ONDEX

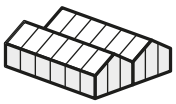
ONDEX
Stretch the future

The world leader in the BI-STRETCHED sheet in Polyvinyl Chloride

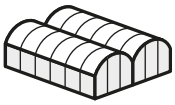
ONDEX BIO sheets

For single layer roofings, sidings and gables for greenhouse applications.

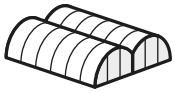
Reference GB26 011 - 11/2026



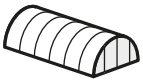
• Chapel and multi-chapel greenhouses with pitched roofs



• Chapel and multi-chapel greenhouses with curved roofs



• Multi-tunnel greenhouses

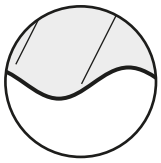


• Tunnel greenhouses

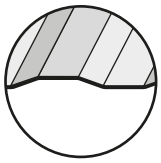
Profiles



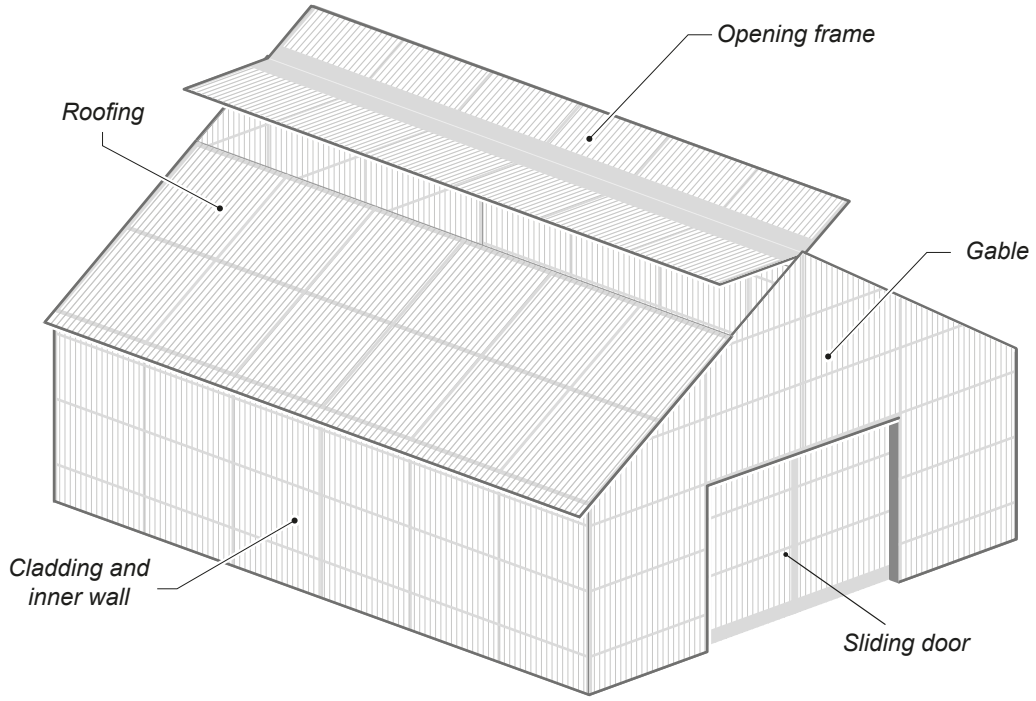
TOG
77 x 20



TO
76 x 18



GRECA
72 x 5



60° maxi

< 200 daN/m²

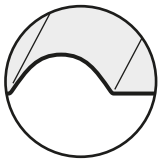
Alt. < 500 M

EN 13031

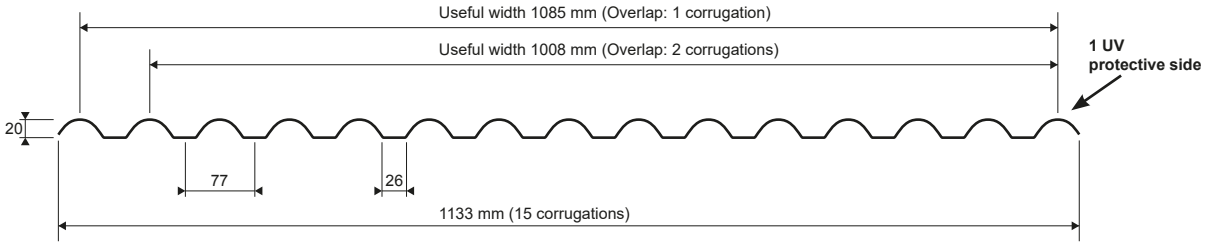
See page 3 for the meaning of the pictograms

Profiles

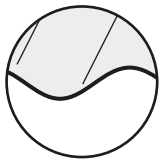
For roofing and all cladding applications



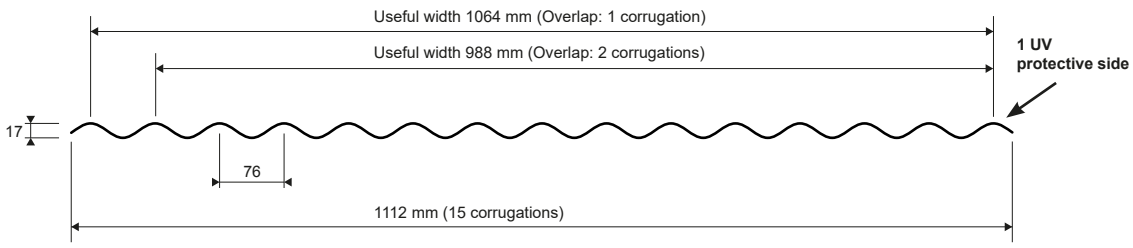
TOG
77 x 20



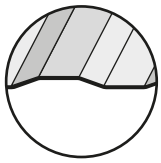
For roofing and all cladding applications



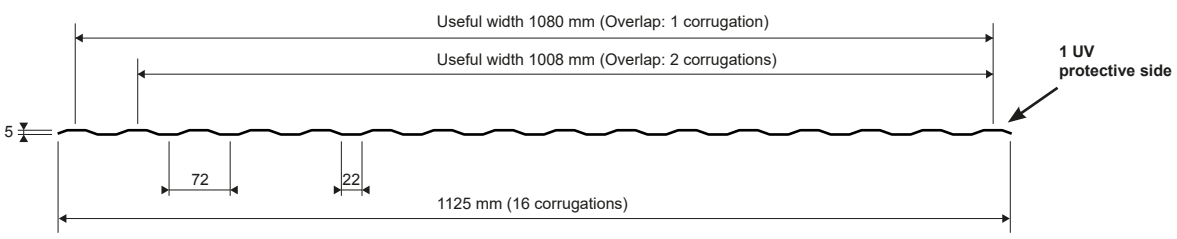
TO
76 x 18



For gable, door applications and refurbishment of glass greenhouses

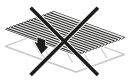


GRECA
72 x 5



Specifications	BIO 1		BIO 2			BIO 3	
	TOG 77 x 20	**TO** 76 x 18	**TOG** 77 x 20	**TO** 76 x 18	**GRECA** 72 x 5	**TOG** 77 x 20	**TO** 76 x 18
Thickness in mm (nominal)	**0,7**		**0,9**			**1.0**	
Length in m	*Standard up to 8.50 m (Please contact us for greater lengths)*						
Weight in kg/m² (nominal)	1.1	1.1	1.45	1.45	1.45	1.6	1.6
Colours corresponding light transmission	90% crystal, 80% diffusing crystal, 50% opal, white opaque (none 0%)						
Fire rating	B s1 d0						
Heat loss coefficient	6.8 W/m²°C		5.7 W/m²°C			5.7 W/m²°C	
Coefficient of linear expansion ASTM D 696 mm/mm °C	6.1×10^{-5}						
Impact and tensile strength DIN 53488	≥ 1200 kJ/m²						
Modulus of elasticity ISO R 527	32000± 2000 daN/cm²						
Breaking stress ISO R 527	700 to 900 daN/cm²						
Bending radius	TOG : 3.0 m minimum ; TO : 2.5 m minimum						
Minimum slope	10%						

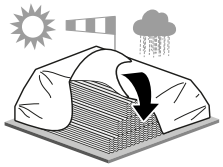
The Ten Commandments

 The temperature of the ventilated sheet must not exceed the recommended temperatures.	 Do not exceed the recommended wind conditions.	 Do not install above the recommended altitudes.	 Stability and safety standards for greenhouse construction	 Protect the sheets from sunlight, wind and rain with an opaque white polyethylene tarpaulin during storage and throughout the installation.
 Identify the UV protected side(s)* - 1 or 2 sides.	 Do not step directly on the sheets.	 Drill and use screws and accessories in accordance with the manufacturer's recommendation.	 Check the distance between purlin support centres according to the loads (snow/wind).	 The sheets must not be used to form dual walls over horticultural glass, film or insulating products.

*The sheet outer side features the product label and a laser marking.

Behaviour in response to sources of heat





Storage

Protect the sheets from sunlight, wind and rain with an opaque white polyethylene tarpaulin during storage.

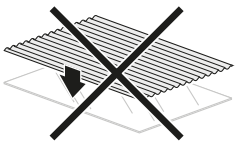
The following precautions must be observed in presence of great sources of heat:

- The ONDEX BIO sheets must not be placed in contact with heating pipes or hot-air outlets.
- The sheets must not be placed close to a boiler.
- The projection of incandescent ash (oil fired heating system or coal heating, etc.) should be avoided, since this could cause local burn spots on the sheets.
- Operate the greenhouse (air renewal, etc.) so that the sheet temperature does not exceed 60°C. Incidentally the plants would not survive it subjected to such a treatment (See § III.5)

Do not use any temporary shading system (fabric) or dropped ceiling underneath the ONDEX BIO sheets.
Do not place any insulating product, opaque tarpaulin or suspended ceiling directly underneath or very close to the ONDEX BIO sheets.

Storage

On site the pallets can be stacked up to 1 m high (the longest pallet should be at the bottom).



Installation

The sheets must not be used to form dual walls over horticultural glass, film or insulated products.

Shading systems

The potential inner shading systems such as nets can be stretched horizontally between the gutters. They must not follow the sheet slope. It is imperative that there is enough space between the sheets and the nets to allow free air circulation and a good ventilation so as to maintain a temperature below 60°C.
To maintain temperatures within the limits set we advise to make an opening on the gables, the tympanums or the ridge.
Regarding greenhouse outer shading systems the nets must be fixed to a dedicated metallic structure. The nets distance must be approx. 40 cm from the gutters and 60 cm from the ridge. The shading nets must under no circumstances be in contact with the ONDEX BIO sheets.

Shading product (lime washing)

The ONDEX BIO sheets can be shaded with slaked lime. Other products can be used if they are suitable for PVC. It is recommended to carry out preliminary compatibility tests.

Cleaning of the sheets

Clean the ONDEX BIO sheets with cold or lukewarm water (max. 30°C).
It is possible to use a non-abrasive liquid detergent suitable for PVC. Using a high pressure jet cleaner is possible (150 bar).
It is recommended to clean the ONDEX BIO sheets regularly (approx. once a year) or as soon as necessary to guarantee their performances.

Important:

- Do not use any abrasive or aggressive products for PVC.
- Do never steam clean.
- Do not scrub with brushes, steel wool or any other sharp or abrasive devices.

The structure



EN 13031

The structures in contact with the ONDEX BIO sheets must be a light colour, with an absorption coefficient < 0.7 to prevent any overheating or localized expansion. The timber purlins must be painted white. The supports in galvanized steel and in aluminium can be left raw.
The section of the secondary frameworks must be established in accordance with the calculation methods for materials

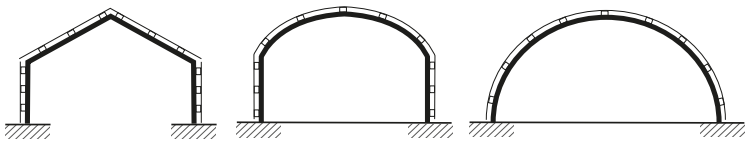
The width of the purlin supports is 25 mm for a metal purlin and 40 mm for a wooden one.
When a glass chapel greenhouse with pitched roof is refurbished, small wooden structural elements must be removed and the greenhouse has to be prepared as previously mentioned.
The bearing surfaces will be flat and parallel. The framework will be perfectly aligned.

• Standards for load-bearing components
The ONDEX BIO sheets must be installed on supporting frame structures in compliance with the technical regulations in force at the time (greenhouse standards, calculation methods for materials).
The ONDEX BIO sheets do not contribute to the stability of greenhouses: it is left to the bearing structure.

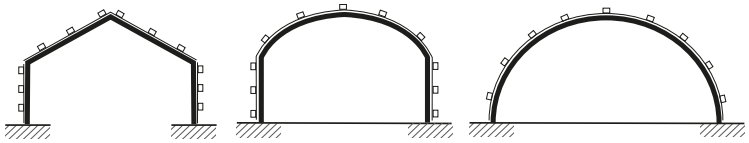
• Anchoring to the ground
The greenhouse resistance to snow (pressure) and wind (depressure) loads must be guaranteed by the framework and its anchor regardless of the sheets.

• Greenhouse framework and structure
The ONDEX BIO 2 sheets are installed on purlins or struts.
The secondary structure must be aligned with or above (never underneath) the curve or angle of the main structure.

Fastening type A - B - C - E



Fastening type D fastening with pressure bar



• The loads



Snow downward loads for a deflection equal to 1/50th of the span, safety factor = 3 for an overlap: 1 or 2 corrugations (load in daN/m^2 - distance between purlin support centres in cm)

LOADS	BIO 1				BIO 2				BIO 3			
	TOG 77 x 20		TO 76 X 18		TOG 77 x 20		TO 76 x 18		TOG 77 x 20		TO 76 x 18	
	Pitched roof	Curved roof	Pitched roof	Curved roof	Pitched roof	Curved roof	Pitched roof	Curved roof	Pitched roof	Curved roof	Pitched roof	Curved roof
50	130	130	110	110	140	140	120	120	150	150	130	130
60	130	130	103	110	140	140	120	120	150	150	130	130
70	130	130	88	96	137	140	114	120	142	150	126	130
80	127	130	77	84	131	140	99	108	136	148	111	121
90	122	130	69	75	126	137	88	96	131	143	98	107
100	117	128	62	68	122	133	80	87	126	137	88	96
110	114	124	56	61	118	129	72	79	122	133	80	87
120	111	121	52	57	115	125	66	72	119	130	74	81
130	108	118	48	52	112	122	61	67	116	126	68	74
140	105	114	44	48	109	119	57	62	113	123	63	69

Snow downward loads for a deflection equal to 50 mm, safety factor = 3 for an overlap: 2 corrugations (load in daN/m² - distance between purlin support centres in cm)

LOADS	BIO 1				BIO 2				BIO 3			
	TOG 77 x 20		TO 76 X 18		TOG 77 x 20		TO 76 x 18		TOG 77 x 20		TO 76 x 18	
	Pitched roof	Curved roof	Pitched roof	Curved roof	Pitched roof	Curved roof	Pitched roof	Curved roof	Pitched roof	Curved roof	Pitched roof	Curved roof
60	130	130	103	110	140	140	120	120	150	150	130	130
70	130	130	88	96	140	140	114	120	150	150	126	130
80	130	130	77	84	140	140	99	108	150	150	111	121
90	130	130	69	75	140	140	88	96	150	150	98	107
100	130	130	62	68	140	140	80	87	150	150	88	96
110	130	130	56	61	140	140	72	79	150	150	80	87
120	130	130	52	57	140	140	66	72	143	150	74	81
130	127	130	48	52	137	140	61	67	140	150	68	74
140	118	129	44	48	133	140	57	62	138	150	63	69

Wind uplift loads for a deflection equal to 1/50th of the span, safety factor = 3 for an overlap: 1 corrugation (load in daN/m² - distance between purlin support centres in cm)

LOADS	BIO 1						BIO 2						BIO 3					
	TOG 77 x 20			TO 76 X 18			TOG 77 x 20			TO 76 x 18			TOG 77 x 20			TO 76 x 18		
	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding
60	130	130	130	110	110	110	140	140	140	120	120	120	148	150	150	130	130	130
70	130	130	130	110	110	110	136	140	140	120	120	120	141	150	146	130	130	130
80	125	130	129	110	110	110	130	140	135	120	120	120	135	147	140	125	130	129
90	120	130	124	107	110	110	125	136	129	116	120	120	129	141	133	120	130	124
100	116	126	120	103	110	107	121	132	125	112	120	116	125	136	129	116	126	120
110	113	123	117	100	109	103	117	128	121	109	119	113	121	132	125	113	123	117
120	109	119	113	97	106	100	114	124	118	106	116	110	118	129	122	109	119	113
130	106	116	110	95	104	98	111	121	115	103	112	107	114	124	118	106	116	110
140	104	113	108	92	100	95	108	118	112	100	109	103	112	122	116	104	113	108
150	102	111	106	90	98	93	105	114	109	98	107	101	109	119	113	102	111	106
160	99	108	102	88	96	91	103	112	107	96	105	99	107	117	111	99	108	102
170	97	106	100	86	94	89	101	110	105	94	102	97	105	114	109	97	106	100
180	92	100	95	85	93	88	99	108	102	92	100	95	103	112	107	96	105	99
190	87	95	90	83	90	86	97	106	100	91	99	94	101	110	105	94	102	97
200	83	90	86	82	89	85	93	101	96	89	97	92	99	108	102	92	100	95

Wind uplift loads for a deflection equal to 50 mm, safety factor = 3 for an overlap: 2 corrugations (load in daN/m² - distance between purlin support centres in cm

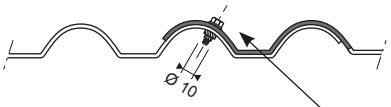
LOADS	BIO 1						BIO 2						BIO 3					
	TOG 77 x 20			TO 76 X 18			TOG 77 x 20			TO 76 x 18			TOG 77 x 20			TO 76 x 18		
	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding	Pitched roof	Curved roof	Siding
120	130	130	130	110	110	110	138	140	140	120	120	120	142	150	147	130	130	130
130	127	130	130	110	110	110	136	140	140	120	120	120	139	150	144	130	130	130
140	118	129	122	110	110	110	133	140	138	120	120	120	137	149	142	130	130	130
150	110	120	114	110	110	110	124	135	128	120	120	120	134	146	139	127	130	130
160	103	112	107	106	110	110	116	126	120	120	120	120	129	141	133	125	130	129
170	97	106	100	100	109	103	109	119	113	120	120	120	121	132	125	123	130	127
180	92	100	95	94	102	97	103	112	107	118	120	120	115	125	119	122	130	126
190	87	95	90	89	97	92	98	107	101	115	120	119	109	119	113	120	130	124
200	83	90	86	85	93	88	93	101	96	109	119	113	103	112	107	118	129	122

Installation

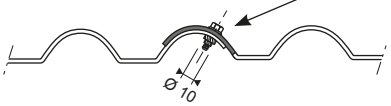
- TOG 77 x 20 and TO 76 x 18
For roofing and cladding applications

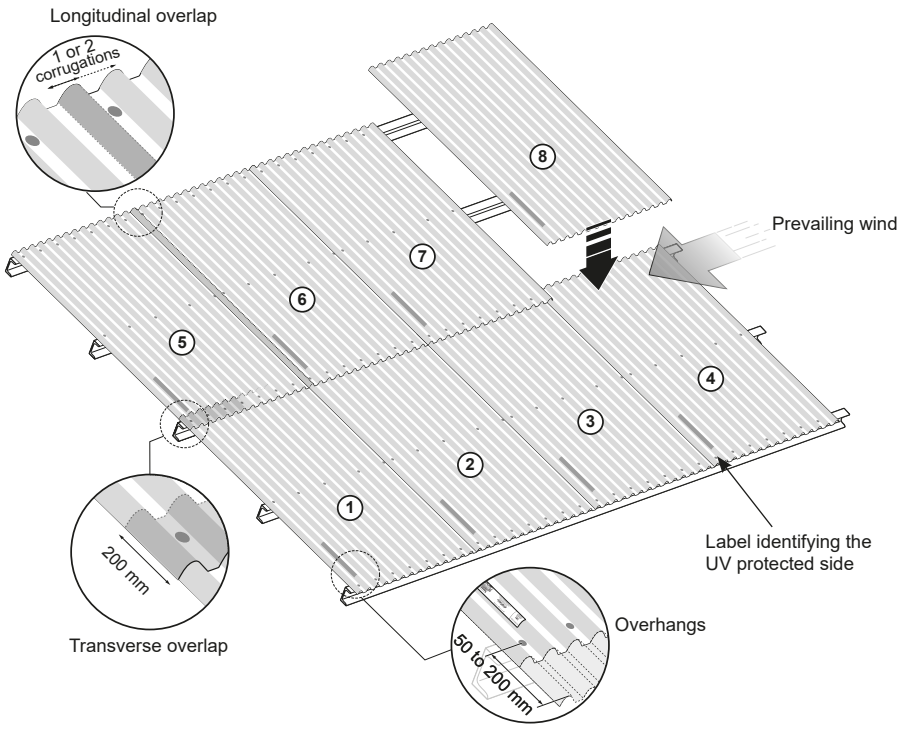
- GRECA 72 x 5
For cladding applications

Overlap: 2 corrugations and seaming



Overlap: 1 corrugation and seaming





If the distance between purlin support centres is > 80 cm, it is receommended to put a plasteseam 11



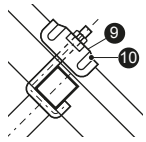
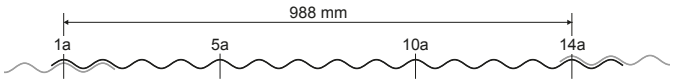
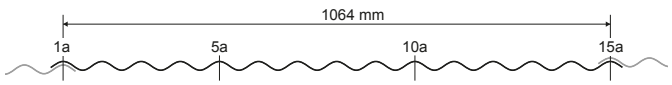
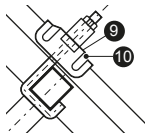
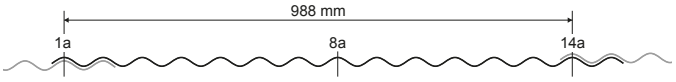
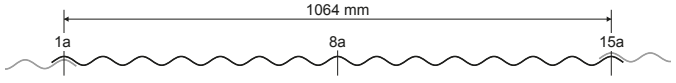
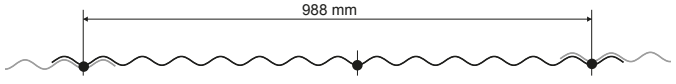


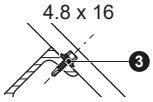
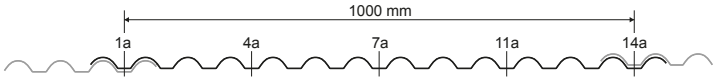
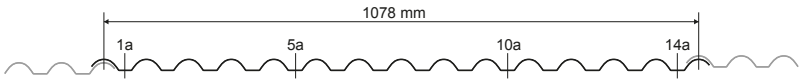
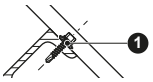
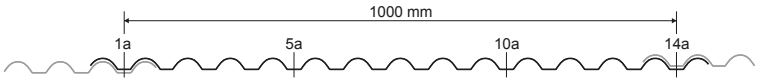
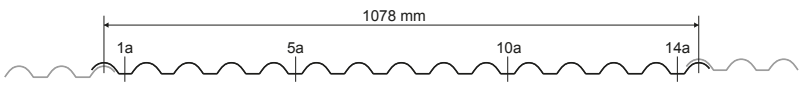
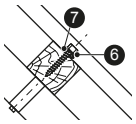
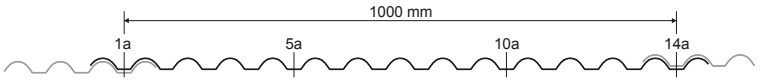
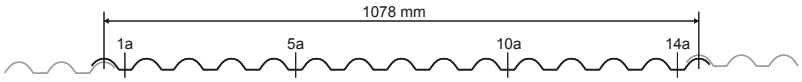
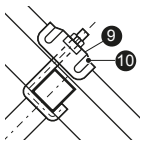
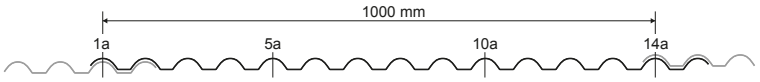
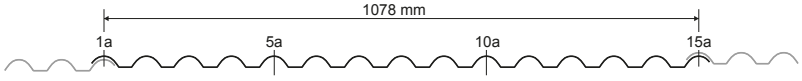
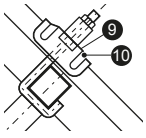
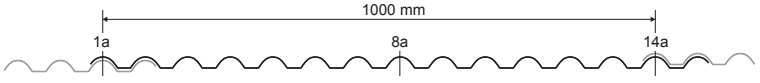
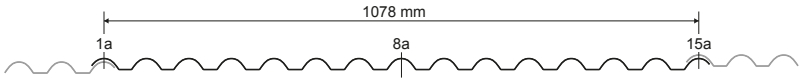
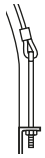
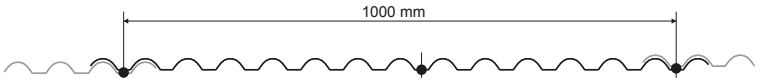


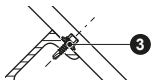
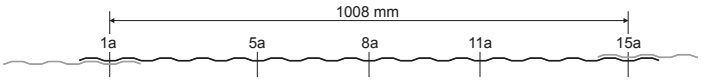
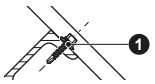
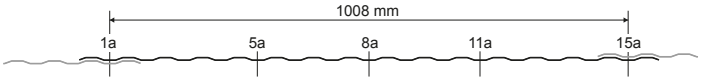
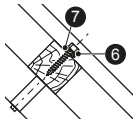
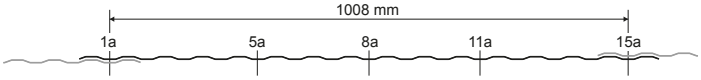




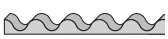
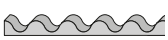
Distribution of the fastenings

Fastening type and overlap		TO 76 x 18	
		For roofing and cladding applications	
		Intermediate purlins	Eave, gutter, ridge purlins and width overlaps
Type C Crown 	2 corrugations	 988 mm; 1a; 5a; 10a; 14a	Every 2 crowns
	1 corrugation	 1064 mm; 1a; 5a; 10a; 15a	
Type D Pressure bars 	2 corrugations	 988 mm; 1a; 8a; 14a	
	1 corrugation	 1064 mm; 1a; 8a; 15a	
Type E Cables 	2 corrugations	 988 mm	
	1 corrugation	N/A	

Fastening type and overlap		TOG 77 x 20 For roofing and cladding applications Intermediate purlins	Eave, gutter, ridge purlins and width overlaps
Type A Trough Metal purlin with screws 4.8 x 16 	2 corrugations		Every 2 troughs
	1 corrugation		
Type A Trough Metal purlin with screws 6.3 x 22 	2 waves		
	1 wave		
Type B Trough Wooden purlin 	2 corrugations		
	1 corrugation		
Type C Crown 	2 waves		Every 2 crowns
	1 wave		
Type D Pressure bars 	2 corrugations		Every 2 troughs
	1 corrugation		
Type E Cables 	2 corrugations		
	1 corrugation	N/A	

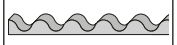
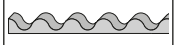
Fastening type and overlap		GRECA 72X5	
		For cladding application	
		Intermediate sill purlins	Upper and lower sill purlins
Type A Trough Metal purlin with screws 4.8 x 16 	2 corruga-tions		Every 2 troughs
Type A Trough Metal purlin with screws 6.3 x 22 	2 corruga-tions		Every 2 troughs
Type B Trough Timber purlin 	2 corruga-tions		Every 2 troughs

Fastening accessories

N°	References	Sketch	Description	Packaging
1	11 252		Zinc steel screw 6,3x22 + Washer VA 19 - steel support < 6 mm	100 units per packaging
2	11 272		Steel screw 6,5x22 + Washer VA 19 - timber support	100 units per packaging
3	11 271		Screw 4,8 x 16 + Washer VA16 - steel support < 4 mm	100 units per packaging
4	11 270		Steel screw 6,3 x 38 - steel support < 6 mm	100 units per packaging
5	11 350		Steel screw 6,3 x 50 - steel support < 6 mm	100 units per packaging
6	11 351		Steel screw 6,3 x 50 - timber support	100 units per packaging
7	11 266		Washer VA 19 x 6,5 x thickness 2 mm	100 units per packaging
8	03 757		Washer VA 16 x 6,5 x thickness 2 mm	100 units per packaging
9	20 686 20 538 20 665 11 408		TO Galvanized steel saddle 40 x 28 ø 6,5 TO Pre-painted Galvanized steel saddle WHITE Ral 9010 TOG Galvanized steel saddle TOG Pre-painted Galvanized steel saddle WHITE Ral 9010	100 units per packaging
10	20 660		PVC washer SH60 (20 x 5 x thickness 3 mm)	100 units per packaging
11	09 270		Stainless steel plasteseam A2 - M5 x 20 - ø. 9.6	100 units per packaging
12	11 407		PE foam TOG closer PE WHITE with adhesive	25 linear meters per packaging
13	05 436		PE foam TOG closer PE WHITE non-adhesive	25 linear meters per packaging
14	11 295		Foam washer WHITE 25 x 10 with adhesive	10 linear meters per packaging
15	11 294		Foam washer WHITE 25 x 5 with adhesive	10 linear meters per packaging

Fastening details according to the profile

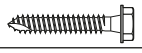
Profile TOG 77/20

N°	References	Sketch	Description	Packaging
Roof fastening				
❾	20 665 11 408		TOG Galvanized steel saddle TOG Pre-painted Galvanized steel saddle WHITE Ral 9010	100 units per packaging
❿	20 660		PVC washer SH60 (20 x 5 x thickness 3 mm)	100 units per packaging
❹	11 270		Steel screw 6,3 x 50 - steel support < 6 mm	100 units per packaging
❺	11 350		Steel screw 6,3 x 50 - steel support < 6 mm	100 units per packaging
❻	11 351		Washer VA 19 x 6,5 x thickness 2 mm - timber support	100 units per packaging
Cladding fastening				
❸	11 271		Screw 4,8 x 16 + Washer VA16 - steel support < 4 mm	100 units per packaging
❶	11 252		Zinc steel screw 6,3x22 + Washer VA 19 - steel support < 6 mm	100 units per packaging
❷	11 272		Steel screw 6,5x22 + Washer VA 19 - timber support	100 units per packaging
❷bis	20 697		Steel screw 6,5x35 + Washer VA 16 - timber support	100 units per packaging
❻	11 351		Steel screw 6,3 x 50 - timber support	100 units per packaging
❼	11 266		Washer VA 19 x 6,5 x thickness 2 mm	100 units per packaging
❽	03 757		Washer VA 16 x 6,5 x thickness 2 mm	100 units per packaging
⓫	09 270		Stainless steel plasteseam A2 - M5 x 20 - ø. 9.6	100 units per packaging
⓬	11 407		PE foam TOG closer PE WHITE with adhesive	25 linear meters per packaging
⓭	05 436		PE foam TOG closer PE WHITE non-adhesive	25 linear meters per packaging
⓮	11 295		Foam washer WHITE 25x10 with adhesive	10 linear meters per packaging

Profile TO 76/18

N°	References	Sketch	Description	Packaging
Roof fastening				
9	20 686 20 538		TO Galvanized steel saddle 40x 28 ø 6,5 TO Pre-painted Galvanized steel saddle WHITE Ral 9010	100 units per packaging
10	20 660		PVC washer SH60 (20 x 5 x thickness 3 mm)	100 units per packaging
4	11 270		Steel screw 6,3 x 38 - steel support < 6 mm	100 units per packaging
5	11 350		Steel screw 6,3 x 50 - steel support < 6 mm	100 units per packaging
6	11 351		Steel screw 6,3 x 50 - timber support	100 units per packaging
Cladding fastening				
3	11 271		Screw 4,8 x 16 + Washer VA16 - steel support < 4 mm	100 units per packaging
1	11 252		Zinc steel screw 6,3x22 + Washer VA 19 - steel support < 6 mm	100 units per packaging
2	11 272		Steel screw 6,5x22 + Washer VA 19 - timber support	100 units per packaging
2bis	20 697		Steel screw 6,5x35 + Washer VA 16 - timber support	100 units per packaging
6	11 351		Steel screw 6,3 x 50 - timber support	100 units per packaging
7	11 266		Washer VA 19 x 6,5 x thickness 2 mm	100 units per packaging
8	03 757		Washer VA 16 x 6,5 x thickness 2 mm	100 units per packaging
11	09 270		Stainless steel plasteseam A2 - M5 x 20 - ø. 9.6	100 units per packaging

Profile GRECA 72/5 - for inner walls and sliding doors

N°	References	Sketch	Description	Packaging
3	11 271		Screw 4,8 x 16 + Washer VA16 - steel support < 4 mm	100 units per packaging
1	11 252		Zinc steel screw 6,3x22 + Washer VA 19 - steel support < 6 mm	100 units per packaging
2	11 272		Steel screw 6,5x22 + Washer VA 19 - timber support	100 units per packaging
2bis	20 697		Steel screw 6,5x35 + Washer VA 16 - timber support	100 units per packaging
6	11 351		Steel screw 6,3 x 50 - timber support	100 units per packaging
7	11 266		Washer VA 19 x 6,5 x thickness 2 mm	100 units per packaging
8	03 757		Washer VA 16 x 6,5 x thickness 2 mm	100 units per packaging
11	09 270		Stainless steel plasteseam A2 - M5 x 20 - ø. 9.6	100 units per packaging
14	11 295		Foam washer WHITE 25x10 with adhesive	10 linear meters per packaging
15	11 294		Foam washer WHITE 25x -5 with adhesive	10 linear meters per packaging

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