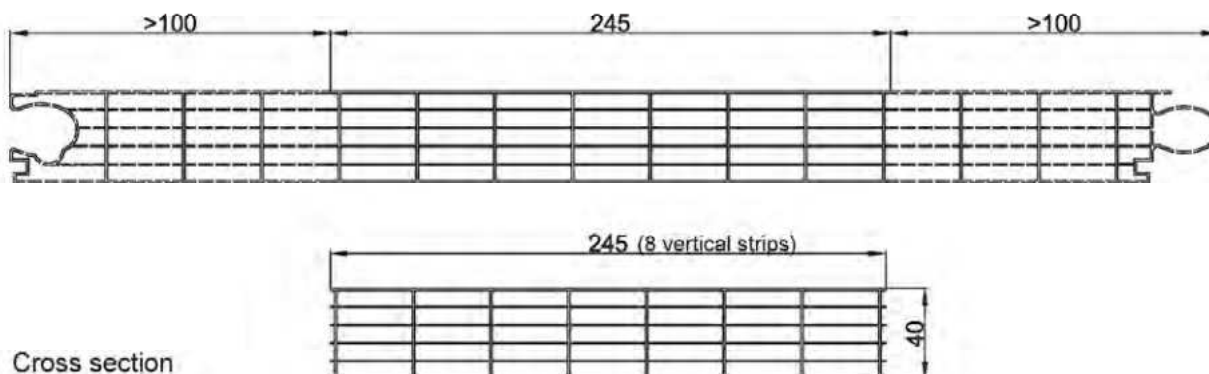


h.M1 mm	h.M2 mm	t.A mm	t.I mm	t.SA mm	t.SM mm	t.SI mm	t.M1 mm	t.M2 mm	t.F mm	t.FG mm	t.FO mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δa zu 90°
10,15	32,80	1,17	0,90	0,50	0,36	0,51	0,13	0,15	0,64	0,66	0,53	30,85	500	40	1,80	
+ 0,30 - 0,25	+ 0,35 - 0,35	- 0,06	- 0,08	- 0,10	- 0,05	- 0,06	- 0,03	- 0,04	- 0,08	- 0,10	- 0,18	+ 0,65	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 2°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-4-MC

Annex A 4.2



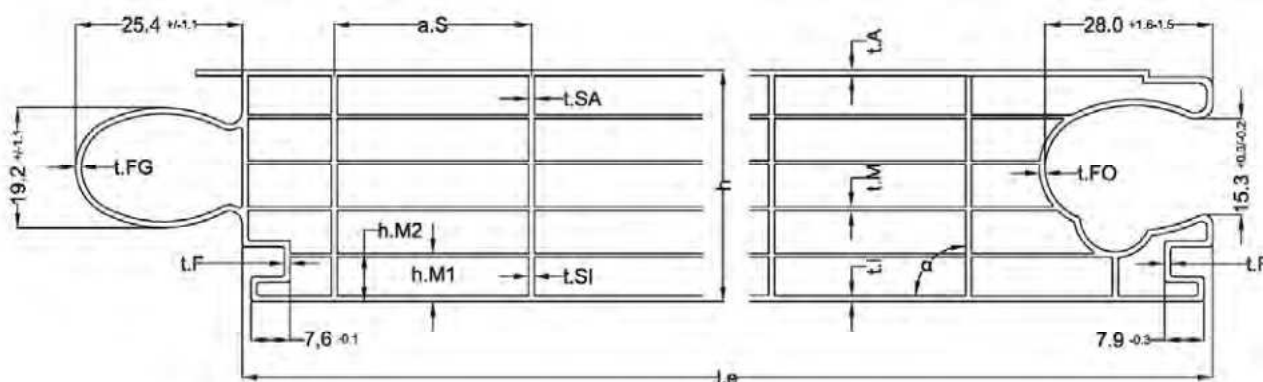
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B _x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1838	1,2	1,2	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

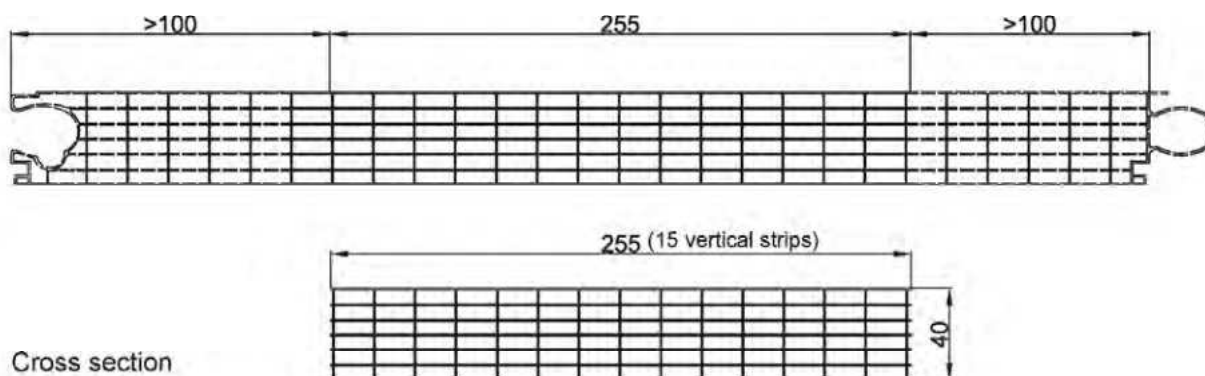


h.M1 mm	h.M2 mm	t.A mm	t.I mm	t.M mm	t.SA mm	t.SI mm	t.F mm	t.FG mm	t.FO mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δα zu 90°
9,00	15,40	0,90	0,95	0,07	0,75	0,49	0,73	0,65	0,78	32,90	500	40	2,00	
+ 0,25 - 0,30	+ 0,35 - 0,35	- 0,08	- 0,12	- 0,02	- 0,12	- 0,06	- 0,05	- 0,09	- 0,05	+ 1,20	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 2°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-6

Annex A 4.3

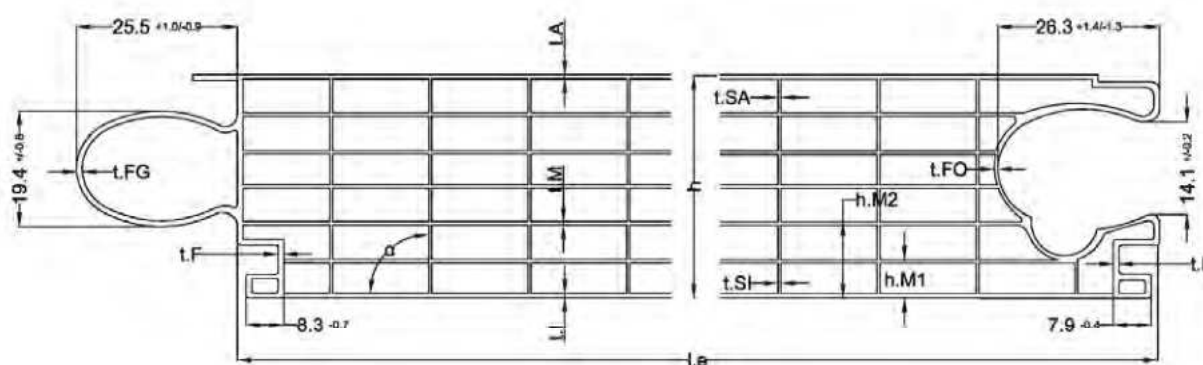


Minimum performance levels or classes for the sheets in accordance with EN 16153

B _x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1814	1,2	1,1	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

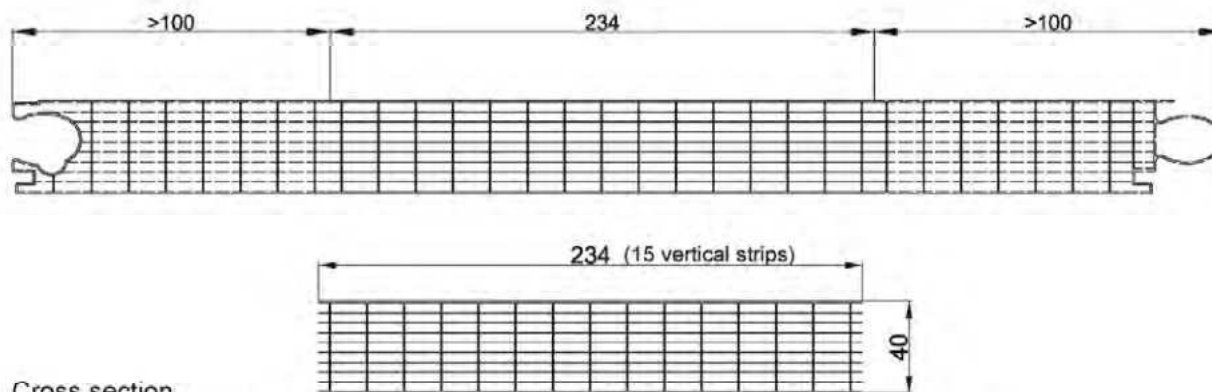


h.M1 mm	h.M2 mm	t.A mm	t.l mm	t.M mm	t.SA mm	t.SI mm	t.F mm	t.FG mm	t.FO mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δa zu 90°
6,70	15,30	0,75	0,75	0,15	0,55	0,59	0,47	0,63	0,53	17,40	500	40	2,10	
+ 0,90 - 0,80	+ 1,40 - 1,20	-0,06	- 0,11	- 0,03	- 0,05	- 0,09	- 0,09	- 0,05	- 0,06	+0,40 - 0,40	Tolerances acc. EN 16153:2015-05/Tab 2			≤ 3°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-7

Annex A 4.4



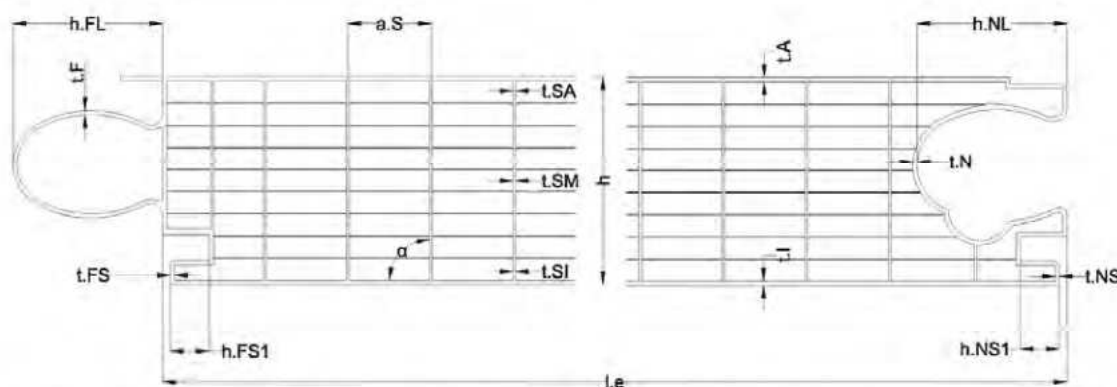
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1545	1,0	1,0	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

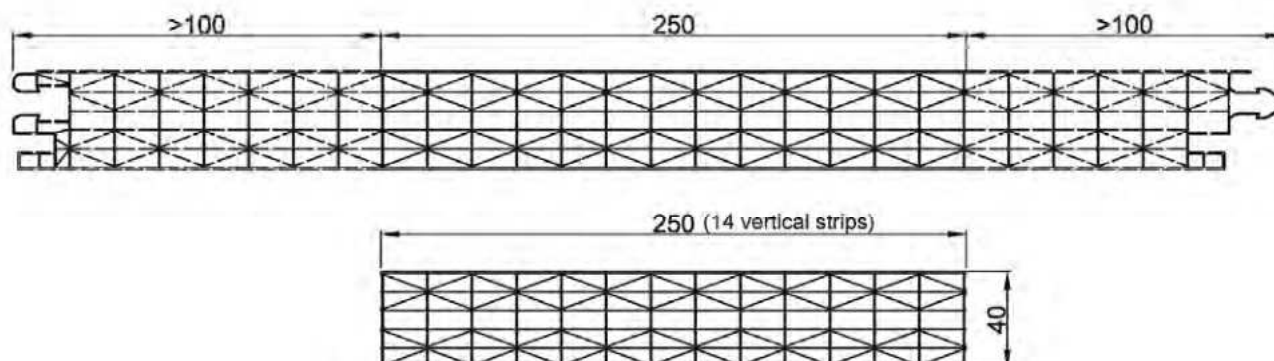


t.A	t.I	t.SA	t.SM	t.SI	a.S	t.F	h.FL	t.FS	h.FS1	t.N	h.NL	t.NS	h.NS1	l.e	h	weight	difference
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	Δa zu 90°
0,60	0,64	0,41	0,43	0,53	15,90	0,49	25,77	0,86	6,56	0,72	27,67	0,84	6,75	500	40	2,00	
-0,10	-0,06	-0,12	-0,14	-0,15	-0,65	-0,17	-0,89	-0,50	-0,59	-0,29	-1,09	-0,27	-1,04	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 5°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-10

Annex A 4.5



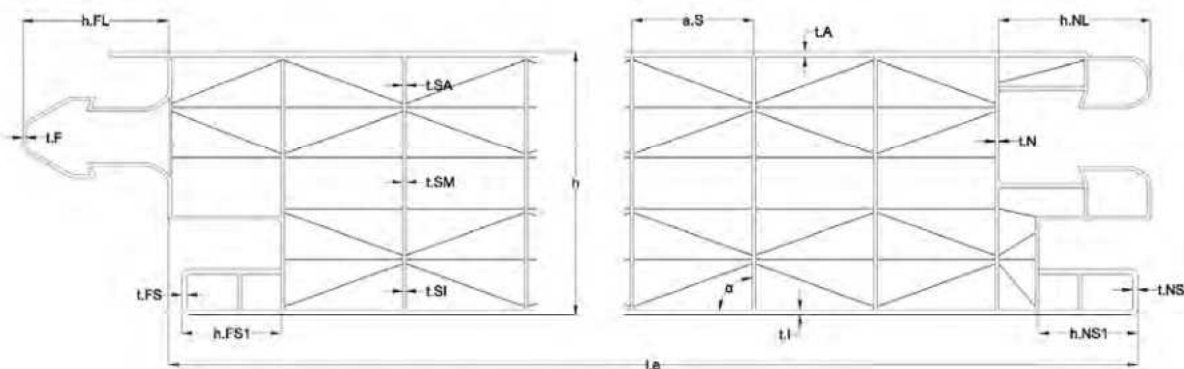
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1674	1,1	1,1	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

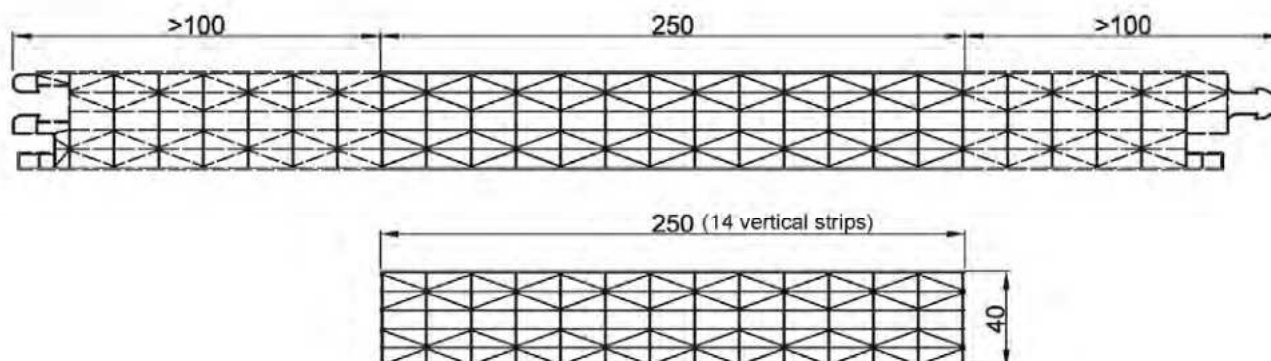


t.A	t.I	t.SA	t.SM	t.SI	a.S	t.F	h.FL	t.FS	h.FS1	t.N	h.NL	t.NS	h.NS1	l.e	h	weight	difference
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	lΔal zu 90°
0,67	0,64	0,33	0,41	0,43	17,85	0,96	21,50	0,88	14,87	0,62	22,39	0,75	14,85	495	40	2,25	
-0,17	-0,18	-0,07	-0,13	-0,07	-0,54	-0,41	-1,24	-0,36	-1,12	-0,31	-1,67	-0,35	-0,43	Tolerances acc. EN 16153:2015-05/Tab 2			≤ 5°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-10DX

Annex A 4.6



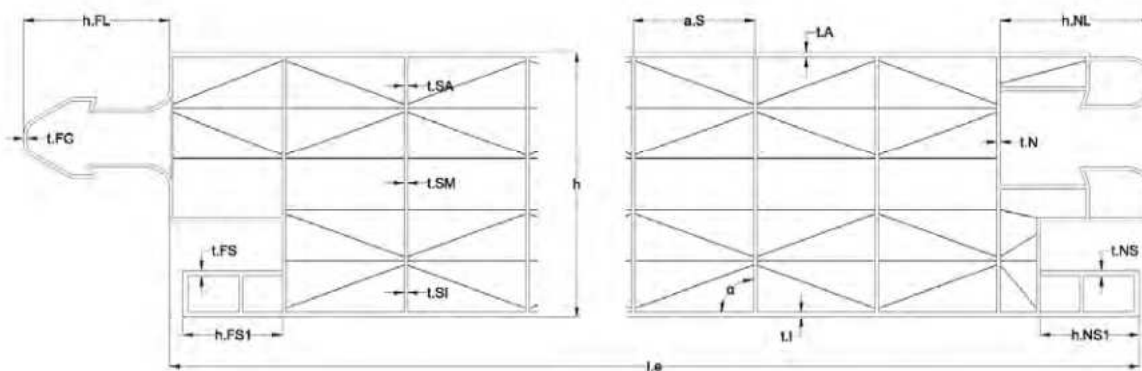
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
2660	1,1	1,1	≤ 10 (ΔA)*	$\leq 5\%$ (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

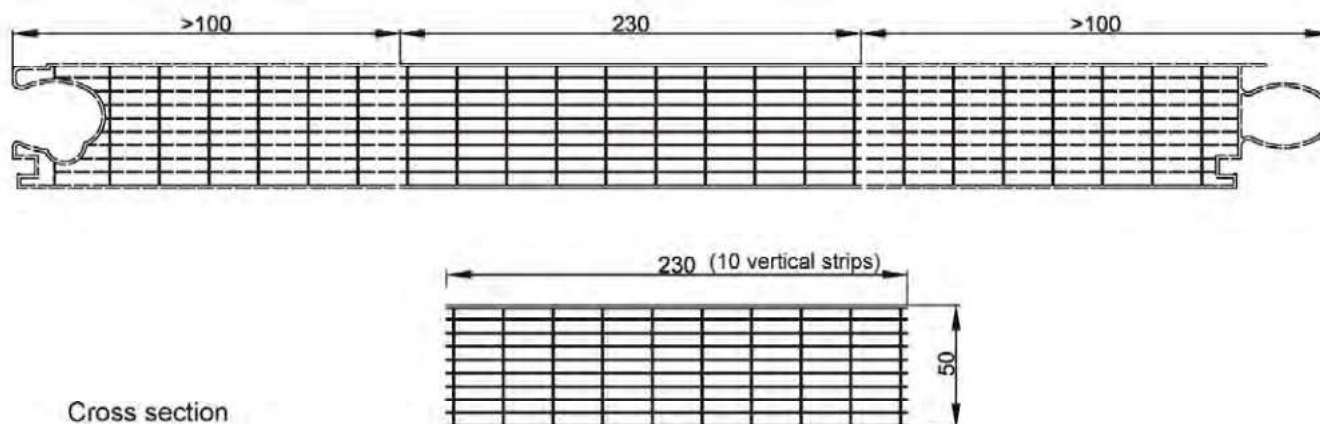


t.A	t.I	t.SA	t.SM	t.SI	a.S	t.FG	h.FL	t.FS	h.FS1	t.NS	h.NS1	h.NL	t.N	l.e	h	weight	difference
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	l $\Delta\alpha$ zu 90°
1,31	1,36	0,38	0,38	0,38	17,82	0,92	22,05	1,16	15,07	0,61	14,98	23,12	0,38	495	40	2,87	
-0,33	-0,43	-0,27	-0,27	-0,27	-0,78	-0,53	-1,57	-0,55	-0,58	-0,25	-0,47	-0,44	-0,26	Tolerances acc. EN 16153:2015-05/Tab.2			$\leq 5^\circ$

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-10DX HI

Annex A 4.7



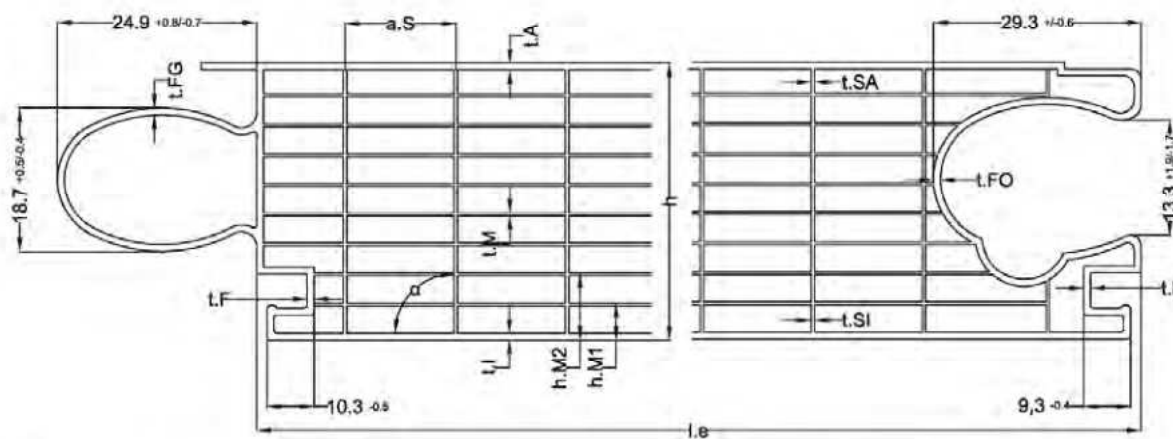
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
	Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus
3309	0,92	0,90	0,90	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1
						Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

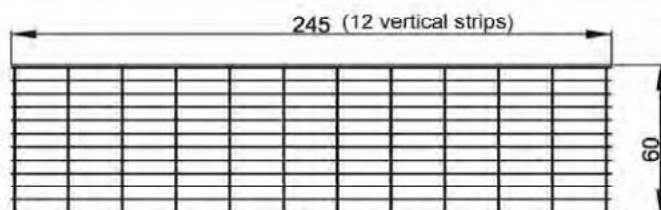
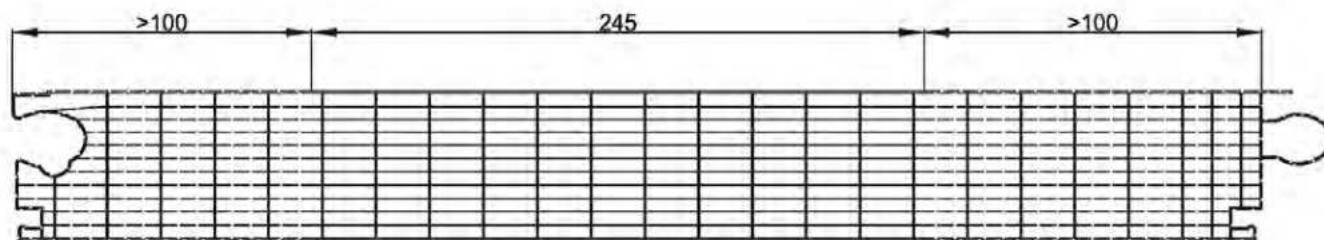


t.A	t.I	t.M	t.SA	t.SI	t.FG	t.FO	t.F	a.S	l.e	h	weight	difference
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	Δα
0,84	0,95	0,06	0,36	0,57	0,55	0,65	0,94	24,15	495	50	2,38	zu 90°
-0,09	-0,10	-0,01	-0,05	-0,08	-0,10	-0,17	-0,37	+0,25	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 2°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2550-10

Annex A 4.8



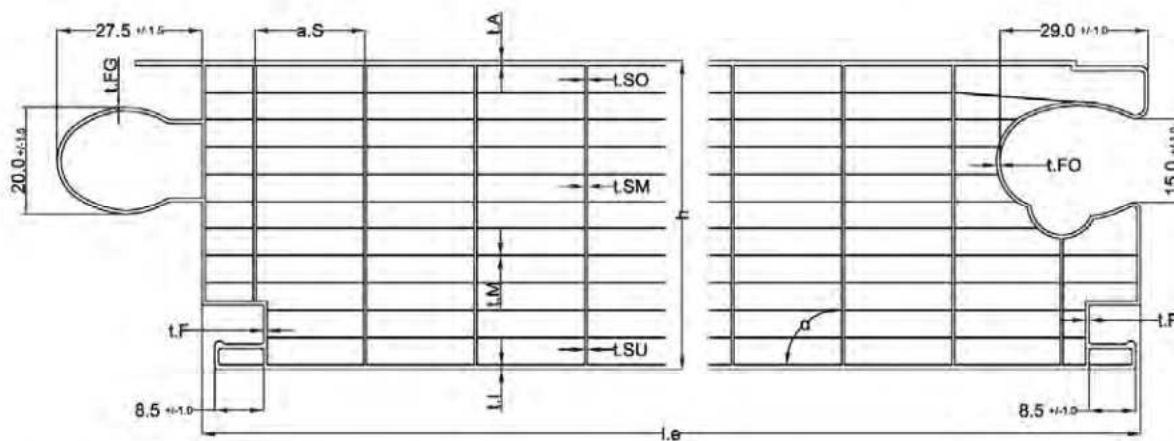
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B _x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
4984	0,77	0,75	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

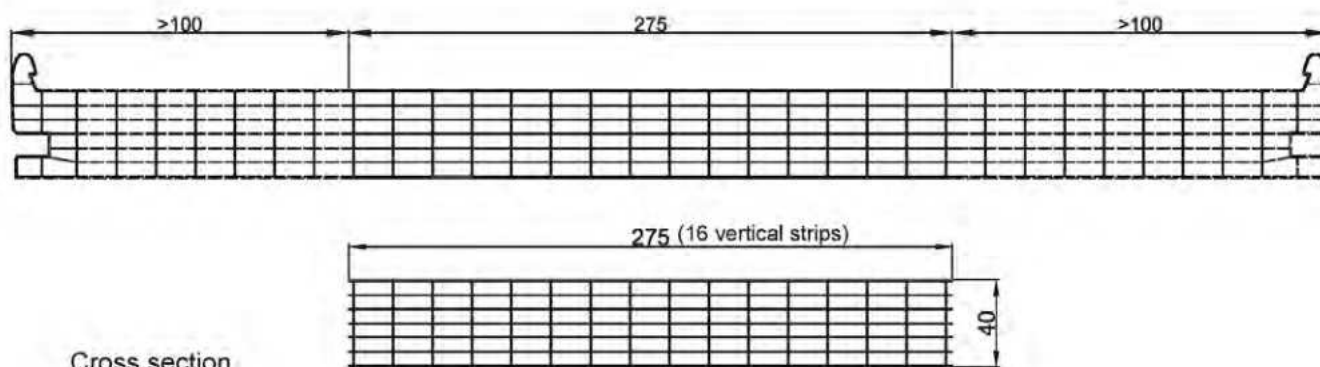


t.A mm	t.I mm	t.M mm	t.SU mm	t.SO mm	t.SM mm	t.FO mm	t.FG mm	t.F mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δα zu 90°
0,79	0,96	0,04	0,86	0,45	0,56	0,39	0,54	1,66	20,7	500	60	2,77	
- 0,06	- 0,07	-0,01	- 0,29	- 0,12	- 0,15	- 0,17	- 0,18	-0,42	+1,0	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 3°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2560-12

Annex A 4.9



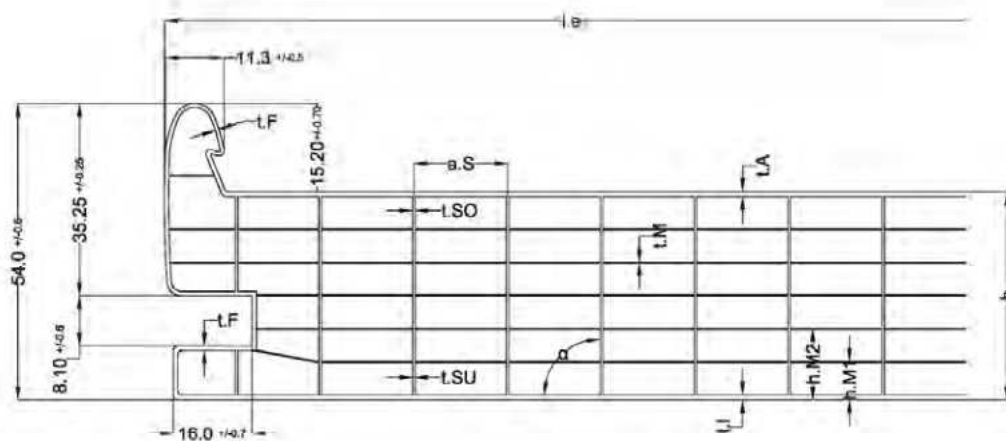
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B _x	U [W/m²K]		Durability			
Nm²/m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1566	1,2	1,1	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

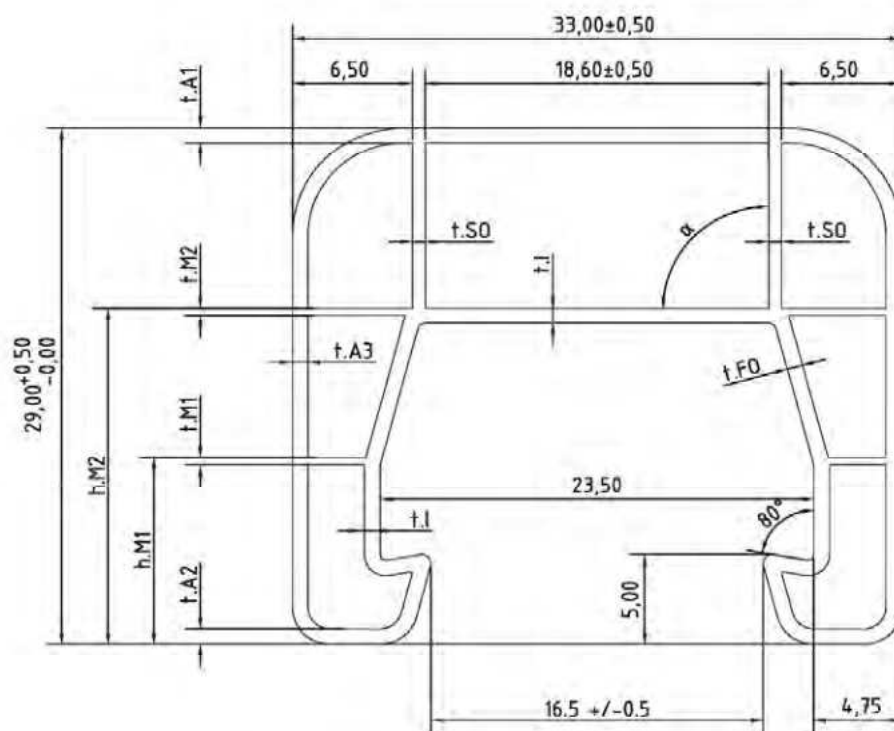


h.M1 mm	h.M2 mm	t.A mm	t.l mm	t.M mm	t.SO mm	t.SU mm	a.S mm	l.e mm	h mm	weight kg/m	difference $ \Delta\alpha $ zu 90°
7,50	14,60	0,76	0,68	0,13	0,55	0,55	17,75	605	40	2,71	
+ 0,40 - 0,40	+ 0,40 - 0,40	-0,09	-0,09	-0,02	-0,08	-0,08	+0,30	Tolerances acc. EN 16153-2015-05/Tab.2			$\leq 2^\circ$

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2600-40-7-U

Annex A 4.10



t.A1 mm	t.A2 mm	t.A3 mm	t.M1 mm	t.M2 mm	t.S0 mm	t.L mm	t.F0 mm	h.M1 mm	h.M2 mm	weight kg/m
0,89	0,82	0,87	0,35	0,43	0,70	0,80	0,65	10,90	17,6	0,17
- 0,02	- 0,14	-0,15	-0,06	- 0,07	- 0,11	- 0,36	- 0,06	- 0,20	-0,30	+0,02 -0,02

Rodeca LBE

Geometry/ weight per area
Connection profile 380062

Annex A 4.11

Rodeca LBE

Annex B

Provisions for design and dimensioning

Dimensioning, installation and execution of the 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 D).

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 and wall 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.

The verification of aluminium covering profiles and lift anchors, their fixings as well as the verification of substructure is not included in this ETA.

B 1.2 Design values for actions, E_d

The design values for the actions shall be determined in accordance with EN 1991 + EN 1990.

The action resulting from the dead weight of the multi-wall sheets may be neglected for the structural design calculation in accordance with Section B.1.3 of the roof and wall kit. Live loads are not permitted.

The design value of the action results from the characteristic values of the actions taking into account the partial safety factors γ_F , the coefficients ψ and the factors for the effects of the duration of load action C_t .

For the wind and temperature effects to be considered in the load case "summer" the Ψ coefficient defined in EN 1990 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.

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	$K_t = C_t$
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
Dead Load	constantly	1.50

B 1.3 Design values for structural resistance R_d (ULS) and C_d (SLS)

The design values for structural resistance R_d and C_d result from the characteristic value of structural resistance R_k and C_d 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:

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

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	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 shall be taken from the tables in Annex B 2.1.1 to B 2.2.9 for the given multi-wall sheets and direction of loading.

- One-span system

The load direction "negative" and "positive" as well as the span l_F are defined in Annex A 2.1 to A 2.4. The characteristic values for structural resistance R_k and C_k related to the span l_F shall be taken from the tables in Annex B 2.1.1 to B 2.1.5 for the given multi-wall sheets and direction of loading.

- Multi-field system

The load direction "negative" and "positive" as well as the span l_F is given in Annex A 2.1 to A 2.4. The characteristic values for structural resistance R_k and C_k are given as interaction between support moment and force at the intermediate support and shall be taken from the tables in Annex B 2.2.1 to B 2.2.9 for the given multi-wall sheets and direction of loading.

The load at intermediate support is decisive.

For load direction "negative" the factor C_u can be set to 1,0. Therefore direct sunlight on the inside of the multi-wall sheets must be excluded.

Height of intermediate support for fixing the lift anchors must be at least 50mm for the roof and wall kit PC 2333-30-6 / PC 2540-4, PC 2540-4-MC, PC 2540-6, PC 2540-7, PC 2540-10, PC 2540-10DX / PC 2540-10-DX HI and 2600-40-7-U. Height of intermediate support for roof and wall kit PC 2550-10 and PC 2560-12 must be at least 60 mm. The minimum span l_F as given in Annex A 1.2 to A 1.3 shall be 0,50 m.

For the determination of the respective span, the centre of the lift anchor is decisive for the load direction "negative" and the centre of the intermediate support for the load direction "positive".

- Local buckling

When the characteristic values of Annexes B 2.2.1 to B 2.2.9 are fully utilised, reversible local buckling may occur in the pressed outer wall of the sheets without affecting the load-bearing capacity.

B 1.4 Limiting of deflection

The limiting of deflection shall be assessed. in particular case e.g. to avoid collection of water. The design value for structural resistance C_d for deflection is given by the design value of limiting of deflection $f_{R,d}^{GZG}$. The deflection is to be carried out for uniformly distributed loads assuming a linear-elastic material behavior as follows:

$$\frac{f_{E,d}^{GZG}}{f_{R,d}^{GZG}} \leq 1,0$$

$f_{E,d}^{GZG}$: design value of deflection as a result of E_d

$f_{R,d}^{GZG}$: design value of deflection limit

For calculation the design value of deflection as a result of E_d the thermal expansion coefficient is $\alpha_T = 65 \cdot 10^{-6} \text{ K}^{-1}$. The following flexural rigidity values (B) of the multi wall sheets shall be applied:

Multi wall sheet	Annex	B (Nm ² /m)
PC 2333-30-6	A 4.0	530
PC 2540-4	A 4.1	1850
PC 2540-4-MC	A 4.2	1800
PC 2540-6	A 4.3	1750
PC 2540-7	A 4.4	1800
PC 2540-10	A 4.5	1550
PC 2540-10DX	A 4.6	1800
PC 2540-10DX HI	A 4.7	2330
PC 2600-40-7-U	A 4.10	2050
PC 2550-10	A 4.8	3050
PC 2560-12	A 4.9	4930

The characteristic values for own weight of multi wall sheets shall be taken from the Annex A.4.
The design values for limiting of deflection results as follows:

$$f_{R,d}^{GZG} = \frac{f_{R,k}}{C_u \cdot C_\theta \cdot \gamma_{MC}}$$

The limit of deflection ($f_{R,k}$) is to be determined that a proper function is not impaired, for example, no water sacks form or water penetrates.

The factors given in Section B 2.1 shall be applied.

B 1.5 Load-bearing capacity of the aluminium covering profiles with plastic insulation bar

The fixing distance of the aluminium covering profiles with plastic insulation bar on the substructure is approx. 350 mm, shear stress from bending must be excluded.

The structural stability against transverse tensile failure is to prove:

$$\left(\frac{\frac{\sigma_{xd}}{Q_k}}{\gamma_M \cdot A} \right) \leq 1$$

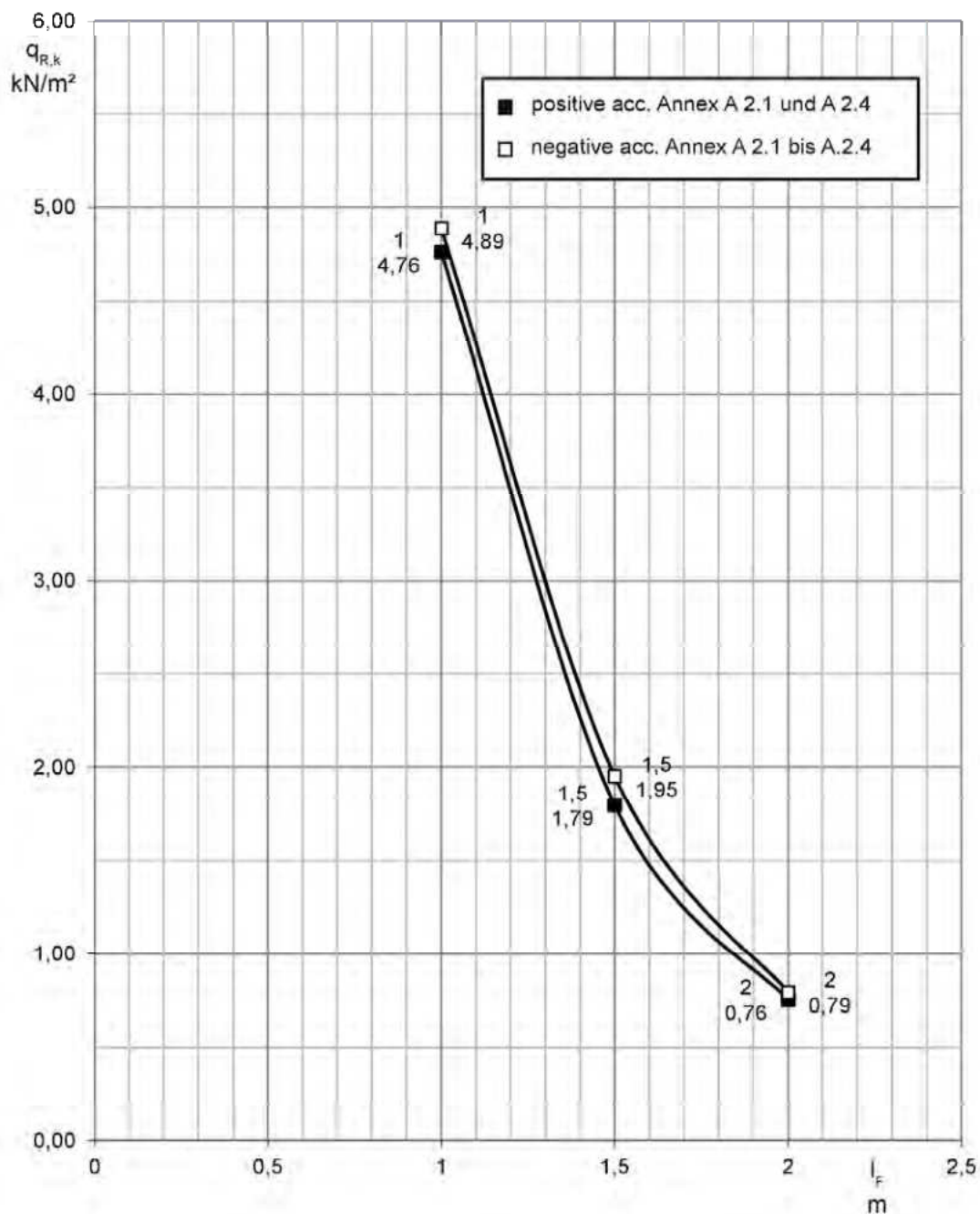
σ_{xd} : design value of normal stress as a result of wind load.

The eccentric load application of the multi-wall sheets regarding the position of the plastic insulating bars must be taken into account.

γ_m : 1,30 - material safety factor

A: 1,56 - factor taking into account the effects of temperature and ageing

Q_k : 80 N/mm – characteristic value of tensile strength of the insulation bar's connection

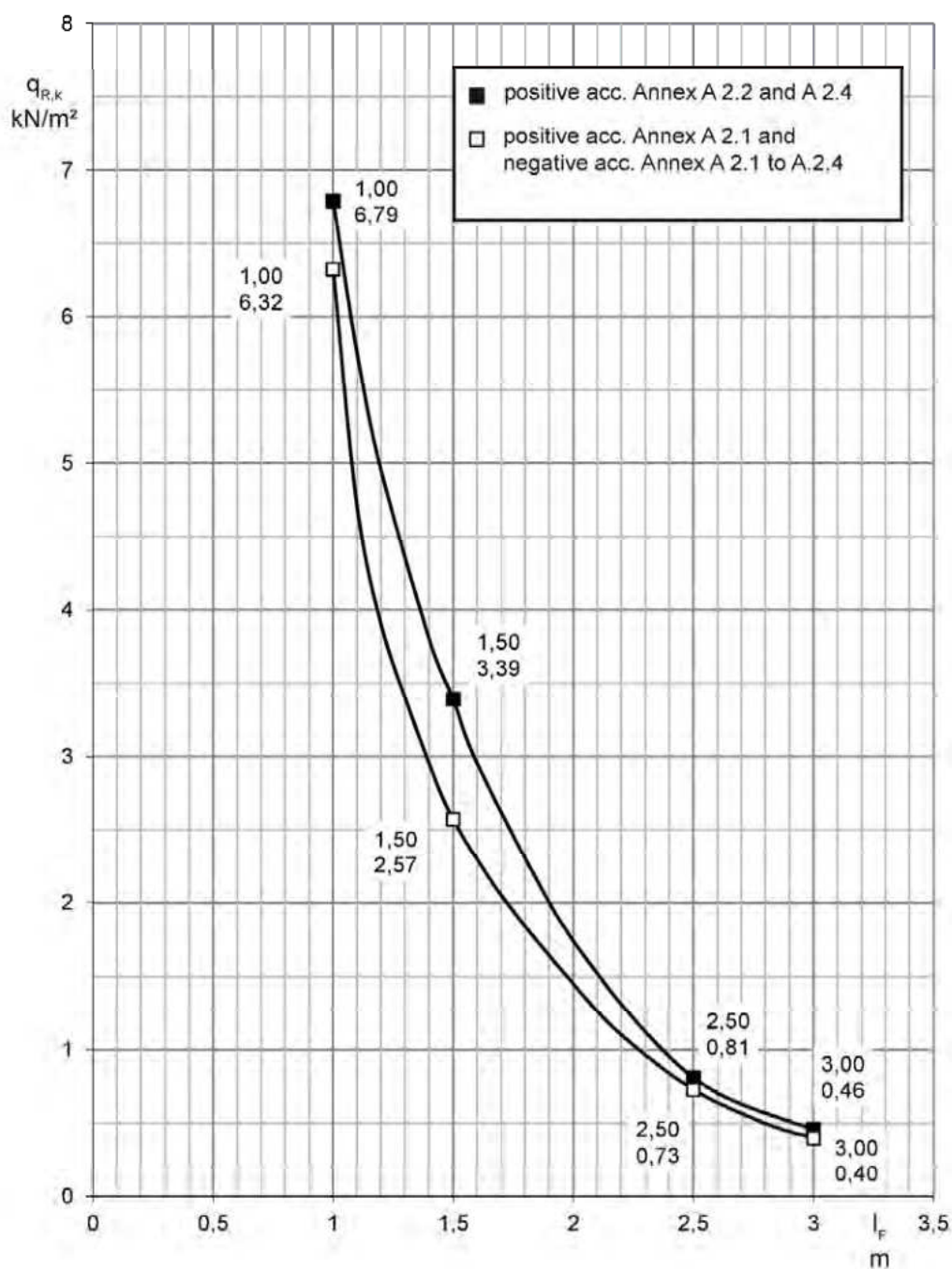


Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

Rodeca LBE

characteristic values for structural resistance
one-span system
PC 2333-30-6

Annex B 2.1.1

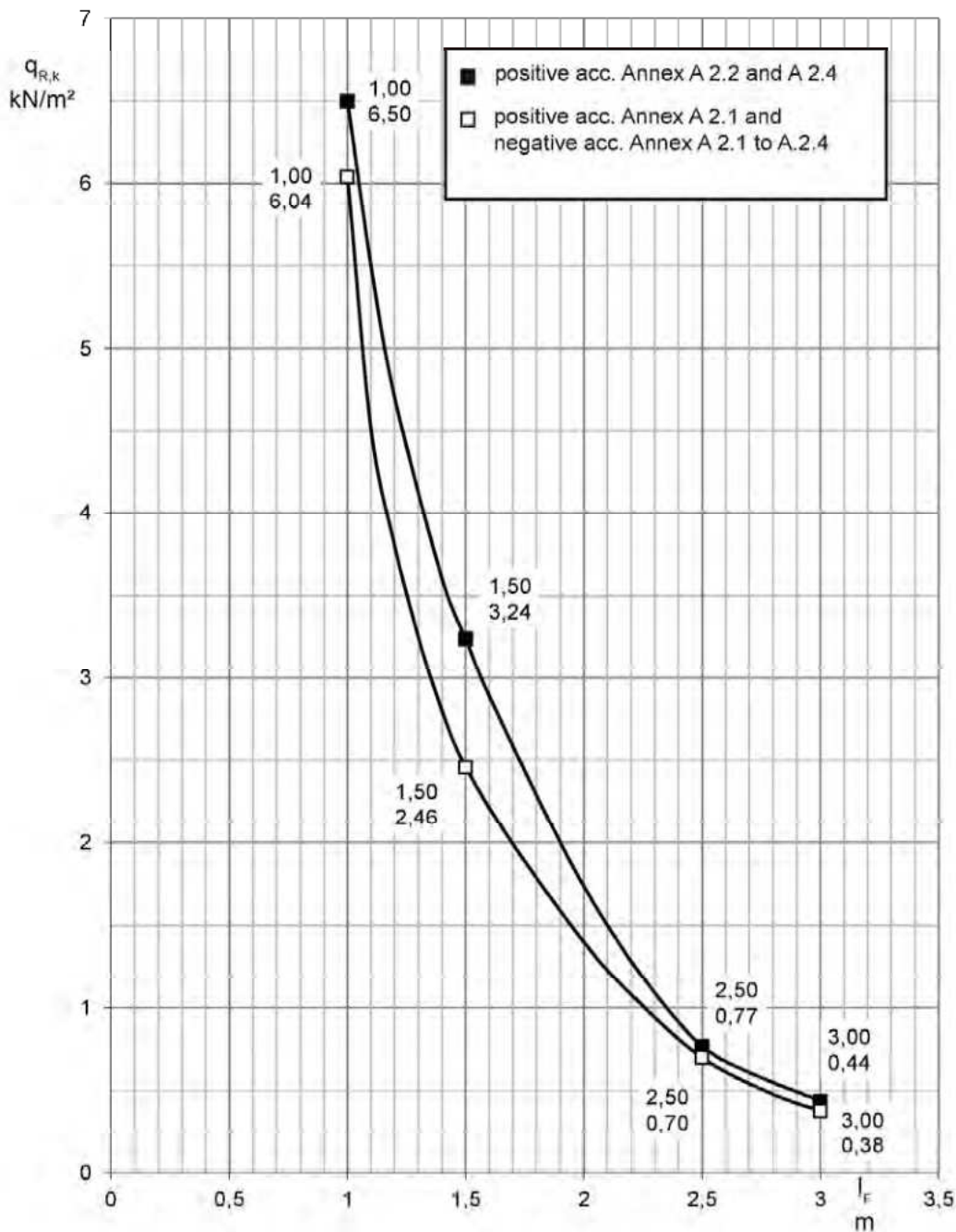


Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

Rodeca LBE

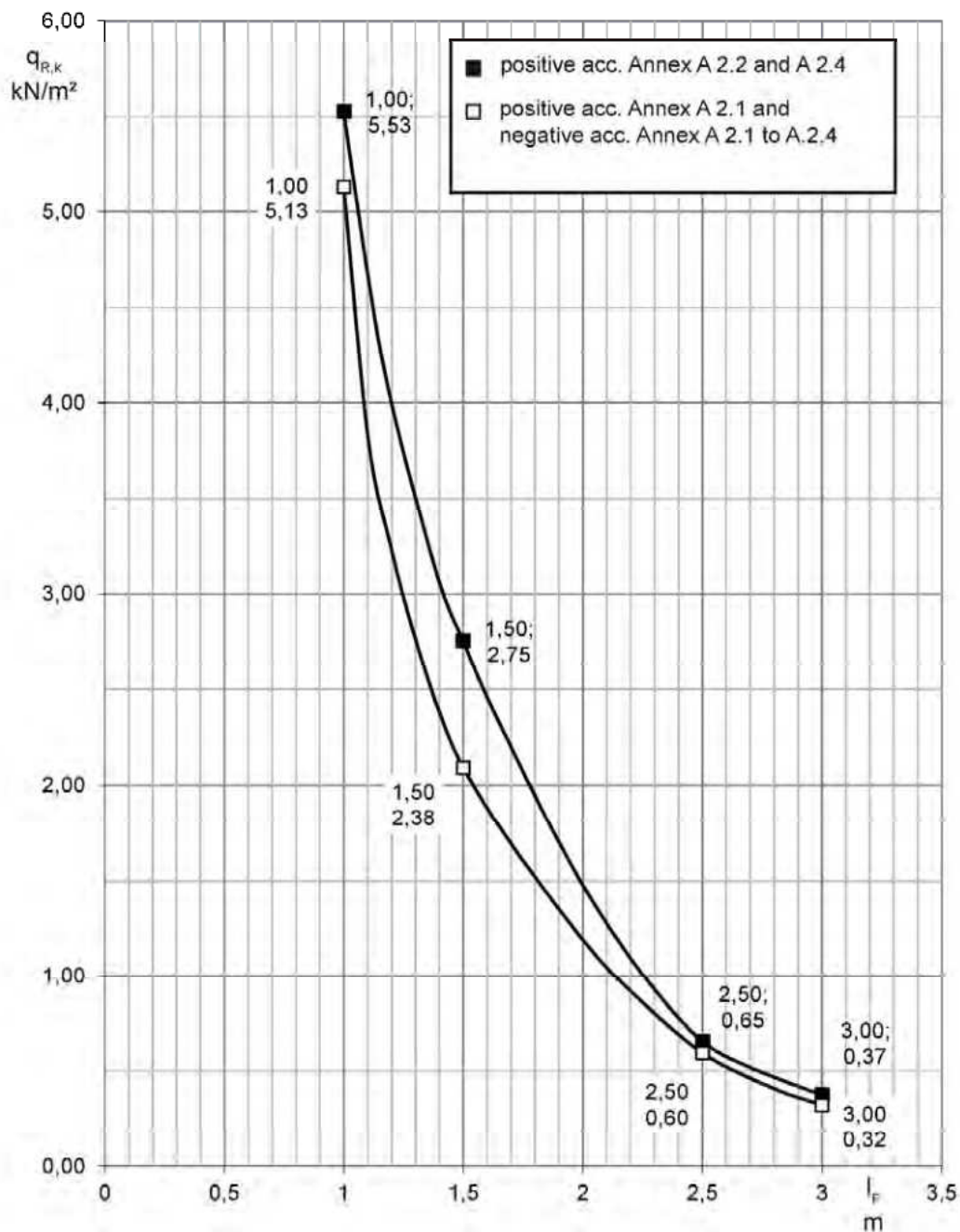
characteristic values for structural resistance
one-span system
PC 2540-4 / PC 2540-4-MC / PC 2540-10DX / PC 2540-10DX HI

Annex B 2.1



Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

Rodeca LBE	Annex B 2.1.3
characteristic values for structural resistance one-span system PC 2540-6 / PC 2540-7	

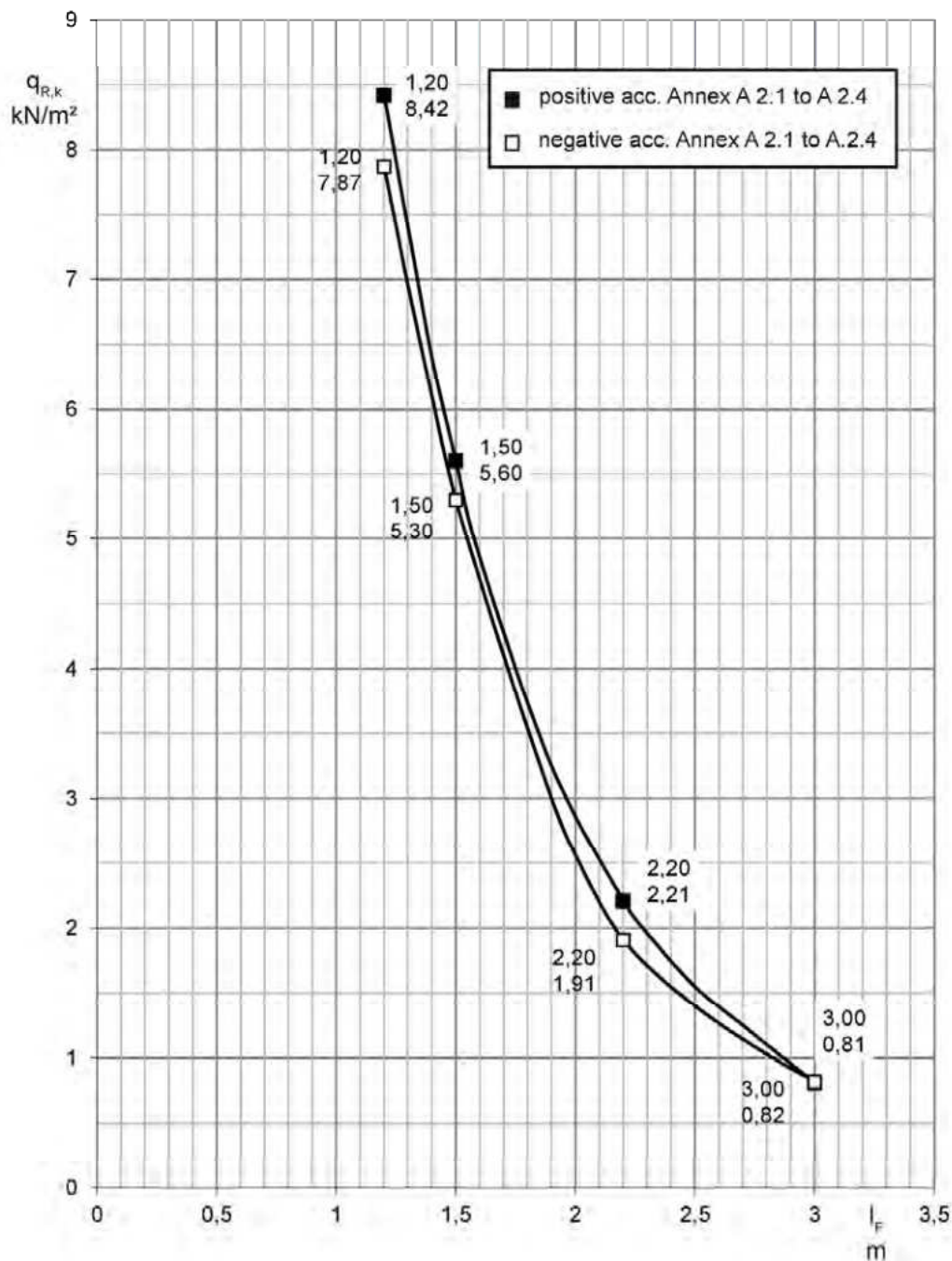


Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

Rodeca LBE

characteristic values for structural resistance
one-span system
PC 2540-10

Annex B 2.1.4

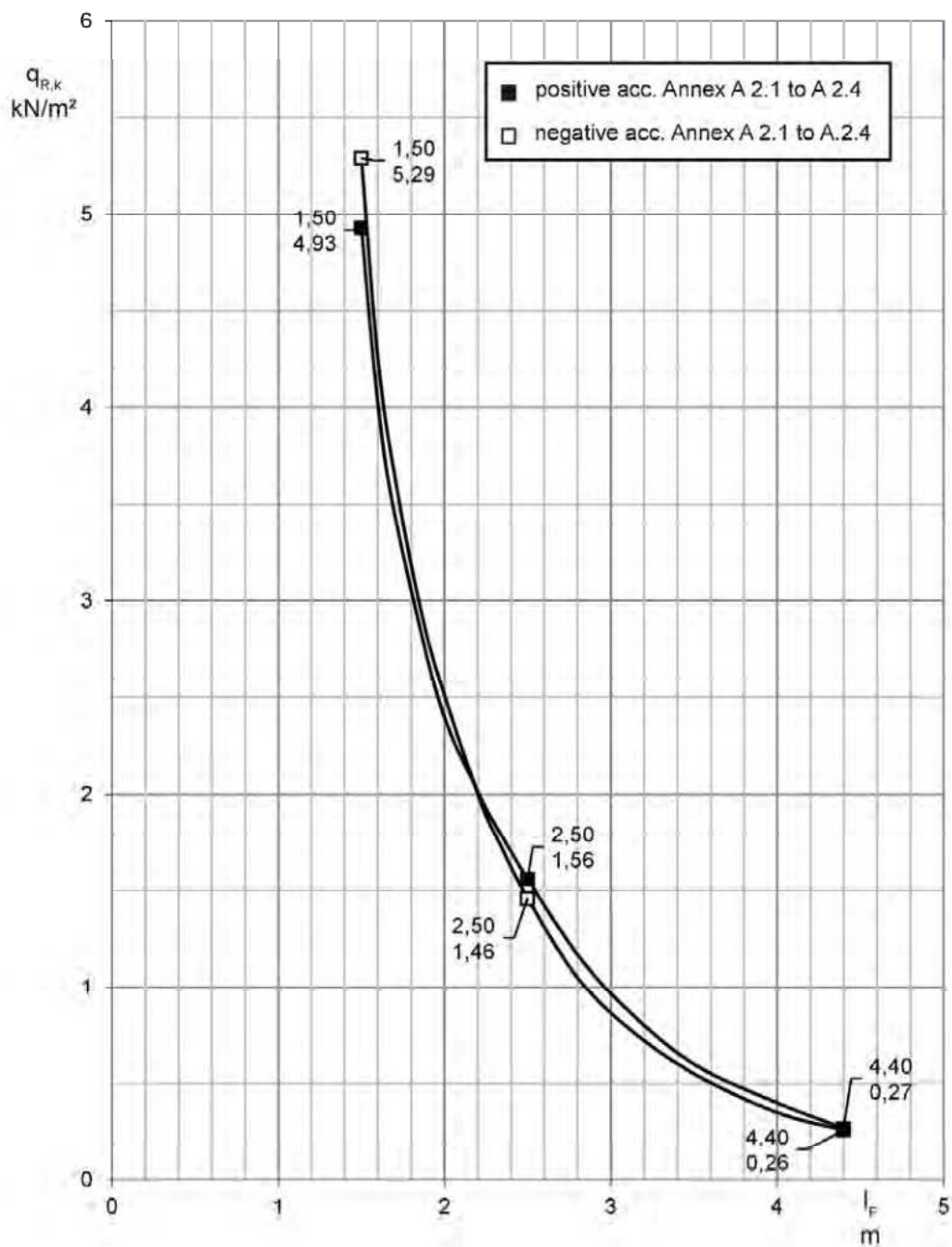


Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

Rodeca LBE

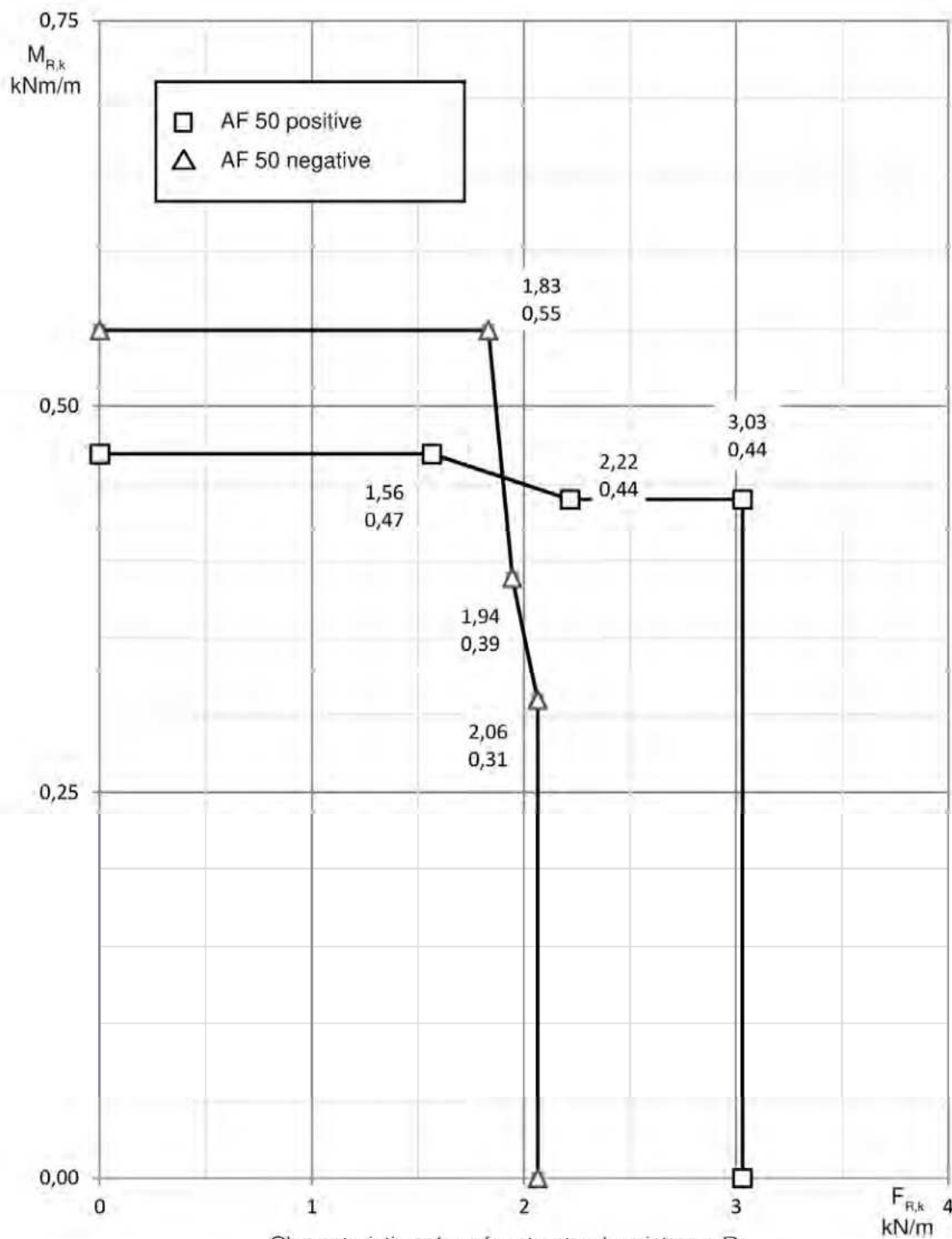
characteristic values for structural resistance
one-span system
PC 2550-10

Annex B 2.1.5



Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

Rodeca LBE	Annex B 2.1.6
characteristic values for structural resistance one-span system PC 2560-12	

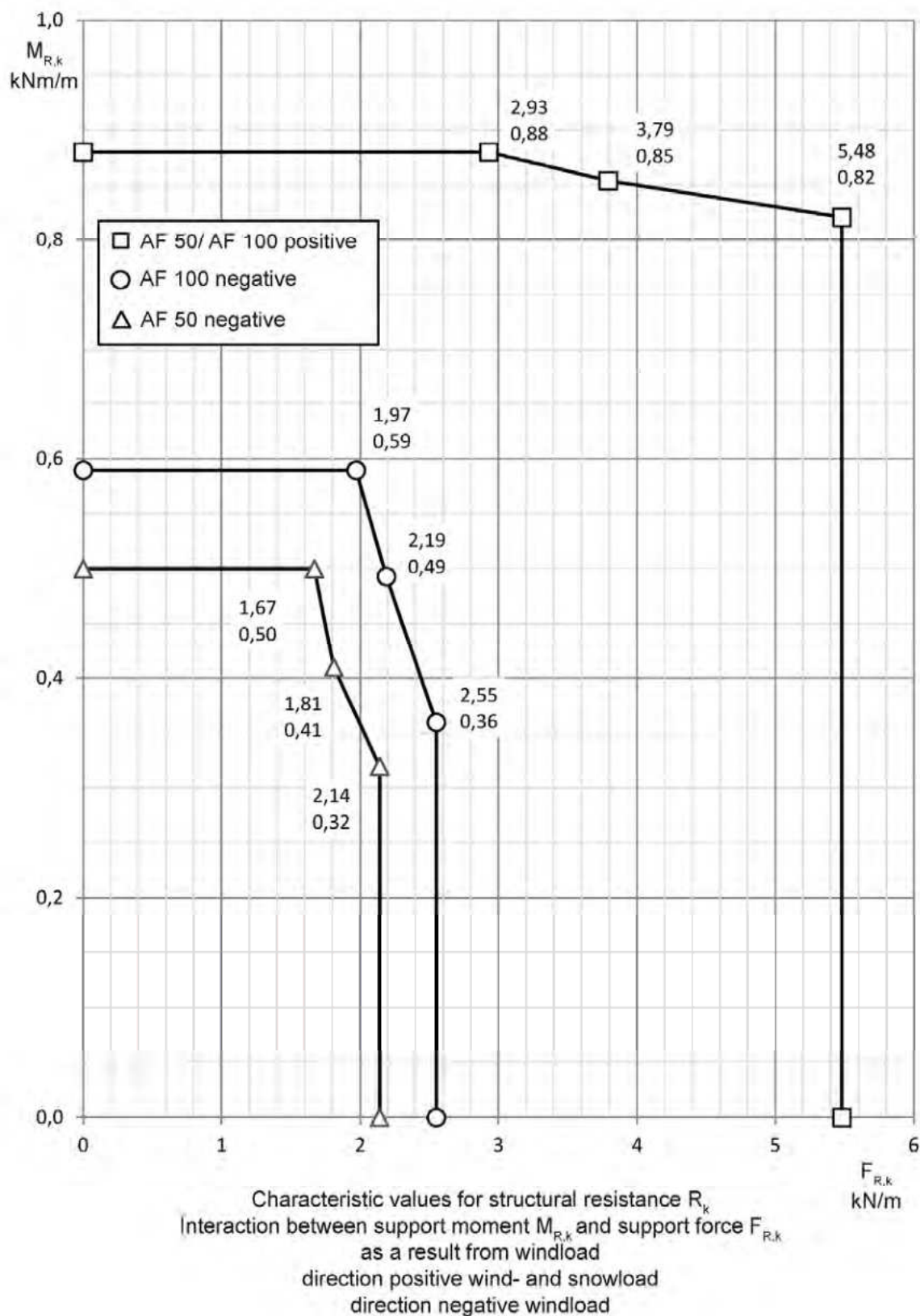


Characteristic values for structural resistance R_k
Interaction between support moment $M_{R,k}$ and support force $F_{R,k}$
as a result from windload
direction positive wind- and snowload
direction negative windload

Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2333-30-6

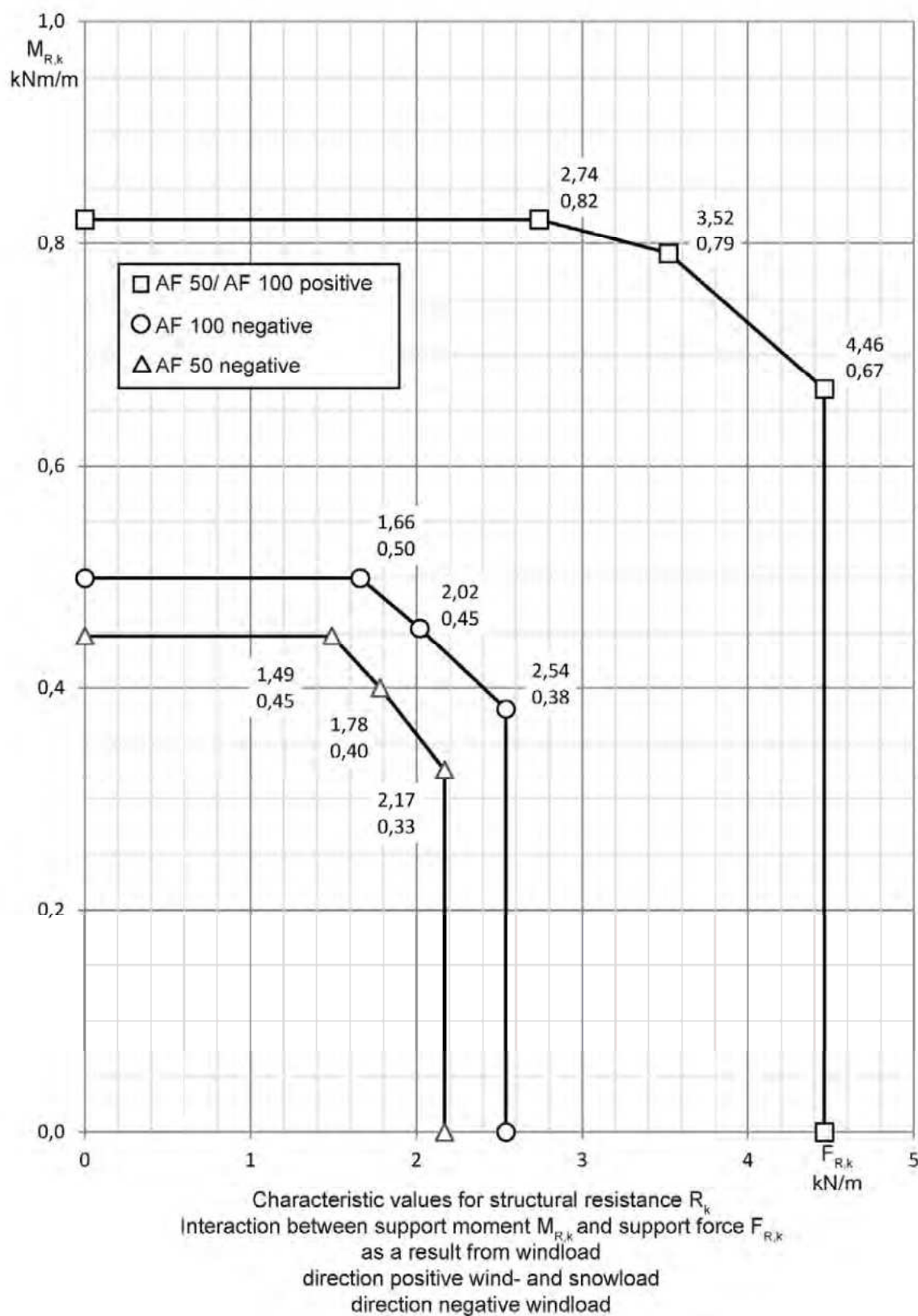
Annex B 2.2.1



Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2540-4

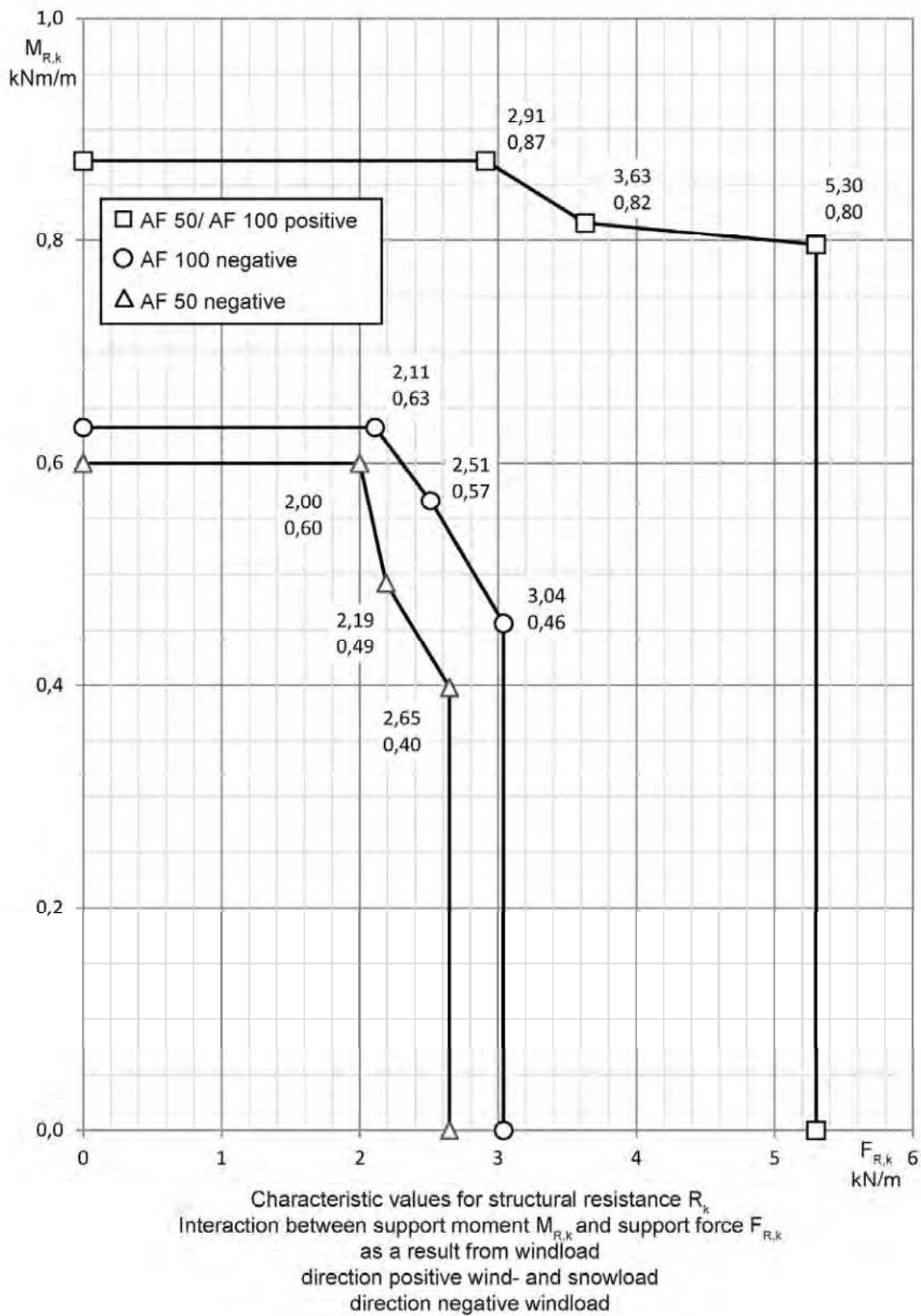
Annex B 2.2.2



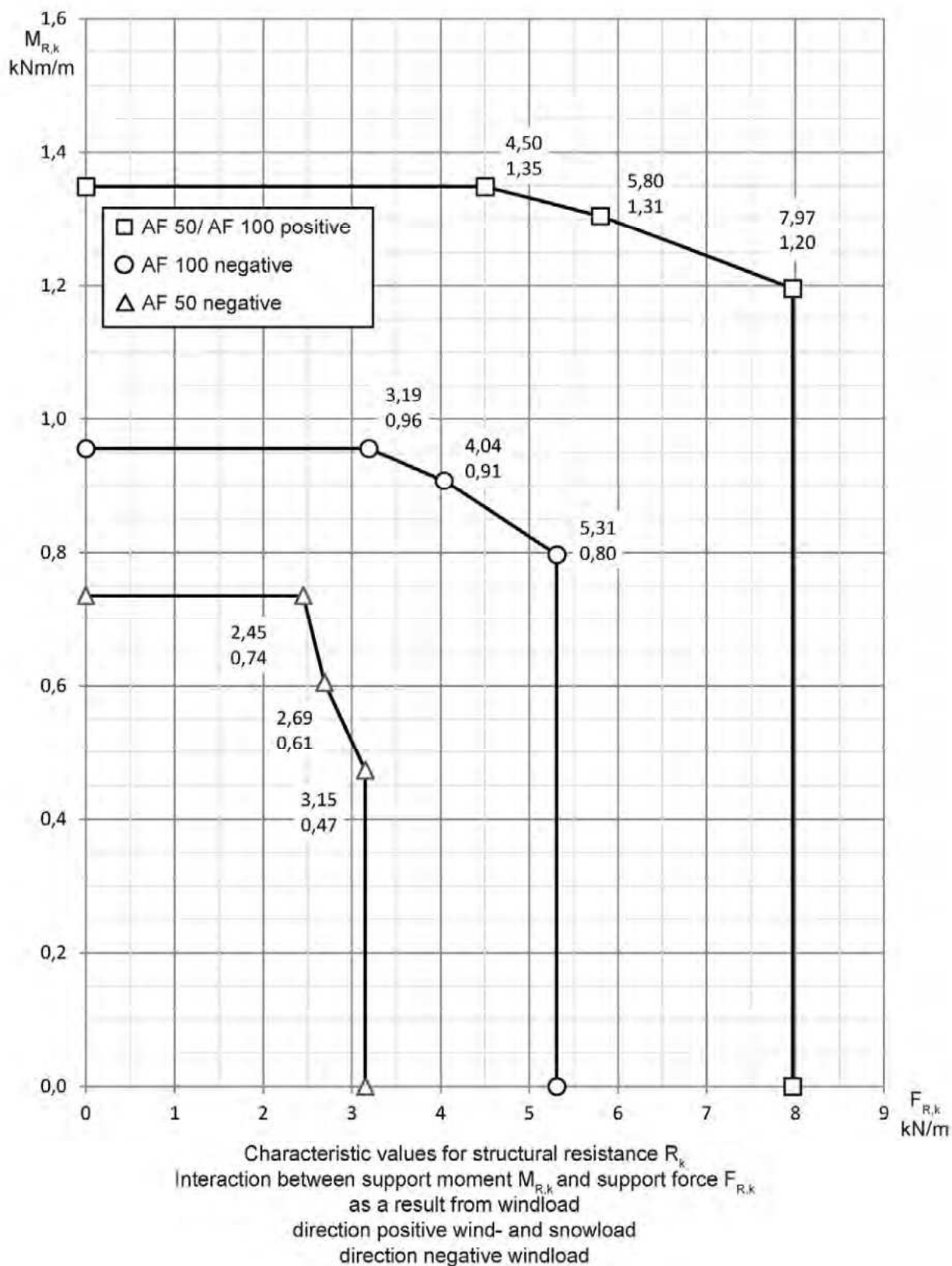
Rodeca LBE

Vcharacteristic values for structural resistance
multi-span system
PC 2540-4 MC

Annex B 2.2.3



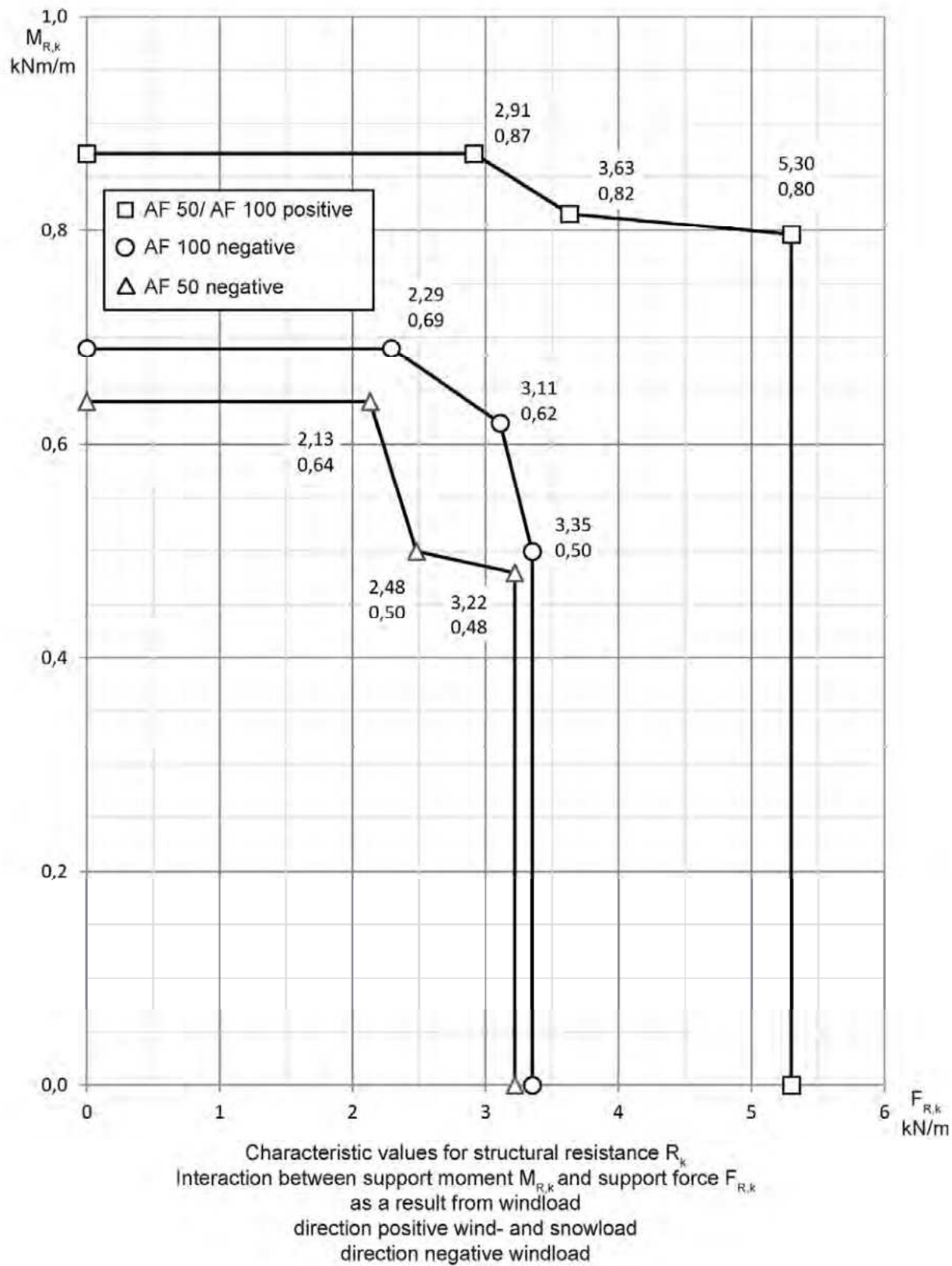
Rodeca LBE	Annex B 2.2.4
characteristic values for structural resistance multi-span system PC 2540-6	



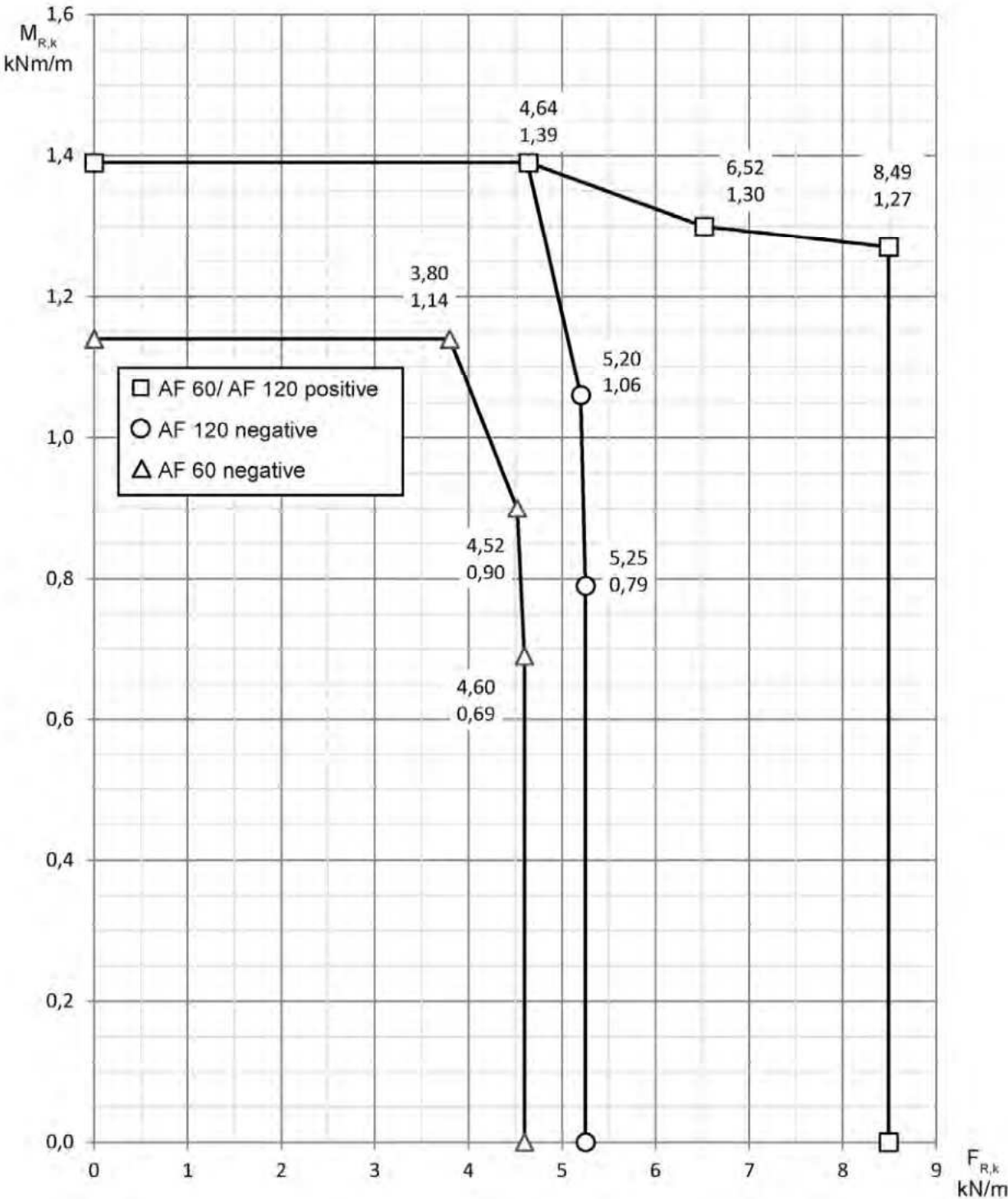
Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2540-7

Annex B 2.2.5

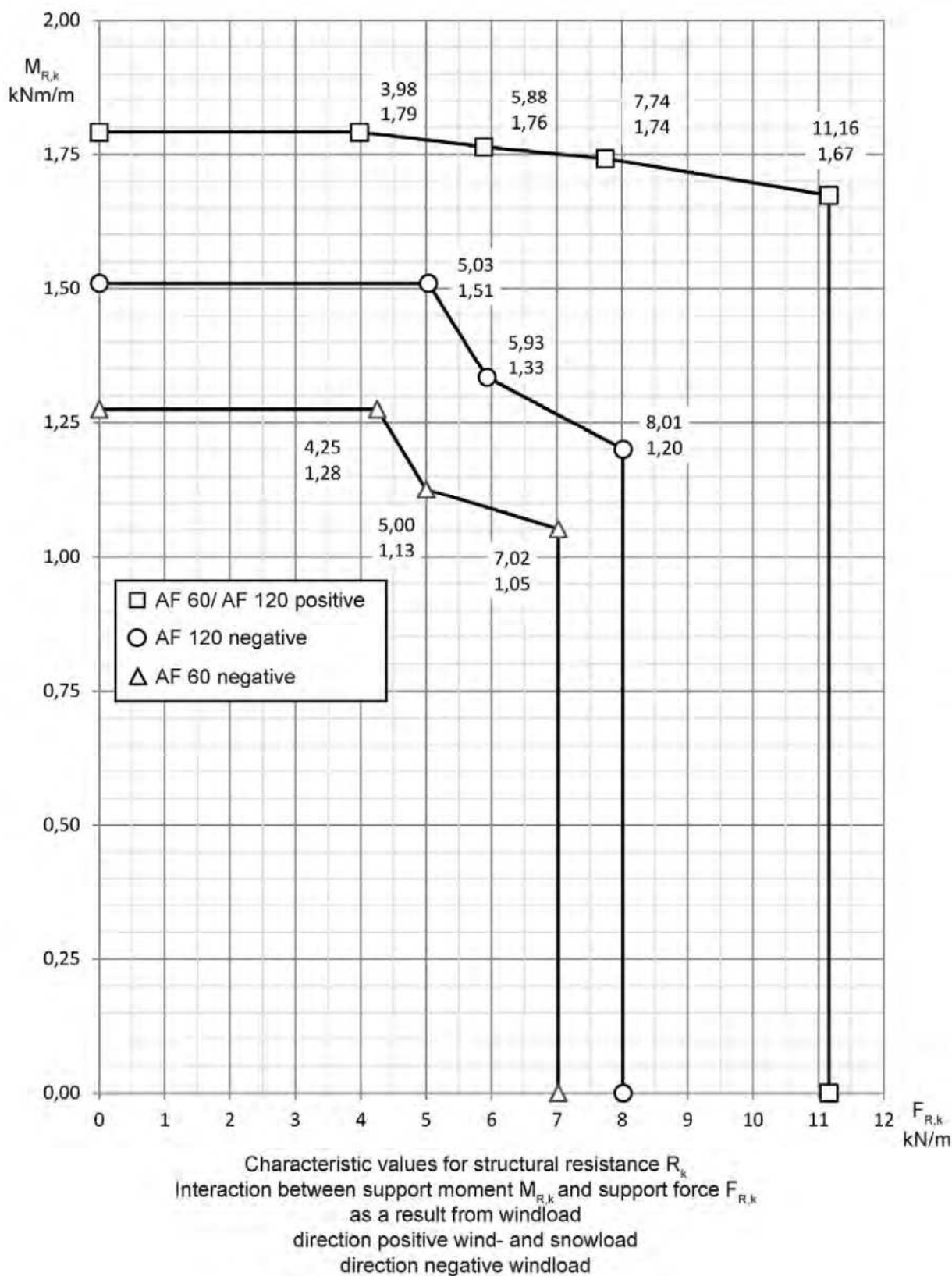


Rodeca LBE	Annex B 2.2.6
characteristic values for structural resistance multi-span system PC 2540-10	



Characteristic values for structural resistance R_k
Interaction between support moment $M_{R,k}$ and support force $F_{R,k}$
as a result from windload
direction positive wind- and snowload
direction negative windload

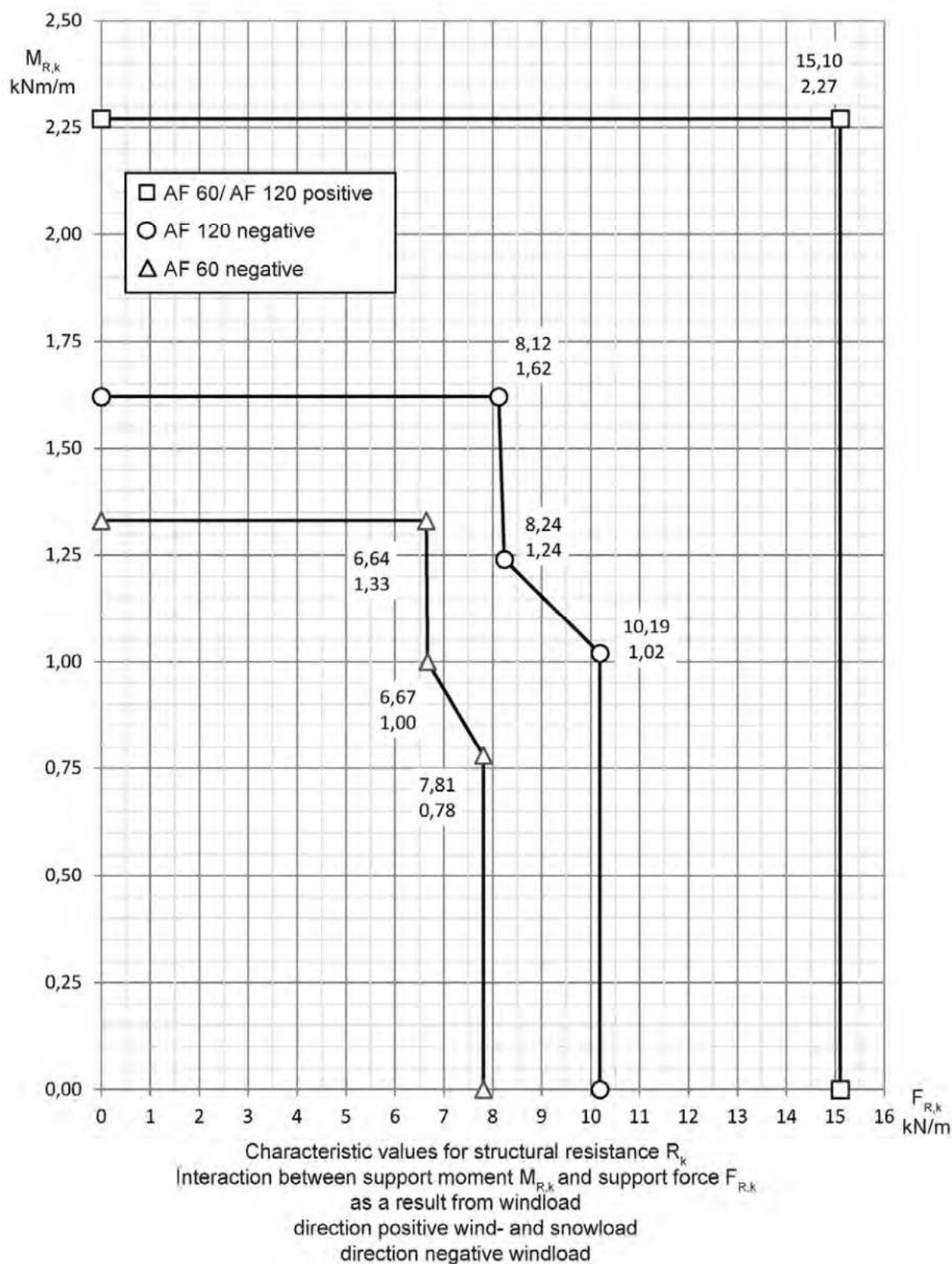
Rodeca LBE	Annex B 2.2.7
characteristic values for structural resistance multi-span system PC 2540-10 DX / PC 2540-10 DX HI	



Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2550-10

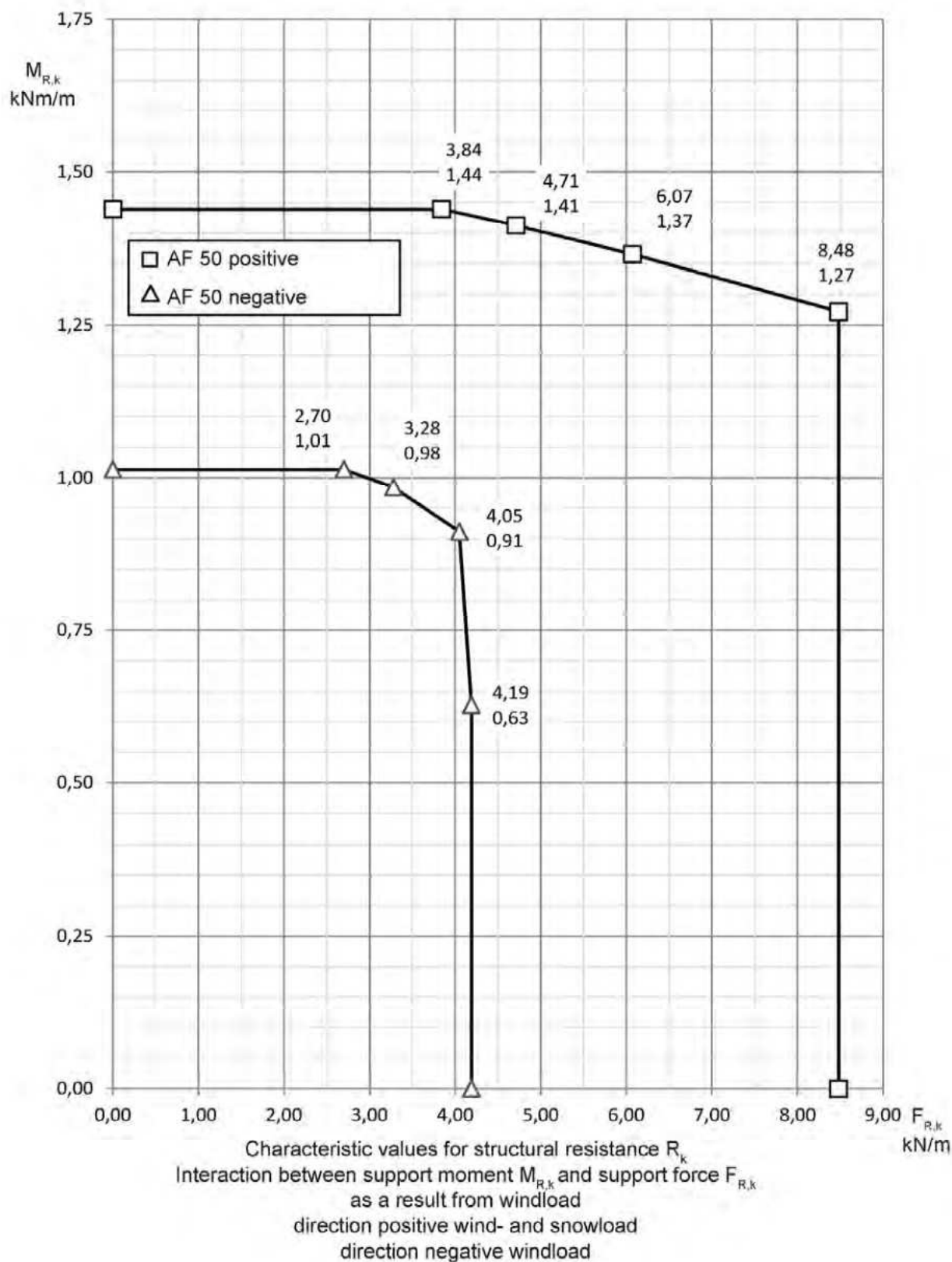
Annex B 2.2.8



Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2560-12

Annex B 2.2.9



Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2600-40-7-U

Annex B 2.2.10

Rodeca LBE

Annex C

Thermal resistance

C 1 Thermal transmittance coefficient

The thermal transmittance U_{cw} shall be determined in accordance with EN ISO 10077-1 as the resultant of the thermal transmittance coefficients of the covering profiles and the multi-wall sheets, weighted on the basis of the area as well as the length-weighted values of linear thermal transmittance coefficients of the multi-wall sheets at the level of covering profiles.

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

$$U_{cw} = \frac{\sum (U_f \cdot A_f) + \sum (U_p \cdot A_p) + \sum (\Psi_p \cdot l_p)}{A_{ges}} \text{ in } W/(m^2 \cdot K)$$

where:

- U_f : thermal transmittance coefficient of the covering profiles $W/(m^2K)$
- A_f : area of the covering profiles
- U_p : thermal transmittance coefficient of the PC multi-wall sheets incl. tongue and groove connection in $W/(m^2K)$
- A_p : visible surface of multi-wall sheets in m^2
- Ψ_p : linear thermal transmittance coefficient of multi wall sheets at the level of covering profiles in $W/(mK)$
- l_p : covering profile length in m
- A_{ges} : total area of the roof and wall kit in m^2

The values of thermal transmittance U_p of the multi wall sheets and U_f of the covering profiles shall be taken from Annex C 2.1 to C 2.4.

Linear thermal transmittance coefficient Ψ_p shall be assumed to $\Psi_p = 0$ (acc. EN ISO 10077-1). The punctiform thermal bridges of the lift anchors in continuous systems can be neglected. The roof and wall kit must be installed and connected to adjacent components so that thermal bridges are avoided whenever possible. These details are to be assessed by the designers in individual cases.

Thermal transmittance coefficients U_p of the multi-wall sheets 30mm

	Installation horizontal/vertical	
multi-wall sheet	installation horizontal	installation vertikal
PC 2333-30-6 acc. Annex A 4.0	$U_p = 1,4 \text{ (W/(m}^2\text{K))}$	$U_p = 1,3 \text{ (W/(m}^2\text{K))}$

Thermal transmittance coefficients U_p of the multi-wall sheets 40mm

	Installation horizontal/vertical	
multi-wall sheet	installation horizontal	installation vertikal
PC 2540-4 acc. Annex A 4.1	$U_p = 1,5 \text{ (W/(m}^2\text{K))}$	$U_p = 1,4 \text{ (W/(m}^2\text{K))}$
PC 2540-4-MC acc. Annex A 4.2	$U_p = 1,6 \text{ (W/(m}^2\text{K))}$	$U_p = 1,5 \text{ (W/(m}^2\text{K))}$
PC 2540-6 acc. Annex A 4.3	$U_p = 1,2 \text{ (W/(m}^2\text{K))}$	$U_p = 1,2 \text{ (W/(m}^2\text{K))}$
PC 2540-7 acc. Annex A 4.4	$U_p = 1,2 \text{ (W/(m}^2\text{K))}$	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$
PC 2540-10 acc. Annex A 4.5	$U_p = 1,0 \text{ (W/(m}^2\text{K))}$	$U_p = 1,0 \text{ (W/(m}^2\text{K))}$
PC 2540-10DX acc. Annex A 4.6	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$
PC 2540-10DX HI acc. Annex A 4.7	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$
PC 2600-40-7-U acc. Annex A 4.10	$U_p = 1,2 \text{ (W/(m}^2\text{K))}$	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$

Linear thermal transmittance coefficients Ψ_p of the connection joint of multi-wall sheets

	$\Psi_p \text{ (W/(mK))}$
PC 2333-30-6 acc. Annex A 4.0	0,010 W/mK
PC 2540-4-MC acc. Annex A 4.2	0,0017 W/mK
PC 2540-6 acc. Annex A 4.3	0,011 W/mK
PC 2540-7 acc. Annex A 4.4	0,012 W/mK
PC 2540-10 acc. Annex A 4.5	0,014 W/mK
PC 2540-10 DX acc. Annex A 4.6	0,010 W/mK
PC 2540-10 DX HI acc. Annex A 4.7	0,010 W/mK
PC 2600-40-7-U acc. Annex A 4.10	0,0085 W/mK

Rodeca LBE

Thermal transmittance coefficients of the multi-wall sheets U_p

Annex C 2.1

Thermal transmittance coefficients U_f of the aluminium covering profiles			
Profile no.	variants of profile	width	U_f (W/(m ² K))
423040 acc. Annex A 3.0	profile without plastic insulation bar	50mm	6,0 (W/(m ² K))
414001 acc. Annex A 3.1.3	profile without plastic insulation bar	101,5mm	5,6 (W/(m ² K))
414002 acc. Annex A 3.1.3	profile without plastic insulation bar	101,5mm	5,6 (W/(m ² K))
414011 acc. Annex A 3.1.4	profile without plastic insulation bar	70mm	6,1 (W/(m ² K))
414012 acc. Annex A 3.1.4	profile without plastic insulation bar	70mm	6,1 (W/(m ² K))
414051 acc. Annex A 3.1.4	profile without plastic insulation bar	70mm	0,90 (W/(m ² K))
404051 acc. Annex A 3.1.1	profile without plastic insulation bar	70mm	0,84 (W/(m ² K))
420031 acc. Annex A 3.1.5	profile without plastic insulation bar	50mm	6,5 (W/(m ² K))
420040 acc. Annex A 3.1.6	profile without plastic insulation bar	50mm	5,9 (W/(m ² K))
420080 acc. Annex A 3.1.7	profile without plastic insulation bar	80mm	5,0 (W/(m ² K))
404062 acc. Annex A 3.1.2	profile without plastic insulation bar	100mm	5,6 (W/(m ² K))
454001 acc. Annex A 3.1.9	profile with plastic insulation bar	101,5mm	2,1 (W/(m ² K))
454002 acc. Annex A 3.1.9	profile with plastic insulation bar	101,5mm	2,9 (W/(m ² K))
454011 acc. Annex A 3.1.10	profile with plastic insulation bar	70mm	2,5 (W/(m ² K))
454012 acc. Annex A 3.1.10	profile with plastic insulation bar	70mm	3,3 (W/(m ² K))
444062 acc. Annex A 3.1.8	profile with plastic insulation bar	154mm	2,0 (W/(m ² K))
Rodeca LBE			
Thermal transmittance coefficients of the aluminium covering profiles U_f			Annex C 2.2

Thermal transmittance coefficients U_p of the multi-wall sheet PC 2550-10		
	installation horizontal/vertical	
PC 2550-10 acc. Annex A 4.8	installation horizontal	installation vertikal
	$U_p = 0,92 \text{ (W/(m}^2\text{K))}$	$U_p = 0,90 \text{ (W/(m}^2\text{K))}$

Linear thermal transmittance coefficients Ψ_p of the connection joint of multi-wall sheet PC 2550-10	
$\Psi_p \text{ (W/(mK))}$	$\Psi_p = 0,020 \text{ (W/(mK))}$

Thermal transmittance coefficients U_r of the aluminium covering profiles			
Profile no.	variants of profile	width	$U_r \text{ (W/(m}^2\text{K))}$
415001 acc. Annex A 3.2.3	profile without plastic insulation bar	101,5mm	5,6 (W(m ² K))
415002 acc. Annex A 3.2.3	profile without plastic insulation bar	101,5mm	5,6 (W(m ² K))
415011 acc. Annex A 3.2.2	profile without plastic insulation bar	70mm	6,1 (W(m ² K))
415051 acc. Annex A 3.2.2	profile without plastic insulation bar	70mm	0,89 (W(m ² K))
415012 acc. Annex A 3.2.2	profile without plastic insulation bar	70mm	6,1 (W(m ² K))
405051 acc. Annex A 3.2.1	profile without plastic insulation bar	85mm	0,75 (W(m ² K))
455001 acc. Annex A 3.2.6	profile without plastic insulation bar	101,5mm	1,5 (W(m ² K))
455002 acc. Annex A 3.2.6	profile with plastic insulation bar	101,5mm	2,3 (W(m ² K))
455011 acc. Annex A 3.2.5	profile with plastic insulation bar	70mm	1,9 (W(m ² K))
455012 acc. Annex A 3.2.5	profile with plastic insulation bar	70mm	2,8 (W(m ² K))
445062 acc. Annex A 3.2.4	profile with plastic insulation bar	154,4mm	1,6 (W(m ² K))

Rodeca LBE

Thermal transmittance coefficients of the multi-wall sheets U_p and
Thermal transmittance coefficients of the aluminium covering profiles U_r

Annex C 2.3

Thermal transmittance coefficients U_p of the multi-wall sheet PC 2560-12

	installation horizontal/vertical	
PC 2560-12 acc. Annex A 4.9	installation horizontal	installation vertical
	$U_p = 0,77 \text{ (W/(m}^2\text{K))}$	$U_p = 0,75 \text{ (W/(m}^2\text{K))}$

Linear thermal transmittance coefficients Ψ_p of the connection joint of multi-wall sheet PC 2560-12

$\Psi_p \text{ (W/(mK))}$	$\Psi_p = 0,0085 \text{ (W/(mK))}$
---------------------------	------------------------------------

Thermal transmittance coefficients U_f of the aluminium covering profiles

Profile no.	variants of profile	width	$U_f \text{ (W/(m}^2\text{K))}$
456001 acc. Annex A 3.3.5	profile with plastic insulation bar	101,5mm	1,2 (W/(m ² K))
456002 acc. Annex A 3.3.5	profile with plastic insulation bar	101,5mm	2,0 (W/(m ² K))
456011 acc. Annex A 3.3.4	profile with plastic insulation bar	70mm	1,6 (W/(m ² K))
456012 acc. Annex A 3.3.4	profile with plastic insulation bar	70mm	2,3 (W/(m ² K))
406051 acc. Annex A 3.3.1	profile without plastic insulation bar	90mm	0,73 (W/(m ² K))
416012 acc. Annex A 3.3.2	profile without plastic insulation bar	70mm	6,1 (W/(m ² K))
416011 acc. Annex A 3.3.2	profile without plastic insulation bar	70mm	6,1 (W/(m ² K))
416051 acc. Annex A 3.3.2	profile without plastic insulation bar	70mm	0,96 (W/(m ² K))
446062 acc. Annex A 3.3.3	profile with plastic insulation bar	154,4mm	1,5 (W/(m ² K))

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Thermal transmittance coefficients of the multi-wall sheets U_p and
Thermal transmittance coefficients of the aluminium covering profiles U_f

Annex C 2.4

Rodeca LBE

Annex D

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

D 1 Installation

The verification of aluminium covering profiles and lift anchors, their fixings as well as the verification of substructure is not subject of this ETA.

The stability shall be verified for the respective substructure in accordance with the valid European specifications. Before the roof and wall kit is installed, the dimensional stability of the substructure shall be checked.

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 installation of the roof and wall kit may only be performed by specialists who are specially trained for this purpose. The installation guidelines of the manufacturer shall be respected. If the roof and wall kit is installed in roof a minimum inclination of 5° is necessary. The manufacturer of the roof and wall kit shall inform the specialists that they may only carry out assembly and installation of the roof and wall kit in accordance with his instructions and the provisions of the ETA. The hollow chambers of the multi-wall sheets may not be filled.

If the translucent roof and wall kit can systematically come into contact with chemical substances, the resistance to these substances of the multi-wall sheets in particular must be checked. Connection of the translucent roof and wall kit to the substructure shall be carried out in accordance with the structural analysis. The multi-wall sheets are to be connected to an area of any size by means of a joint on the long sides. The multi-wall sheets are to be framed on end supports by aluminum covering profiles given in Annex A 2.1 to A 2.4. The set-in stated there is a minimum bearing width to be observed at all times. Installed as multi-span system the multi-wall sheets are fastened by lift anchors. The translucent roof and wall 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 and wall 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 and wall kit in installed condition is not a walk-on system. For installation purposes, the roof and wall kit may be walked on by a single person using boards laid across the substructure (at least two bearing profiles) for support.

To maintain the visual appearance the roof and wall kit is to clean in regular intervals to manufacturers instructions. Within the scope of maintenance, the installed roof and wall kit shall be visually inspected by the building's owner every two years. The manufacturer shall be consulted if the PC multi-wall sheets exhibit surface cracks or damage or if they are strongly discoloured. Repair shall be arranged where necessary.

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

**ETA-19/0452
of 2 August 2021**

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General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Rodeca LBE

Product family
to which the construction product belongs

Self-supporting translucent roof and wall kits

Manufacturer

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Manufacturing plants

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Specific part

1 Technical description of the product

1.1 Kit description and setup

The "Rodeca LBE" roof and wall kit is made up of components which are factory-made and assembled on site as a self-supporting translucent roof or wall kit.

The kit 'Rodeca LBE' is available in the following types: PC 2333-30-6, PC 2540-4, PC 2540-4-MC, PC 2540-6, PC 2540-7, PC 2540-10, PC 2540-10DX, PC 2540-10DX HI, PC 2600-40-U, PC 2550-10 und PC 2560-12.

An essential part of the kit are translucent PC multi-wall sheets in accordance with EN 16153, which can be connected to an area of any size by means of a joint on the long sides. The PC sheets are housed in aluminium covering profiles, which are optionally thermally separated by plastic insulating bars. The kit can be constructed as one-span system or, with additional intermediate supports transverse to the main bearing direction, as multi-span system. To withstand wind suction on continuous systems, they are held on internal supports by lift anchors.

The following components are used for the manufacture of the "Rodeca LBE" self-supporting translucent roof and wall kit

- translucent polycarbonate (PC) multi-wall sheets of thickness 30 mm (PC 2333-30-6)
- translucent polycarbonate (PC) multi-wall sheets of thickness 40 mm (PC 2540-4, PC 2540-4-MC, PC 2540-6, PC 2540-7, PC 2540-10, PC 2540-10DX, PC 2540-10DX HI, PC 2600-40-7-U)
- translucent polycarbonate (PC) multi-wall sheets of thickness 50 mm (PC 2550-10)
- translucent polycarbonate (PC) multi-wall sheets of thickness 60 mm (PC 2560-12)
- polycarbonate (PC) connection profile (for kit 2600-40-7-U only)
- aluminium covering profiles
- aluminium lift anchors
- sealing profiles

The components and the system setup of the product are given in Annexes A 1.1 to A 1.3 and A 2.1 to A 2.4.

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 documentation¹ of this European Technical Assessment.

¹ The technical documentation comprises all information of the holder of this ETA necessary for the production, installation and maintenance of the roof and wall 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 16153² are used.

Table 1:

Manufacturer	Trade name	Sheet height [mm]	Annex
Rodeca GmbH	PC 2333-30-6	30	A 4.0
Rodeca GmbH	PC 2540-4	40	A 4.1
Rodeca GmbH	PC 2540-4-MC	40	A 4.2
Rodeca GmbH	PC 2540-6	40	A 4.3
Rodeca GmbH	PC 2540-7	40	A 4.4
Rodeca GmbH	PC 2540-10	40	A 4.5
Rodeca GmbH	PC 2540-10DX	40	A 4.6
Rodeca GmbH	PC 2540-10DX HI	40	A 4.7
Rodeca GmbH	PC 2600-40-7-U	40	A 4.10
Rodeca GmbH	PC 2550-10	50	A 4.8
Rodeca GmbH	PC 2560-12	60	A 4.9

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

1.1.2 Covering Profiles

The aluminium profiles are made from the aluminium alloy EN AW-6060, T66 in accordance with EN 755-2 and have the dimensions given in Annexes A 3.0 to A 3.3.5.

For aluminium covering profiles, which are thermally separated, the plastic insulating bars consist of polyamide PA66 with a glass fiber content of about 25 % and are produced by extrusion of the molding material ISO 1874-PA66, EC2L, 14-025, GF25. This corresponds to the deposit at the Deutsches Institut für Bautechnik.

1.1.3 Lift anchors

The aluminium profiles are made from EN AW-6060 T66 in accordance with EN 755-2³ and have the dimensions given in Annexes A 3.4.1 to A 3.4.5.

1.1.4 Sealing profile

The sealing profiles are made from ethylene-propylene terpolymer (EPDM) or thermoplastic elastomer (TPE) and has the dimensions and Shore hardness in accordance with EN ISO 868⁴ given in Annex A 3.5.

1.1.5 Connection profile

The polycarbonate connection profile "380062" has the dimensions given in Annexes A 4.11. This corresponds to the deposit at the Deutsches Institut für Bautechnik.

² 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

³ EN 755-2:2016-10 Aluminium and aluminium alloys - Extruded rod/bar, tube and profiles - Part 2: Mechanical properties

⁴ EN ISO 868: 2003-10 Plastics and ebonite - Determination of indentation hardness by means of a durometer

1.6 "Rodeca LBE" roof and wall kit.

The "Rodeca LB" of the type PC 2333-30-6, PC 2540-4, PC 2540-4-MC, PC 2540-6, PC 2540-7, PC 2540-10, PC 2540-10DX, PC 2540-10DX HI, PC 2550-10 and PC 2560-12 are made up of the components described in Section 1.1.1 to 1.1.4.

The following combinations in accordance with table 2a are possible:

Table 2a:

Variation	Multi-wall sheet Annex	Covering profile Annex	Lift Anchor Annex	Support system
PC 2333-30-6	A 4.0	A 3.0	-	one-span
PC 2333-30-6 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-4	A 4.1	A 3.1	-	one-span
PC 2540-4 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-4 AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-4-MC	A 4.2	A 3.1	-	one-span
PC 2540-4-MC AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-4-MC AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-6	A 4.3	A 3.1	-	one-span
PC 2540-6 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-6 AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-7	A 4.4	A 3.1	-	one-span
PC 2540-7 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-7 AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-10	A 4.5	A 3.1	-	one-span
PC 2540-10 AF 50			A 3.4.1 No.49404050	multi-span
PC 2540-10 AF 100			A 3.4.1 No.494040100	multi-span
PC 2540-10DX	A 4.6	A 3.1	-	one-span
PC 2540-10DX AF 60			A 3.4.2 No.4940X60	multi-span
PC 2540-10DX AF 120			A 3.4.2 No.4940X120	multi-span
PC 2540-10DX HI	A 4.7	A 3.1	-	one-span
PC 2540-10DX HI AF 60			A 3.4.2 No.4940X60	multi-span
PC 2540-10DX HI AF 120			A 3.4.2 No.4940X120	multi-span
PC 2550-10	A 4.8	A 3.2	-	one-span
PC 2550-10 AF 60			A 3.4.3 No.49405060	multi-span
PC 2550-10 AF 120			A 3.4.3 No.494050120	multi-span
PC 2560-12	A 4.9	A 3.3	-	one-span
PC 2560-12 AF 60			A 3.4.4 No.49406060	multi-span
PC 2560-12 AF 120			A 3.4.4 No.494060120	multi-span

The "Rodeca LBE" type PC 2600-40-7-U is made up of the components described in Section 1.1.1 to 1.1.5.

The following combination is possible:

Table 2b:

Variation	Multi-wall sheet Annex	Covering profile Annex	Lift Anchor Annex	Connection profile Annex	Support system
PC 2600-40-7-U AF49404000	A 4.10	A 3.1	A 3.4.5	A 4.11	multi-span

Table 3: Reaction to fire of the components

Multi-wall sheets	class Bs1-d0 in accordance with EN 13501-1 ⁵
Sealing profile/ Plastic insulating bars of aluminium covering profiles	No contribution to fire spread in accordance with EOTA TR 021 (Version June 2005)
Covering profiles, Lift anchors	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)

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

The self-supporting translucent roof and wall kit may be used in the roof or wall area for open or closed structures. The multi-wall sheets may be combined to form continuous areas of any length over a rectangular ground plan.

The pitch of a roof's covering is at least 5°. The roof and wall kit is not a walk-on system; it may not be used for bracing of the support structure.

The performance data given in Section 3 is only valid if the roof kit is used in compliance with the specifications and the conditions given in Annexes A to 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 and wall 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 a means for choosing the right products in relation to the expected economically reasonable working life of the structure.

3 Performance of the product

3.1 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Fire performance in case of external fire exposure	No performance assessed
Reaction to fire	Class Bs1-d0 in accordance with EN 13501-1

⁵ EN 13501-1:2010-01

Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests

3.2 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Watertightness ^{a)}	Class 8A in accordance with EN 12208 ⁶
^{a)} Considered solely the tightness of tongue and groove connection	

3.3 Safety and accessibility (BWR 4)

Essential characteristic	Performance
Characteristic structural resistance resulting from downward loads and uplift loads [kN/m ²]	See Annex B 2.1
Moment and support reaction at intermediate supports for multi-span systems	See Annex B 2.2
Material-dependent influencing factor for the effect of load duration	See Annex B 1.2
Material-dependent influencing factor for ageing and environmental effects	See Annex B 1.3
Material-dependent influencing factor for thermal effects	See Annex B 1.3
Deformation behaviour	See Annex B 1.4
Transverse tensile strength capacity	See Annex B 1.5
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)	Passed in accordance with EN 16153

3.4 Protection against noise (BWR 5)

No performance assessed

3.5 Energy economy and heat retention (BWR 6)

3.5.1 Thermal resistance

Essential characteristic	Performance
Thermal transmittance coefficient	See Annex C

3.5.2 Air permeability

Essential characteristic	Performance
Air permeability ^{a)}	Class 4 in accordance with EN 12207 ⁷
^{a)} Considered solely the tightness of tongue and groove connection	

3.5.3 Spectral characteristics

No performance assessed

3.5.4 Total solar energy transmittance

No performance assessed

⁶ EN 12208:2000-06
⁷ EN 12207:2017-03

Windows and doors - Watertightness - Classification
Windows and doors - Air permeability - Classification

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

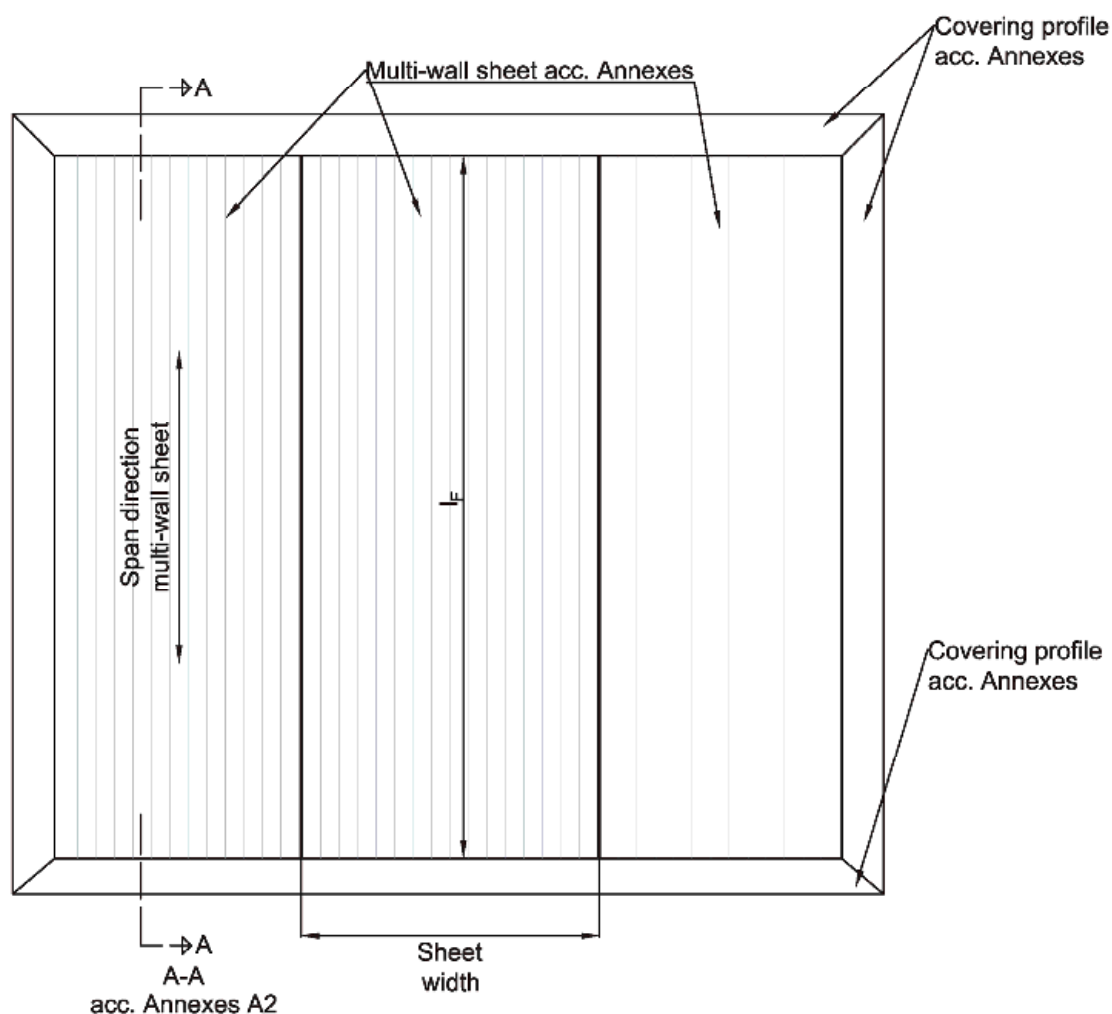
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 2 August 2021 by Deutsches Institut für Bautechnik

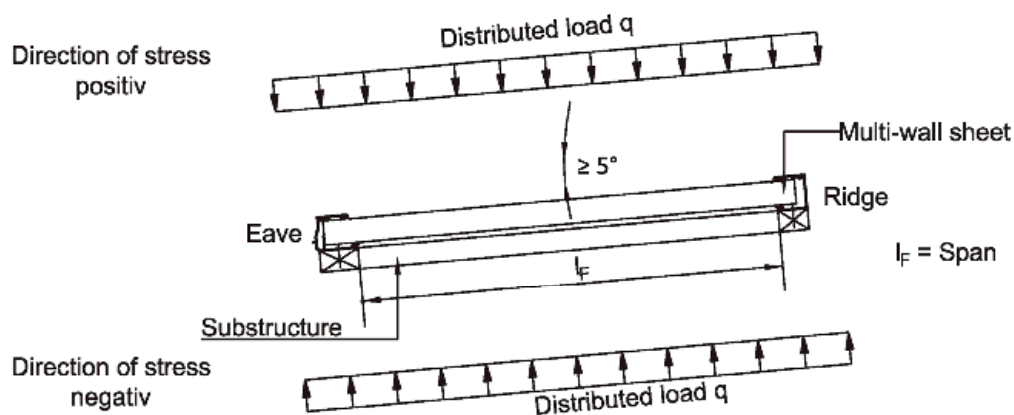
Renée Kamanzi-Fechner
Head of Section

beglaubigt:
Wachner

Front view roof and wall -single-span-system-



Schematic figure longitudinal section roof

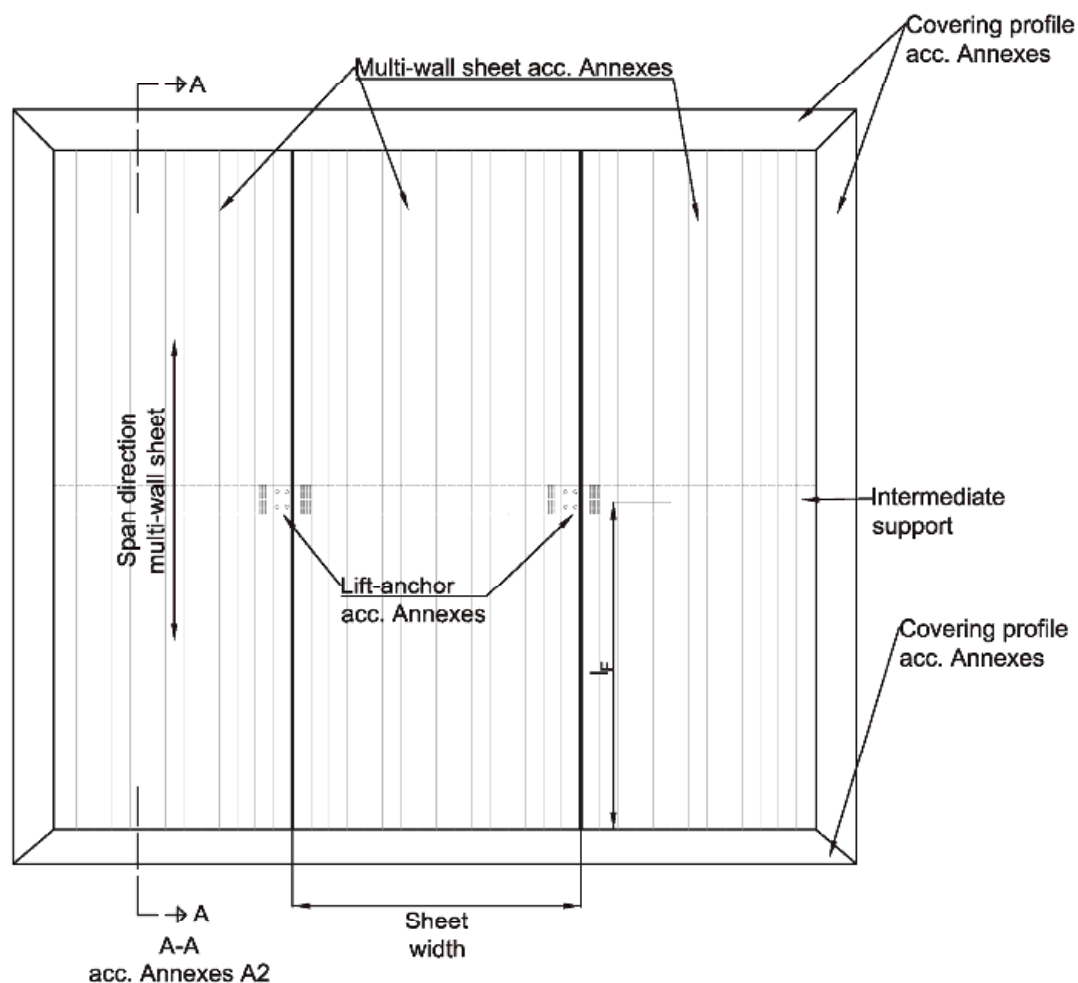


Rodeca LBE

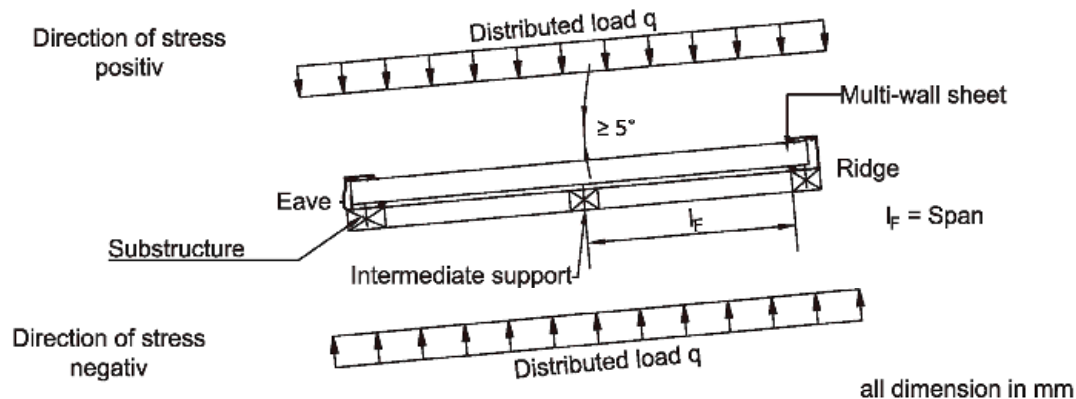
Assembly situation one-span-system

Annex A 1.1

Front view roof and wall -continuous-span-system-



Schematic figure longitudinal section roof

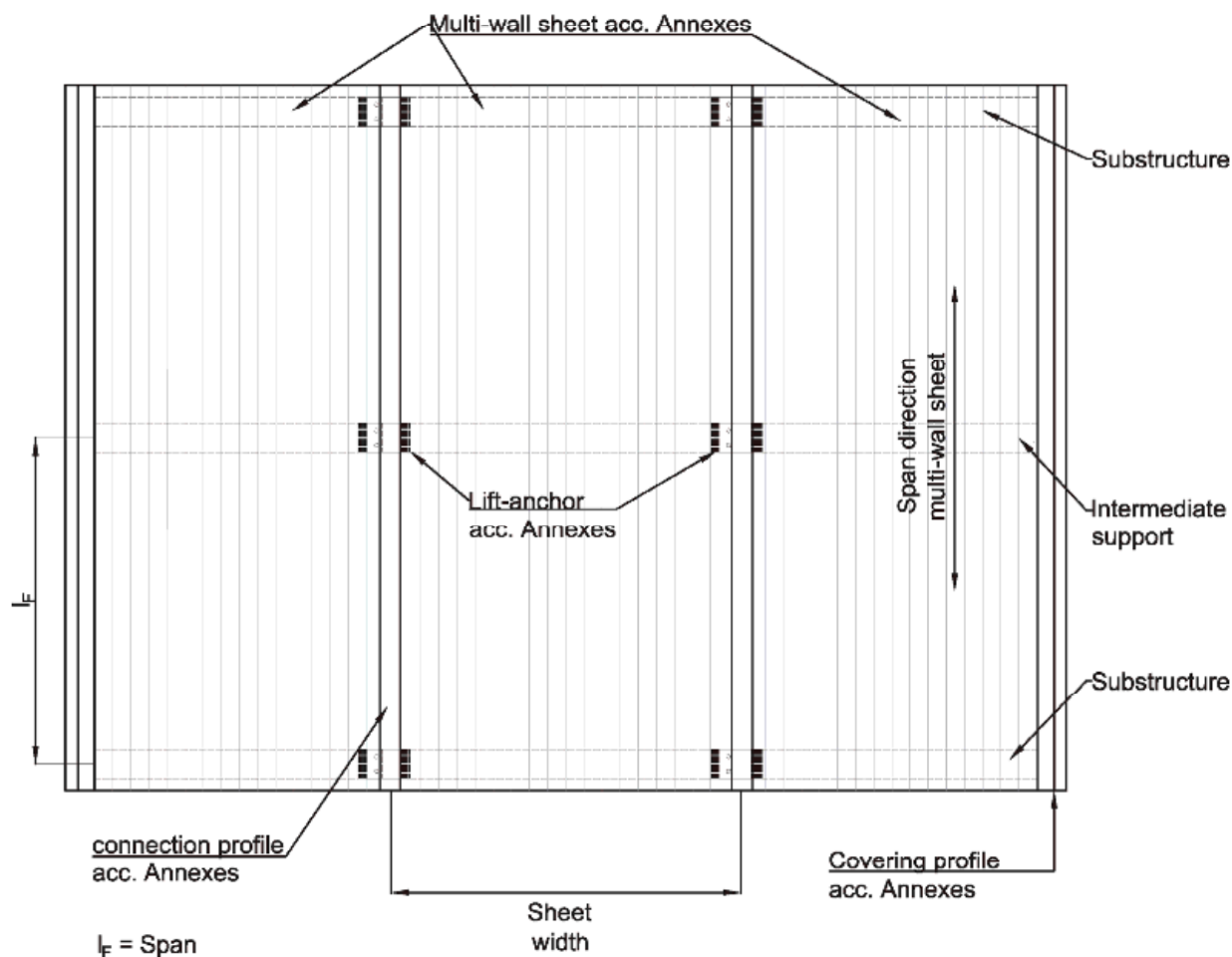


Rodeca LBE

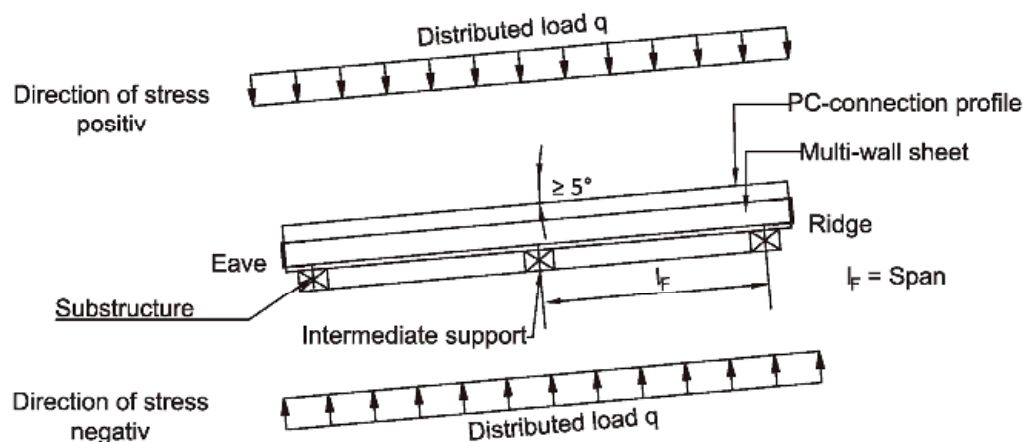
Assembly situation multi-span-system

Annex A 1.2

Front view roof and wall -continuous-span-system-



Schematic figure longitudinal section roof



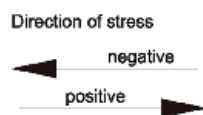
all dimension in mm

Rodeca LBE

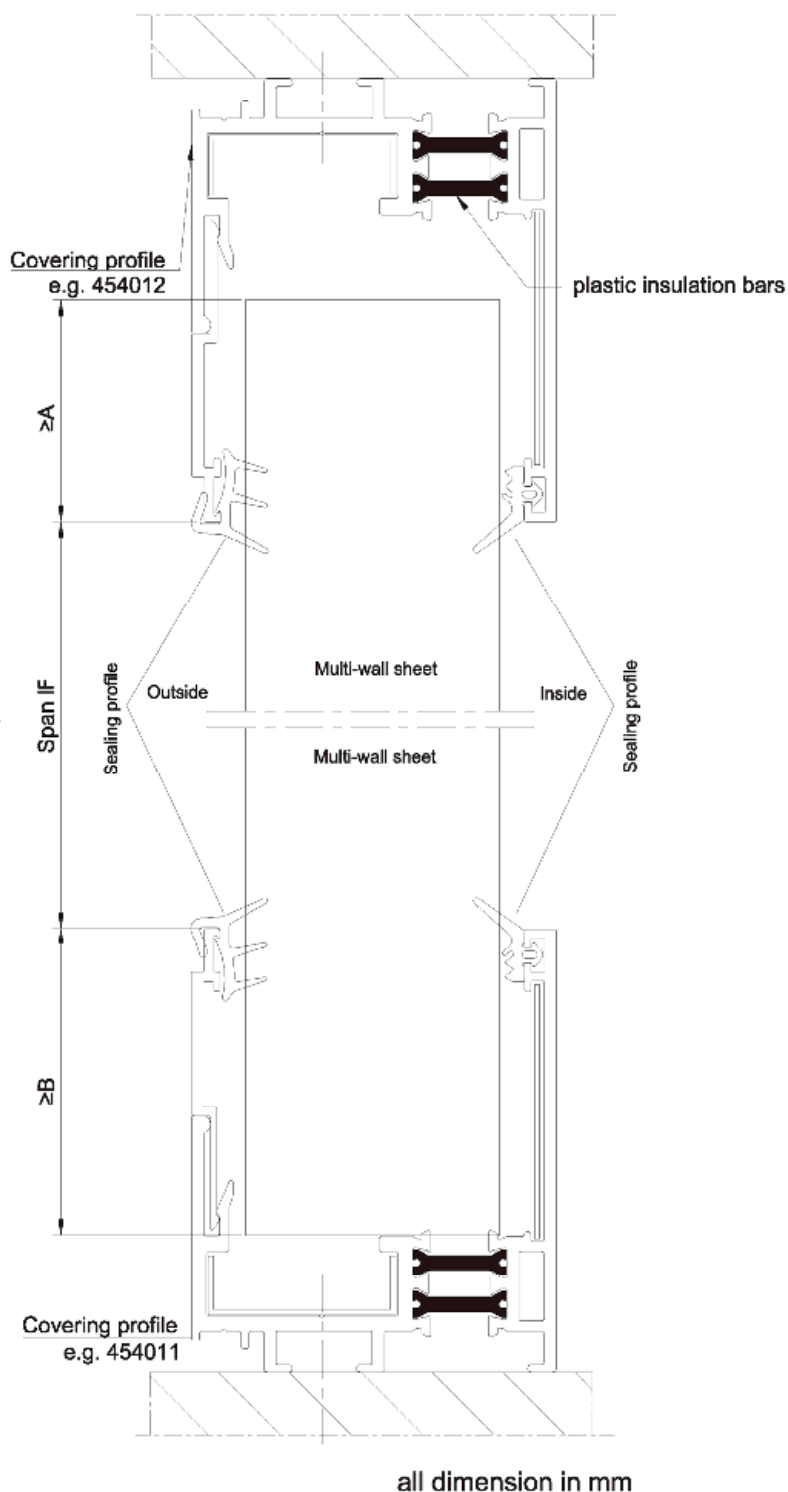
Assembly situation multi-span-system
with PC-connection profile

Annex A 1.3

Profile no.	Annex	Thickness of multi-wall sheet	Dimension "A"
423040	3.0	30 mm	≥30 mm
414002	3.1.3	40 mm	≥35 mm
414012	3.1.4	40 mm	≥35 mm
420040	3.1.6	40 mm	≥35 mm
420080	3.1.7	40 mm	≥35 mm
454002	3.1.9	40 mm	≥35 mm
454012	3.1.10	40 mm	≥35 mm
415002	3.2.3	50 mm	≥40 mm
415012	3.2.2	50 mm	≥40 mm
455002	3.2.6	50 mm	≥40 mm
455012	3.2.5	50 mm	≥40 mm
416012	3.3.2	60 mm	≥40 mm
456002	3.3.5	60 mm	≥40 mm
456012	3.3.4	60 mm	≥40 mm



Profile no.	Annex	Thickness of multi-wall sheet	Dimension "B"
423040	3.0	30 mm	≥30 mm
414001	3.1.3	40 mm	≥20 mm
414011	3.1.4	40 mm	≥20 mm
420031	3.1.5	40 mm	≥20 mm
454001	3.1.9	40 mm	≥20 mm
454011	3.1.10	40 mm	≥20 mm
415001	3.2.3	50 mm	≥40 mm
415011	3.2.2	50 mm	≥40 mm
455001	3.2.6	50 mm	≥40 mm
455011	3.2.5	50 mm	≥40 mm
416011	3.3.2	60 mm	≥40 mm
456001	3.3.5	60 mm	≥40 mm
456011	3.3.4	60 mm	≥40 mm



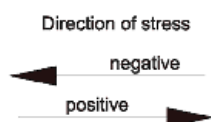
Rodeca LBE

Support condition wall installation
Example for assembly in reveal

Annex A 2.1

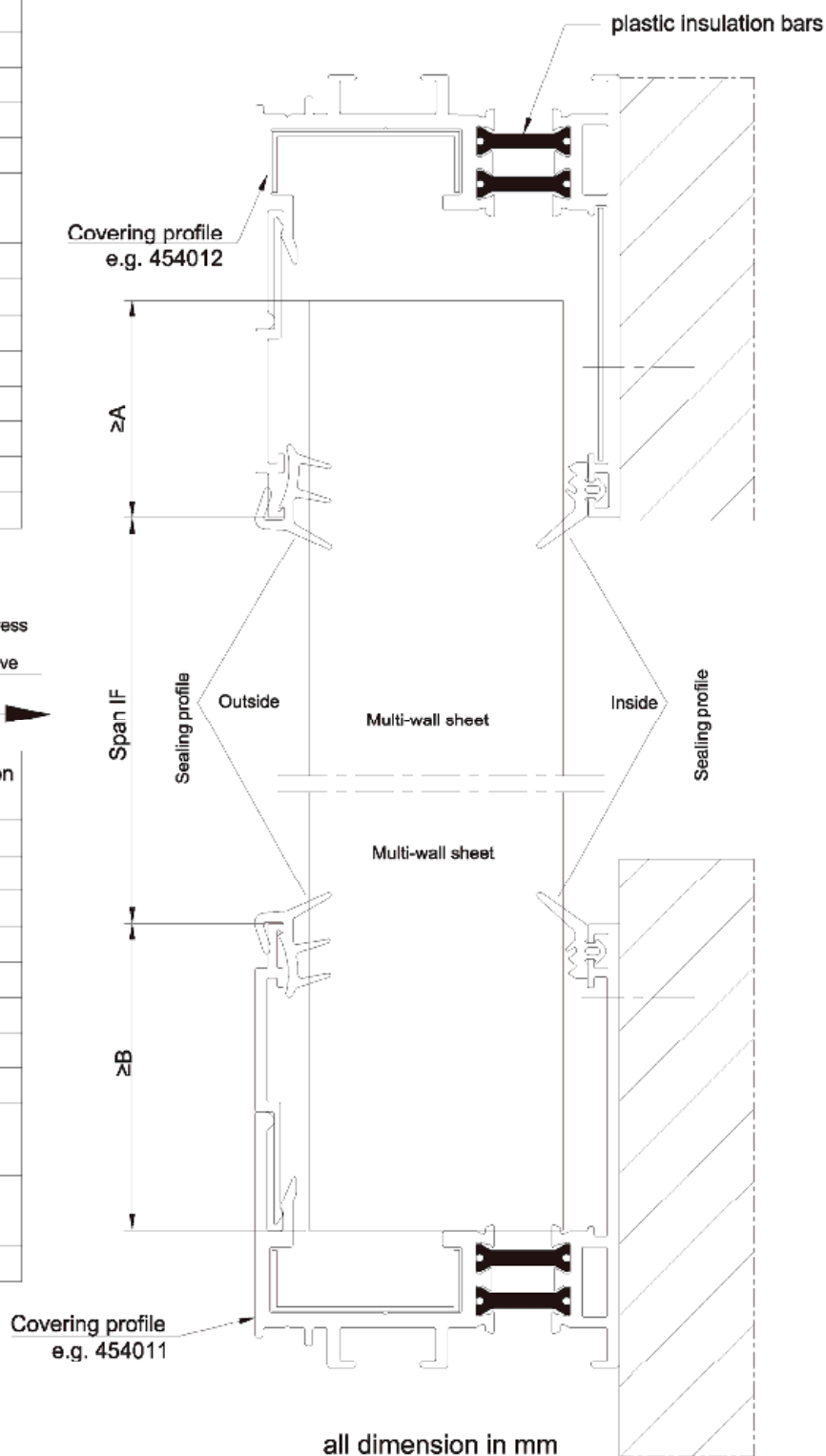
Profile no.	Annex	Thickness of multi-wall sheet	Dimension "A"
423040	3.0	30 mm	≥30 mm
414002	3.1.3	40 mm	≥35 mm
414012	3.1.4	40 mm	≥35 mm
420040	3.1.6	40 mm	≥35 mm
420080	3.1.7	40 mm	≥35 mm
454002	3.1.9	40 mm	≥35 mm
454012	3.1.10	40 mm	≥35 mm
415002	3.2.3	50 mm	≥40 mm
415012	3.2.2	50 mm	≥40 mm
455002	3.2.6	50 mm	≥40 mm
455012	3.2.5	50 mm	≥40 mm
416012	3.3.2	60 mm	≥40 mm
456002	3.3.5	60 mm	≥40 mm
456012	3.3.4	60 mm	≥40 mm

Optional support transomprofile Annex A 2.3



Profile no.	Annex	Thickness of multi-wall sheet	Dimension "B"
423040	3.0	30 mm	≥30 mm
414001	3.1.3	40 mm	≥20 mm
414011	3.1.4	40 mm	≥20 mm
420031	3.1.5	40 mm	≥20 mm
454001	3.1.9	40 mm	≥20 mm
454011	3.1.10	40 mm	≥20 mm
415001	3.2.3	50 mm	≥40 mm
415011	3.2.2	50 mm	≥40 mm
455001	3.2.6	50 mm	≥40 mm
455011	3.2.5	50 mm	≥40 mm
416011	3.3.2	60 mm	≥40 mm
456001	3.3.5	60 mm	≥40 mm
456011	3.3.4	60 mm	≥40 mm

Optional support transomprofile Annex A 2.3

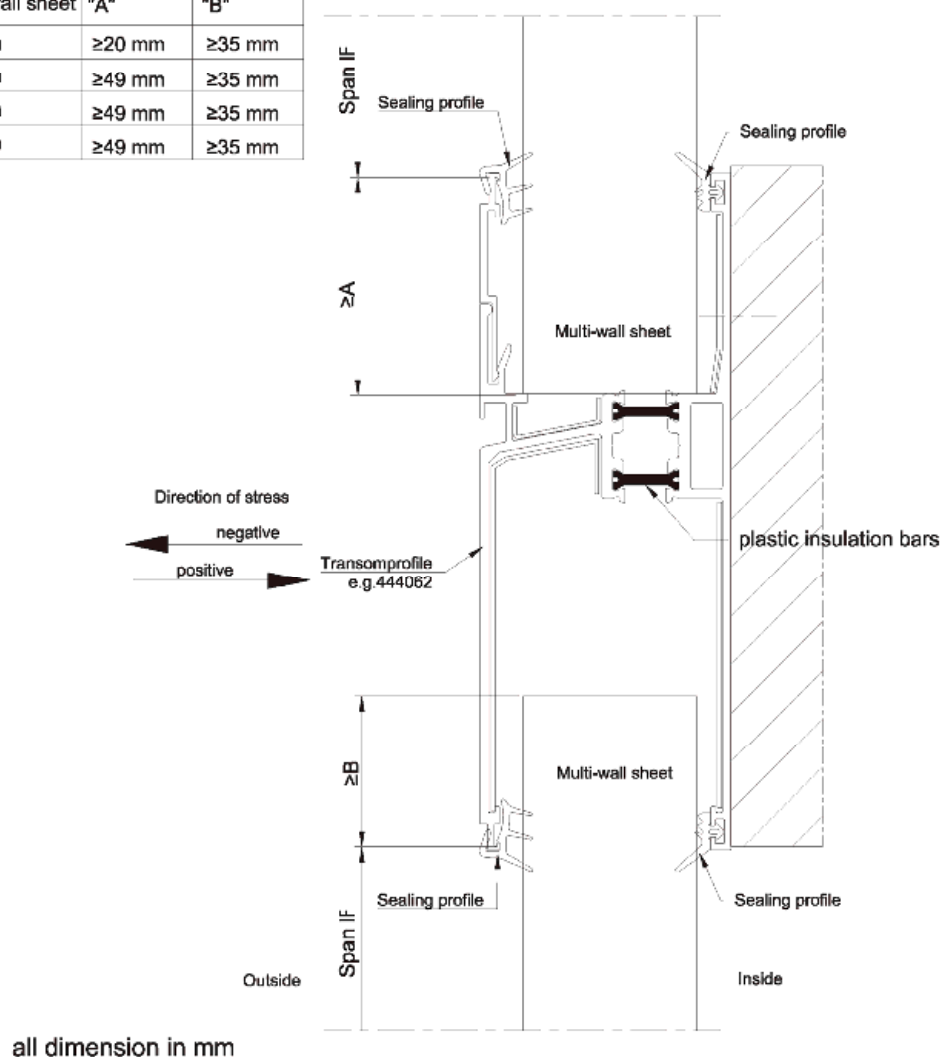


Rodeca LBE

Support condition wall and roof installation
Example curtain wall installation

Annex A 2.2

Profile no.	Annex	Thickness of multi-wall sheet	Dimension "A"	Dimension "B"
404062	3.1.2	40 mm	≥20 mm	≥35 mm
444062	3.1.8	40 mm	≥49 mm	≥35 mm
445062	3.2.4	50 mm	≥49 mm	≥35 mm
446062	3.3.2	60 mm	≥49 mm	≥35 mm



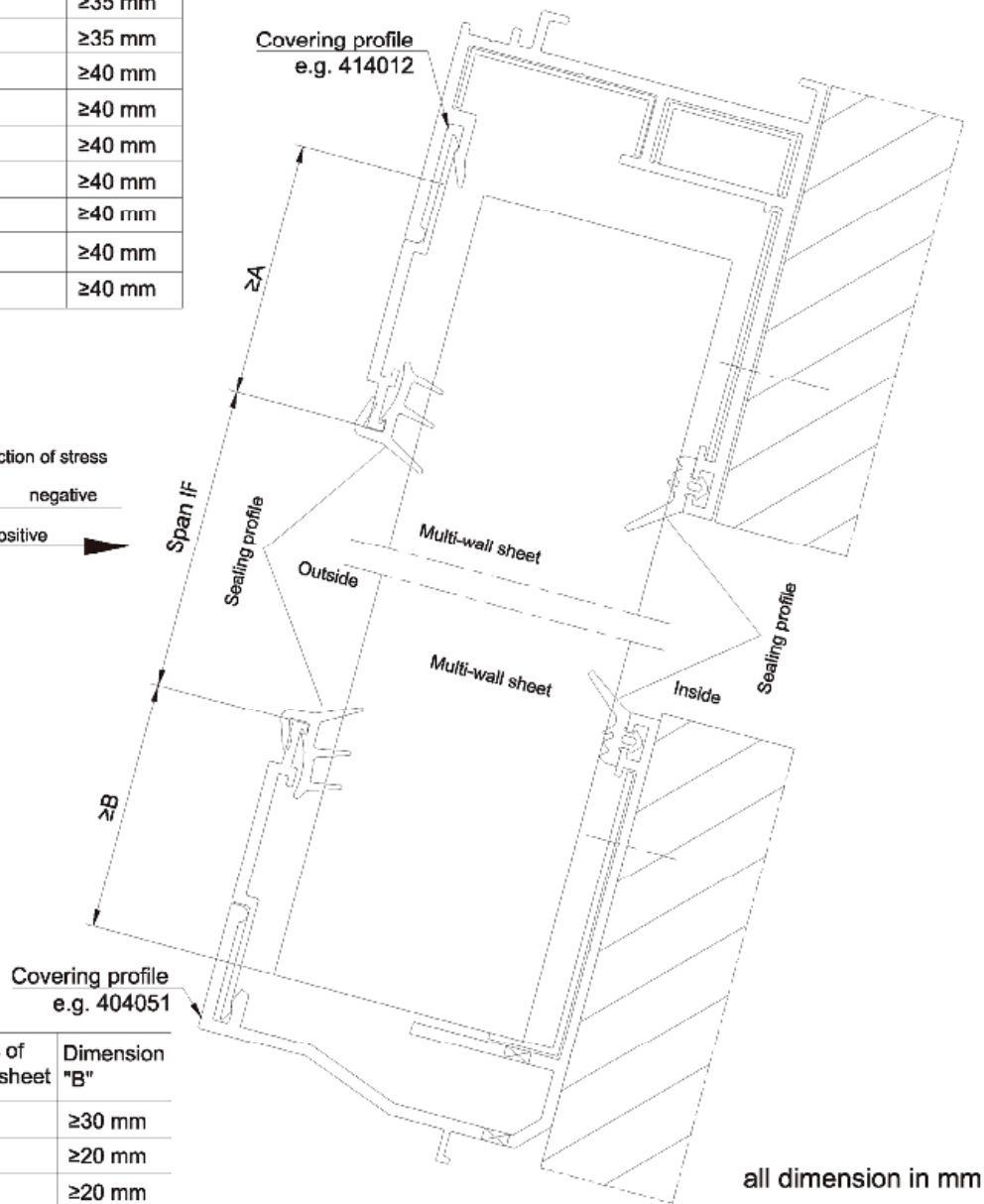
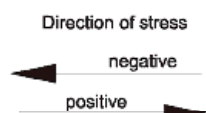
all dimension in mm

Rodeca LBE

Support condition wall installation
Example installation transomprofile

Annex A 2.3

Profile no.	Annex	Thickness of multi-wall sheet	Dimension "A"
423040	3.0	30 mm	≥30 mm
414002	3.1.3	40 mm	≥35 mm
414012	3.1.4	40 mm	≥35 mm
420040	3.1.6	40 mm	≥35 mm
420080	3.1.7	40 mm	≥35 mm
454002	3.1.9	40 mm	≥35 mm
454012	3.1.10	40 mm	≥35 mm
415002	3.2.3	50 mm	≥40 mm
415012	3.2.2	50 mm	≥40 mm
455002	3.2.6	50 mm	≥40 mm
455012	3.2.5	50 mm	≥40 mm
416012	3.3.2	60 mm	≥40 mm
456002	3.3.5	60 mm	≥40 mm
456012	3.3.4	60 mm	≥40 mm

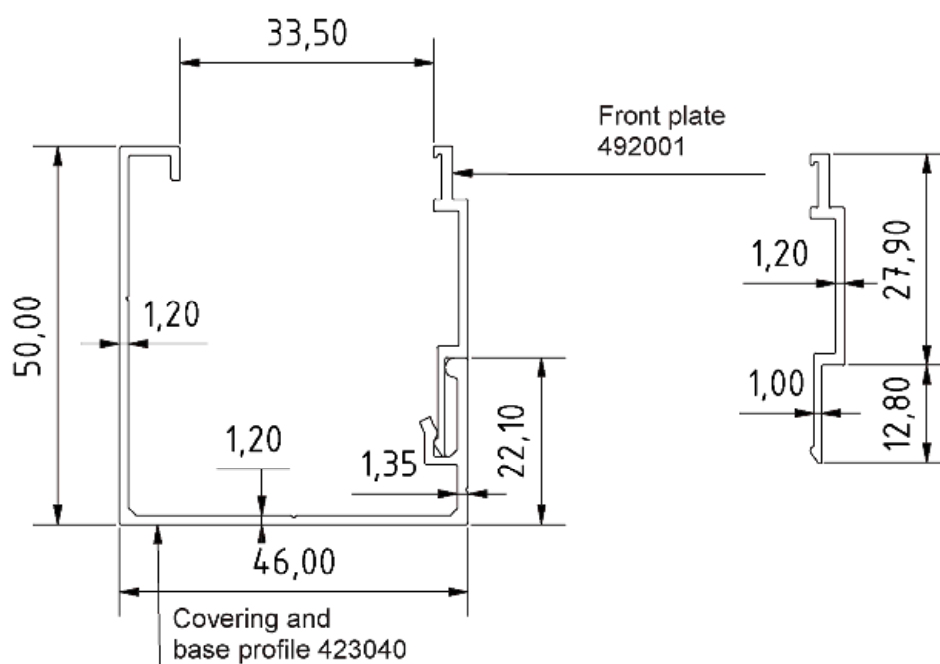


Profil no.	Annex	Thickness of multi-wall sheet	Dimension "B"
423040	3.0	30 mm	≥30 mm
404051	3.1.1	40 mm	≥20 mm
414051	3.1.4	40 mm	≥20 mm
405051	3.2.1	50 mm	≥40 mm
415051	3.2.2	50 mm	≥40 mm
406051	3.3.1	60 mm	≥40 mm
416051	3.3.2	60 mm	≥40 mm

Rodeca LBE

Support condition wall and roof installation
Example inclined wall / roof

Annex A 2.4

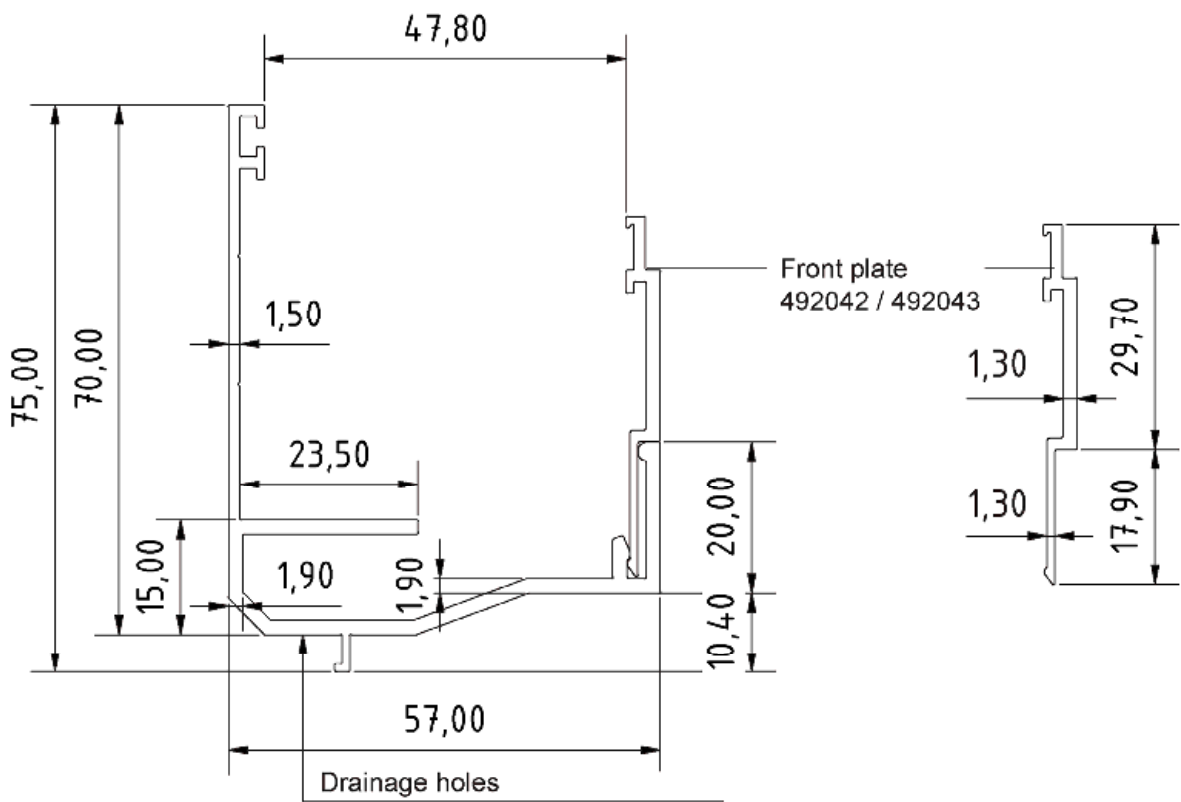


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 423040
Front plate A492001
For thickness of multi-wall sheet of 30 mm

Annex A 3.0

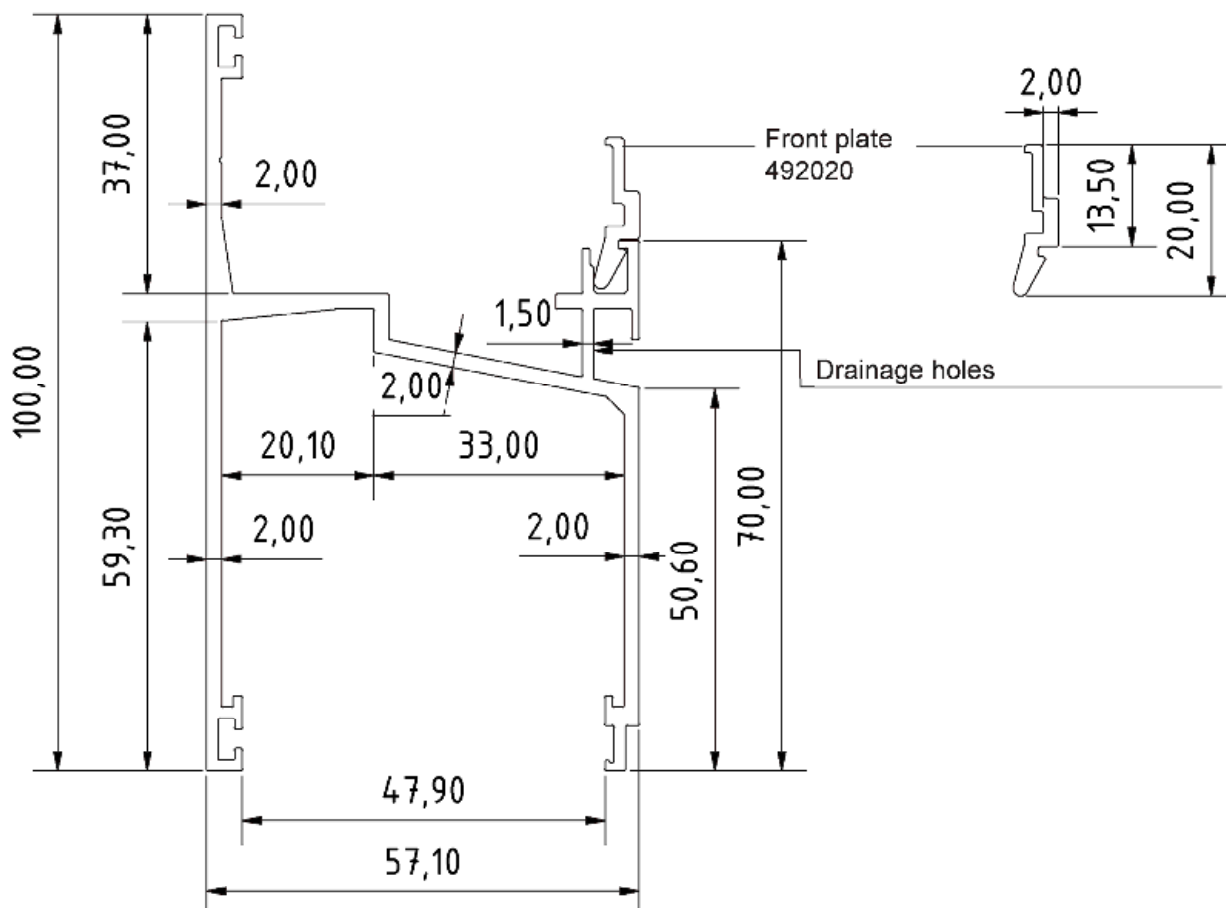


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 404051
Front plate A492042 / 492043
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.1

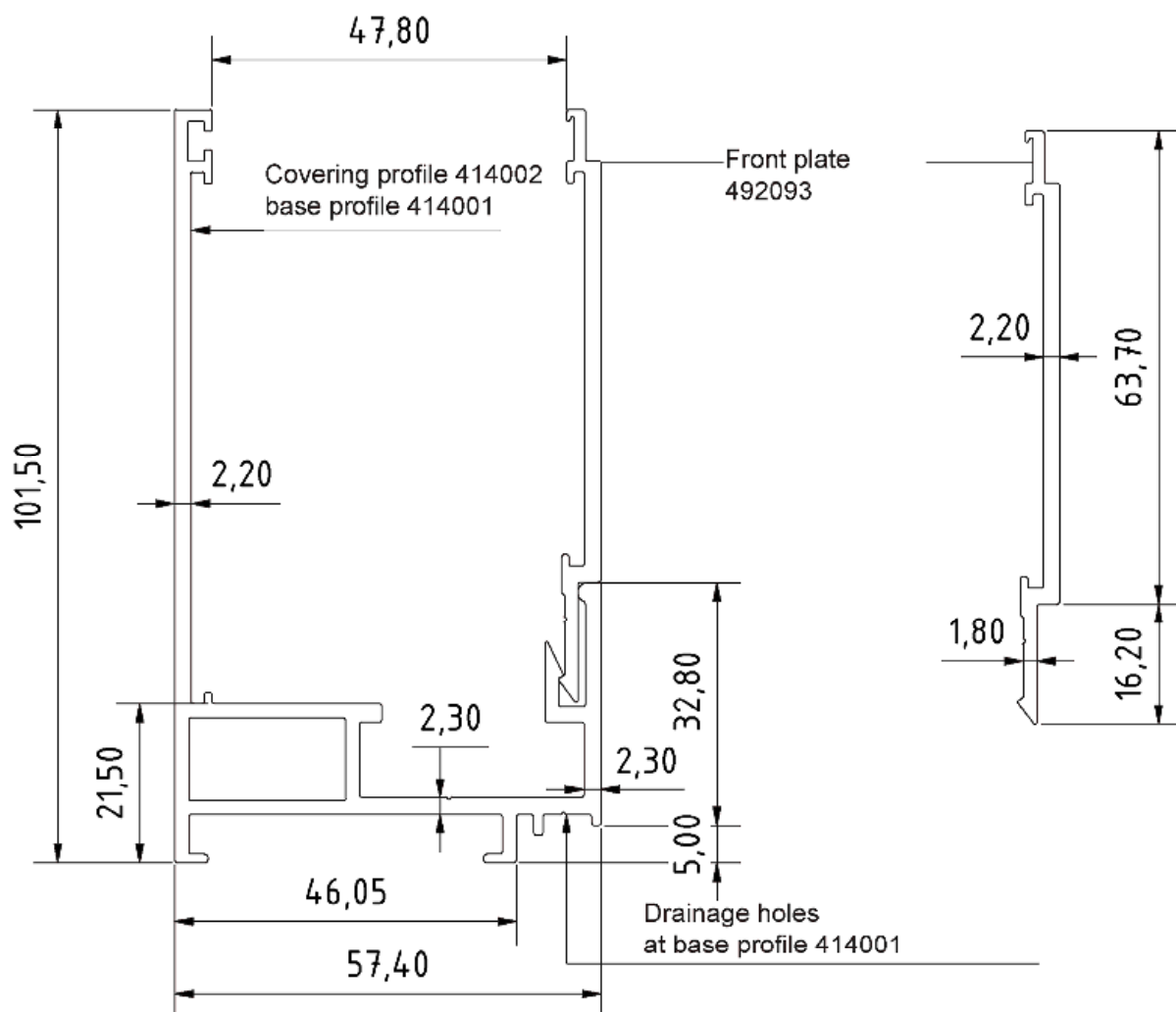


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Transom profile 404062
Front plate 492020
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.2

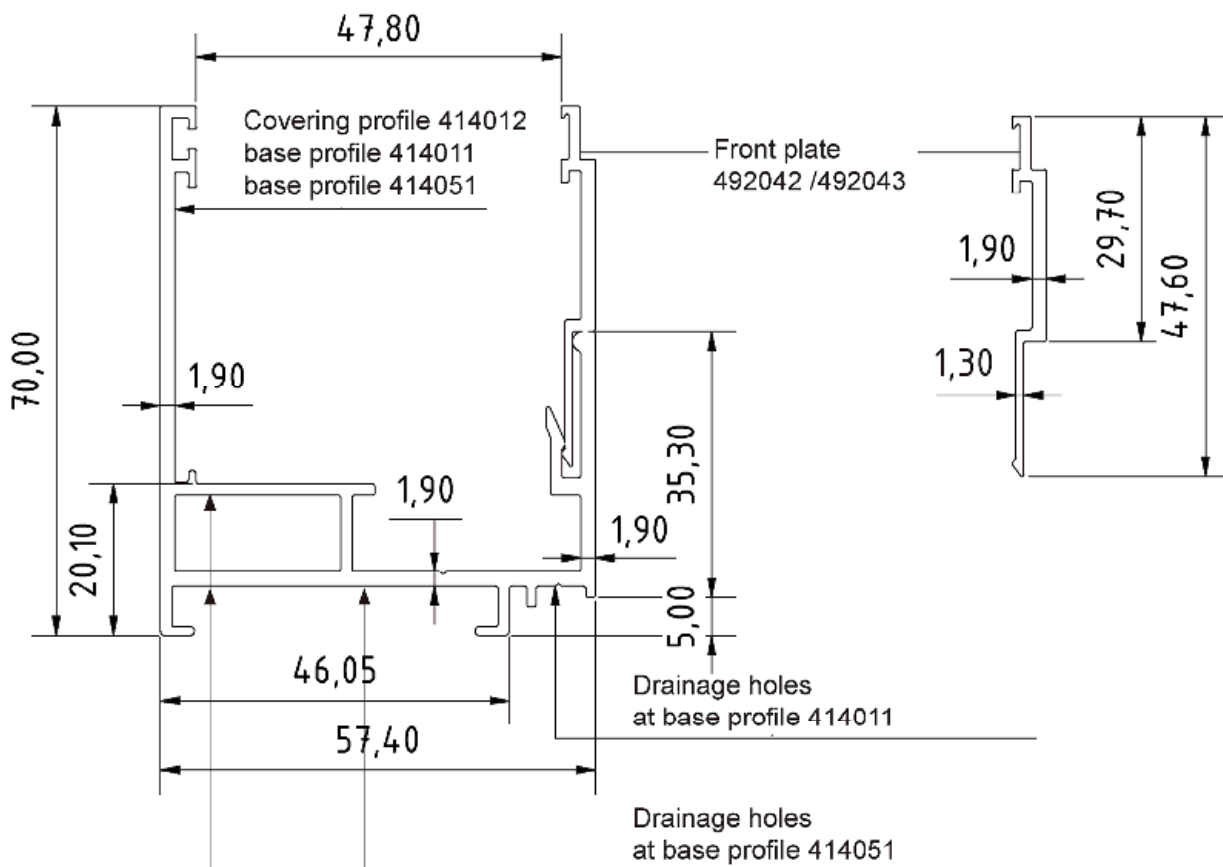


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 414001/ covering profile 414002
Front plate 492093
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.3

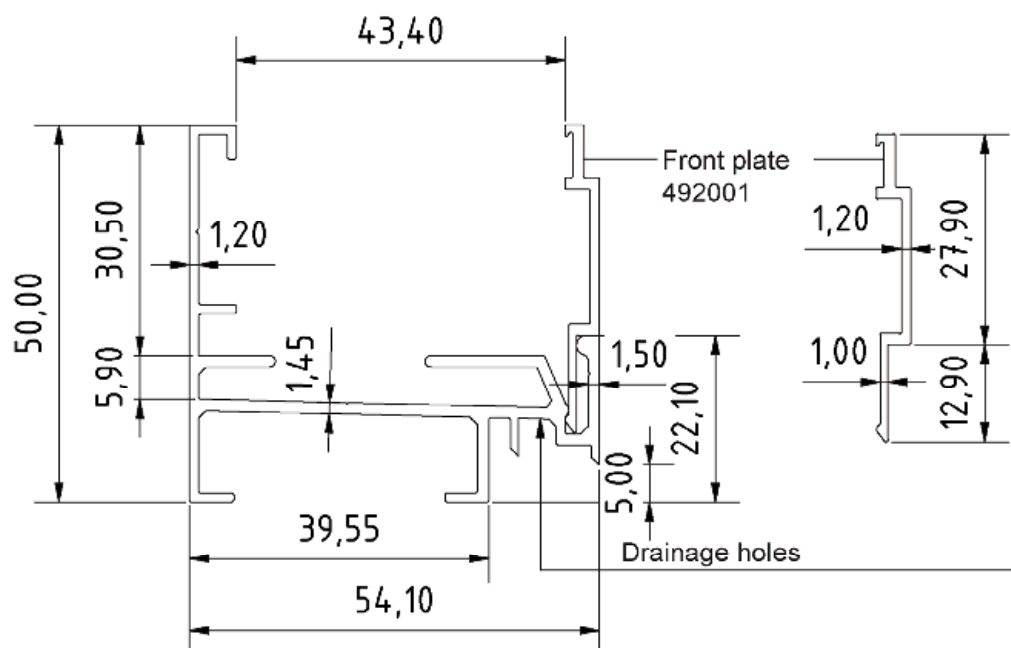


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Coverling base profile 414011 / 414051 / covering profile 414012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.4

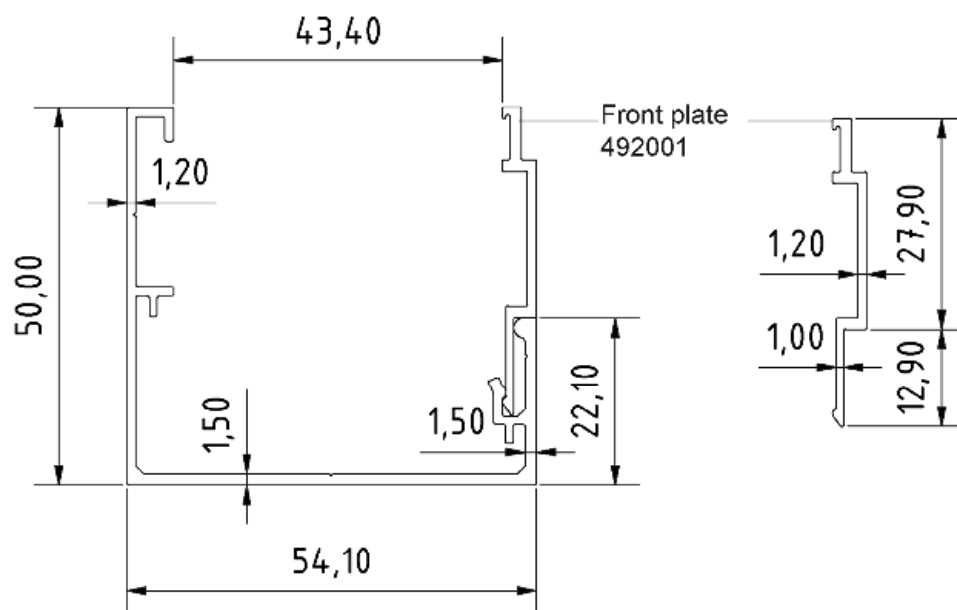


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 420031
Front plate 492001
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.5

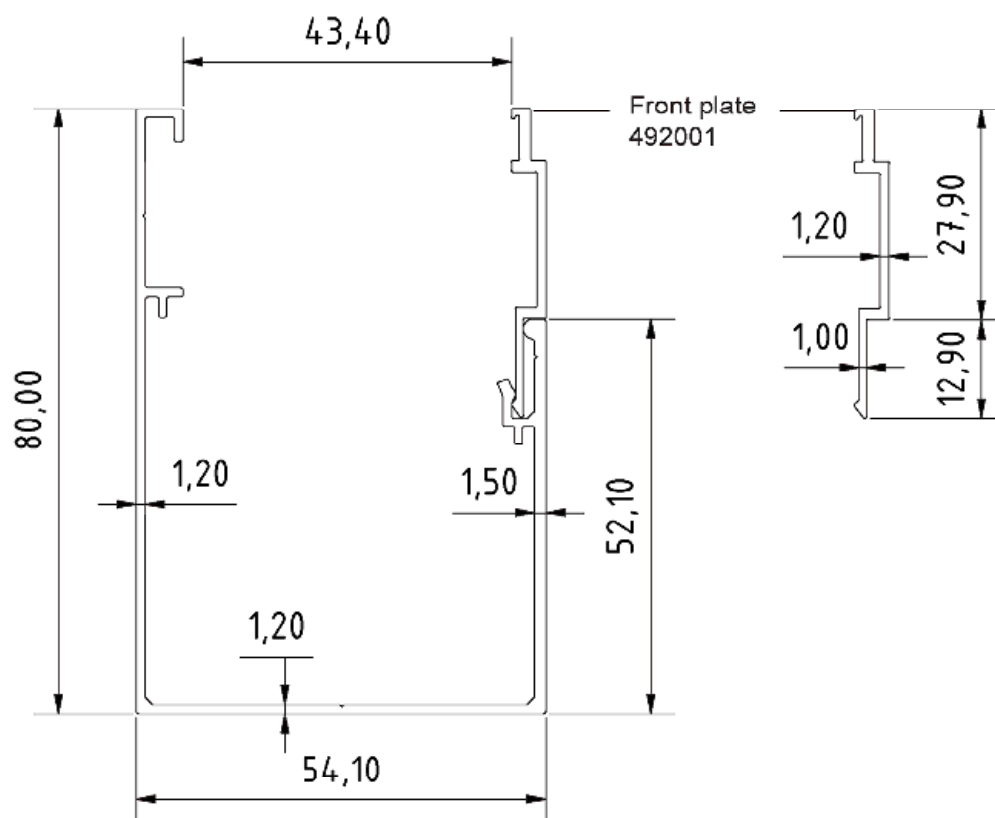


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering profile 420040
Front plate 492001
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.6

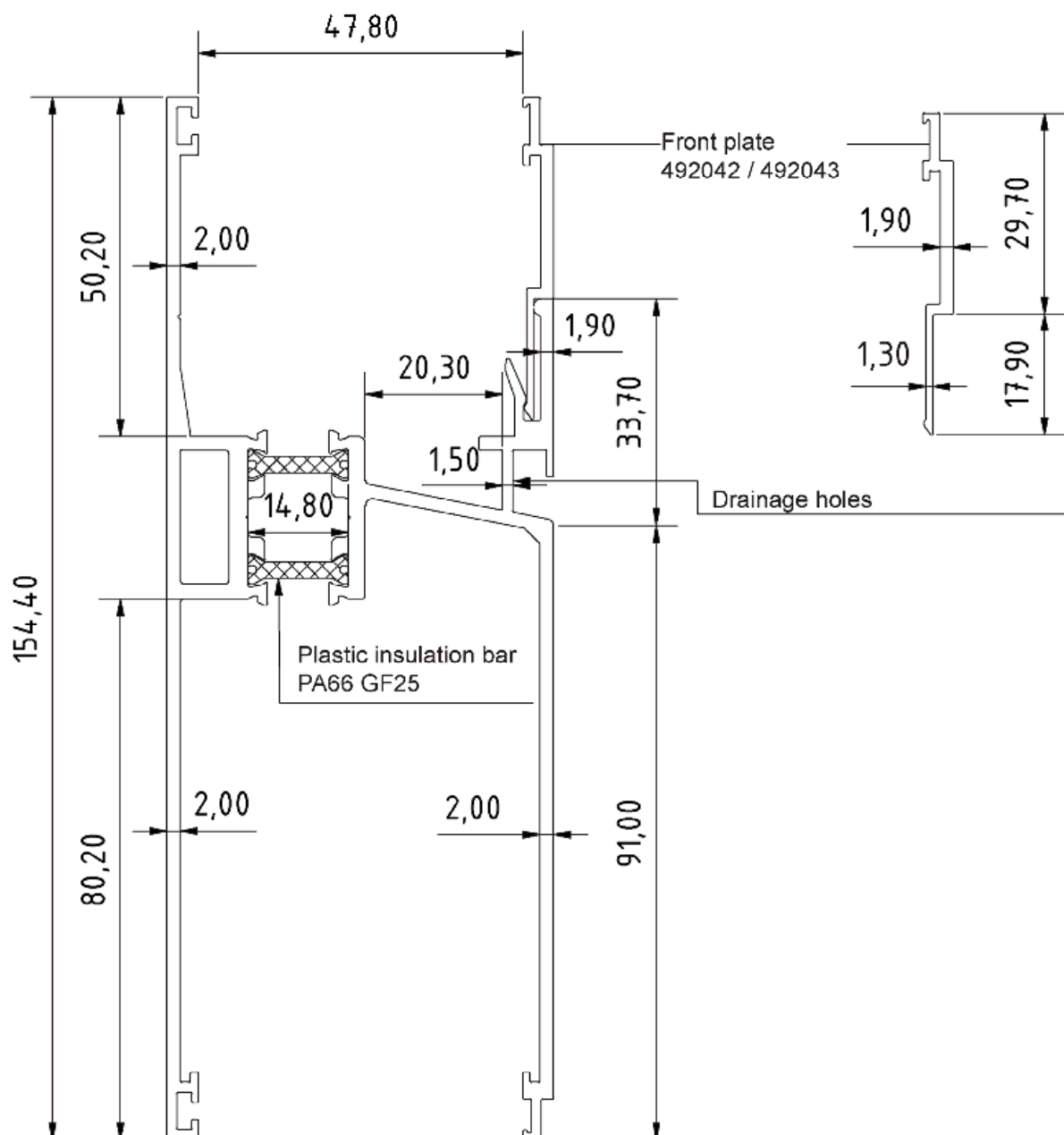


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering profile 420080
Front plate 492001
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.7

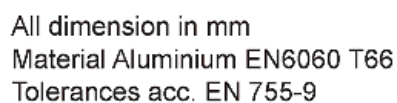


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

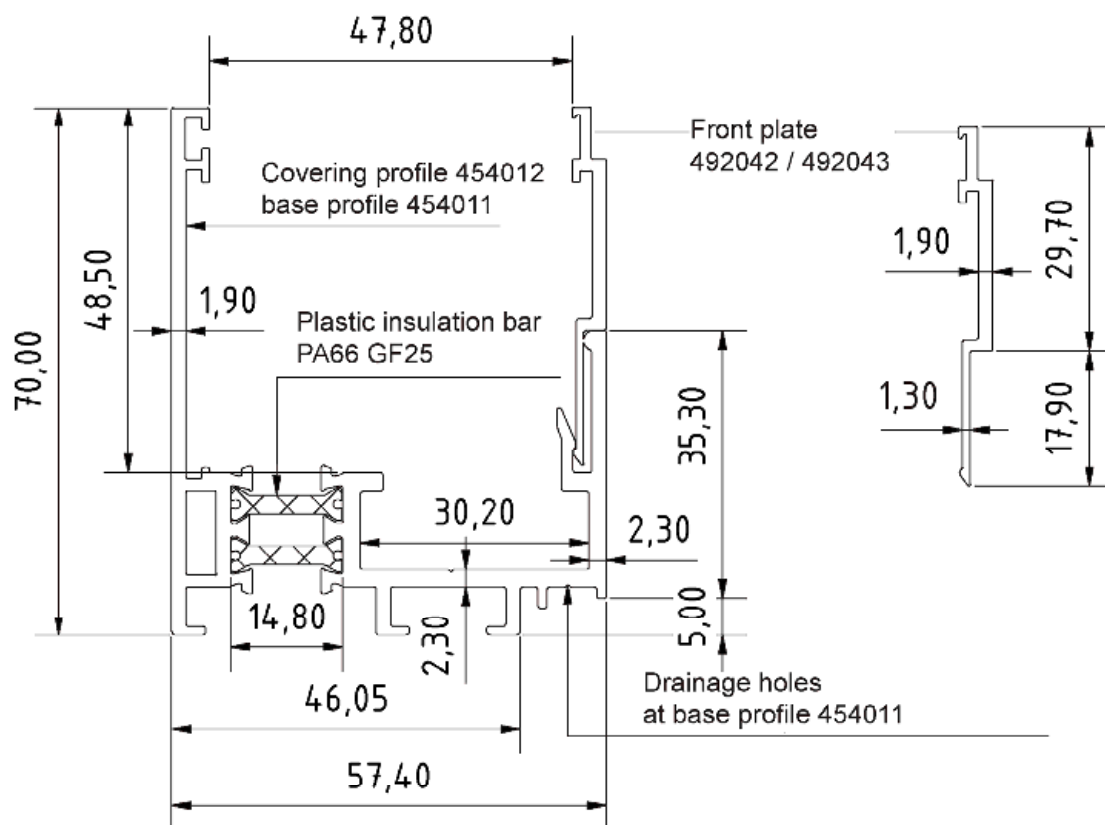
Transom profile 444062
Front plate 492042 / 492043
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.8



Covering base profile 454001 / covering profile 454002
Front plate 492093
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.9

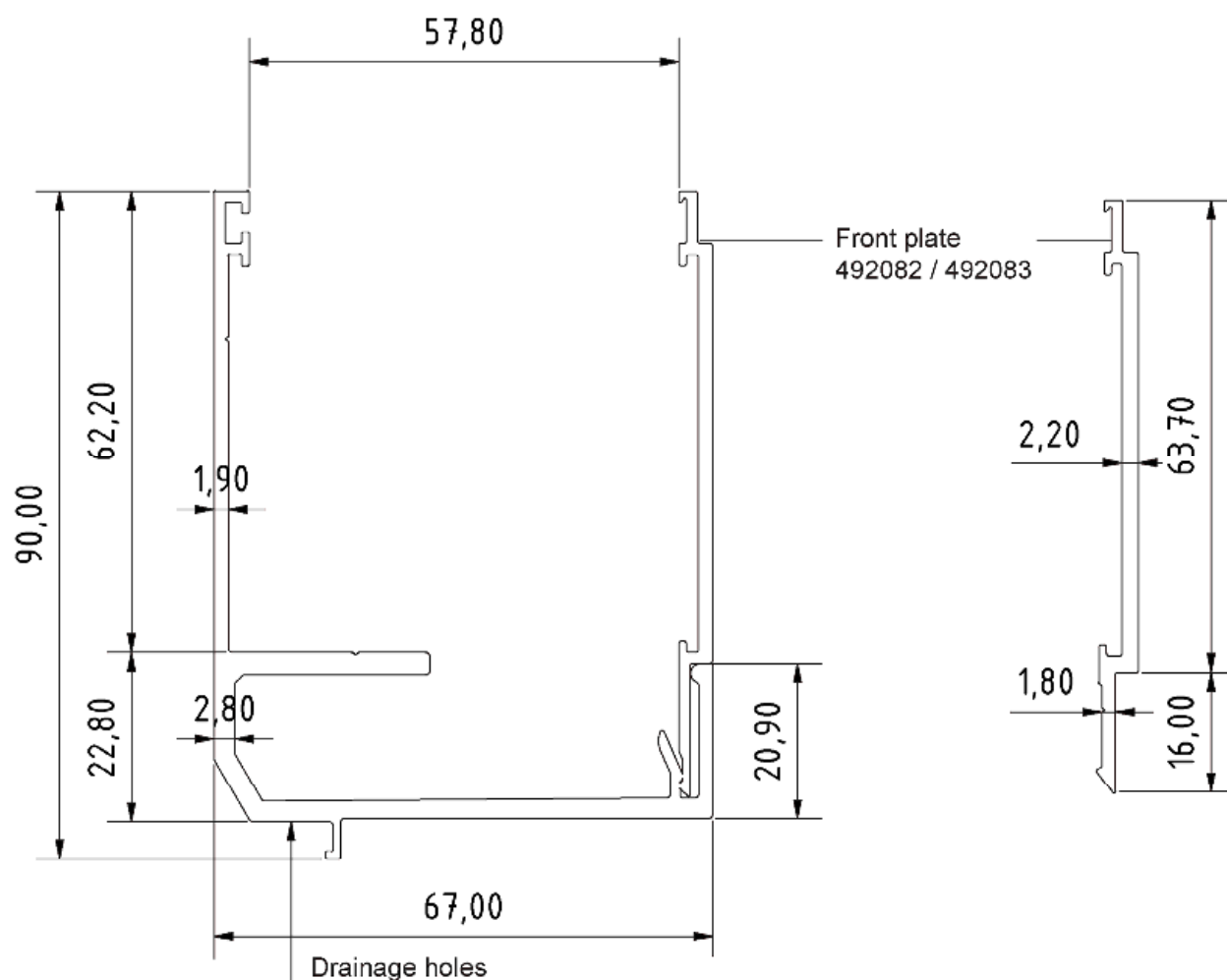


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 454011 / covering profile 454012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 40 mm

Annex A 3.1.10

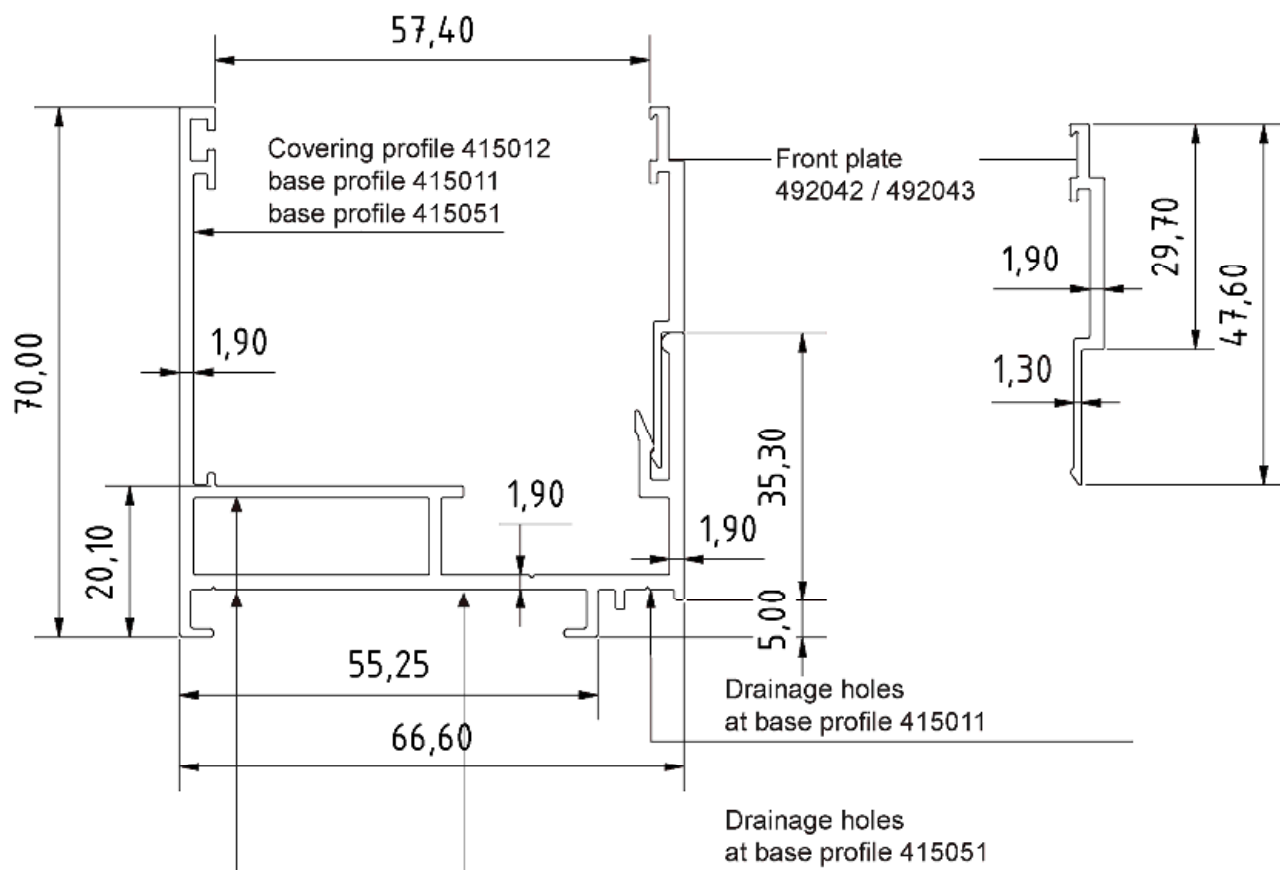


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 405051
Front plate 492082/492083
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.1

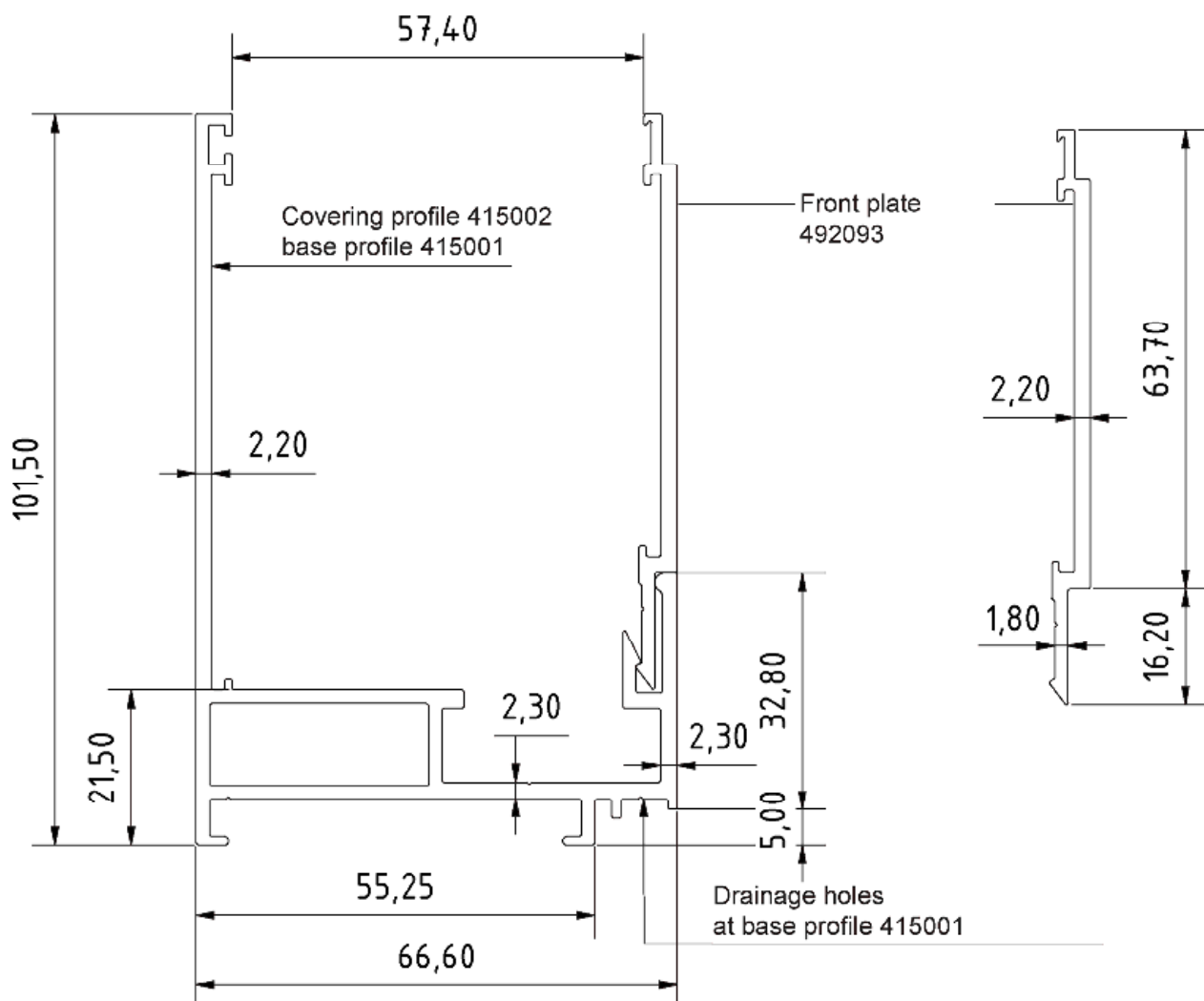


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 415011/ 415051 / covering profile 415012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.2

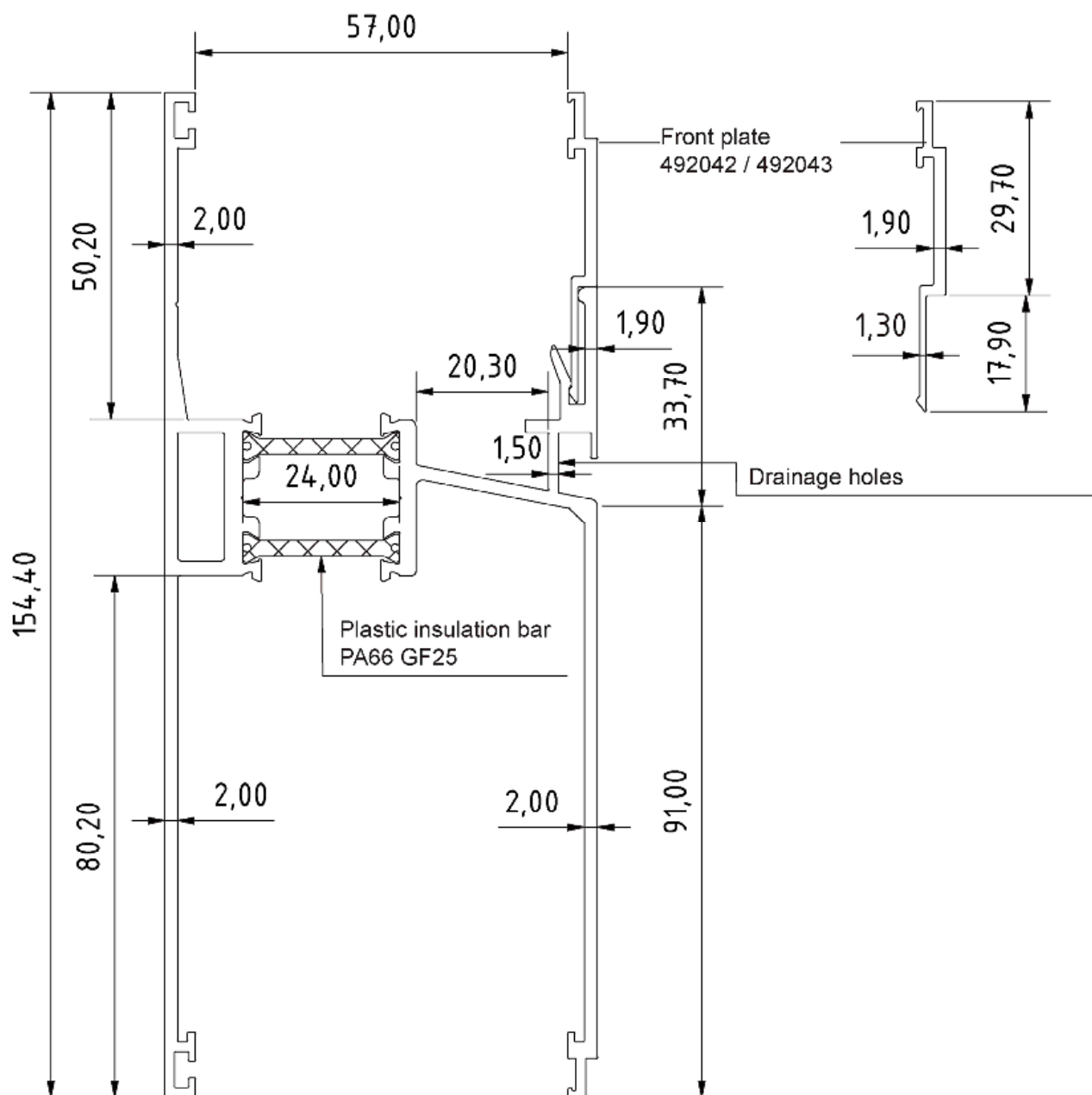


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 415001 / covering profile 415002
Front plate 492093
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.3

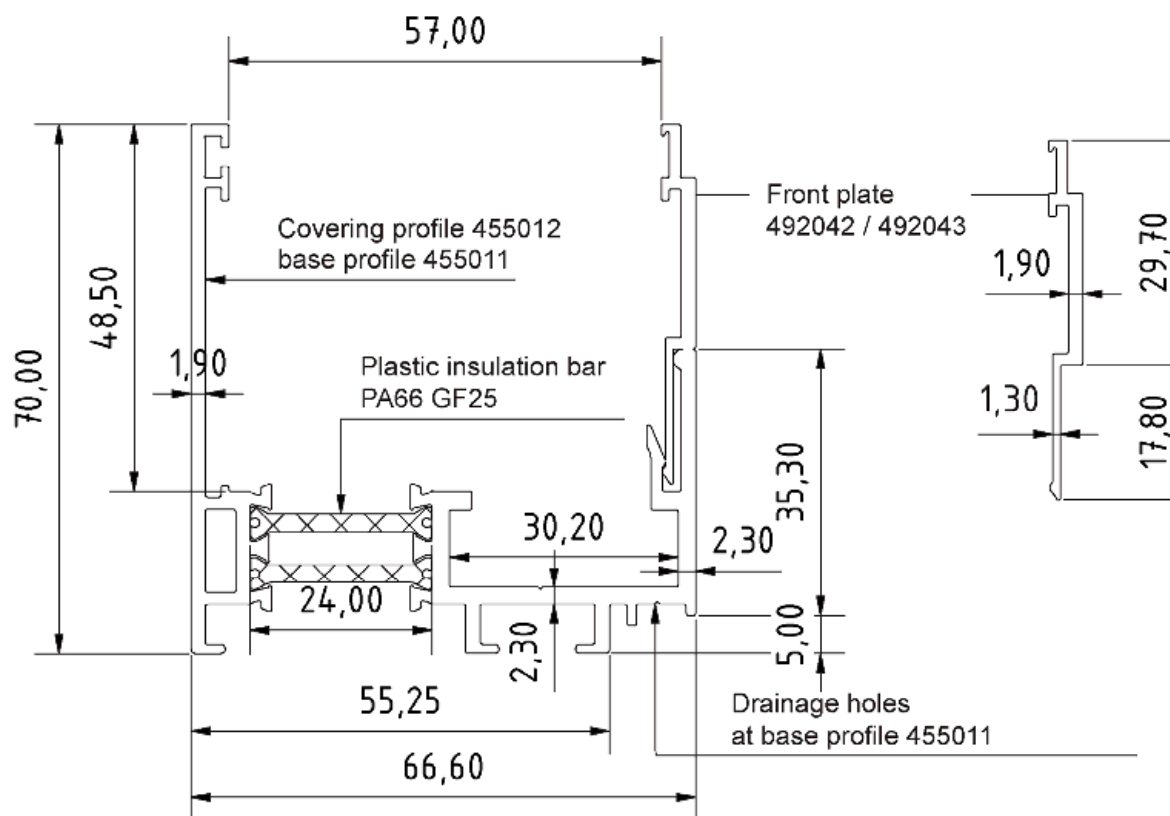


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Transom profile 445062
Front plate 492042 / 492043
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.4

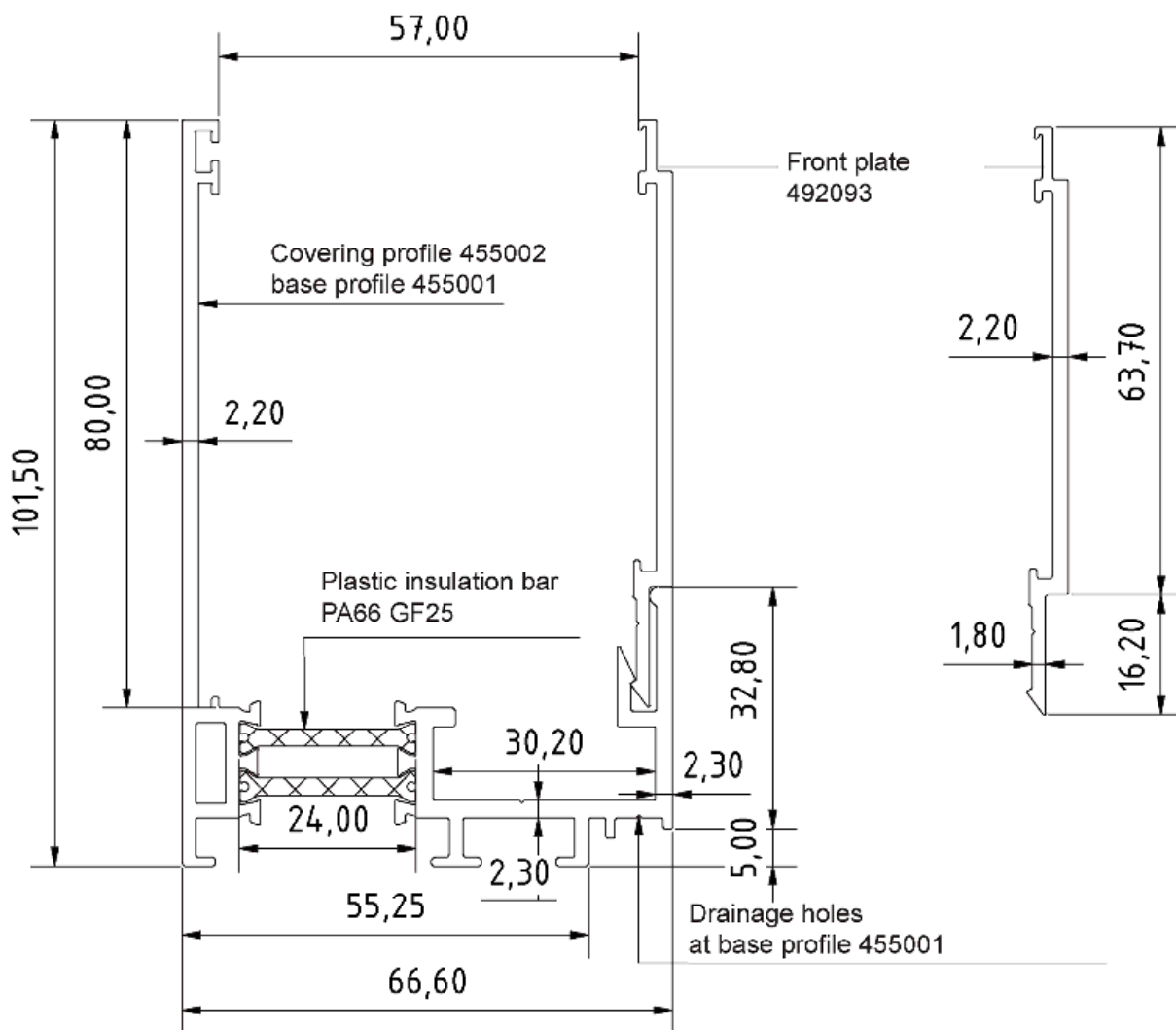


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 455011 / covering profile 455012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.5

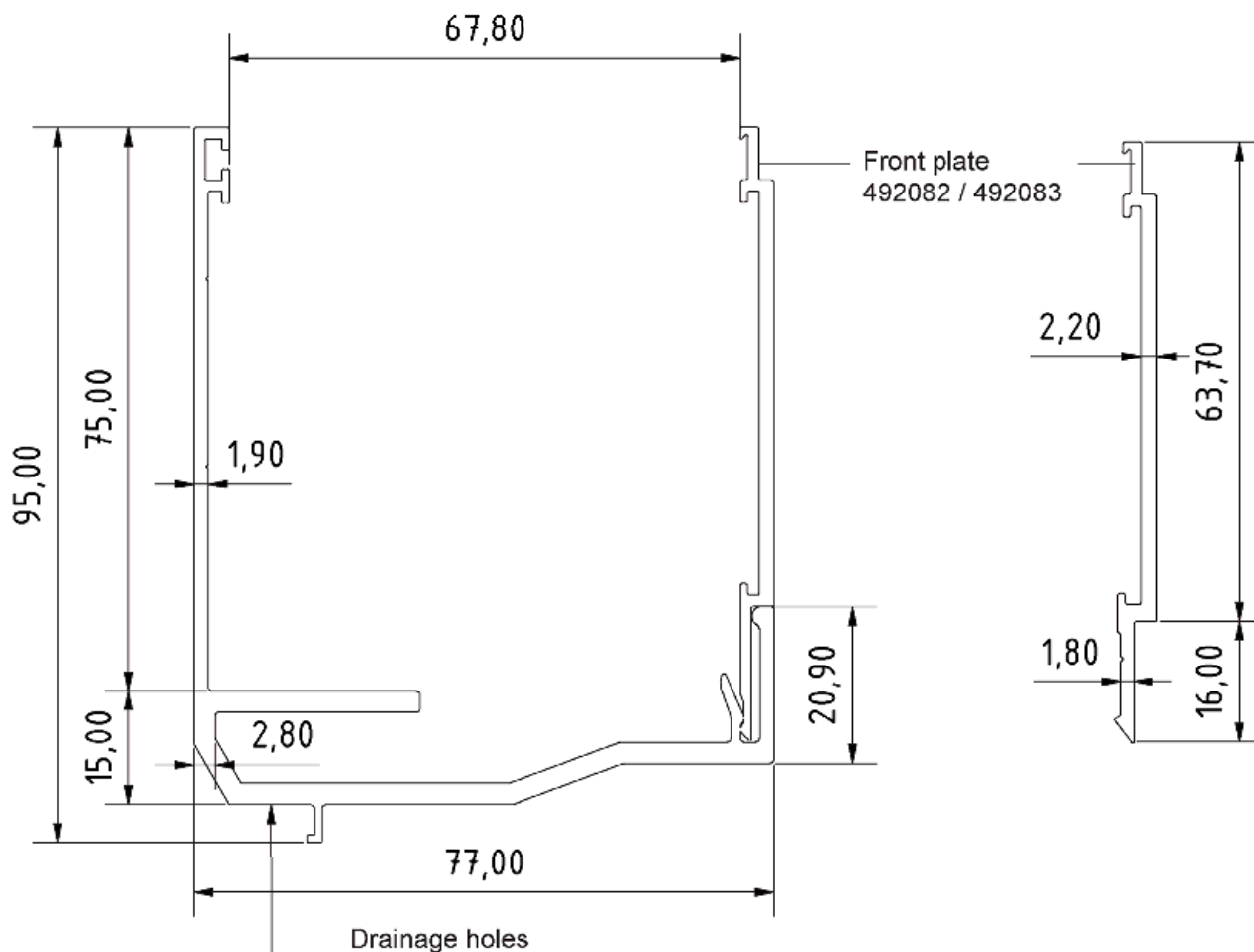


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 455001 / covering profile 455002
Front plate 492093
For thickness of multi-wall sheet of 50 mm

Annex A 3.2.6

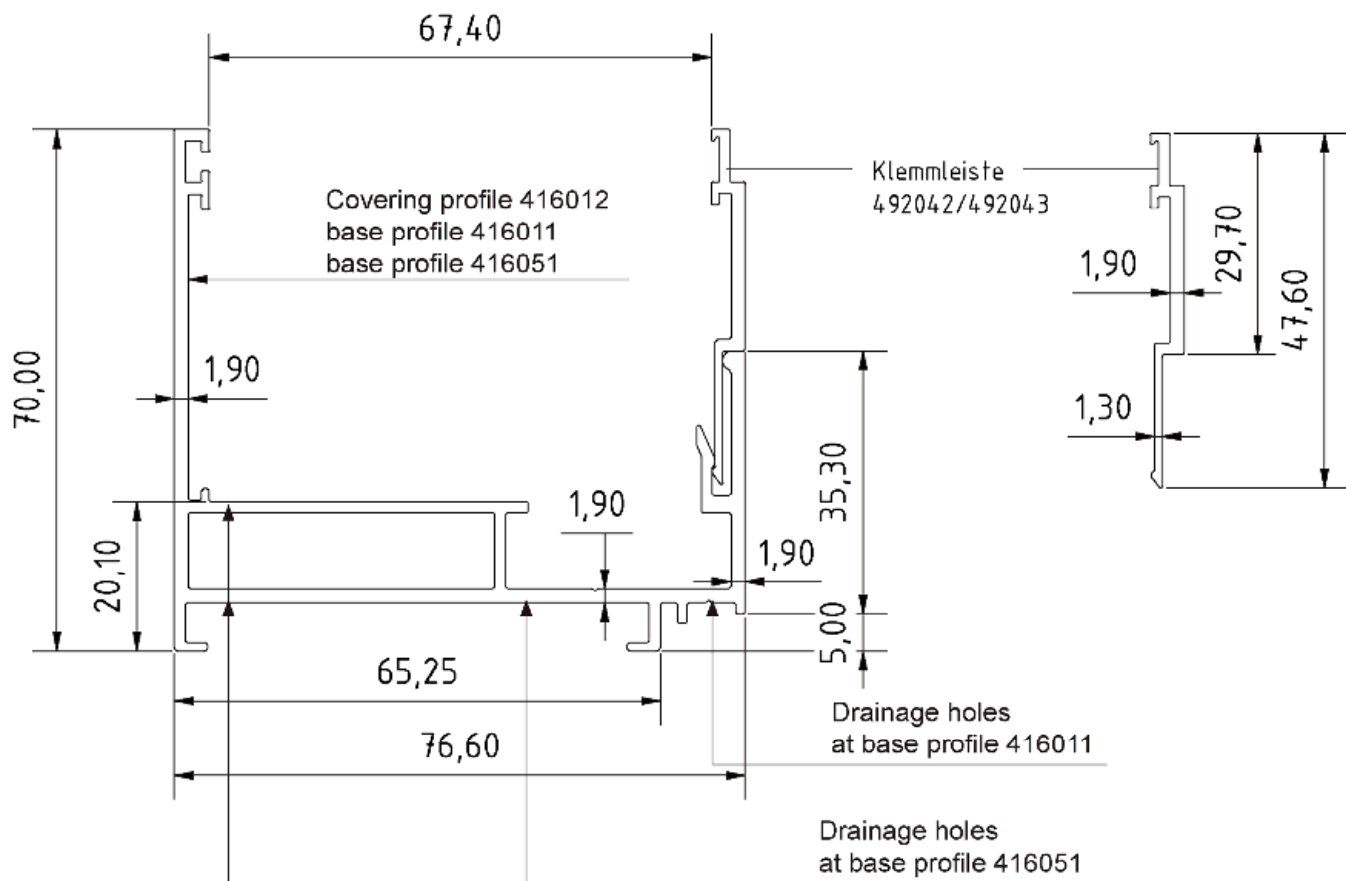


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 406051
Front plate 492082 / 492083
For thickness of multi-wall sheet of 60 mm

Annex A 3.3.1

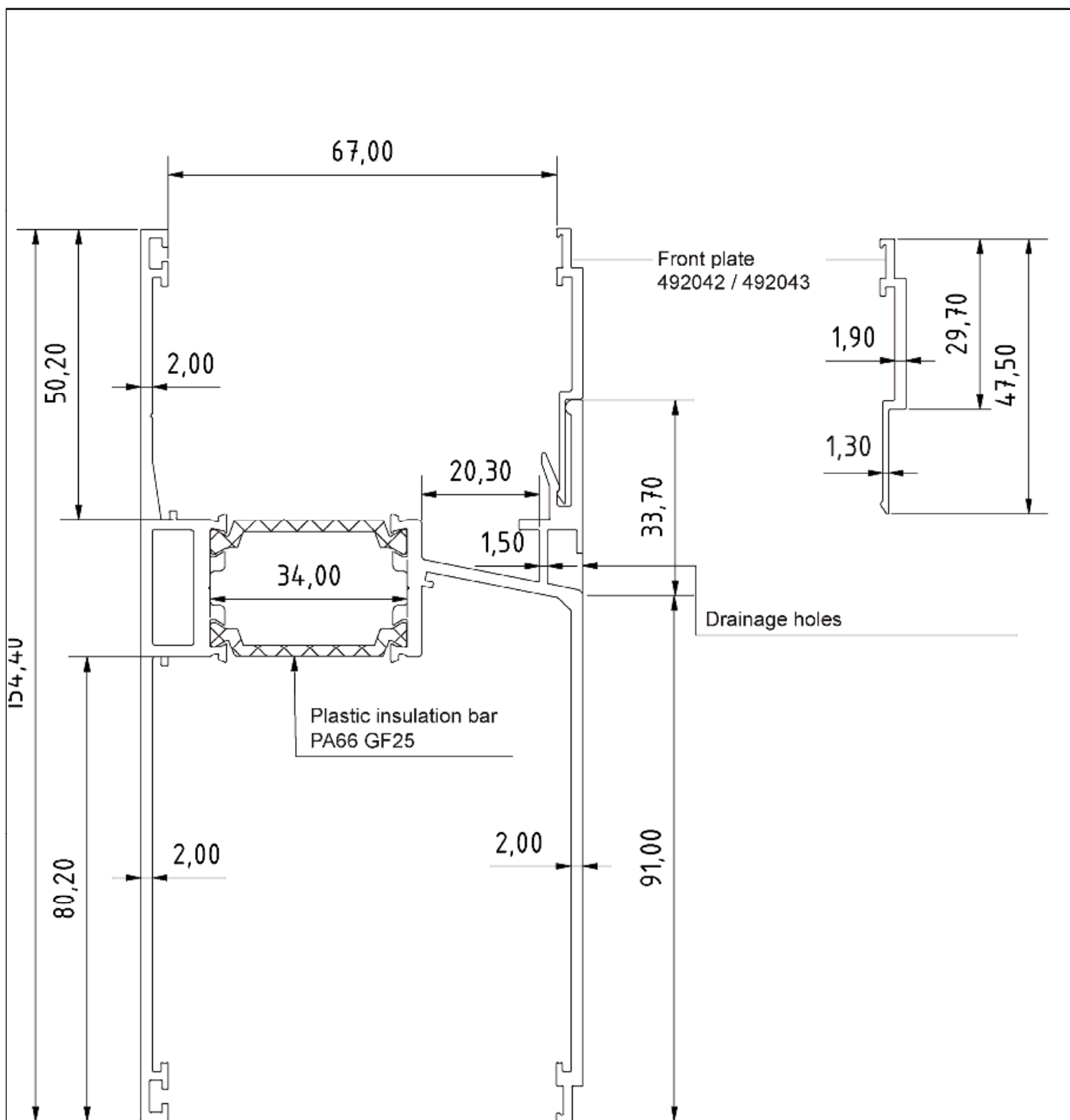


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 416011 / 416051 / covering profile 416012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 60 mm

Annex A 3.3.2

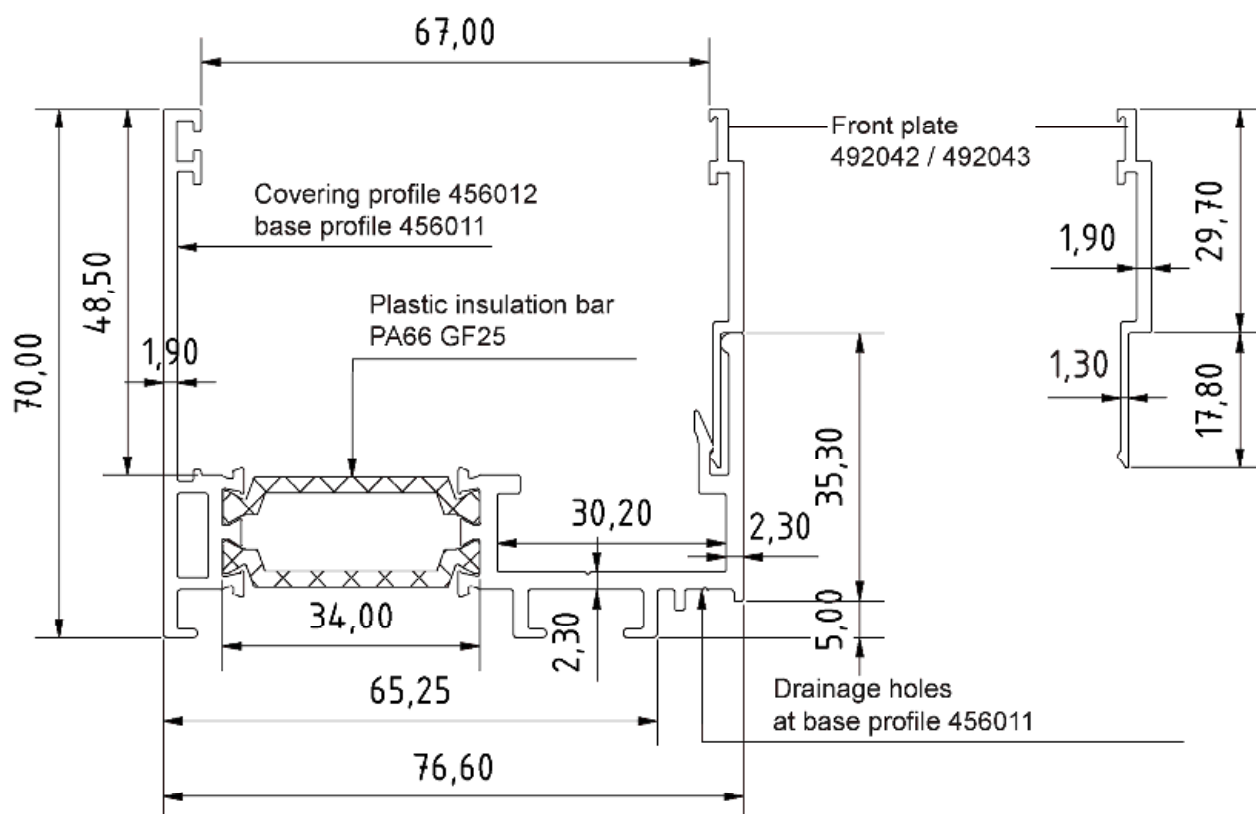


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Transom profile 446062
Front plate 492042 / 492043
For thickness of multi-wall sheet of 60 mm

Annex A 3.3.3

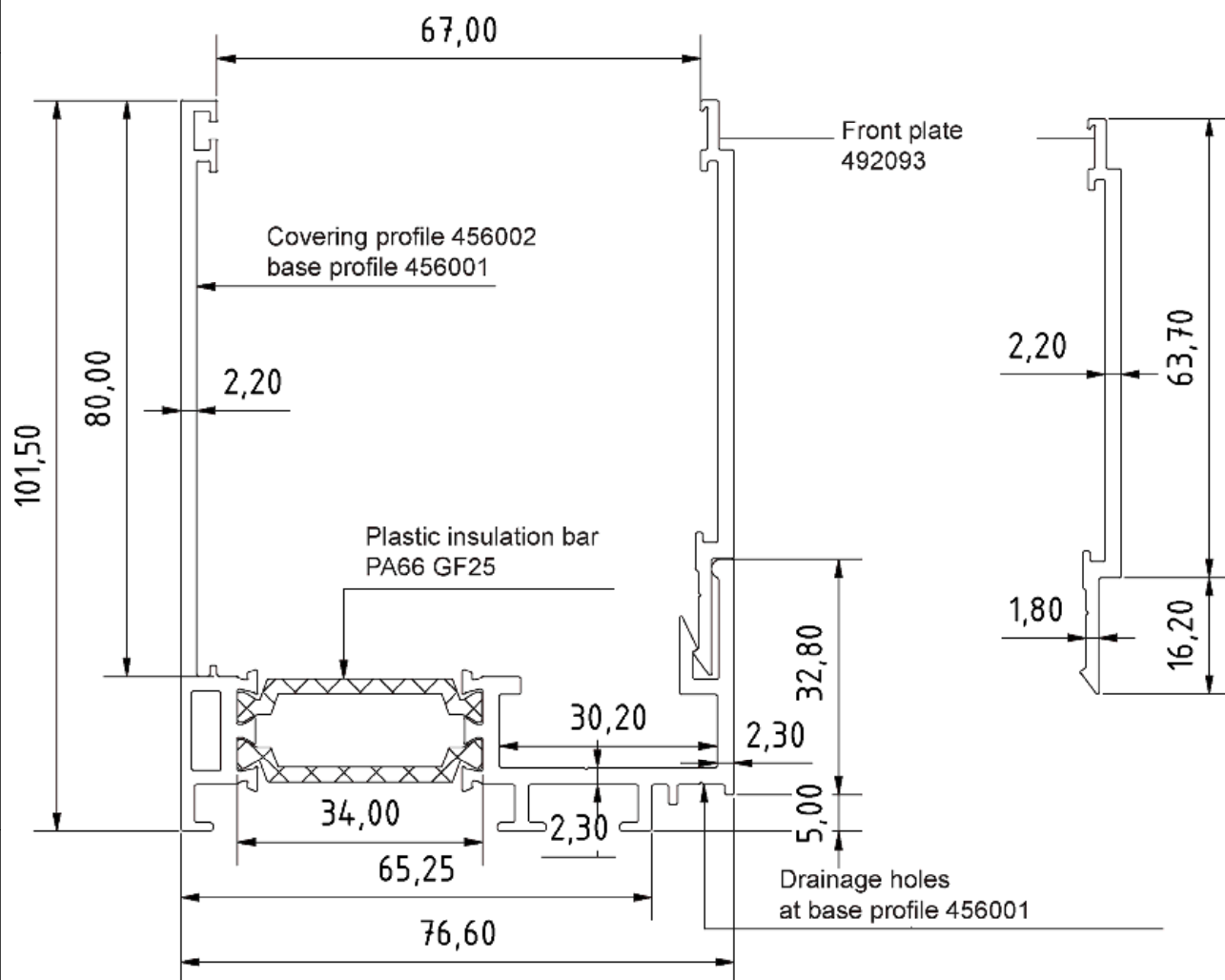


All dimension in mm
Material Aluminium EN6060 T66
Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 456011 / covering profile 456012
Front plate 492042 / 492043
For thickness of multi-wall sheet of 60 mm

Annex A 3.3.4



All dimension in mm

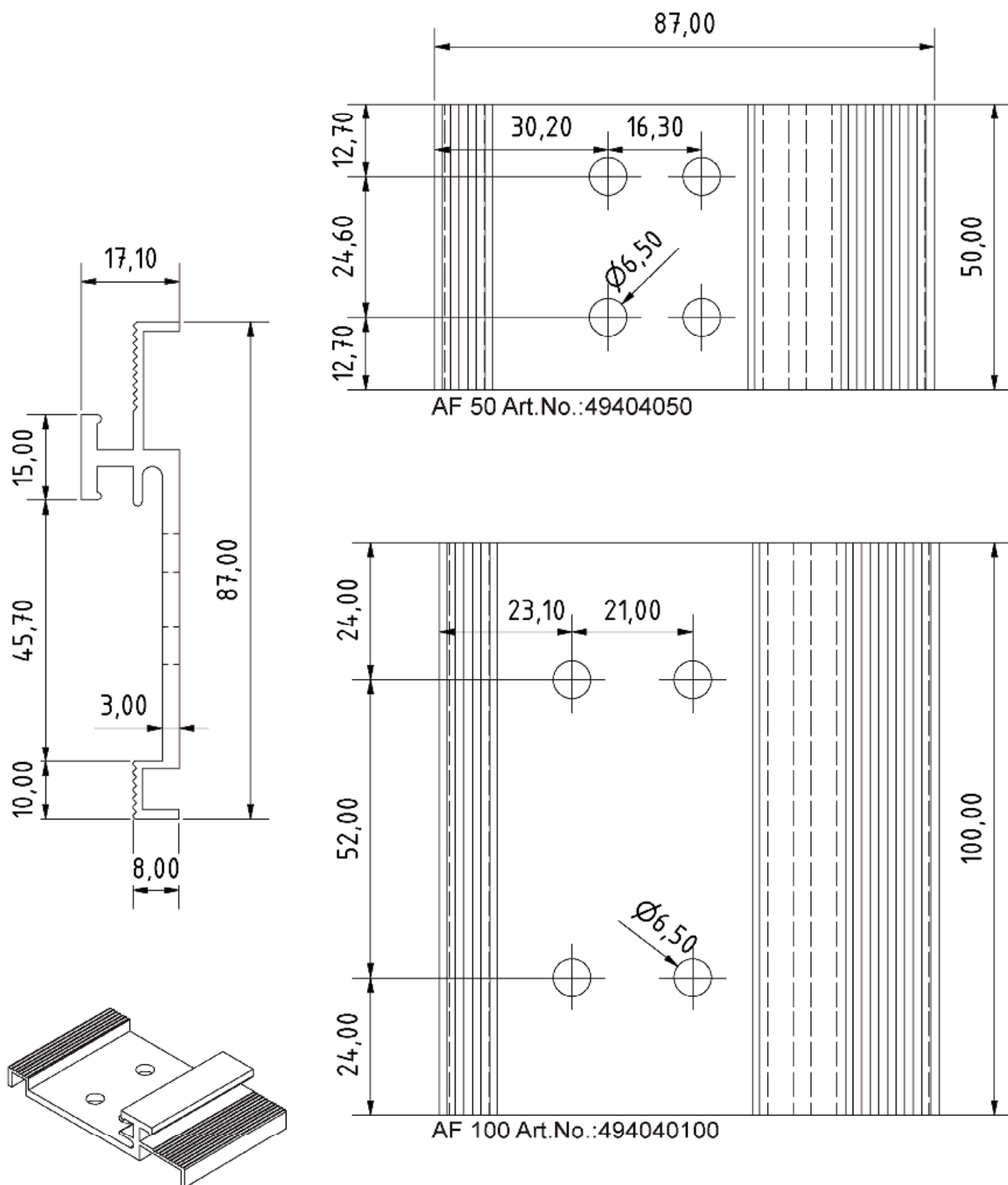
Material Aluminium EN6060 T66

Tolerances acc. EN 755-9

Rodeca LBE

Covering base profile 456001 / covering profile 456002
Front plate 492093
For thickness of multi-wall sheet of 60 mm

Annex A 3.3.5

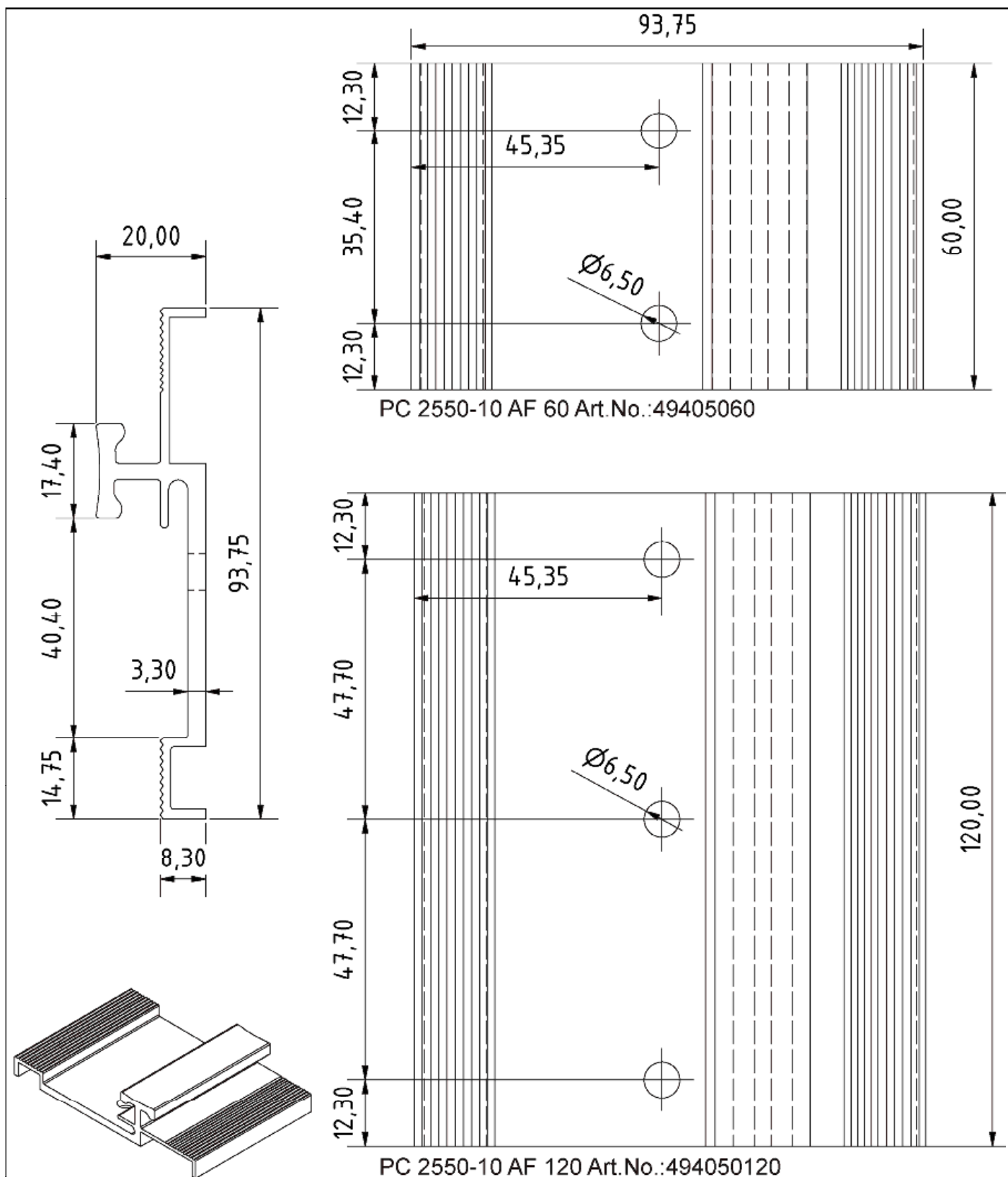


All dimension in mm / Material Aluminium EN6060 T66 / Tolerances acc. EN 755-9

Rodeca LBE

Lift anchor AF 50 / AF 100
Art.No.:49404050 / 494040100
for PC 2333-30-6 / PC 2540-4 / PC 2540-4-MC / PC 2540-6 / PC 2540-7 / PC 2540-10

Annex A 3.4.1

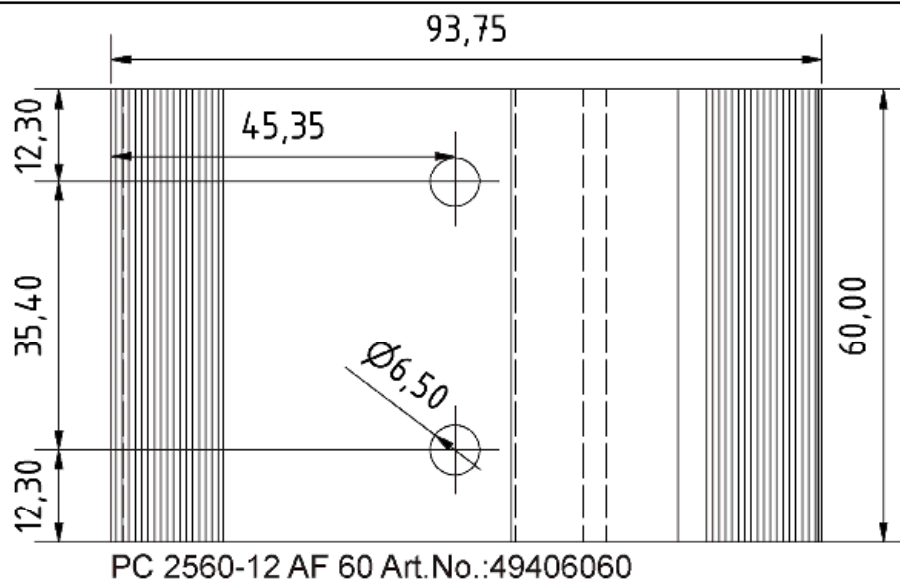
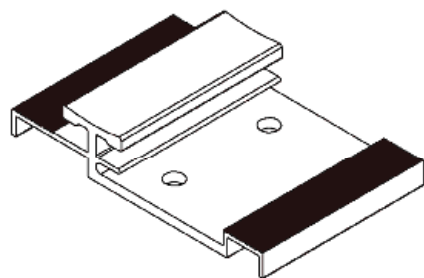
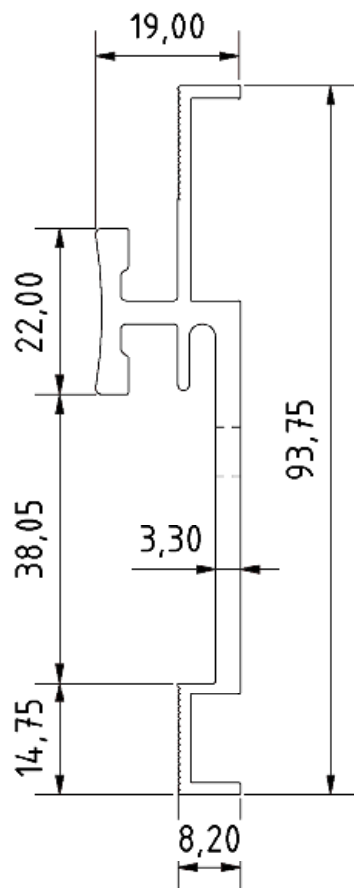


All dimension in mm / Material Aluminium EN6060 T66 / Tolerances acc. EN 755-9

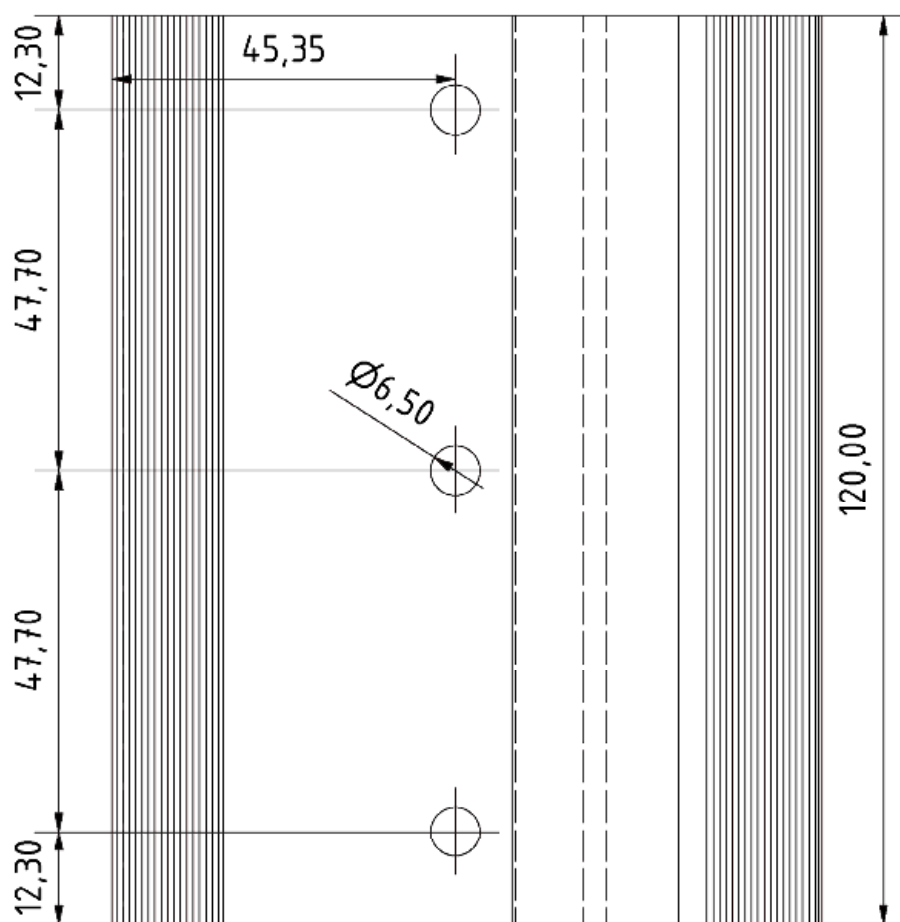
Rodeca LBE

Lift anchor PC 2550-10 AF 60 / AF 120
Art.No.: 49405060 / 494050120
for PC 2550-10

Annex A 3.4.3



PC 2560-12 AF 60 Art.No.:49406060



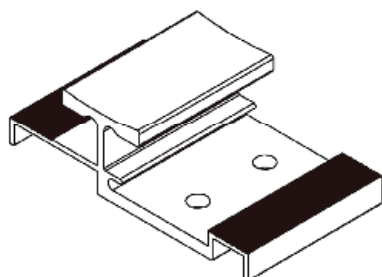
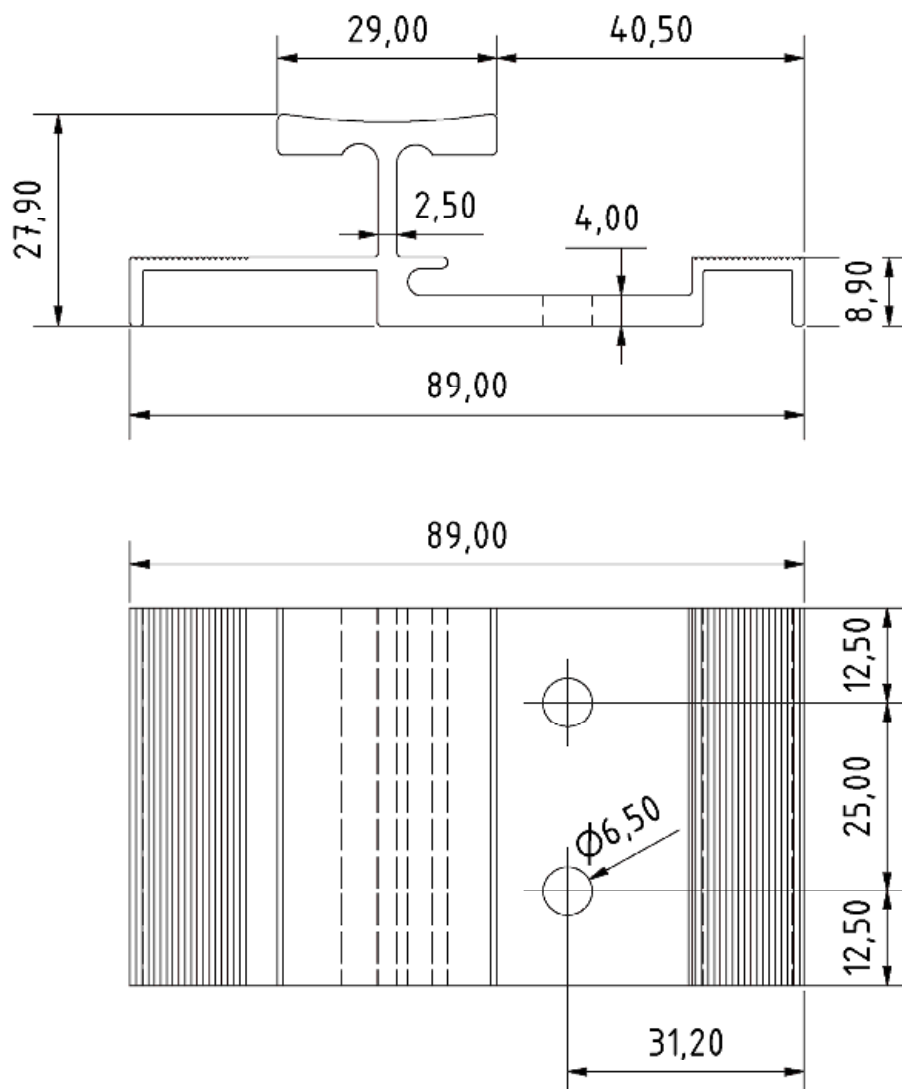
PC 2560-12 AF 120 Art.No.:494060120

All dimension in mm / Material Aluminium EN6060 T66 / Tolerances acc. EN 755-9

Rodeca LBE

Lift anchor 2560-12 AF 60 / AF 120
Art.No.: 49406060 / 494060120
für PC 2560-12

Annex A 3.4.4



All dimension in mm / Material Aluminium EN6060 T66 / Tolerances acc. EN 755-9

Rodeca LBE

Lift anchor PC 2600-40-7-U AF 50
Art.Nr.: 49404000
for PC 2600-40-7-U

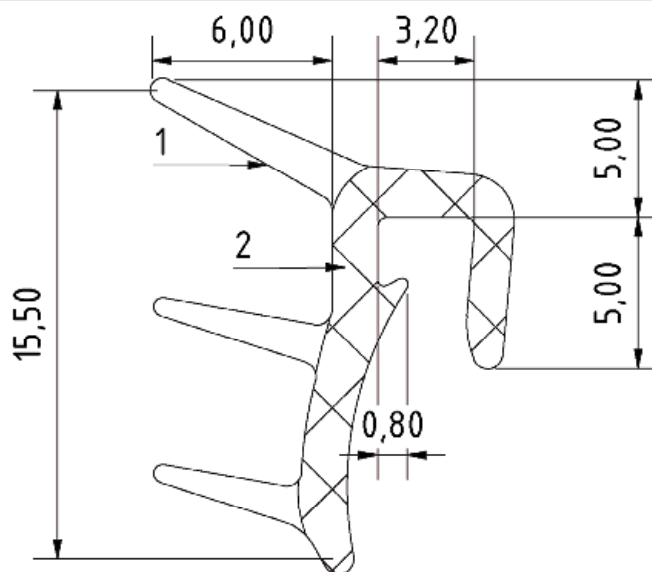
Annex A 3.4.5

Art.No.: 902801

Sealing profile, outside

1 - TPE / EPDM acc. DIN 7863
hardness 70 $\pm$ 5 Shore A
acc. DIN En ISO 868

2 - TPE / EPDM acc. DIN 7863
hardness 95 $\pm$ 5 Shore A
acc. DIN En ISO 868

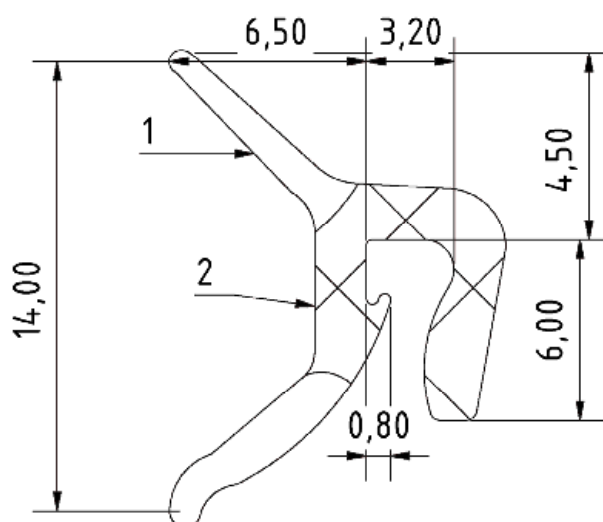


Art.Nr.: 902901

Sealing profile, outside

1 - TPE / EPDM acc. DIN 7863
hardness 70 $\pm$ 5 Shore A
acc. DIN En ISO 868

2 - TPE / EPDM acc. DIN 7863
hardness 95 $\pm$ 5 Shore A
acc. DIN En ISO 868

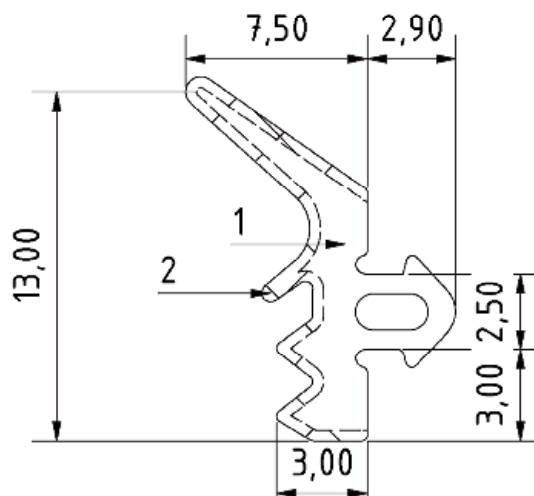


Art.Nr.: 902902

Sealing profile, inside

1 - TPE / EPDM acc. DIN 7863
hardness 70 $\pm$ 5 Shore A
acc. DIN En ISO 868

2 - TPE / EPDM acc. DIN 7863
hardness 60 $\pm$ 5 Shore A
acc. DIN En ISO 868

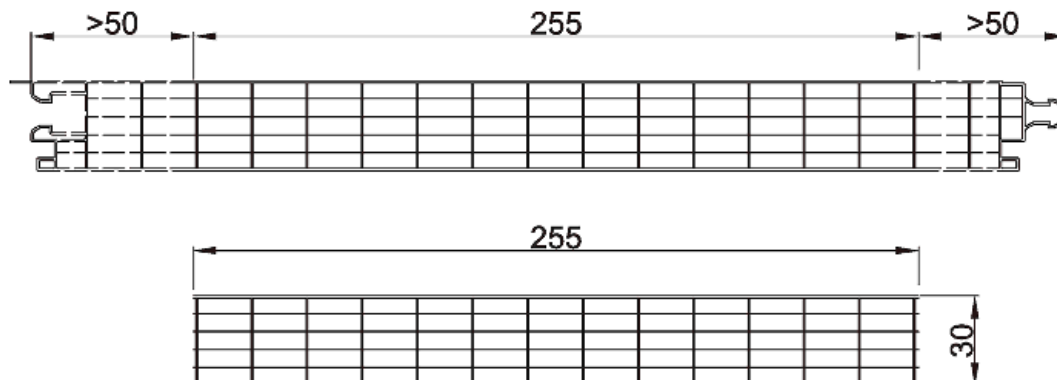


All dimension in mm

Rodeca LBE

Sealing profile
Art.No.: 902801 / 902901 / 902902

Annex A 3.5



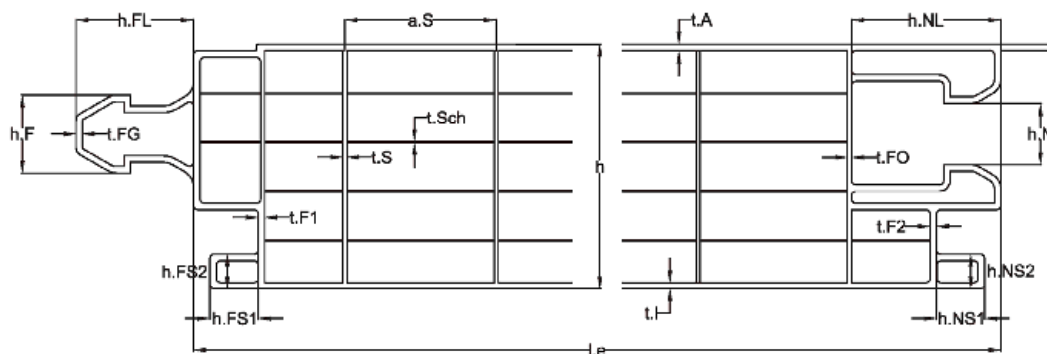
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
559	1,40	1,30	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

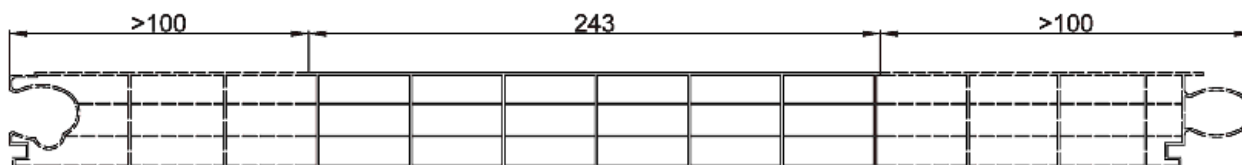


t.A	t.I	t.S	t.L	t.Sch	a.S	t.FG	h.F	t.FL	t.F1	t.F2	h.FS1	h.FS2	t.FO	h.N	h.NL	h.NS1	h.NS2	l.e	h	weight
0,62	0,57	0,26	0,96	0,11	30,08	0,52	11,63	14,98	0,19	0,45	6,37	4,72	0,46	9,58	16,18	6,39	4,67	333	30	1,00
-0,15	-0,35	-0,15	-0,06	-0,08	+1,14	-0,26	-0,82	-1,00	-0,07	-0,09	-0,59	-0,31	-0,23	-0,54	-0,53	-0,67	-0,13	Tolerances acc. EN 16153:2015-05/Tab.2		

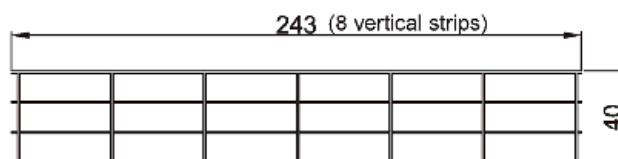
Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2333-30-6

Annex A 4.0



Cross section

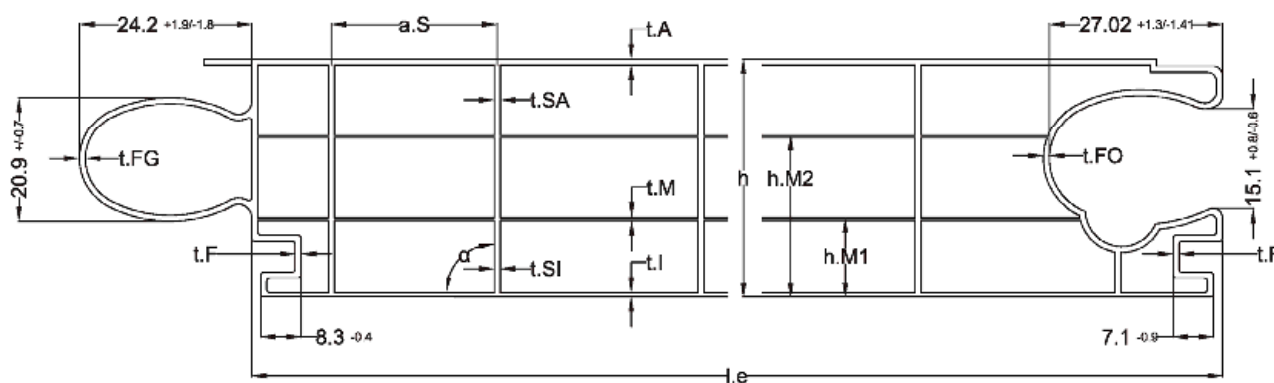


Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1916	1,5	1,4	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

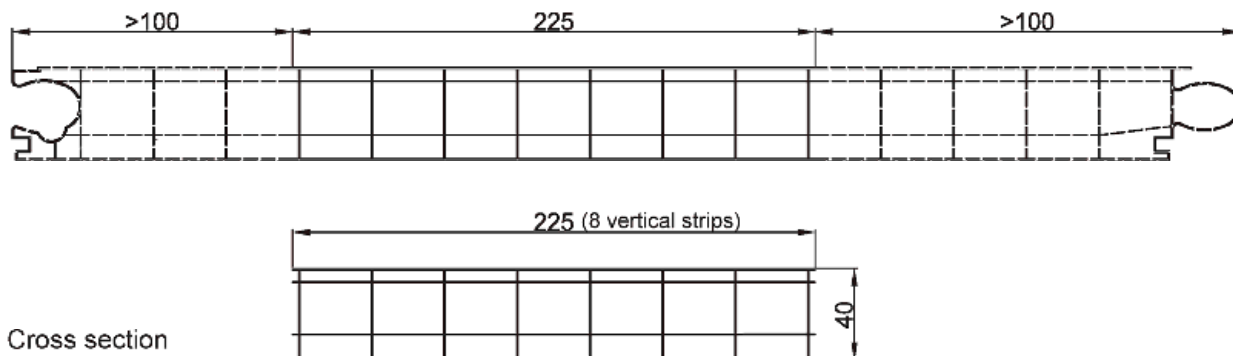


h.M1 mm	h.M2 mm	t.A mm	t.I mm	t.M mm	t.SA mm	t.SI mm	t.F mm	t.FG mm	t.FO mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δa zu 90°
12,10	24,10	0,89	0,96	0,16	0,62	0,62	0,71	0,67	0,68	33,10	500	40	2,02	
+ 0,35 - 0,30	+ 0,35 - 0,35	-0,05	-0,06	-0,03	-0,10	-0,10	-0,13	-0,11	-0,11	+1,10	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 2°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-4

Annex A 4.1

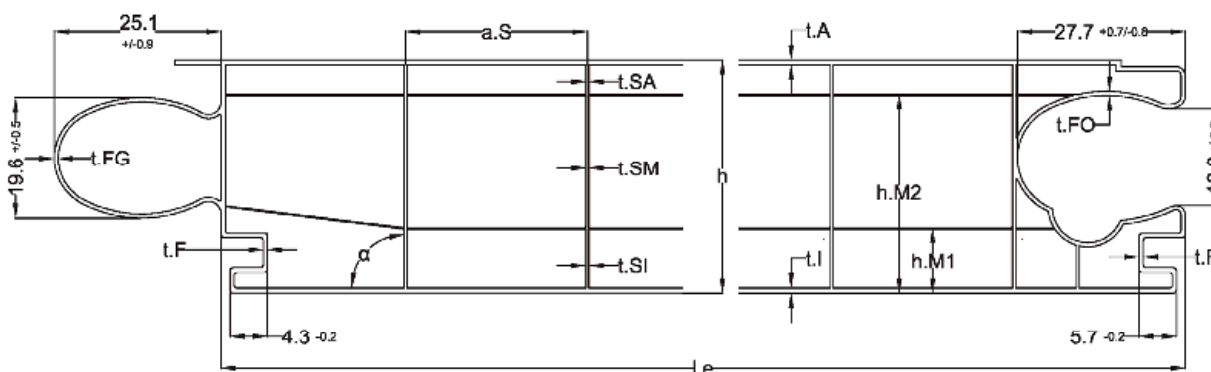


Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1786	1,6	1,5	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

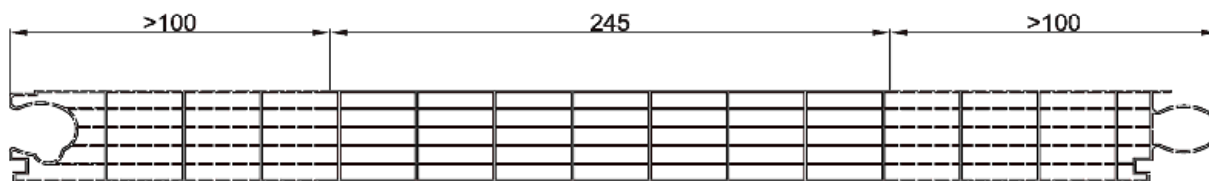


h.M1 mm	h.M2 mm	t.A mm	t.L mm	t.SA mm	t.SM mm	t.SI mm	t.M1 mm	t.M2 mm	t.F mm	t.FG mm	t.FO mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δα zu 90°
10,15	32,80	1,17	0,90	0,50	0,36	0,51	0,13	0,15	0,64	0,66	0,53	30,85	500	40	1,80	
+ 0,30 - 0,25	+ 0,35 - 0,35	- 0,06	- 0,08	- 0,10	- 0,05	- 0,06	- 0,03	- 0,04	- 0,08	- 0,10	- 0,18	+ 0,65	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 2°

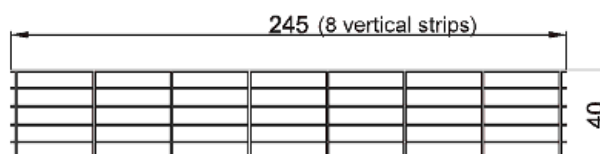
Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-4-MC

Annex A 4.2



Cross section

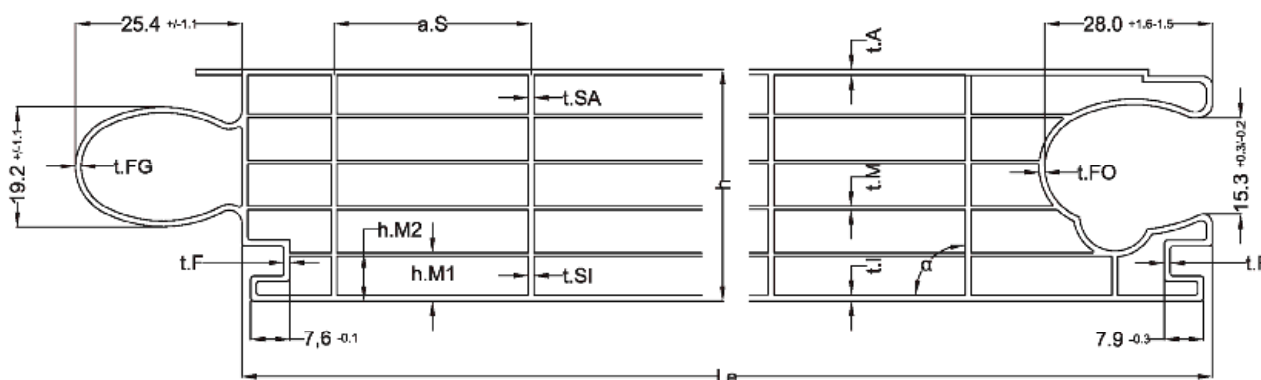


Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1838	1,2	1,2	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

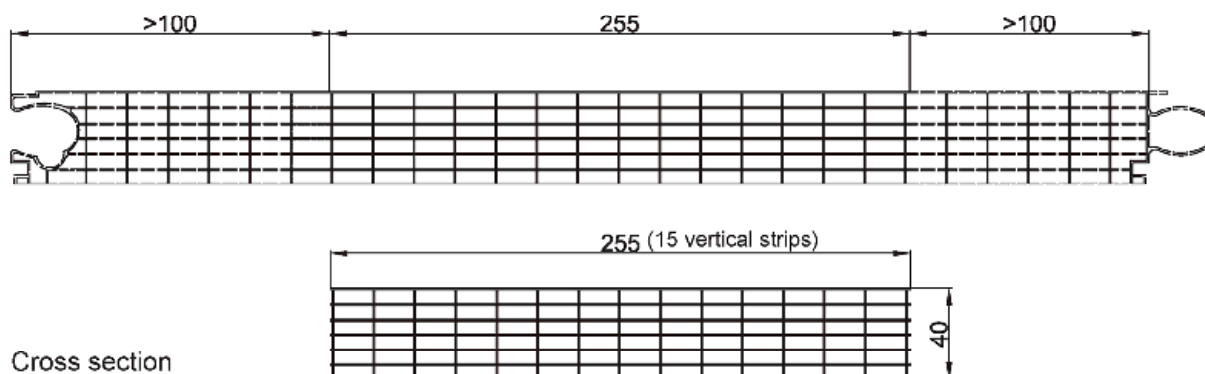


h.M1 mm	h.M2 mm	t.A mm	t.I mm	t.M mm	t.SA mm	t.SI mm	t.F mm	t.FG mm	t.FO mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δα zu 90°
9,00	15,40	0,90	0,95	0,07	0,75	0,49	0,73	0,65	0,78	32,90	500	40	2,00	
+ 0,25 - 0,30	+ 0,35 - 0,35	- 0,08	- 0,12	- 0,02	- 0,12	- 0,06	- 0,05	- 0,09	- 0,05	+1,20	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 2°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-6

Annex A 4.3



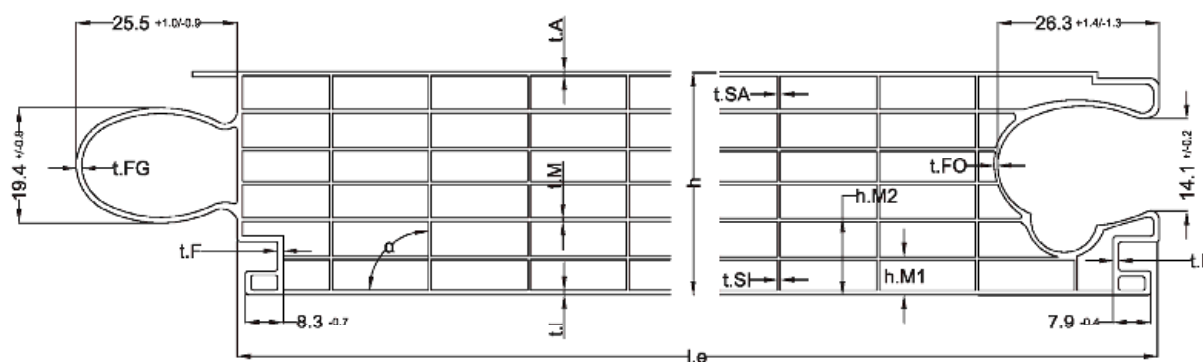
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1814	1,2	1,1	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

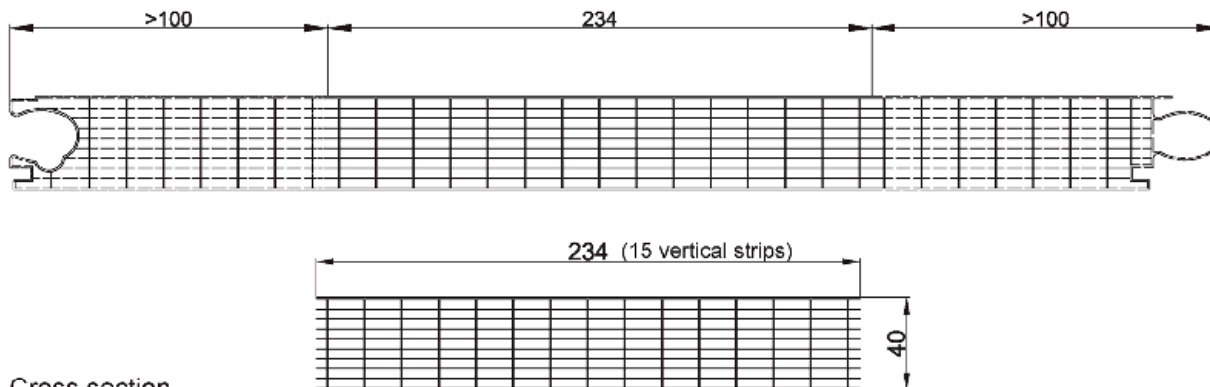


h.M1 mm	h.M2 mm	t.A mm	t.L mm	t.M mm	t.SA mm	t.SI mm	t.F mm	t.FG mm	t.FO mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δα zu 90°
6,70	15,30	0,75	0,75	0,15	0,55	0,59	0,47	0,63	0,53	17,40	500	40	2,10	
+ 0,90 - 0,80	+ 1,40 - 1,20	-0,06	- 0,11	- 0,03	- 0,05	- 0,09	- 0,09	- 0,05	- 0,06	+0,40 - 0,40	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 3°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-7

Annex A 4.4



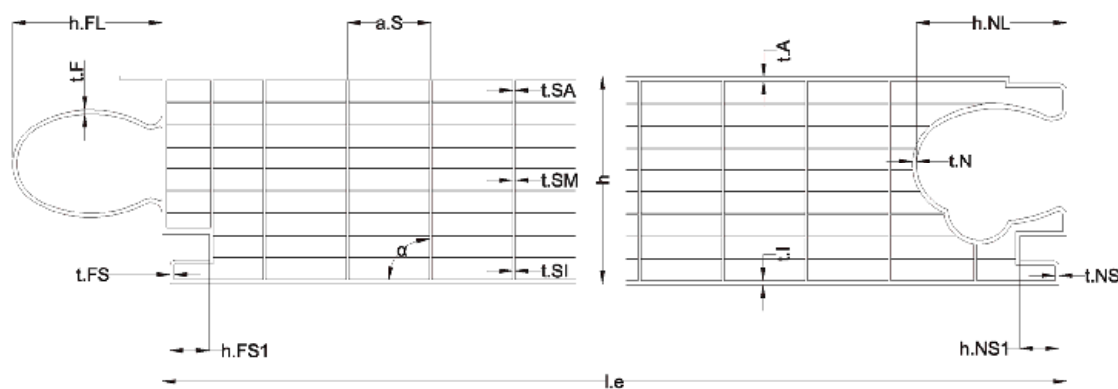
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
	Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus
1545	1,0	1,0	1,0	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1
						Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

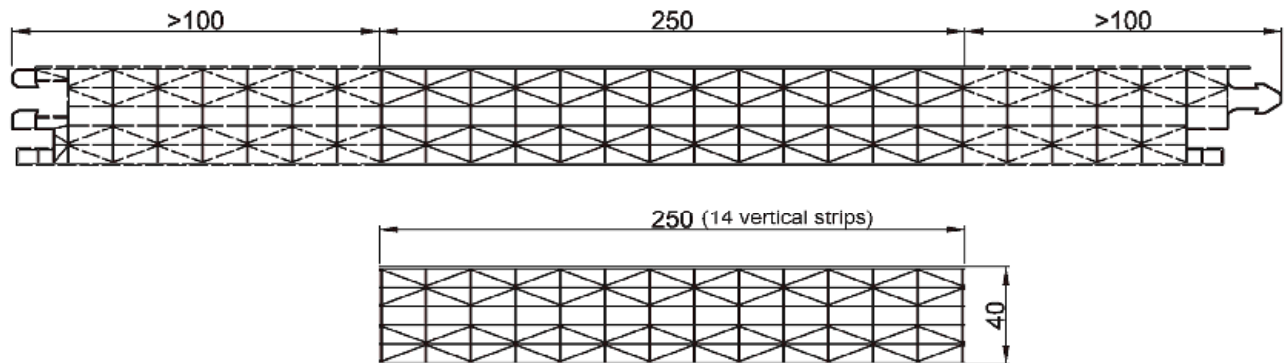


t.A	t.I	t.SA	t.SM	t.SI	a.S	t.F	h.FL	t.FS	h.FS1	t.N	h.NL	t.NS	h.NS1	l.e	h	weight	difference
0,60	0,64	0,41	0,43	0,53	15,90	0,49	25,77	0,86	6,56	0,72	27,67	0,84	6,75	500	40	2,00	
-0,10	-0,06	-0,12	-0,14	-0,15	-0,65	-0,17	-0,89	-0,50	-0,59	-0,29	-1,09	-0,27	-1,04	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 5°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-10

Annex A 4.5



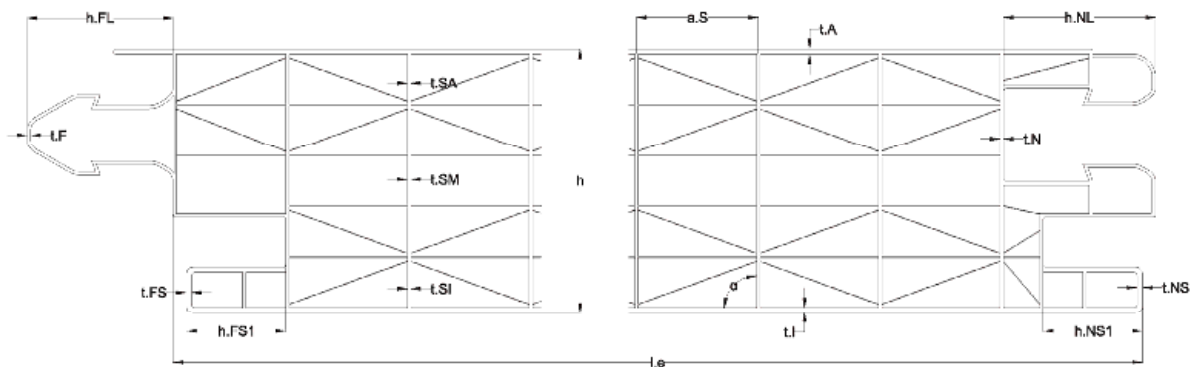
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
1674	1,1	1,1	≤ 10 (ΔA)*	$\leq 5\%$ (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

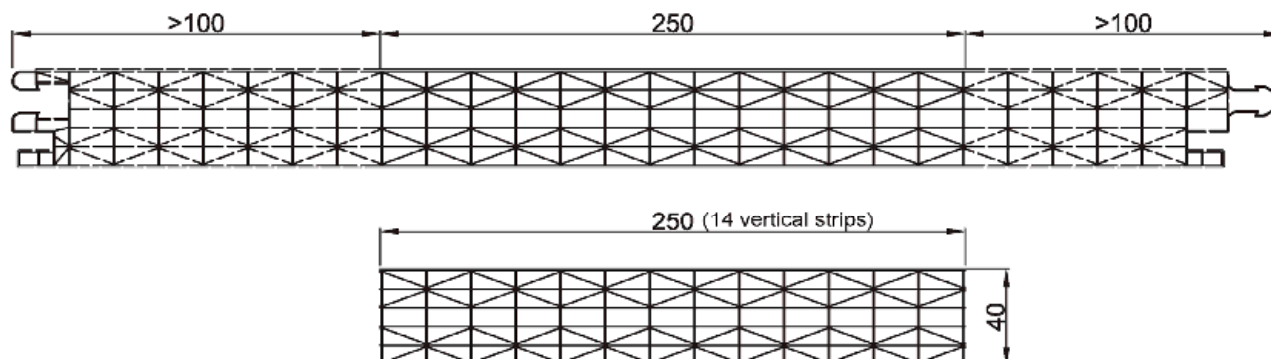


t.A	t.l	t.SA	t.SM	t.SI	a.S	t.F	h.FL	t.FS	h.FS1	t.N	h.NL	t.NS	h.NS1	l.e	h	weight	difference
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	$ \Delta a $ zu 90°
0,67	0,64	0,33	0,41	0,43	17,85	0,96	21,50	0,88	14,87	0,62	22,39	0,75	14,85	495	40	2,25	
-0,17	-0,18	-0,07	-0,13	-0,07	-0,54	-0,41	-1,24	-0,36	-1,12	-0,31	-1,67	-0,35	-0,43	Tolerances acc. EN 16153:2015-05/Tab 2			$\leq 5^\circ$

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-10DX

Annex A 4.6



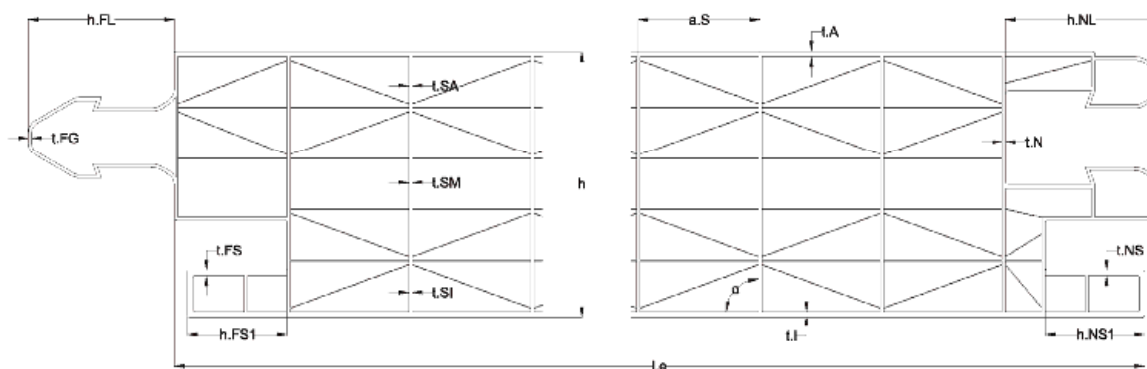
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
2660	1,1	1,1	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

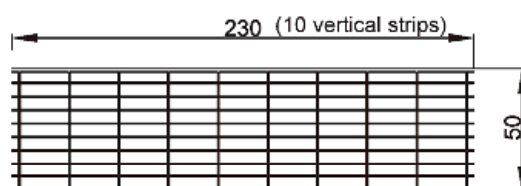
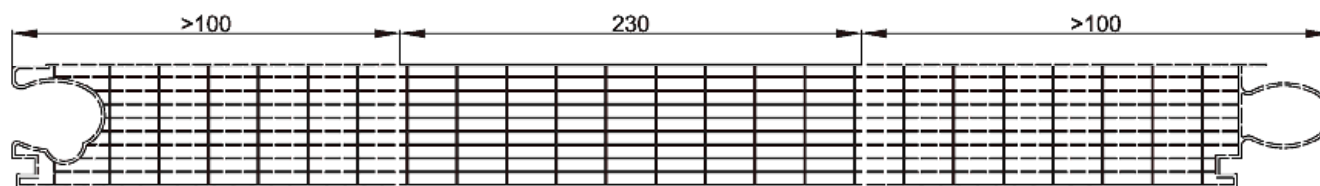


t.A mm	t.I mm	t.SA mm	t.SM mm	t.SI mm	a.S mm	t.FG mm	h.FL mm	t.FS mm	h.FS1 mm	t.NS mm	h.NS1 mm	h.NL mm	t.N mm	l.e mm	h mm	weight kg/m	difference Δα zu 90°
1,31	1,36	0,38	0,38	0,38	17,82	0,92	22,05	1,16	15,07	0,61	14,98	23,12	0,38	495	40	2,87	
-0,33	-0,43	-0,27	-0,27	-0,27	-0,78	-0,53	-1,57	-0,55	-0,58	-0,25	-0,47	-0,44	-0,26	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 5°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2540-10DX HI

Annex A 4.7



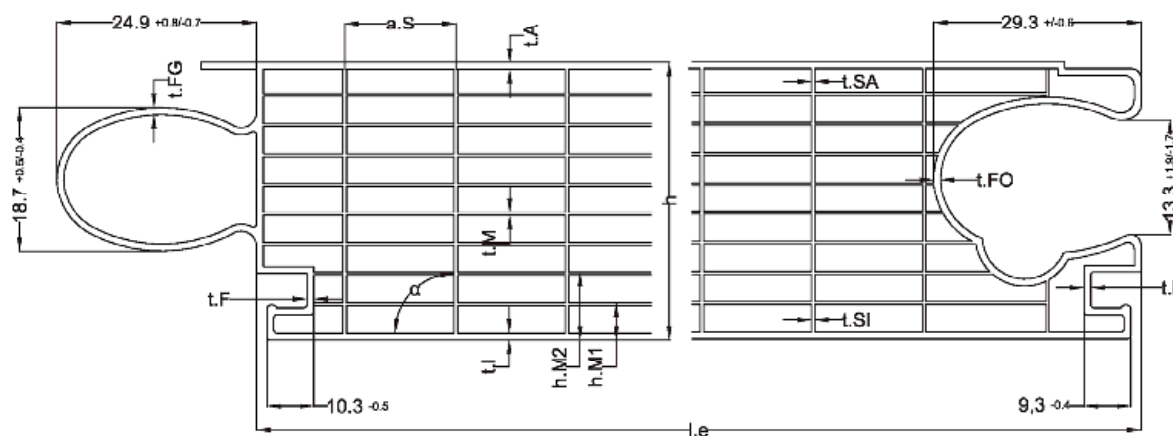
Cross section

Minimum performance levels or classes for the sheets in accordance with EN 16153

B _x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
3309	0,92	0,90	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

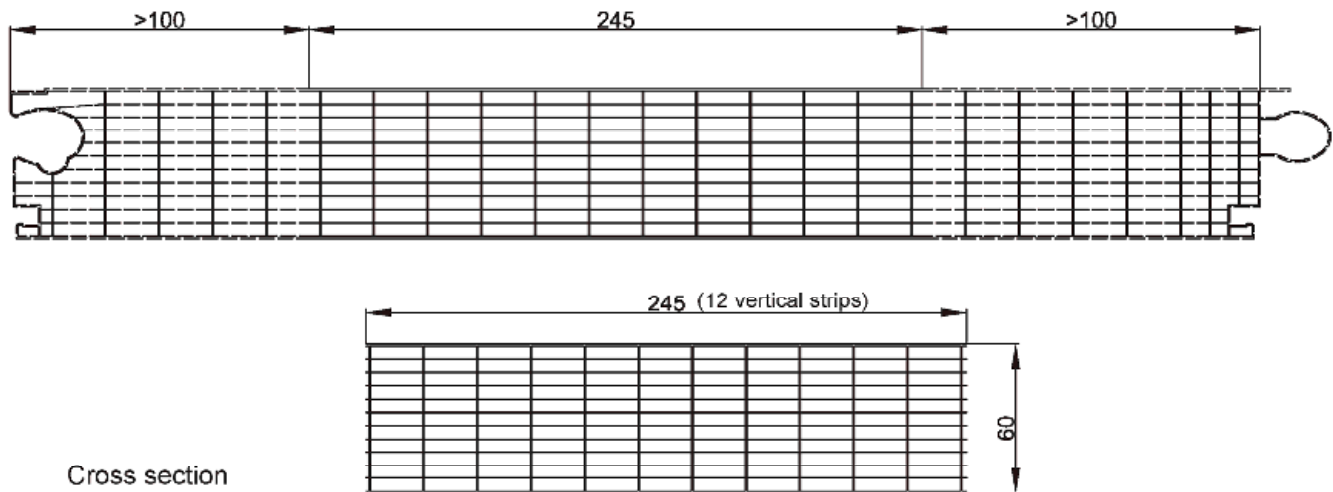


t.A mm	t.l mm	t.M mm	t.SA mm	t.SI mm	t.FG mm	t.FO mm	t.F mm	a.S mm	l.e mm	h mm	weight kg/m	difference $\Delta\alpha$ zu 90°
0,84	0,95	0,06	0,36	0,57	0,55	0,65	0,94	24,15	495	50	2,38	
- 0,09	- 0,10	-0,01	- 0,05	- 0,08	- 0,10	- 0,17	- 0,37	+0,25	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 2°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2550-10

Annex A 4.8

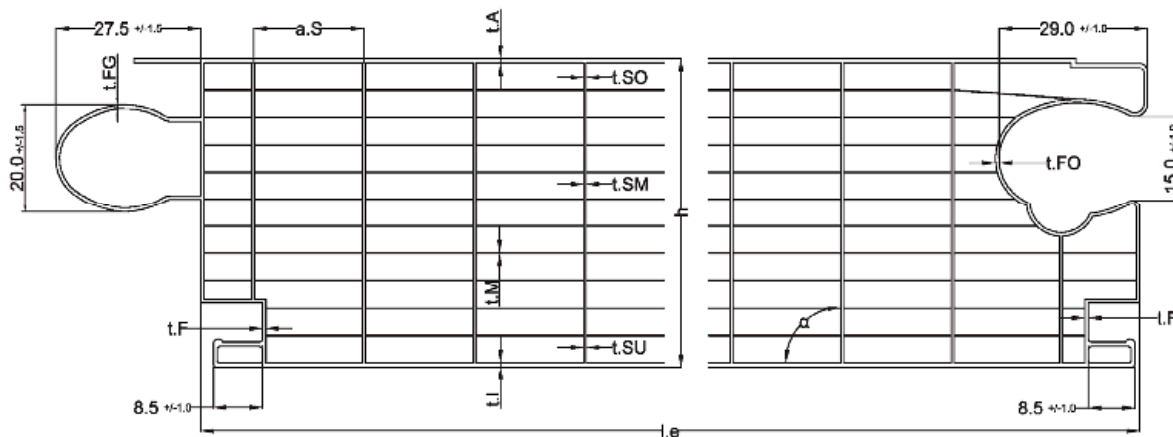


Minimum performance levels or classes for the sheets in accordance with EN 16153

B_x	U [W/m ² K]		Durability			
Nm ² /m	Horizontal	Vertical	Variation of yellowness index	Variation of light transmittance	Variation of deformation flexural modulus	Variation of tensile strength
4984	0,77	0,75	≤ 10 (ΔA)*	≤ 5% (ΔA)*	Cu 1	Ku 1

Polycarbonat (PC)

*coloured sheets from the same PC resin as uncoloured sheets shall be classified ΔD acc. Tab. 3 DIN EN 16153:2015-05

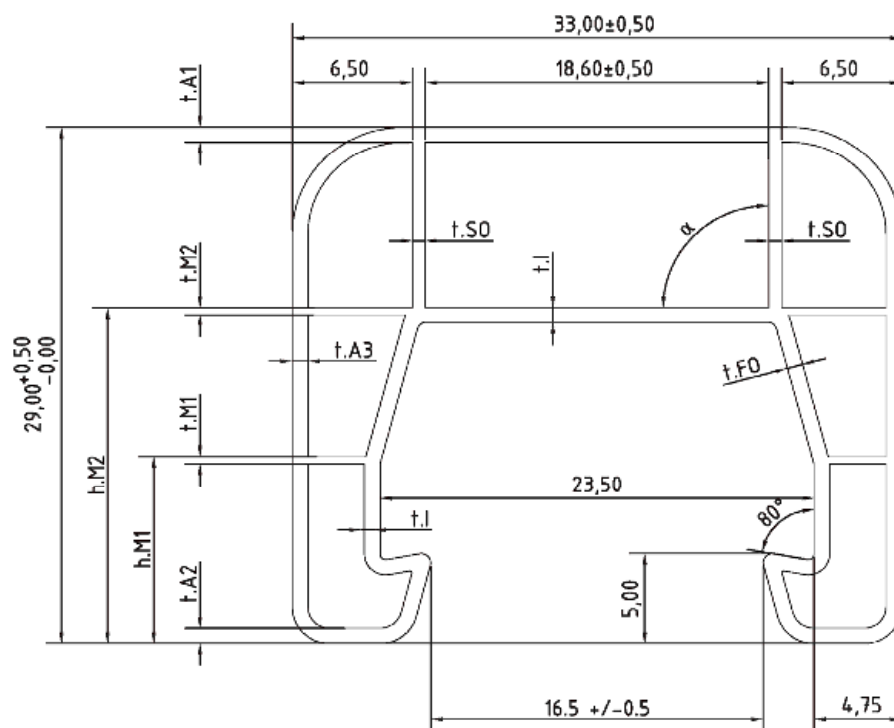


t.A mm	t.LI mm	t.M mm	t.SU mm	t.SO mm	t.SM mm	t.FO mm	t.FG mm	t.F mm	a.S mm	l.e mm	h mm	weight kg/m	difference Δα zu 90°
0,79	0,96	0,04	0,86	0,45	0,56	0,39	0,54	1,66	20,7	500	60	2,77	
- 0,06	- 0,07	-0,01	- 0,29	- 0,12	- 0,15	- 0,17	- 0,18	-0,42	+1,0	Tolerances acc. EN 16153:2015-05/Tab.2			≤ 3°

Rodeca LBE

Geometry/ weight per area,
Minimum performance levels or classes for the sheets in accordance with EN 16153
PC 2560-12

Annex A 4.9



t.A1 mm	t.A2 mm	t.A3 mm	t.M1 mm	t.M2 mm	t.S0 mm	t.I mm	t.F0 mm	h.M1 mm	h.M2 mm	weight kg/m
0,89	0,82	0,87	0,35	0,43	0,70	0,80	0,65	10,90	17,6	0,17
- 0,02	- 0,14	-0,15	-0,06	- 0,07	- 0,11	- 0,36	- 0,06	- 0,20	-0,30	+0,02 -0,02

Rodeca LBE

Geometry/ weight per area
Connection profile 380062

Annex A 4.11

Rodeca LBE

Annex B

Provisions for design and dimensioning

Dimensioning, installation and execution of the 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 D).

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 and wall 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.

The verification of aluminium covering profiles and lift anchors, their fixings as well as the verification of substructure is not included in this ETA.

B 1.2 Design values for actions, E_d

The design values for the actions shall be determined in accordance with EN 1991 + EN 1990.

The action resulting from the dead weight of the multi-wall sheets may be neglected for the structural design calculation in accordance with Section B.1.3 of the roof and wall kit. Live loads are not permitted.

The design value of the action results from the characteristic values of the actions taking into account the partial safety factors γ_F , the coefficients ψ and the factors for the effects of the duration of load action C_t .

For the wind and temperature effects to be considered in the load case "summer" the Ψ coefficient defined in EN 1990 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.

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	$K_t = C_t$
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
Dead Load	constantly	1.50

B 1.3 Design values for structural resistance R_d (ULS) and C_d (SLS)

The design values for structural resistance R_d and C_d result from the characteristic value of structural resistance R_k and C_d 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:

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

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	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 shall be taken from the tables in Annex B 2.1.1 to B 2.2.9 for the given multi-wall sheets and direction of loading.

- One-span system

The load direction "negative" and "positive" as well as the span l_F are defined in Annex A 2.1 to A 2.4. The characteristic values for structural resistance R_k and C_k related to the span l_F shall be taken from the tables in Annex B 2.1.1 to B 2.1.5 for the given multi-wall sheets and direction of loading.

- Multi-field system

The load direction "negative" and "positive" as well as the span l_F is given in Annex A 2.1 to A 2.4. The characteristic values for structural resistance R_k and C_k are given as interaction between support moment and force at the intermediate support and shall be taken from the tables in Annex B 2.2.1 to B 2.2.9 for the given multi-wall sheets and direction of loading.

The load at intermediate support is decisive.

For load direction "negative" the factor C_u can be set to 1,0. Therefore direct sunlight on the inside of the multi-wall sheets must be excluded.

Height of intermediate support for fixing the lift anchors must be at least 50mm for the roof and wall kit PC 2333-30-6 / PC 2540-4, PC 2540-4-MC, PC 2540-6, PC 2540-7, PC 2540-10, PC 2540-10DX / PC 2540-10-DX HI and 2600-40-7-U. Height of intermediate support for roof and wall kit PC 2550-10 and PC 2560-12 must be at least 60 mm. The minimum span l_F as given in Annex A 1.2 to A 1.3 shall be 0,50 m.

For the determination of the respective span, the centre of the lift anchor is decisive for the load direction "negative" and the centre of the intermediate support for the load direction "positive".

- Local buckling

When the characteristic values of Annexes B 2.2.1 to B 2.2.9 are fully utilised, reversible local buckling may occur in the pressed outer wall of the sheets without affecting the load-bearing capacity.

B 1.4 Limiting of deflection

The limiting of deflection shall be assessed. in particular case e.g. to avoid collection of water. The design value for structural resistance C_d for deflection is given by the design value of limiting of deflection $f_{R,d}^{GZG}$. The deflection is to be carried out for uniformly distributed loads assuming a linear-elastic material behavior as follows:

$$\frac{f_{E,d}^{GZG}}{f_{R,d}^{GZG}} \leq 1,0$$

$f_{E,d}^{GZG}$: design value of deflection as a result of E_d

$f_{R,d}^{GZG}$: design value of deflection limit

For calculation the design value of deflection as a result of E_d the thermal expansion coefficient is $\alpha_T = 65 \cdot 10^{-6} \text{ K}^{-1}$. The following flexural rigidity values (B) of the multi wall sheets shall be applied:

Multi wall sheet	Annex	B (Nm ² /m)
PC 2333-30-6	A 4.0	530
PC 2540-4	A 4.1	1850
PC 2540-4-MC	A 4.2	1800
PC 2540-6	A 4.3	1750
PC 2540-7	A 4.4	1800
PC 2540-10	A 4.5	1550
PC 2540-10DX	A 4.6	1800
PC 2540-10DX HI	A 4.7	2330
PC 2600-40-7-U	A 4.10	2050
PC 2550-10	A 4.8	3050
PC 2560-12	A 4.9	4930

The characteristic values for own weight of multi wall sheets shall be taken from the Annex A.4.
The design values for limiting of deflection results as follows:

$$f_{R,d}^{GZG} = \frac{f_{R,k}}{C_u \cdot C_\theta \cdot \gamma_{MC}}$$

The limit of deflection ($f_{R,k}$) is to be determined that a proper function is not impaired, for example, no water sacks form or water penetrates.

The factors given in Section B 2.1 shall be applied.

B 1.5 Load-bearing capacity of the aluminium covering profiles with plastic insulation bar

The fixing distance of the aluminium covering profiles with plastic insulation bar on the substructure is approx. 350 mm, shear stress from bending must be excluded.

The structural stability against transverse tensile failure is to prove:

$$\left(\frac{\frac{\sigma_{xd}}{Q_k}}{\gamma_M \cdot A} \right) \leq 1$$

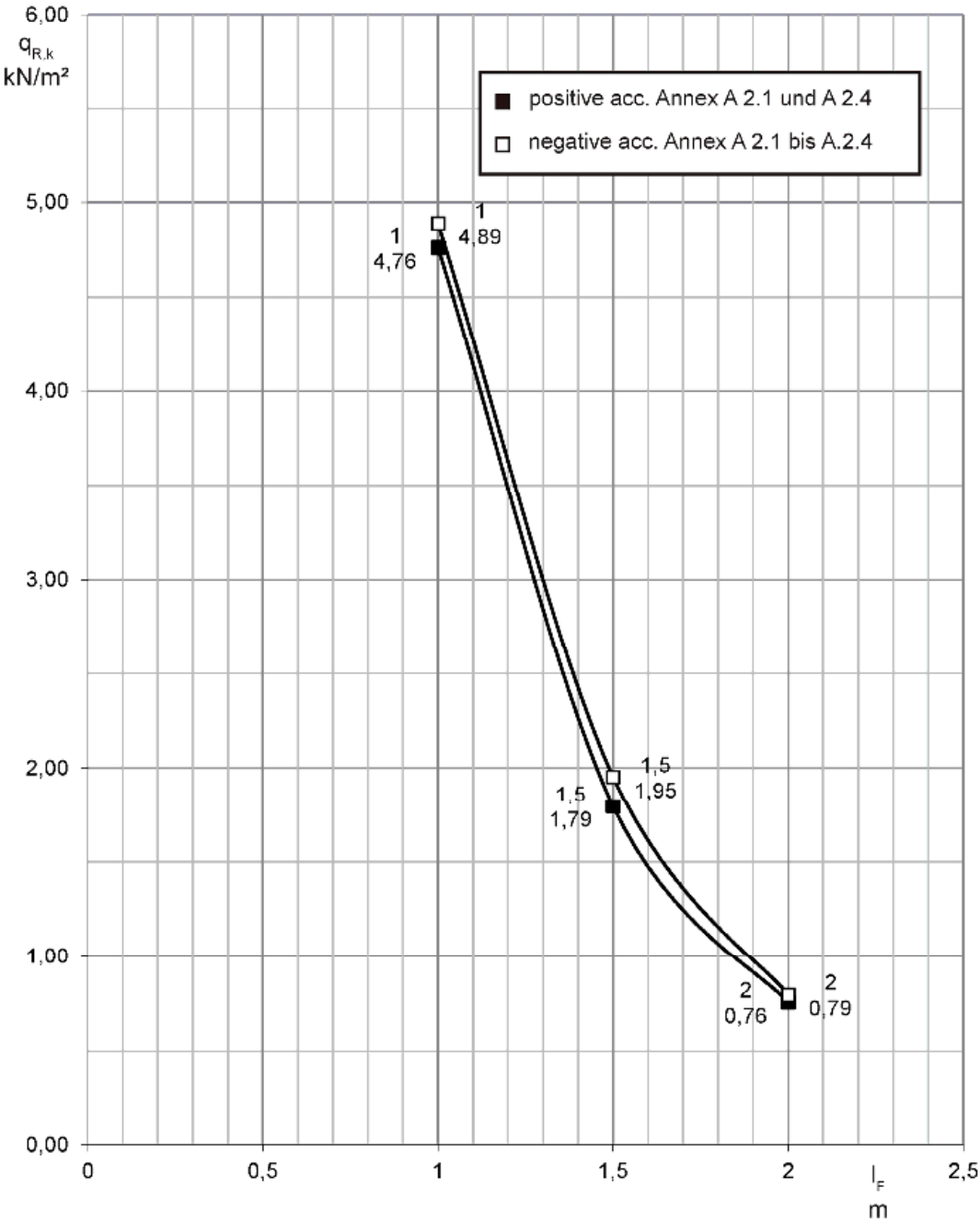
σ_{xd} : design value of normal stress as a result of wind load.

The eccentric load application of the multi-wall sheets regarding the position of the plastic insulating bars must be taken into account.

γ_m : 1,30 - material safety factor

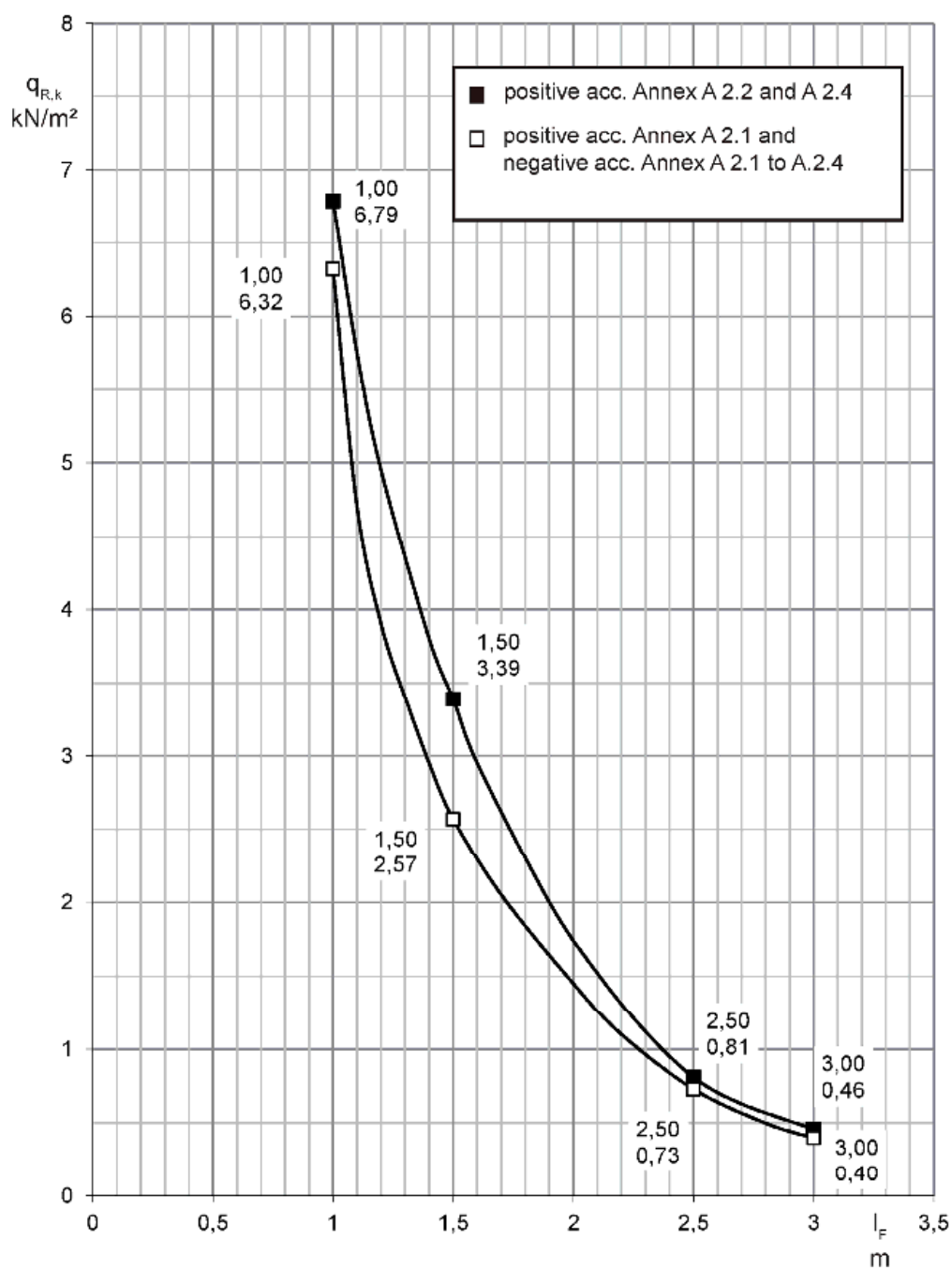
A : 1,56 - factor taking into account the effects of temperature and ageing

Q_k : 80 N/mm – characteristic value of tensile strength of the insulation bar's connection



Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

Rodeca LBE	Annex B 2.1.1
characteristic values for structural resistance one-span system PC 2333-30-6	

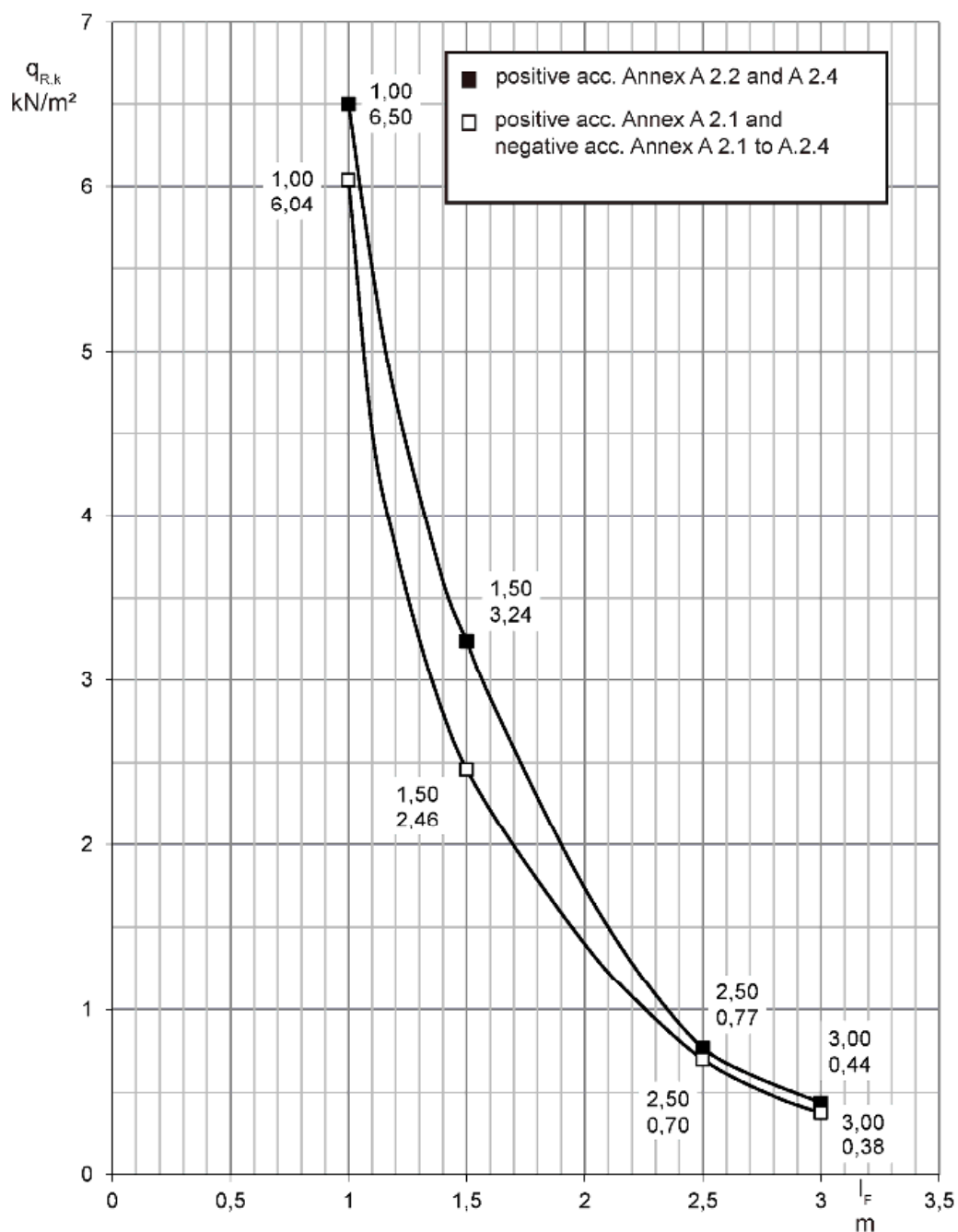


Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

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characteristic values for structural resistance
one-span system
PC 2540-4 / PC 2540-4-MC / PC 2540-10DX / PC 2540-10DX HI

Annex B 2.1

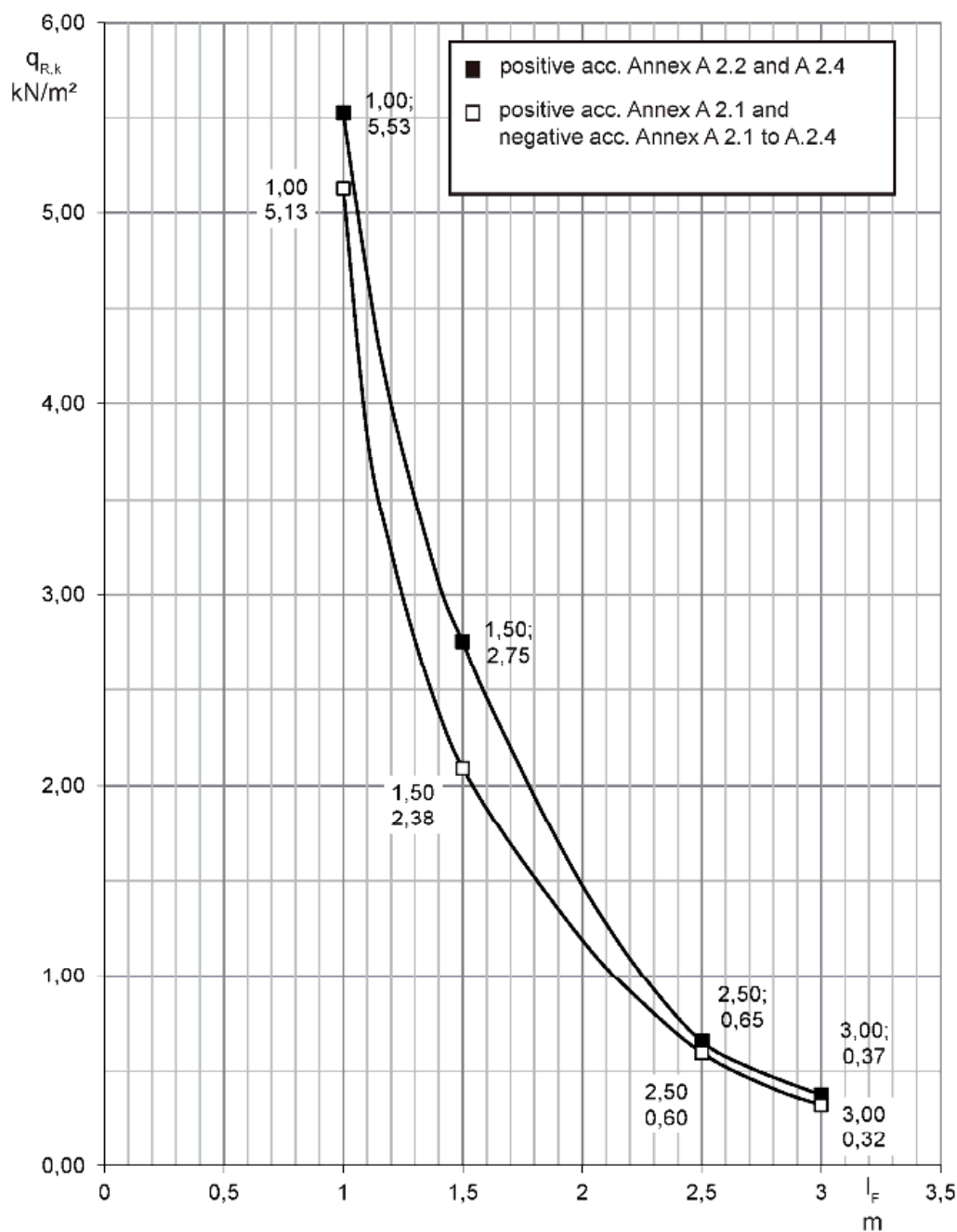


Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

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characteristic values for structural resistance
one-span system
PC 2540-6 / PC 2540-7

Annex B 2.1.3

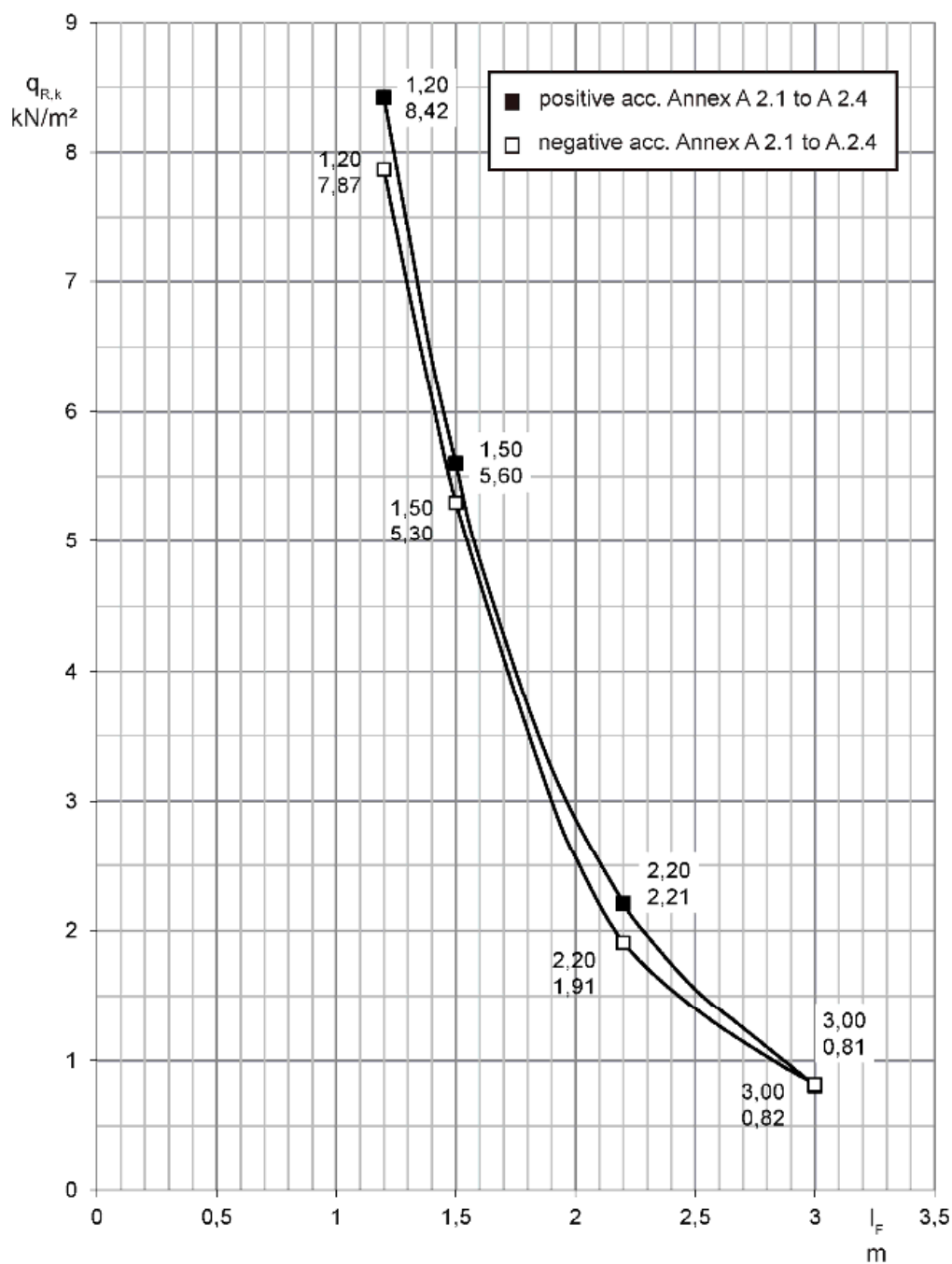


Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

Rodeca LBE

characteristic values for structural resistance
one-span system
PC 2540-10

Annex B 2.1.4

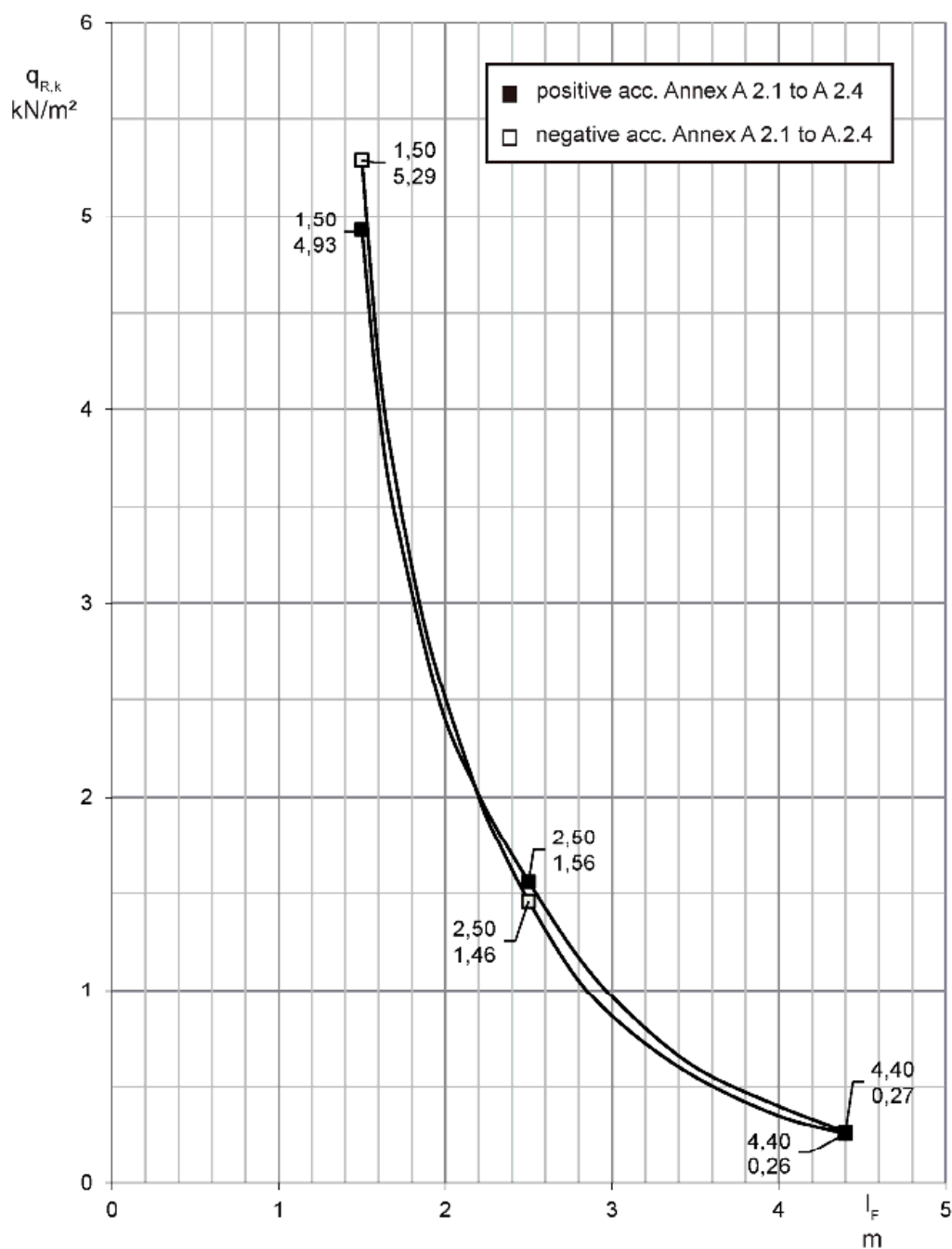


Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

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characteristic values for structural resistance
one-span system
PC 2550-10

Annex B 2.1.5

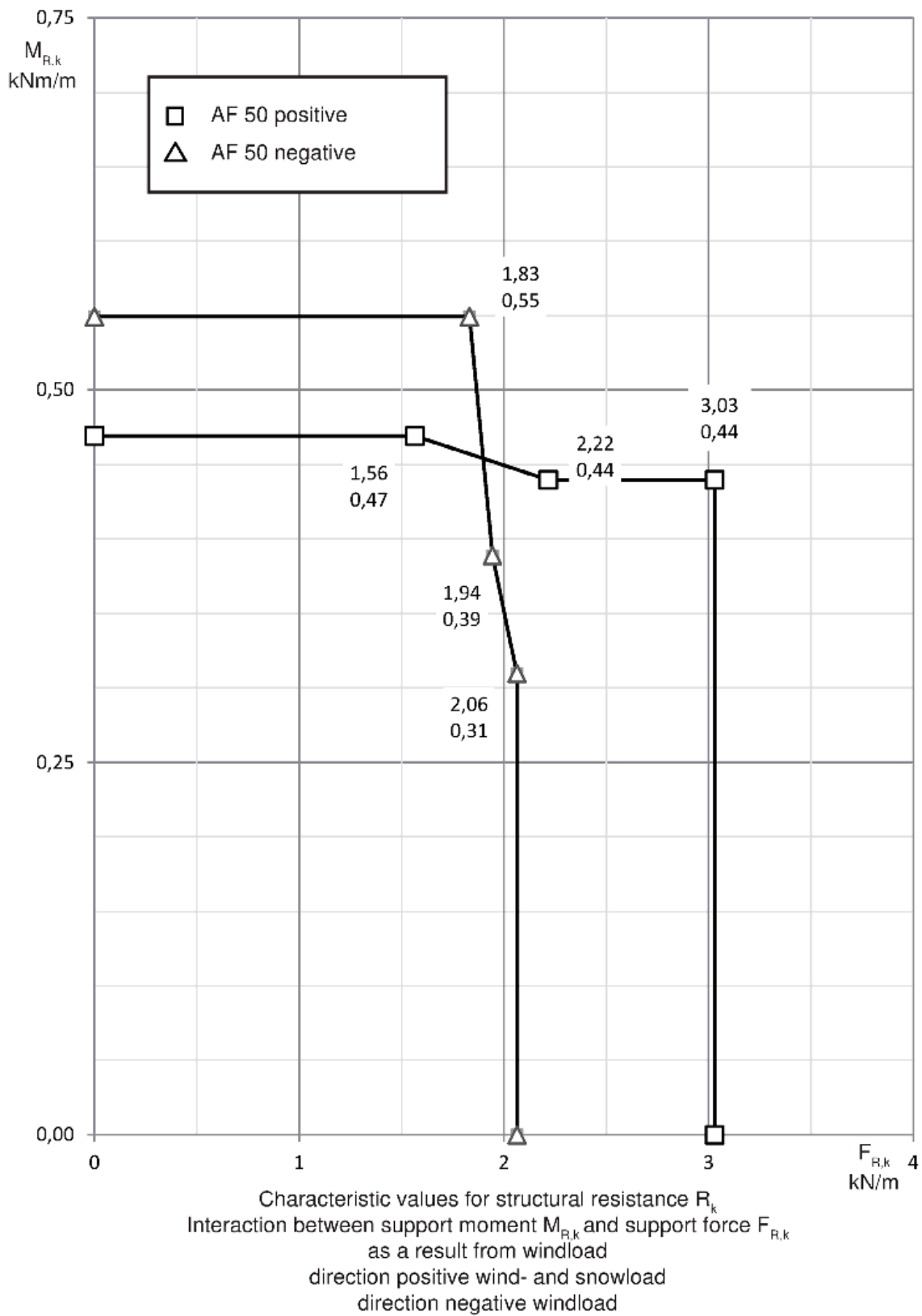


Characteristic values for structural resistance R_k
Uniformly distributed load $q_{R,k}$ in relation to span l_F
direction positive wind- and snowload
direction negative windload

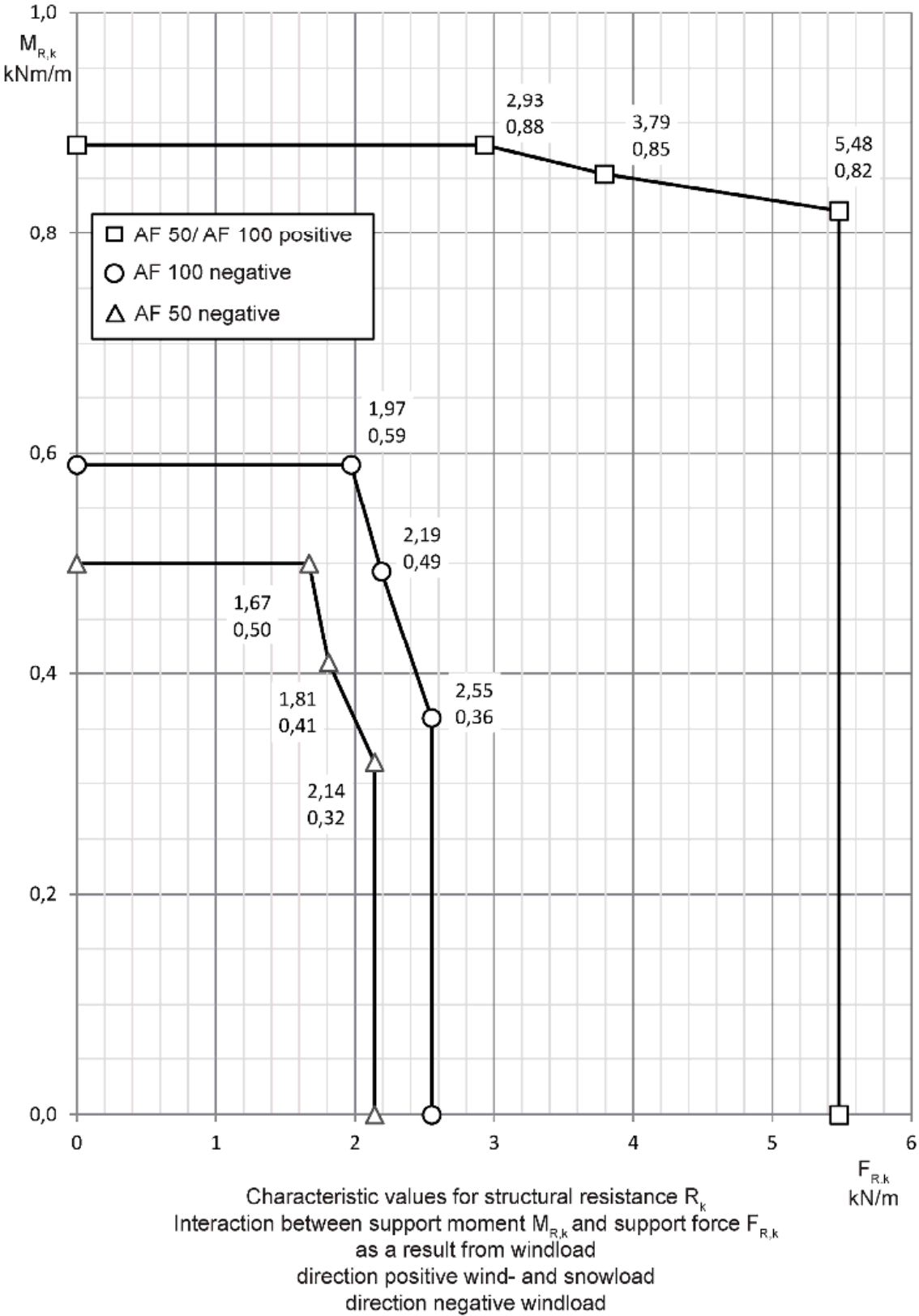
Rodeca LBE

characteristic values for structural resistance
one-span system
PC 2560-12

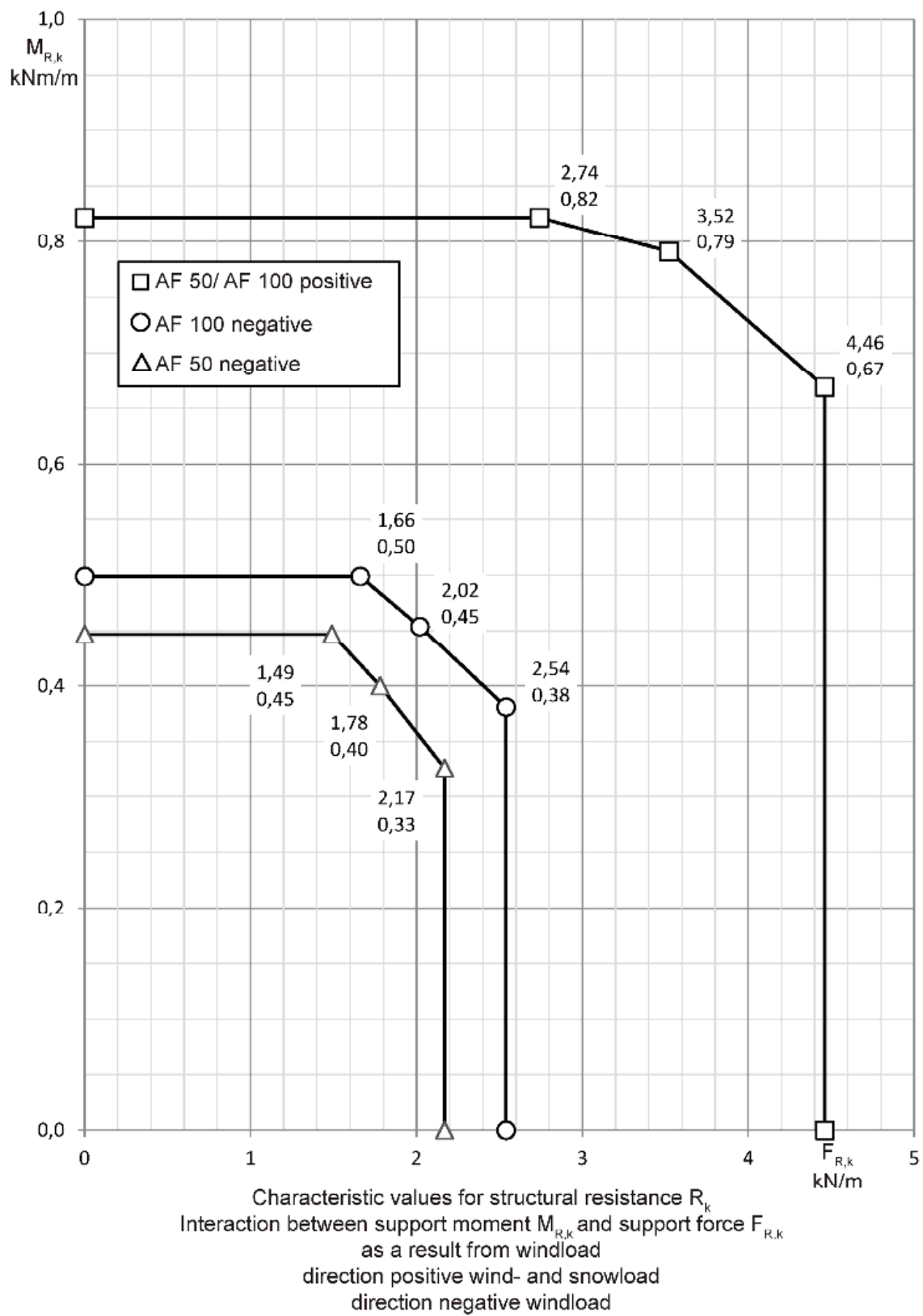
Annex B 2.1.6



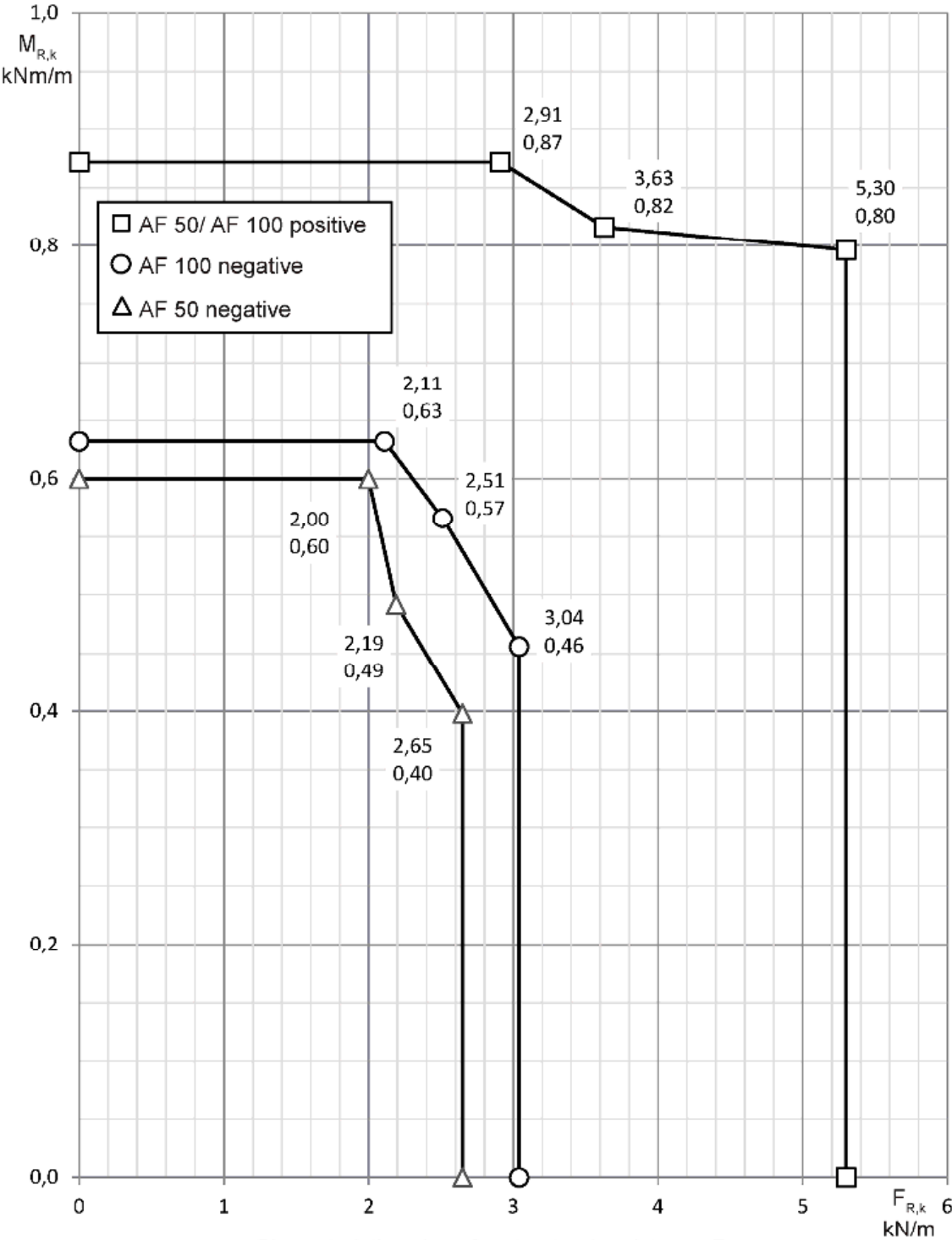
Rodeca LBE	Annex B 2.2.1
characteristic values for structural resistance multi-span system PC 2333-30-6	



Rodeca LBE	Annex B 2.2.2
characteristic values for structural resistance multi-span system PC 2540-4	

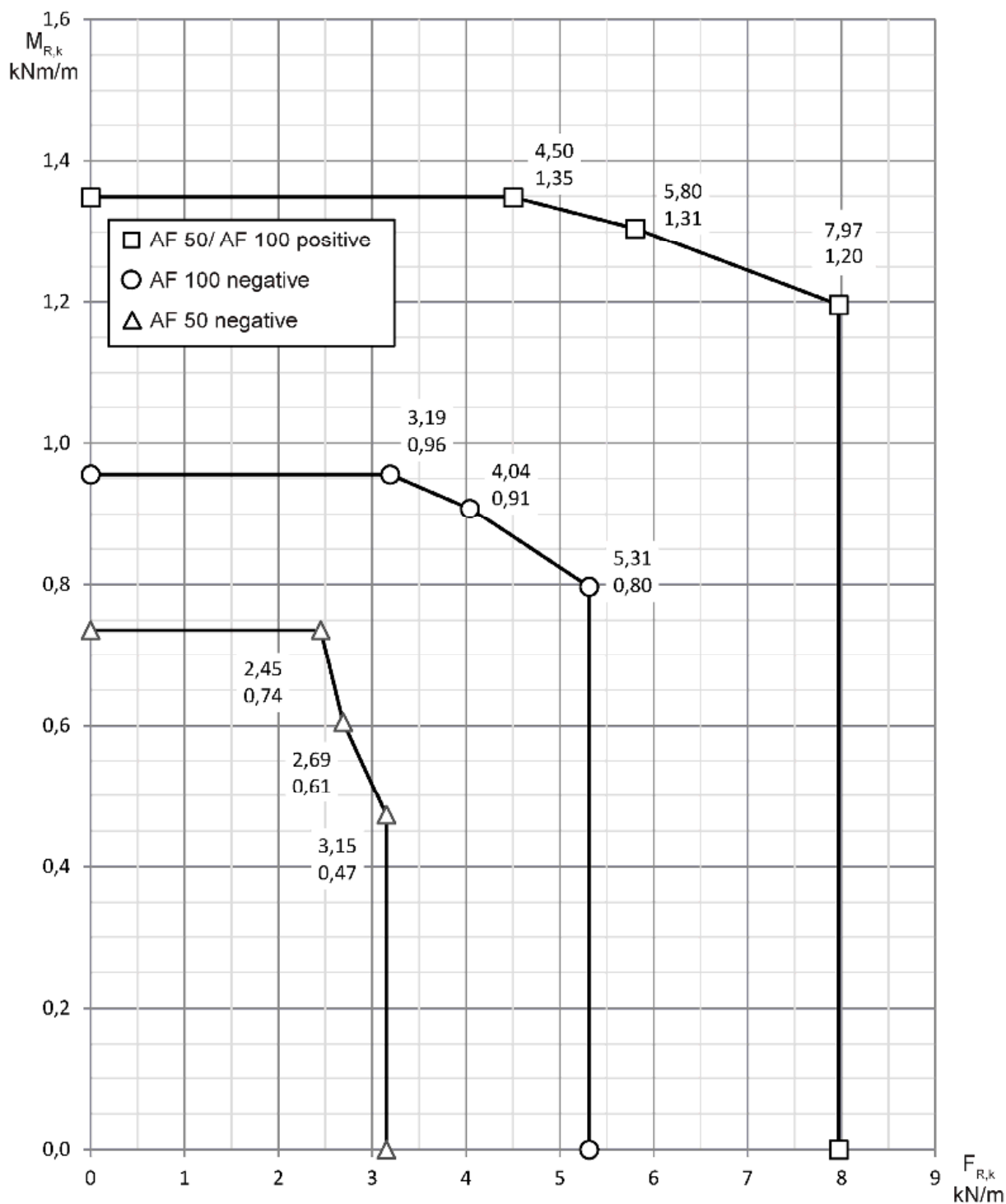


Rodeca LBE	Annex B 2.2.3
Vcharacteristic values for structural resistance multi-span system PC 2540-4 MC	



Characteristic values for structural resistance R_k
Interaction between support moment $M_{R,k}$ and support force $F_{R,k}$
as a result from windload
direction positive wind- and snowload
direction negative windload

Rodeca LBE	Annex B 2.2.4
characteristic values for structural resistance multi-span system PC 2540-6	

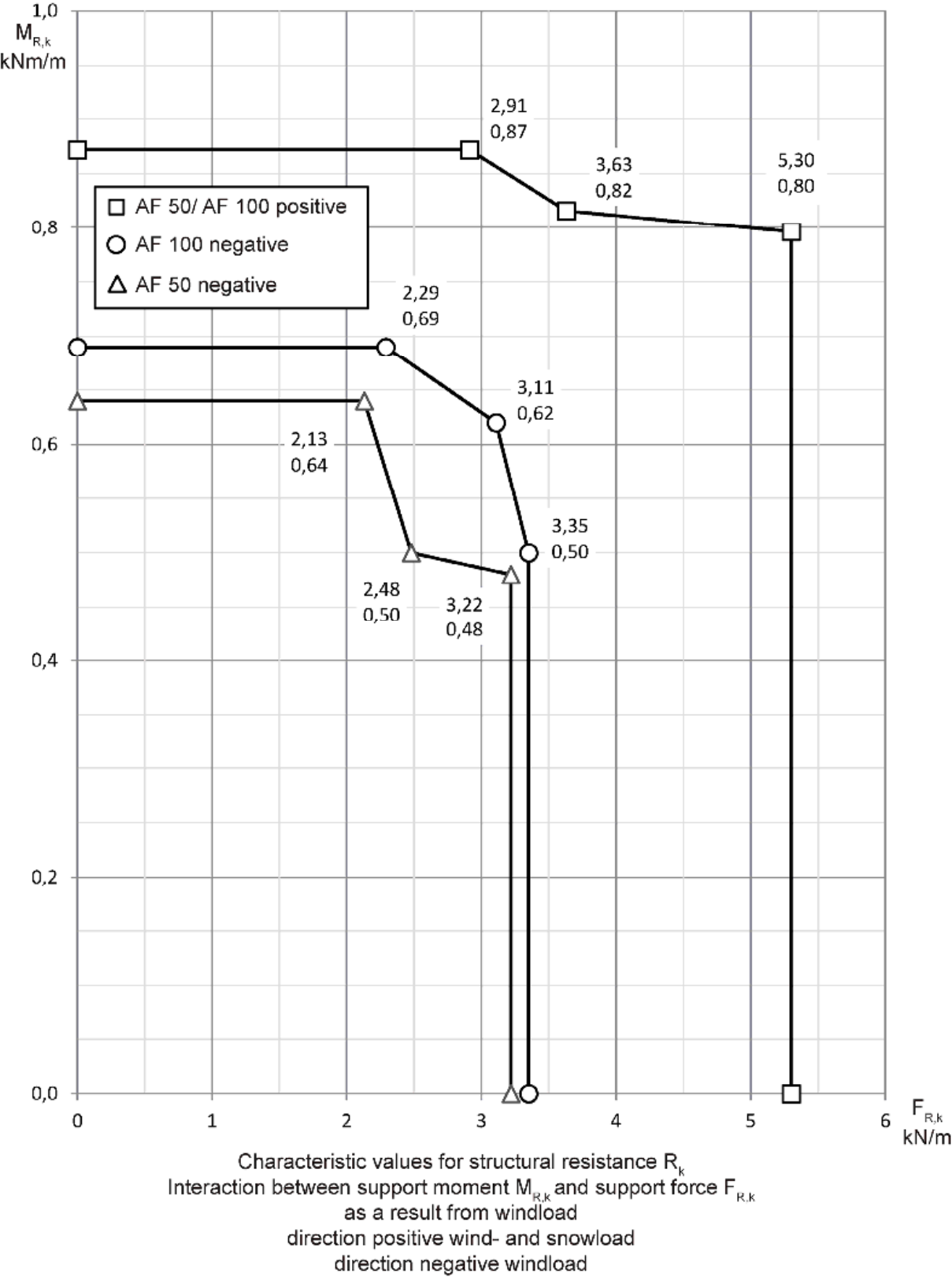


Characteristic values for structural resistance R_k
Interaction between support moment $M_{R,k}$ and support force $F_{R,k}$
as a result from windload
direction positive wind- and snowload
direction negative windload

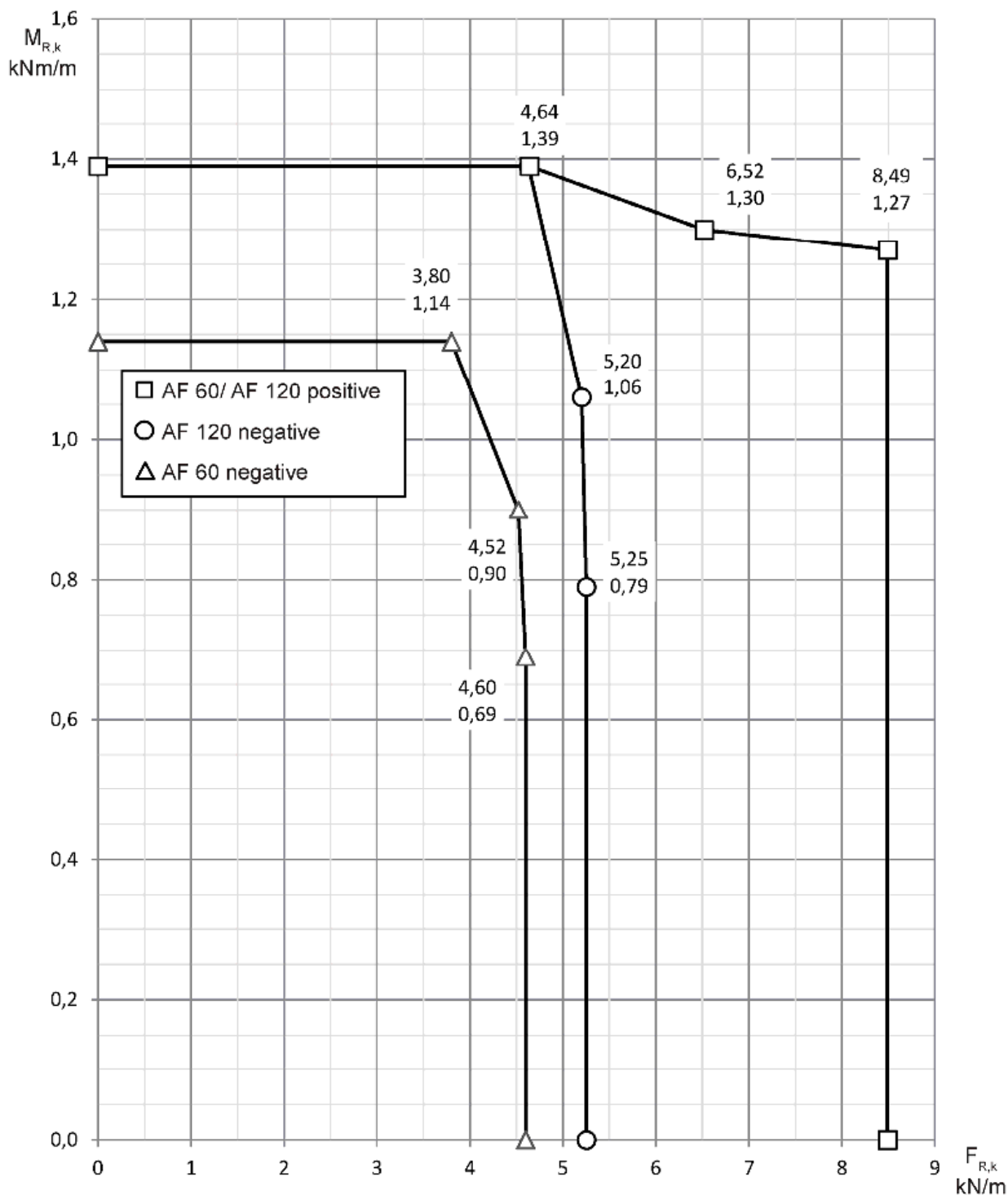
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characteristic values for structural resistance
multi-span system
PC 2540-7

Annex B 2.2.5



Rodeca LBE	Annex B 2.2.6
characteristic values for structural resistance multi-span system PC 2540-10	

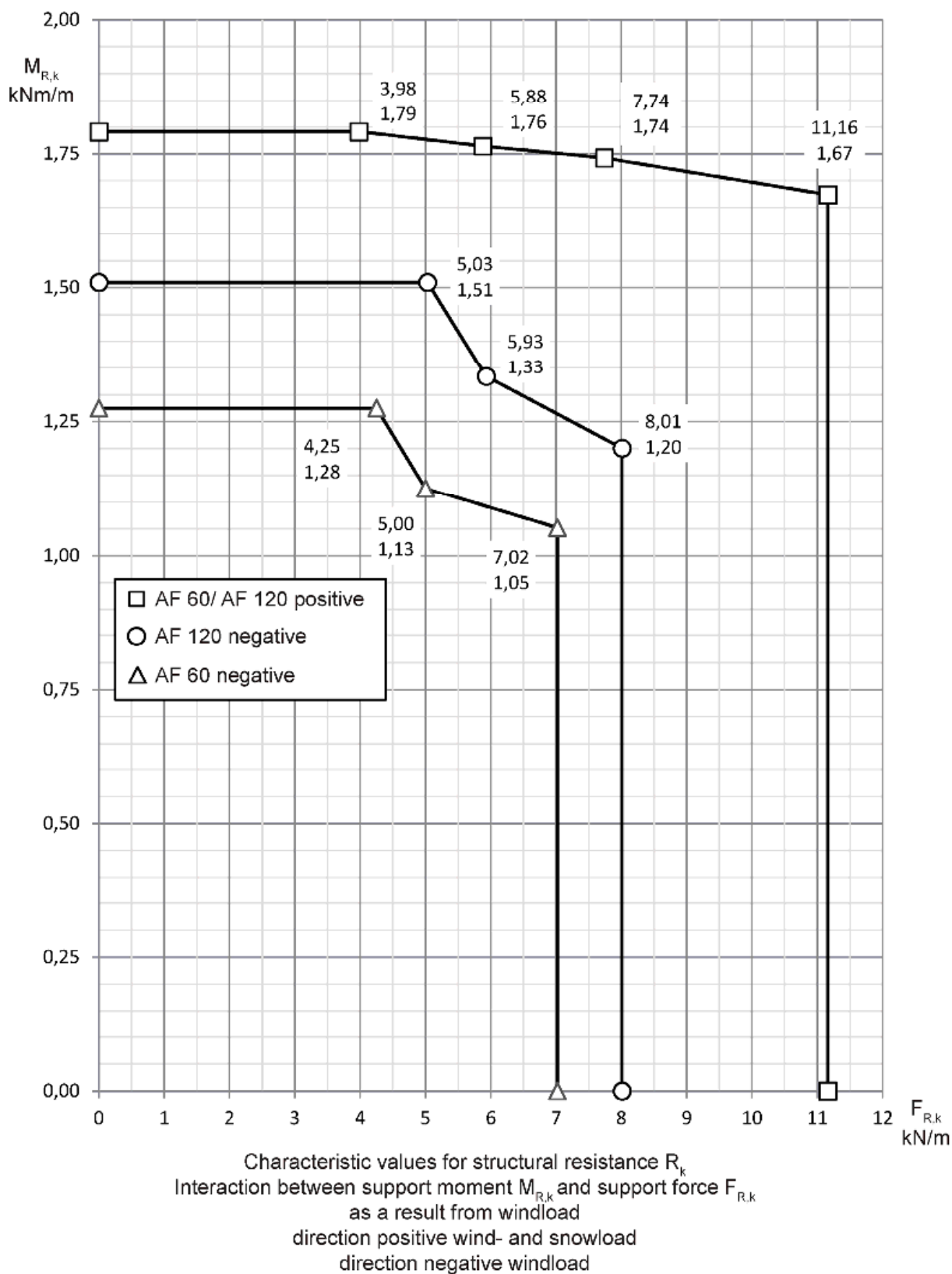


Characteristic values for structural resistance R_k
Interaction between support moment $M_{R,k}$ and support force $F_{R,k}$
as a result from windload
direction positive wind- and snowload
direction negative windload

Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2540-10 DX / PC 2540-10 DX HI

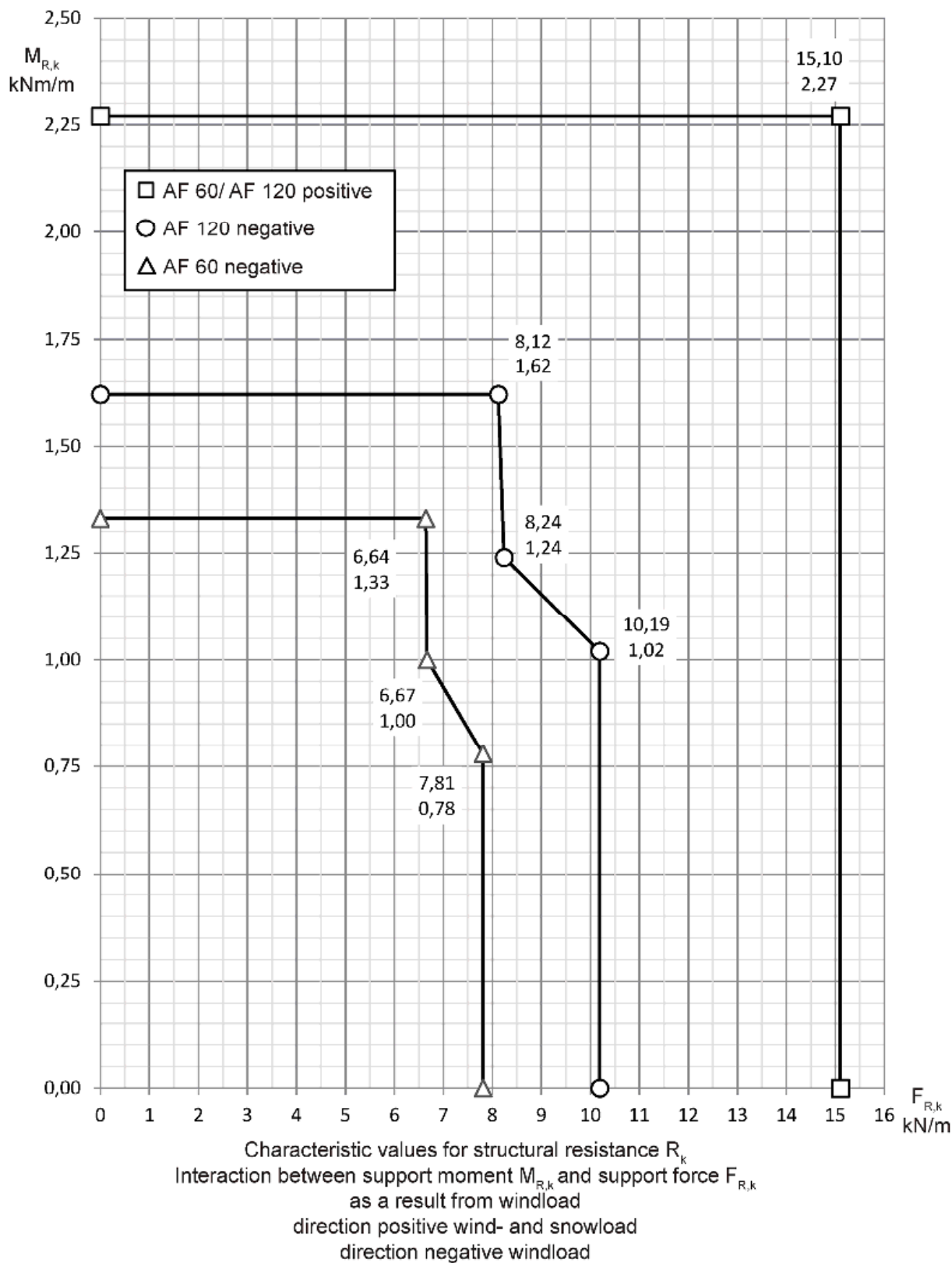
Annex B 2.2.7



Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2550-10

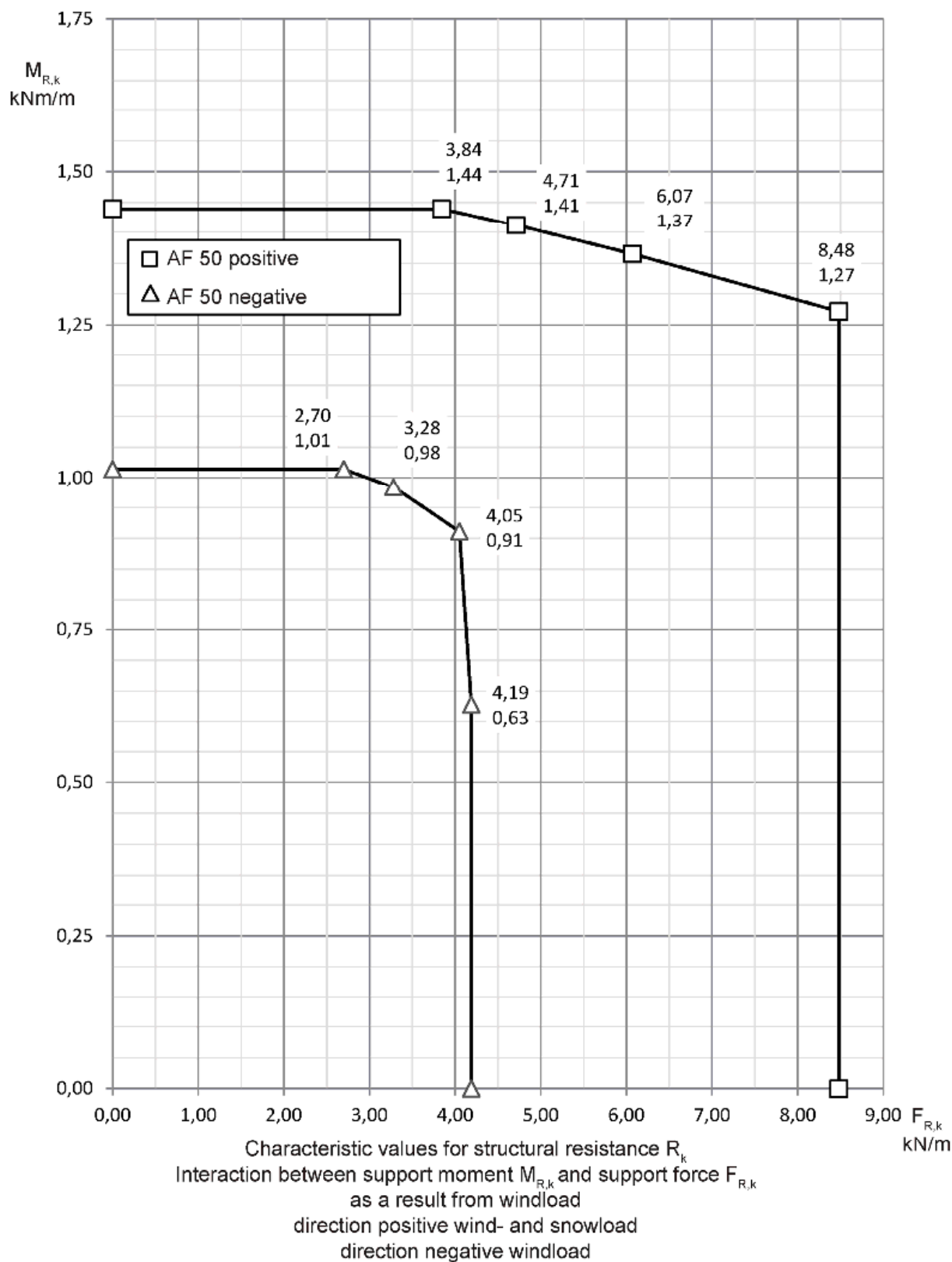
Annex B 2.2.8



Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2560-12

Annex B 2.2.9



Rodeca LBE

characteristic values for structural resistance
multi-span system
PC 2600-40-7-U

Annex B 2.2.10

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Annex C

Thermal resistance

C 1 Thermal transmittance coefficient

The thermal transmittance U_{cw} shall be determined in accordance with EN ISO 10077-1 as the resultant of the thermal transmittance coefficients of the covering profiles and the multi-wall sheets, weighted on the basis of the area as well as the length-weighted values of linear thermal transmittance coefficients of the multi-wall sheets at the level of covering profiles.

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

$$U_{cw} = \frac{\sum (U_f \cdot A_f) + \sum (U_p \cdot A_p) + \sum (\Psi_p \cdot l_p)}{A_{ges}} \text{ in } W/(m^2 \cdot K)$$

where:

- U_f : thermal transmittance coefficient of the covering profiles $W/(m^2K)$
- A_f : area of the covering profiles
- U_p : thermal transmittance coefficient of the PC multi-wall sheets incl. tongue and groove connection in $W/(m^2K)$
- A_p : visible surface of multi-wall sheets in m^2
- Ψ_p : linear thermal transmittance coefficient of multi wall sheets at the level of covering profiles in $W/(mK)$
- l_p : covering profile length in m
- A_{ges} : total area of the roof and wall kit in m^2

The values of thermal transmittance U_p of the multi wall sheets and U_f of the covering profiles shall be taken from Annex C 2.1 to C 2.4.

Linear thermal transmittance coefficient Ψ_p shall be assumed to $\Psi_p = 0$ (acc. EN ISO 10077-1). The punctiform thermal bridges of the lift anchors in continuous systems can be neglected. The roof and wall kit must be installed and connected to adjacent components so that thermal bridges are avoided whenever possible. These details are to be assessed by the designers in individual cases.

Thermal transmittance coefficients U_p of the multi-wall sheets 30mm

	Installation horizontal/vertical	
multi-wall sheet	installation horizontal	installation vertikal
PC 2333-30-6 acc. Annex A 4.0	$U_p = 1,4 \text{ (W/(m}^2\text{K))}$	$U_p = 1,3 \text{ (W/(m}^2\text{K))}$

Thermal transmittance coefficients U_p of the multi-wall sheets 40mm

	Installation horizontal/vertical	
multi-wall sheet	installation horizontal	installation vertikal
PC 2540-4 acc. Annex A 4.1	$U_p = 1,5 \text{ (W/(m}^2\text{K))}$	$U_p = 1,4 \text{ (W/(m}^2\text{K))}$
PC 2540-4-MC acc. Annex A 4.2	$U_p = 1,6 \text{ (W/(m}^2\text{K))}$	$U_p = 1,5 \text{ (W/(m}^2\text{K))}$
PC 2540-6 acc. Annex A 4.3	$U_p = 1,2 \text{ (W/(m}^2\text{K))}$	$U_p = 1,2 \text{ (W/(m}^2\text{K))}$
PC 2540-7 acc. Annex A 4.4	$U_p = 1,2 \text{ (W/(m}^2\text{K))}$	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$
PC 2540-10 acc. Annex A 4.5	$U_p = 1,0 \text{ (W/(m}^2\text{K))}$	$U_p = 1,0 \text{ (W/(m}^2\text{K))}$
PC 2540-10DX acc. Annex A 4.6	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$
PC 2540-10DX HI acc. Annex A 4.7	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$
PC 2600-40-7-U acc. Annex A 4.10	$U_p = 1,2 \text{ (W/(m}^2\text{K))}$	$U_p = 1,1 \text{ (W/(m}^2\text{K))}$

Linear thermal transmittance coefficients Ψ_p of the connection joint of multi-wall sheets

	$\Psi_p \text{ (W/(mK))}$
PC 2333-30-6 acc. Annex A 4.0	0,010 W/mK
PC 2540-4-MC acc. Annex A 4.2	0,0017 W/mK
PC 2540-6 acc. Annex A 4.3	0,011 W/mK
PC 2540-7 acc. Annex A 4.4	0,012 W/mK
PC 2540-10 acc. Annex A 4.5	0,014 W/mK
PC 2540-10 DX acc. Annex A 4.6	0,010 W/mK
PC 2540-10 DX HI acc. Annex A 4.7	0,010 W/mK
PC 2600-40-7-U acc. Annex A 4.10	0,0085 W/mK

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Thermal transmittance coefficients of the multi-wall sheets U_p

Annex C 2.1

Thermal transmittance coefficients U_f of the aluminium covering profiles

Profile no.	variants of profile	width	U_f (W(m ² K))
423040 acc. Annex A 3.0	profile without plastic insulation bar	50mm	6,0 (W(m ² K))
414001 acc. Annex A 3.1.3	profile without plastic insulation bar	101,5mm	5,6 (W(m ² K))
414002 acc. Annex A 3.1.3	profile without plastic insulation bar	101,5mm	5,6 (W(m ² K))
414011 acc. Annex A 3.1.4	profile without plastic insulation bar	70mm	6,1 (W(m ² K))
414012 acc. Annex A 3.1.4	profile without plastic insulation bar	70mm	6,1 (W(m ² K))
414051 acc. Annex A 3.1.4	profile without plastic insulation bar	70mm	0,90 (W(m ² K))
404051 acc. Annex A 3.1.1	profile without plastic insulation bar	70mm	0,84 (W(m ² K))
420031 acc. Annex A 3.1.5	profile without plastic insulation bar	50mm	6,5 (W(m ² K))
420040 acc. Annex A 3.1.6	profile without plastic insulation bar	50mm	5,9 (W(m ² K))
420080 acc. Annex A 3.1.7	profile without plastic insulation bar	80mm	5,0 (W(m ² K))
404062 acc. Annex A 3.1.2	profile without plastic insulation bar	100mm	5,6 (W(m ² K))
454001 acc. Annex A 3.1.9	profile with plastic insulation bar	101,5mm	2,1 (W(m ² K))
454002 acc. Annex A 3.1.9	profile with plastic insulation bar	101,5mm	2,9 (W(m ² K))
454011 acc. Annex A 3.1.10	profile with plastic insulation bar	70mm	2,5 (W(m ² K))
454012 acc. Annex A 3.1.10	profile with plastic insulation bar	70mm	3,3 (W(m ² K))
444062 acc. Annex A 3.1.8	profile with plastic insulation bar	154mm	2,0 (W(m ² K))

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Thermal transmittance coefficients of the aluminium covering profiles U_f

Annex C 2.2

Thermal transmittance coefficients U_p of the multi-wall sheet PC 2550-10

	installation horizontal/vertical	
PC 2550-10 acc. Annex A 4.8	installation horizontal	installation vertikal
	$U_p = 0,92 \text{ (W/(m}^2\text{K))}$	$U_p = 0,90 \text{ (W/(m}^2\text{K))}$

Linear thermal transmittance coefficients Ψ_p of the connection joint of multi-wall sheet PC 2550-10

$\Psi_p \text{ (W/(mK))}$	$\Psi_p = 0,020 \text{ (W/(mK))}$
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Thermal transmittance coefficients U_f of the aluminium covering profiles

Profile no.	variants of profile	width	$U_f \text{ (W/(m}^2\text{K))}$
415001 acc. Annex A 3.2.3	profile without plastic insulation bar	101,5mm	5,6 (W/(m ² K))
415002 acc. Annex A 3.2.3	profile without plastic insulation bar	101,5mm	5,6 (W/(m ² K))
415011 acc. Annex A 3.2.2	profile without plastic insulation bar	70mm	6,1 (W/(m ² K))
415051 acc. Annex A 3.2.2	profile without plastic insulation bar	70mm	0,89 (W/(m ² K))
415012 acc. Annex A 3.2.2	profile without plastic insulation bar	70mm	6,1 (W/(m ² K))
405051 acc. Annex A 3.2.1	profile without plastic insulation bar	85mm	0,75 (W/(m ² K))
455001 acc. Annex A 3.2.6	profile without plastic insulation bar	101,5mm	1,5 (W/(m ² K))
455002 acc. Annex A 3.2.6	profile with plastic insulation bar	101,5mm	2,3 (W/(m ² K))
455011 acc. Annex A 3.2.5	profile with plastic insulation bar	70mm	1,9 (W/(m ² K))
455012 acc. Annex A 3.2.5	profile with plastic insulation bar	70mm	2,8 (W/(m ² K))
445062 acc. Annex A 3.2.4	profile with plastic insulation bar	154,4mm	1,6 (W/(m ² K))

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Thermal transmittance coefficients of the multi-wall sheets U_p and
Thermal transmittance coefficients of the aluminium covering profiles U_f

Annex C 2.3

Thermal transmittance coefficients U_p of the multi-wall sheet PC 2560-12

	installation horizontal/vertical	
PC 2560-12 acc. Annex A 4.9	installation horizontal	installation vertical
	$U_p = 0,77 \text{ (W/(m}^2\text{K))}$	$U_p = 0,75 \text{ (W/(m}^2\text{K))}$

Linear thermal transmittance coefficients Ψ_p of the connection joint of multi-wall sheet PC 2560-12

$\Psi_p \text{ (W/(mK))}$	$\Psi_p = 0,0085 \text{ (W/(mK))}$
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Thermal transmittance coefficients U_f of the aluminium covering profiles

Profile no.	variants of profile	width	$U_f \text{ (W/(m}^2\text{K))}$
456001 acc. Annex A 3.3.5	profile with plastic insulation bar	101,5mm	1,2 (W/(m ² K))
456002 acc. Annex A 3.3.5	profile with plastic insulation bar	101,5mm	2,0 (W/(m ² K))
456011 acc. Annex A 3.3.4	profile with plastic insulation bar	70mm	1,6 (W/(m ² K))
456012 acc. Annex A 3.3.4	profile with plastic insulation bar	70mm	2,3 (W/(m ² K))
406051 acc. Annex A 3.3.1	profile without plastic insulation bar	90mm	0,73 (W/(m ² K))
416012 acc. Annex A 3.3.2	profile without plastic insulation bar	70mm	6,1 (W/(m ² K))
416011 acc. Annex A 3.3.2	profile without plastic insulation bar	70mm	6,1 (W/(m ² K))
416051 acc. Annex A 3.3.2	profile without plastic insulation bar	70mm	0,96 (W/(m ² K))
446062 acc. Annex A 3.3.3	profile with plastic insulation bar	154,4mm	1,5 (W/(m ² K))

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Thermal transmittance coefficients of the multi-wall sheets U_p and
Thermal transmittance coefficients of the aluminium covering profiles U_f

Annex C 2.4

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Annex D

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

D 1 Installation

The verification of aluminium covering profiles and lift anchors, their fixings as well as the verification of substructure is not subject of this ETA.

The stability shall be verified for the respective substructure in accordance with the valid European specifications. Before the roof and wall kit is installed, the dimensional stability of the substructure shall be checked.

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 installation of the roof and wall kit may only be performed by specialists who are specially trained for this purpose. The installation guidelines of the manufacturer shall be respected. If the roof and wall kit is installed in roof a minimum inclination of 5° is necessary. The manufacturer of the roof and wall kit shall inform the specialists that they may only carry out assembly and installation of the roof and wall kit in accordance with his instructions and the provisions of the ETA. The hollow chambers of the multi-wall sheets may not be filled.

If the translucent roof and wall kit can systematically come into contact with chemical substances, the resistance to these substances of the multi-wall sheets in particular must be checked. Connection of the translucent roof and wall kit to the substructure shall be carried out in accordance with the structural analysis. The multi-wall sheets are to be connected to an area of any size by means of a joint on the long sides. The multi-wall sheets are to be framed on end supports by aluminum covering profiles given in Annex A 2.1 to A 2.4. The set-in stated there is a minimum bearing width to be observed at all times. Installed as multi-span system the multi-wall sheets are fastened by lift anchors. The translucent roof and wall 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 and wall 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 and wall kit in installed condition is not a walk-on system. For installation purposes, the roof and wall kit may be walked on by a single person using boards laid across the substructure (at least two bearing profiles) for support.

To maintain the visual appearance the roof and wall kit is to clean in regular intervals to manufacturers instructions. Within the scope of maintenance, the installed roof and wall kit shall be visually inspected by the building's owner every two years. The manufacturer shall be consulted if the PC multi-wall sheets exhibit surface cracks or damage or if they are strongly discoloured. Repair shall be arranged where necessary.