VistaClad™

Cladding inspired by nature

VISTACLAD INFINITY TECHNICAL DATA SHEET

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VistaClad Infinity

The VistaClad lightweight bamboo composite cladding system is revolutionising how cladding works with an innovative clip strip which locks boards into place using reliable dual clip technology. VistaClad is available in a range of colours and finishes, as a complete cladding system with optional trim and accessories, and designed for ease of installation. Backed by an industry-leading warranty, this low-maintenance, weather resistant cladding is a smart, cost-efficient investment in your project, and a sustainable investment in our planet.

Product name: VistaClad
Product use: Primarily used in cladding, façades, screens, and similar applications
Material: Infinity
Material description: Co-extruded profiles with a cellulose-polymer composite core

Document layout

Eva-Last strives to evaluate their products in depth and present the technical and safety information available in a manner that assists with the application thereof. If additional data or information is required, please do not hesitate to contact us at **rad@eva-last.com**.

In an attempt to simplify the information, similar data is loosely grouped into the categories summarised below. This document is ordered according to these categories and the applicable page number for the start of each section captured in the Table of contents on page above.

- Material
- Physical properties
- Mechanical properties
- Thermal properties
- Fire reaction properties
- Weathering properties
- Surface properties

The material compositions section captures a summary of the product make-up from the Material Safety Data Sheet (MSDS). A link to the MSDS is provided for additional detail. Summaries of chemical compliance data available are also collected in this section.

The physical properties section provides a summary of available profiles and general material properties such as density, water absorption, etc. Additional profile information can be obtained from drawings in the appropriate **Appendix A**. Where possible, material properties that can be assigned to more specific categories are moved to the relevant section.

The mechanical properties section captures data related to the products reaction to various load conditions. The section is broadly assembled into the below categories. Additional profile and sectional information are captured by the drawings in the appropriate Appendix.

- Material specific mechanical properties
- Profile specific mechanical properties
- Sectional properties

Product properties such as the expansion coefficient, thermal resistance, etc. are captured, where applicable, in the thermal properties section.

Information regarding the product's reaction to fire is captured in the fire reaction properties section.

Test data relating to the acoustic performance of the product is summarised in the acoustic properties section.

Information on the products resistance to mold, termites, etc. is collected in the biodegradation properties section.

The surface properties section summarises information regarding the finish or texture of the product. Test data on aspects such as slip resistance (where applicable) is captured in this section.

Where the products form part of a system and, as a result, utilise other components, an additional section to capture useful data regarding these components has been added to this document.

Where information is not yet available, the section has been omitted. In the cases where information can be substituted or supplemented with alternative data (based on similar compositions, etc.) an attempt to do so is made. Where this is the case, it is highlighted. Please make use of the data accordingly. For any additional information regarding this, please feel free to contact **rad@eva-last.com**.

Ensure the product and application thereof is suitable, rational, and compliant with any applicable regulations or standards. Wherever necessary, consult a suitably qualified professional. For information about the installation and use of the product, please see the applicable Installation Guide (IG). For additional material safety and handling information, please refer to the applicable MSDS. For any further information, please contact **rad@eva-last.com**.

Material composition

The following table is a simplified material composition for the Infinity technology. For more information regarding the composition, safety, and handling of the material, please see the **Infinity MSDS**. To confirm which substances are compatible, or incompatible, with the product, please refer to **Appendix C**.

Component	Substance	Weight percentage
Cap and core	Polyethylene (PE)	62%
	Cellulose fibre (Bamboo fibres)	28%
	Calcium carbonate	4%
Additional additives	Other	6%

Material Compliance

Infinity has been assessed to determine whether it contain Substances of Very High Concern (SVHC) that may be classified as carcinogenic, mutagenic, or toxic to reproduction of humans or animals, or have a persistent, cumulative, or negative impact on the environment in accordance with European REACH (Registration, Evaluation, and Authorization of Chemicals) regulations.

Compliance report	Result	Issue date	Compliance body	Information
SVHC compliance	Pass	2019-06	EU REACH	Of the 197 substances evaluated, non-have been detected. SVHC concentration require detection levels of less than 0.05% of the whole product. See this **link** for the full list of substances.

Physical properties

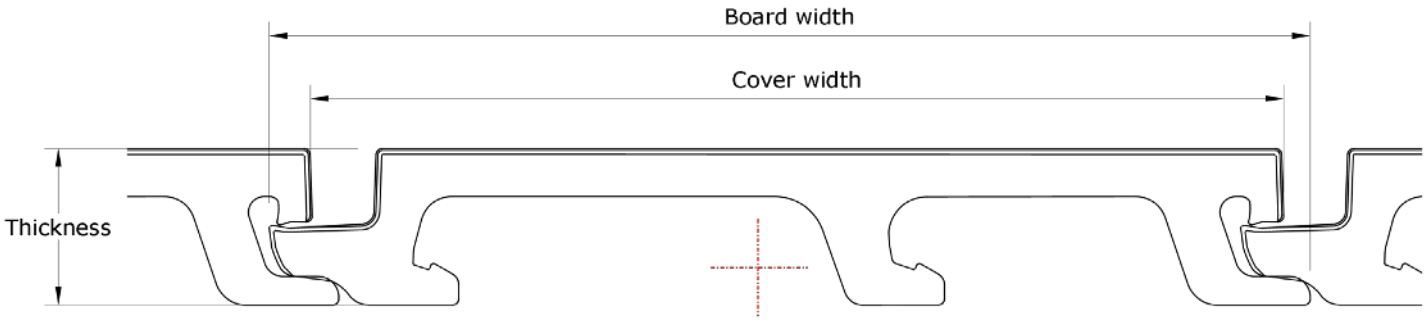
General material properties

Typical properties of the Infinity material technology are captured below as an indication of the expected behaviour of the Infinity material.

Properties	Results	Requirement	Test method	Information
Density	1 250 to 1 300 kg/m^2		EN 15534-1	Based on tests performed upon STGJOTG01
Moisture content	0.2%	Less than 5%	EN 15534-1 for 28 days	Infinity materials were evaluated for water absorption properties in accordance with the test method listed to determine dimensional stability. See the report **here** for further details.
Water absorption (Mass)	0.6%	Less than 7%		
Thickness swell (Dimensional)	0.2%	Less than 5%		
Length swell (Dimensional)	0.1%	Less than 0.6%		
Width swell (Dimensional)	0%	Less than 1.2%		

Profile properties

The following table is a summary of the currently available profiles, please see **Appendix A** for profile drawings.



Profile ID	Width (mm)	Thickness (mm)	Mass (kg/m)	Cover width (mm)	Coverage (m/m^2)	Cover mass (kg/m^2)	Compatible with VistaClad trim
STGJ111	159.5	22.5	2.2	152.6	6.6	14.5	Yes

Mechanical properties

Material specific mechanical properties

All information within this table is currently based on internal laboratory results of Infinity.

Properties	Result	Test method	Information
Scratch resistance	20 N	FORD FLTM BO 162-01	A standardised test using weighted sharp nails to scratch the surface of the profiles to determine the surface scratch resistance.
Abrasion resistance	13 mg/c	ASTM D4060	To estimate the wear resistance of the Infinity cap, the product was subjected to abrasive wheels carrying 1kg loads at 60 rotations a minute for 1 000 cycles.
Cap delamination	60 N / 50 mm 5.32mm	ISO 24345-2006	Allowable peel-off length is 10 mm.
Shore hardness (D)	71	ISO 868	A standardised test to determine the depth of penetration of a specific indenter. Results greater than 60 fall under the category "extra hard".
Brinelle Hardness	39.8 N/mm^2	EN 15534-1	To determine the resistance to indentation and cracking of the surface cap on the Infinity material the hardness of the material was measured before the impact test was performed.
Impact test – Value of residual indentation	0.08 mm	EN 15534-1	
Maximum crack length	No crack	EN 15534-1	

Profile flexural performance testing

Flexural properties of polymer composites can be influenced by the profile geometry and span. Typical properties of the Infinity material technology are captured below based on internal test results as an indication of the expected behaviour of the Infinity material.

Profile	Span (mm)	Ultimate Load (kN)	Flexural strength MOR (MPa)	Flexural stiffness MOE (MPa)	Information
STGJ111	300	1.8	26.3	2 028	Internal reports have provided flexural performance of individual profiles at spans achievable with the test equipment used and as close to typical of regional standards in cladding applications as possible. Further testing is underway at typical installation spans to different regions.

Impact of weathering (material factor estimate)

Material properties can vary as a result of long-term weathering. To estimate this impact on the material's flexural properties, the product is subjected to various weathering effects and the performance with and without weathering is compared. The overall end-use adjustment factor is selected based on the weathering effect that has the most impact on the material.

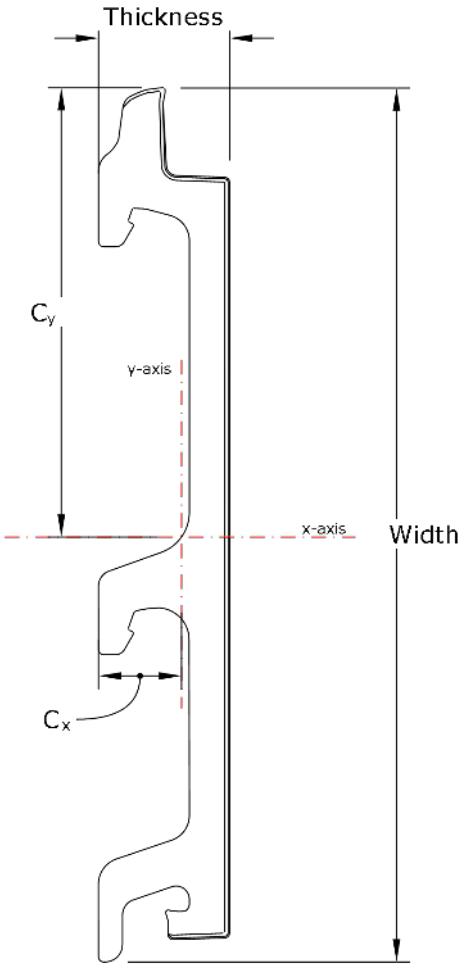
Properties	Flexural strength (%)	Flexural stiffness (%)	Adjustment factor	Test method	Information
High temperature effect	96.8	90.3	0.9	ASTM D7032 – 17, ASTM D2565, and ASTM D790.	To confirm compliance with ICC-ES, AC 174, Infinity materials were evaluated for a decking application to determine what affect temperature, moisture and UV exposure had on the flexural performance of the material in accordance with the test methods listed. The end use adjustment factor is based on the effect with the most impact. The results of which can be located within the issued CCR report, **here**.
Low temperature effect	145.6	137.5	1.0		
Moisture effect	108.3	108.5	1.0		
UV resistance	92.7	94.4	1.0		
Freeze-thaw resistance	104.8	100.7	1.0		
Overall end-Use adjustment factor			0.9		

Flexural tests were conducted to failure at the specified span per ASTM D7032 per the bellow table. The average changes in properties between the control specimen and tested specimens were calculated as a percentage.

Property test	Conditions	Duration
Temperature effect	-29 to 52°C (±2°C)	N/a
Moisture effect	At moisture conditions expected in service.	24 Hour
Ultraviolet resistance	Per ASTM G151, Specimens are exposed to repetitive cycles of light and moisture.	2 000 Hours of exposure in accordance with cycles in accordance with ASTM G151
Freeze-thaw resistance	Profile specimens are Submerged under weights for 24 hours, then frozen at -29°C for 24 hour, then thawed at ambient temperatures for 24 hours.	3 cycles at 72 Hours per cycle.

Sectional properties

The following table provides a sectional property summary of the currently available VistaClad Infinity profiles in their typical board orientation. Please see **Appendix A** for profile drawings and further information.



Profile ID	Width (mm)	Thickness (mm)	Area (mm^2)	I_x (mm^4)	I_y (mm^4)	C_x (mm)	C_y (mm)	S_x (mm^3)	S_y (mm^3)
STGJ111	159.5	22.5	1 796	4 206 259	73 798	14.3	83.6	50 321	5 174

Thermal properties

Typical properties of the Infinity material technology are captured below as an indication of the expected behaviour of the Infinity material.

Properties	Results	Test method	Information
Coefficient of thermal expansion (CTE)	45 x 10^{-6} mm/mm.°C	ISO 11359-1 and 2 (A)	Materials were tested at temperatures between of 23.6°C and 80°C resulting in a total temperature change of 56°C. The full details of this testing can be in the following SGS EU report **here**.

Fire reaction properties

Typical properties of Infinity material technologies are captured below as an indication of their expected behaviour.

Standard	Properties	Result		Requirement	Test Method	Information
EN 13501	Fire growth rate (FIGRA) threshold 0.4MJ	49 W/s	B - s2,d0	Less than 750 W/s	EN 13823	Profile STGJ69B FR was installed in an internal corner application, set alight and the behavior of the material on fire was documented and the measurable properties taken to determine a classification. The report can be found **here**.
	Total heat release (THR) at 600 seconds	4.7 MJ				
	Smoke growth rate (SMOGRA)	16 m^2/s^2		Less than 180 m^2/s^2		
	Total smoke production (TSP) at 600 seconds	97 m^2		Less than 200 m^2		
	Droplets	No		No		
	Flame spread	Pass		Less than 150mm in 60 seconds	EN ISO 11925-2 Exposure 30 s	
	Ignition of paper	No		No		
ICC-ES AC 174	Flame spread index (FSI)	110		Less than 200	ASTM E84	To confirm fire reaction compliance with ICC-ES, AC 174, Infinity deck boards were set alight in accordance with the test methods listed. The results of which can be located within the issued CCR report, **here**.
	Smoke development index (SDI)	500		Less than 450		

Weathering

Most materials are susceptible to weathering. The environment, and factors such as Ultraviolet (UV) light exposure, oxidation and contact with organisms (termites, mold, etc.), to which the materials are exposed will influence the rate of deterioration. The impact of weathering on the flexural performance (material factor estimate) of the products is captured in the Mechanical properties section above.

Colour fade

Weathering over time can result in a colour change of the material. **ΔE** is a common form of measurement for colour fade. The **ΔE** denotes the colour difference between an original sample and a tested sample after different levels of exposure to UV light (and potentially other weathering effects). **ΔE** is measured on a scale of 1 to 100 and attempts to provide a simple metric of how the human eye perceives colour change. Both 'light' and 'dark' colours are tested to provide an indication of the range of performance of the product.

Standard	Colour Reference	ΔE	Grey scale	Test method	Information	
ICC-ES AC 174	Baltic Nero (C02)	2.46	3 to 4	ASTM G155-13 4 000 Hours	Change perceptible at a glance	As part of ICC-ES AC 174 requirements. The results of the issued CCRR can be found here.
	Caribbean coral	2.48	3 to 4		Changes perceptible at a glance	

Biodegradation

Materials exposed to organisms such as termites or mould can degrade as a result.

Fungal and Termite resistance

As a certain percentage of cellulose-polymer composition contains cellulose fibres which may provide nutrition to fungi and mold, promote growth, samples were exposed to spores and their growth rates monitored.

Standard	Fungal strand	Measured value	Test method	Information
ICC-ES AC 174 (Fungal resistance)	G.trabeum (change in mass)	0.77%	ASTM D 2017	To confirm compliance with ICC-ES, AC 174, bio resistance requirements. The results of which can be located within the issued CCR report, here.
	P.Placenta (change in mass)	0.91%		
	T.Versicolor (change in mass)	0.90%		
	I.Lacteus (change in mass)	0.91%		
ICC-ES AC 174 (Termite resistance)	G.trabeum (change in mass)	0.77%		

Infinity materials were submitted for testing to confirm the effectiveness of fungistatic compounds within the composition's formulation, then visually assessed in accordance with the following scale.

0. No growth, the material is resistant to fungal attack.
1. Initial growth, the material is partially protected against fungal attack or generally not susceptible to such attach.
2. Obvious growth and sporulation, the material is susceptible to fungal attack.

Standard	Fungal strand	Measured value	Test method	Information
Eurocode	A.Niger , ATCC 6275	0	ISO 16869	To confirm compliance with ISO 16869 for fungal, Infinity samples were exposed to spores for a period of 21 days and their growth rates monitored. The report can be found **here**.
	C. Globosum , ATCC 6205	0		
	P.Variotii, CICC 40379	0		
	P.Funiculosum, CICC 40279	0		
	T.Longibrachiatum CICC 13053	0		

System components

The following section provides a brief overview of the system components and ancillary items with which the Infinity cladding profiles interact. Please see Appendix B for drawings.

Cladding clip strips

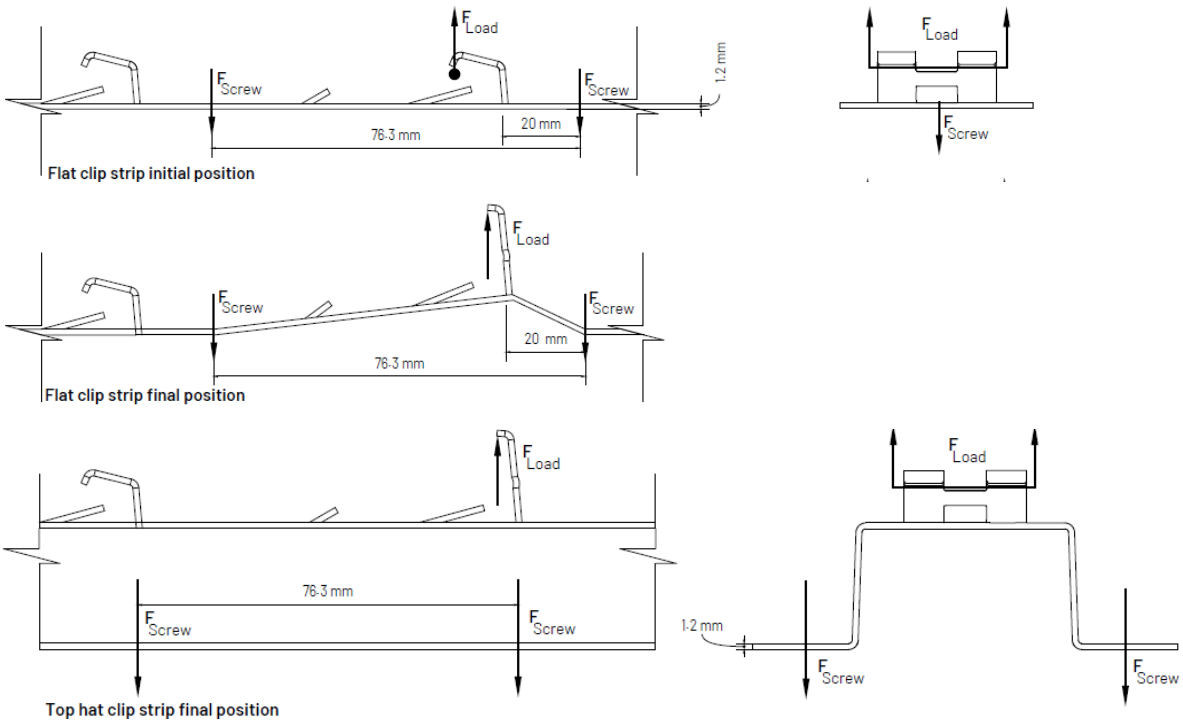
Material specific properties

Typical mechanical properties for ISQ 230 (AMSA) from online sources.

Properties	Results	Notes
Typical yield strength	230 MPa	Typical for ISQ 230 (SANS 4998 Gr220, ASTM A653 Gr230 CS type A, EN 10346 DX 51D, JIS G3302 SGCC).
Ultimate tensile strength	270 to 500 MPa	
Modulus of Elasticity	200 GPa	
Bulk Modulus	160 GPa	
Poisson Ratio	0.29	
Shear modulus	80 (GPa)	

Profile specific strength properties

The individual 'supports' of the clip strip that hold the boards in once installed were tested to provide an indication of a yielding point under a negative load. These springs were loaded (F_{load} in schematics below) individually with a custom-made jig that would result in the maximum moment being generated (attempting to replicate a worst-case scenario). The strips were supported with fasteners (F_{screw} in schematics below) into a secure substructure using the holes provided in the strips: two through the front face of the flat strip either side of the point of application of the tensile load and four through the bottom flanges of the top hat.



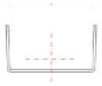
The yield load captured below is an indication of the load at which a single clip deforms to an extent that would allow the respective part of the board profile to escape the clip. This load provides an indication of the maximum load that a single clip strip interaction can support. It is suggested that this would be conservative when considering the interaction of multiple clip strips and boards together. In this scenario, it is expected that a larger load would be required to create enough deformation that would facilitate the release of a board or part thereof. These assessments assume adequate interaction between the board and clip strip, and appropriate fixing of the clip strip to the substructure/substrate. Note that the tests conducted on the flat strips resulted in localized separation (see final flat clip strip schematic above) of the clip strip from the support structure during loading (a potential explanation of the differences in results below). This highlights the need for appropriate fixing frequency between this part and the substructure/substrate (in addition to fastener withdrawal limitations).

Item	Min. yield load (N)	Average yield load (N)	Test method	Information
Flat strip	431	595	N/A	Simple tensile tests were conducted by an independent third-party laboratory. Five samples of the flat strip and five samples of top hat strip were tested. The performance of the top hat strip is assumed to be indicative of that of the channel strip.
Channel	374	429		
Top hat	374	429		

Weathering (Corrosion information)

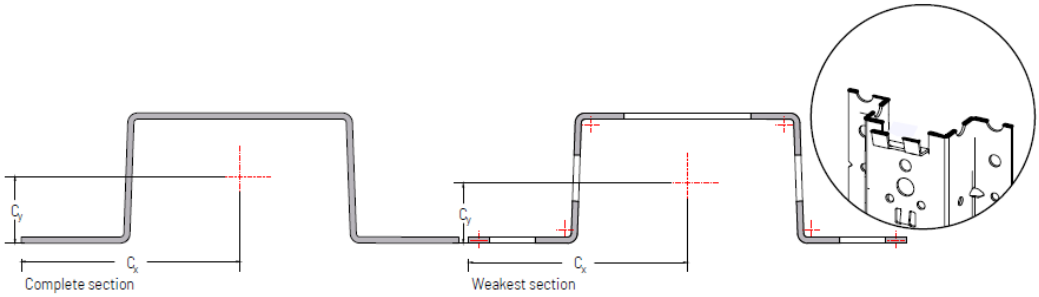
Part	Specification	Thickness	Notes
Steel substrate	ISQ 230	1.2 mm	All clip strip types are 1.2 mm thick.
Galvanisation	Z275	19 µm	Supplier information.
Powder coating	Ferro VEDOC VP Polyester (matt black)	60 to 80 µm	Supplier information.

Profile properties

Item	Description	Material	Width (mm)	Gauge (mm)	Depth (mm)	Ventilation gap (mm)	Length (mm)	Mass (kg/part)
Flat strip		Galvanised steel ISQ 230 (Z275) Powder coated	40	1.2	12	1.2	1831	0.7
Channel			45	1.2	34	>23.5	1831	1.5
							2745	2.2
Top hat			86	1.2	36	25.4	1831	2.2
							2745	3.2

Sectional properties

Sectional properties for the full cross-section of each profile as well as the portion of the profile with the most cavities present are provided.



Item	Width (mm)	Thickness (mm)	Area (mm^2)	I_x (mm^4)	I_y (mm^4)	C_x (mm)	C_y (mm)	S_x (mm^3)	S_y (mm^3)
Flat strip	40	1.2	48	6	6 400	20.0	0.6	10	320
Flat strip adjustment			18	2.2	4 889	20.0	0.6	3.7	244
Channel	45	1.2	105	5 820	33 006	22.7	16.9	345	1 455
Channel adjustment			54	3 775	21 334	22.7	16.0	235	950
Top hat	86	1.2	156	17 166	87 585	42.7	12.8	1 338	2 050
Top hat adjustment			83	9 446	50 452	42.7	11.8	802	1 180

Fasteners

The following table provides a quick reference list of typical fasteners that may be used for various substrates. This information has been collected from several manufacturers for convenience and is presented herein to provide indicative performance. Please refer to applicable manufacturers for further information and/or confirmation of the suitability of the application. Appropriate fasteners must be utilised. Particular attention should be paid to substructure/substrate and environmental conditions (particularly with respect to corrosion) of the site. All applications should adhere to applicable standards. All timber and metal profiles should be treated and/or coated appropriately. Regular proactive maintenance is advised where possible.

Application	Fastener type	Material	Size (mm)	Tensile (kN)	Ultimate Shear (kN)	Withdrawal resistance (kN)	Edge distance (mm)	Minimum spacing (mm)	Minimum substructure material specification
Timber	Wafer head	C1022 case hardened	M5.5 x 45	13.9	8.4	3.9	Ø x 5 = 28	Ø x 5 = 28	Pine - F7 rated at 36 mm embedment
	Tek screw		M5.5 x 50						
Steel	Wafer head	C1022 case hardened	M5.5 x 22	15.3	8.8	2.2	Ø x 2 = 12	Ø x 2 = 12	Steel - 1.2 mm thick
						4.0			Steel - 1.5 mm thick
	Tek screw		M5.5 x 25			5.4			Steel - 1.9 mm thick
						7.4			Steel - 2.4 mm thick
Masonry	Hilti HPS-1 6 PE sleeved anchor*	Carbon steel, galvanised	M 6.0 x 40	0.25	0.35	Not available	30	30	Devoid of cracks and similar. Typical embedment depth of 30 to 40 mm Confirm adequate strength. Refer to Hilti TDS.
	Hilti HUS3-P Concrete screw*	Carbon steel, galvanised	M5.0 x 40	2.8	3.9	Not available	35	35	Devoid of cracks and similar. Typical embedment depth of 40 mm. Confirm adequate strength. Refer to Hilti TDS.

Typical Fastener specifications and coating

Screw corrosion classification

The following table provides a summary of materials and coatings typical fasteners used by Eva-last.

	Material Details			
Fastener category	**Size**	**Material**	**Coating Type**	**Coating Thickness**
Carbon clip screws	M4.2	C1022	Magni 599 (full coat)	20 µm
Carbon deck screws	M5.0			
Carbon Frame screws	M6.0			
Carbon trim screws	M5.5	10B21		20 µm
Tek screw	M5.5	C1022	Class 3	25 µm
	M5.5		Class 4	50 µm
	M5.5		Zinc Plated	8 µm
Stainless clip screw	M4.2	SS316	Magni 599 (full coat)	20 µm
Stainless deck screw	M5.0		Enamel head coating	N/a
Stainless trim screw	M5.5			

Material corrosion rates

The following table provides typical corrosion rates (µm / annum) for common materials seen in composite building systems. Not all materials are published in relation to ISO 9223 corrosion rates but are indicated by source material as suitable for certain environments. It has been assumed that references to a marine environment would be equivalent to a C5 environment.

Nylon adaptors

Profile properties

The following list of adaptors is designed for use with the cladding clip strip and trim listed below. See the IG for further details.

Item	Description	Material	Associated trim	Width (mm)	Height (mm)	Length (mm)	Mass (g)
Top and bottom adaptor		Glass fibre reinforced nylon composite	Universal trim	50	70	23	9
Side adaptor		Glass fibre reinforced nylon composite		50	95	23	15
Internal corner adaptor		Glass fibre reinforced nylon composite	Internal corner trim profile	54	54	40	10
External corner adaptor		Glass fibre reinforced nylon composite	External corner trim profile	71	71	40	8

Aluminum trim

Profile properties

The following list of trim profiles is designed to be compatible with the respective adaptors listed above. See the IG for further details.

Item	Description	Material	Associated adaptor	Width (mm)	Height (mm)	Mass (kg/m)
Universal trim profile		Aluminium 6063-T5, powder coated	Top and bottom adaptor and Side adaptor	25	50	0.37
T trim profile		Aluminium 6063-T5, powder coated	Side adaptor	25	40	0.26
U trim profile		Aluminium 6063-T5, powder coated	Side adaptor and Top and bottom adaptor	13	21	0.17
Internal corner trim profile		Aluminium 6063-T5, powder coated	Internal corner adaptor	51	59	0.50
External corner trim profile		Aluminium 6063-T5, powder coated	External corner adaptor	51	51	0.51

Weathering (Corrosion information)

Part	Specification	Thickness	Notes
Aluminium substrate	6063-T5	0.9 mm	Thinnest part of various trim parts.
Powder coating	Polyester (multiple colour options)	60 to 80 µm	Supplier information.

Board sealant volume requirements

A summary of suggested sealant volumes per application is provided below for convenience. The volume of sealant per board face is in reference to a suggested bead to be placed on the underside of the trim before inserting the trim into the adaptors. The volume of sealant at the groove refers to the cavity created beneath the trim at the tongue and groove joint between two consecutive boards and/or at the groove(s) within the board profile. Refer to the IG for further information.

Profile	Quantity of grooves	Volume of sealant to seal the board face (ml)	Volume of sealant to fill grooves. (ml)	Total Volume of sealant per board (ml)	Total volume of sealant per meter of trim (ml/m)	Information
STGJ111	1	1.3	1.2	4.0	26.2	The volume required between trim and boards are based off a 5 mm diameter bead assumption. See Appendix A for groove sizes. All volumes are estimations and do not include shrinkage.

Potential liquid sealants to consider (application dependent):

Soudal Silirub Colour
Loctite PL Heavy Duty Sealant
Loctite 100% Silicone
Loctite PL Roof and Flashing Sealant
Alcolin Alco Flex Neutral Silicone

System properties

The VistaClad system consists of the board profiles, clip strips and trim system installed on some form of substructure. The results captured below are based off of internal tests and/or finite element analyses (FEA). The internal tests are conducted using a pressurised 3.0 m by 3.6 m test chamber. The chamber allows for varying positive pressures to be applied and for water to be sprayed at differing rates. These results are believed to be indicative and are presented to provide a gauge of performance of an installed system until independent test data is available.

System strength

Test 1: Evaluation of system strength in STTHM202 in a flat wall test.

An installed system of the STTHM202 profile with supports (substructure and clip strips) at 600 mm spans was tested under positive pressures in excess of 3 kPa, the results of which showed no significant yielding of any of the system elements. Internal FEAs supported this result. The internal test rig is not yet capable of generating meaningful negative test pressures, as a result internal FEAs were used to supplement this scenario. Simulations at negative pressures of 1 kPa indicated no significant yielding of any of the system elements. Typical simulation assumptions were made between interactions of components, fixtures to substrate, material homogeneity, and load application.

Test 2: Evaluation of system strength in STTHM203 and STTHM204 in a E2-VM1 test.

A test sample was created per E2-VM1 requirements consisting of a majority of STTHM204 and approximately 5% of STTHM203 profiles and were used for E2-VM1 testing rig per the water ingress testing below. Per the previous tests supports (Substructure and clip strips) at 600 mm spans was tested under positive pressure more than 50 Pa, the results of which showed no significant yielding of any of the system elements.

Water ingress

The water ingress assessment of the system attempted to follow the evaluation of E2-VM1 Verification Method employed by the New Zealand Building Regulations and Australian National Construction Code. Additional test detail is provided in NZS 4284 (Testing of building façades).

Test 1: Evaluation of STTHM202 in a flat wall test.

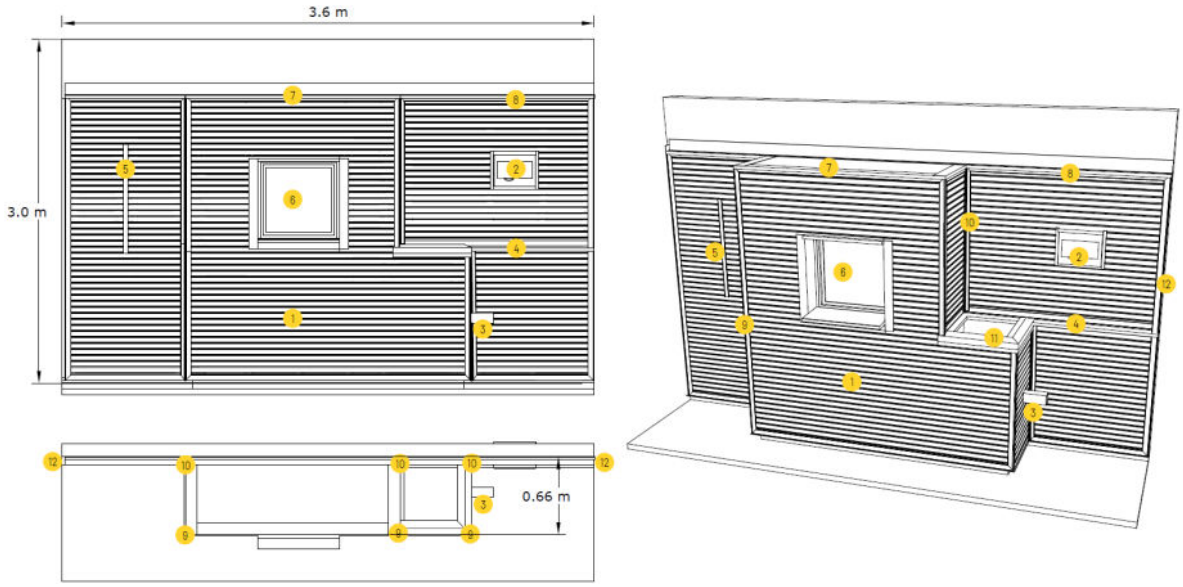
The Wet wall test method (Section 1.4.5) was utilised on a system with the STTHM202 profile installed at 600 mm spans. The requirement to pass this assessment is for no splashing to occur up to a pressure of 50 Pa for certain periods of time. Initial water ingress was recorded at approximately 125 Pa and water ingress that would be considered (internal assessment) a test failure at approximately 150 Pa.

Test 2: Evaluation of STTHM203 and STTHM204 in a E2-VM1 test.

According to the wet wall test method described above, STTHM203 and STTHM204 profiles were installed at 600 mm spans, meeting identical requirements. The internal simulation for testing followed the established E2-VM1 test methods per the diagram below. To pass this assessment, it was necessary to ensure that no splashing occurred up to a pressure of 50 Pa for specified time periods.

Test 3: Evaluation of full system with STTHM203 and STTHM204 in a E2-VM1 test.

The assessment process included conducting individual evaluations of each component within the complete assembly during testing. The lowest performing pressure result within each component of the assembly was recorded. For an overview, please refer to the table below, which summarizes the performance of each specific assembly. Details regarding any additional flashing parts utilized can be found in **Appendix A**. The primary sealant employed was Alcolin Alco Flex Neutral Silicone, along with standard flashing tape. For further information, please consult the Installation Guide (IG) for relevant assembly details.



Summary of E2-VM1 Internal test results (Pressure range up to 100 Pa)

	Assembly	Static water ingress	Result at 50 Pa	Maximum pressure achieved before leak to wet wall	Observed impact on parts at pressure spike greater than 2 770 Pa
1	Apex STTHM202	Pass - Not part of test	N/a	Same tongue and groove as STTHM203 and 204.	
	Apex STTHM203	Pass	Pass	> 100*	
	Apex STTHM204	Pass	Pass	> 100*	Single leak found between profile joints.
	Joint between STTHM203 and 204	Not part of test	N/a	> 100*	
	Apex STTHM205	Pass	N/a	Same tongue and groove as STTHM202,203 and 204.	
2	Electric box	Pass	Pass	> 100*	Leaked through fastener hole inside the electric box.
3	Gutter Penetration	Pass	Pass	> 100*	
4	Horizontal joint (Second story joint)	Pass	Pass	> 100*	
5	Vertical joint (Butt joint)	Pass	Pass	80	
6	Window	Pass	Pass	100	Leak started at one corner. Causing problems throughout remaining testing.
7	Flat roof	Pass	Pass	> 100*	Composite profile above window spanned 1 000mm. Collapsed inward opening joint between board and trim.
8	Perpendicular roof join	Pass	Pass	> 100*	
9	External corner	Pass	Pass	> 100*	Isolated leak that did not hit wet wall. Pressure caused silicon seals to break.
10	Internal corner	Pass	Pass	> 100*	Isolated leak that did not hit wet wall. Pressure caused silicon seals to break.
11	Parapet	Pass	Pass	86	
12	Edges	Pass	Pass	> 100*	

*Did not leak to wet wall

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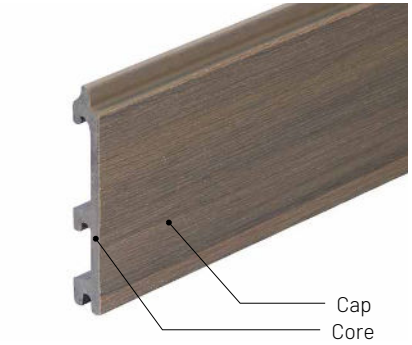
Website: www.eva-last.com

Appendix A
Profiles details

Profile properties

Product code	STGJ111
Sectional area (mm^2)	1795.8
Approximate mass (kg/m)	2.2



Sectional properties

I_x (mm^4)	4 206 259
I_y (mm^4)	73 799
C_x (mm)	14.3
C_y (mm)	84.4
S_x (mm^3)	50 320.9
S_y (mm^3)	5 175

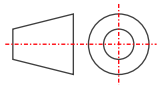
Drawing title

Profile properties - STGJ111

File name

2022-09-25 - VistaClad profiles

File details



Drawing number	01
Date	March 3, 2023
Page	5 of 8
Scale	NTS

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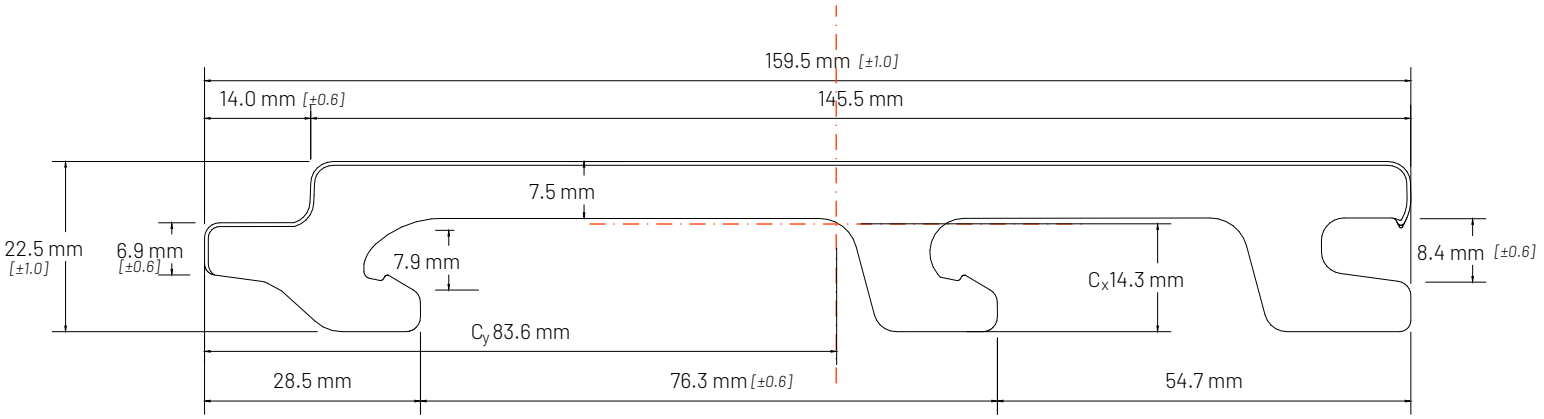
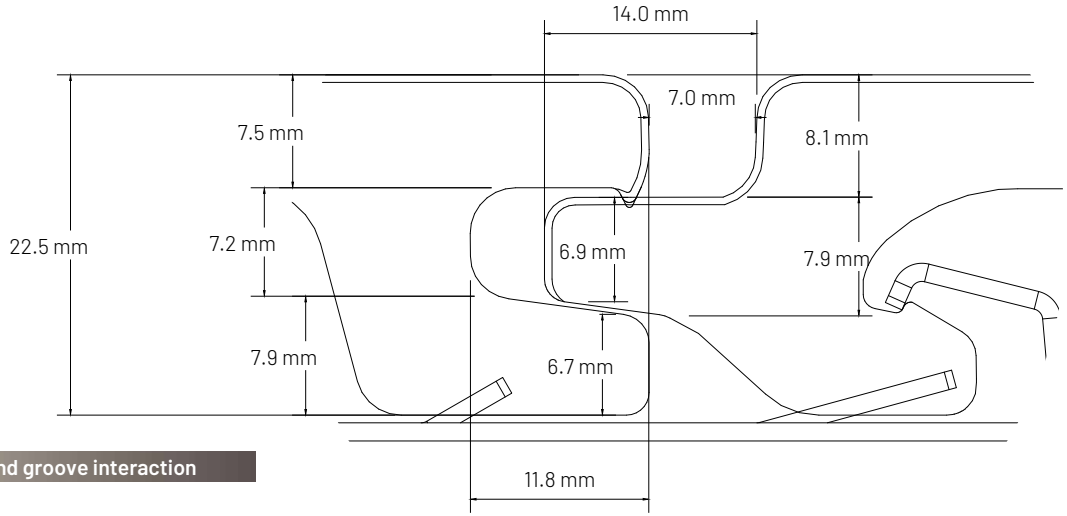
VistaClad™
Cladding inspired by nature



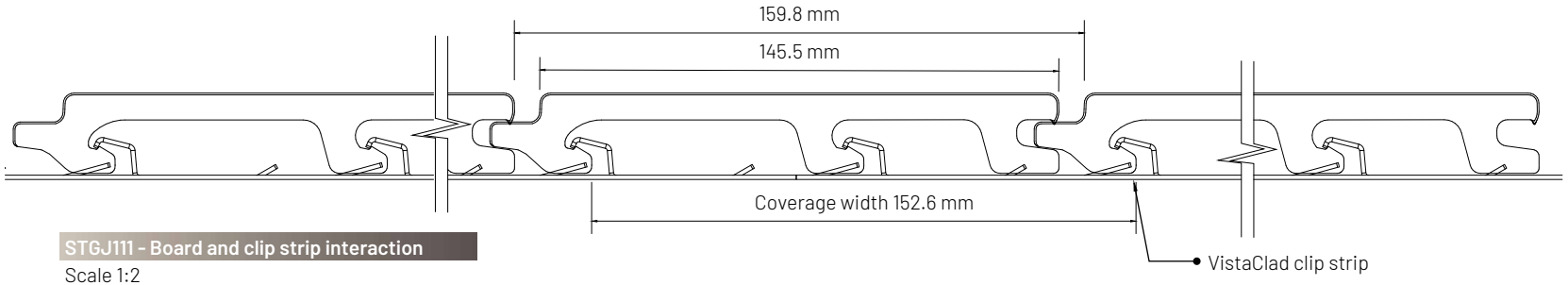
STGJ111 - Profile

Scale 1:1



STGJ111 - Tongue and groove interaction

Scale 2:1



STGJ111 - Board and clip strip interaction

Scale 1:2

Appendix B
System component

Profile properties	
Product code	Flat strip
Sectional area (mm²)	48
Approximate mass (kg/m)	±0.4

Sectional properties				
I_x (mm⁴)	*Section A*	6	*Section B*	2.2
I_y (mm⁴)		6 400		4 889
C_x (mm)		0.6		0.6
C_y (mm)		20		20
S_x (mm³)		10		10
S_y (mm³)		320		244

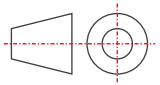
Drawing title

Cladding clip strip - Flat strip

File name

TDS - 2023-03-03 - Cladding

File details



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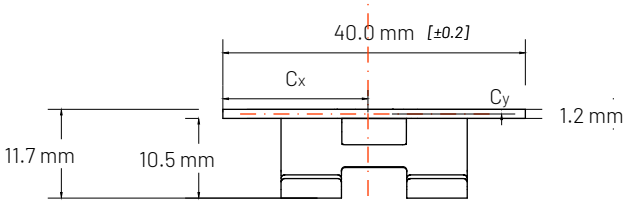
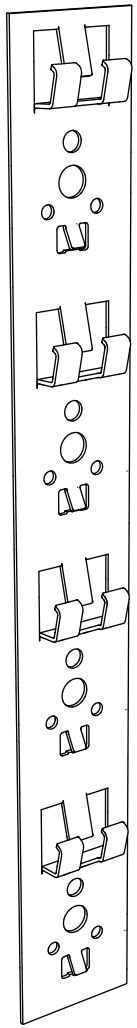
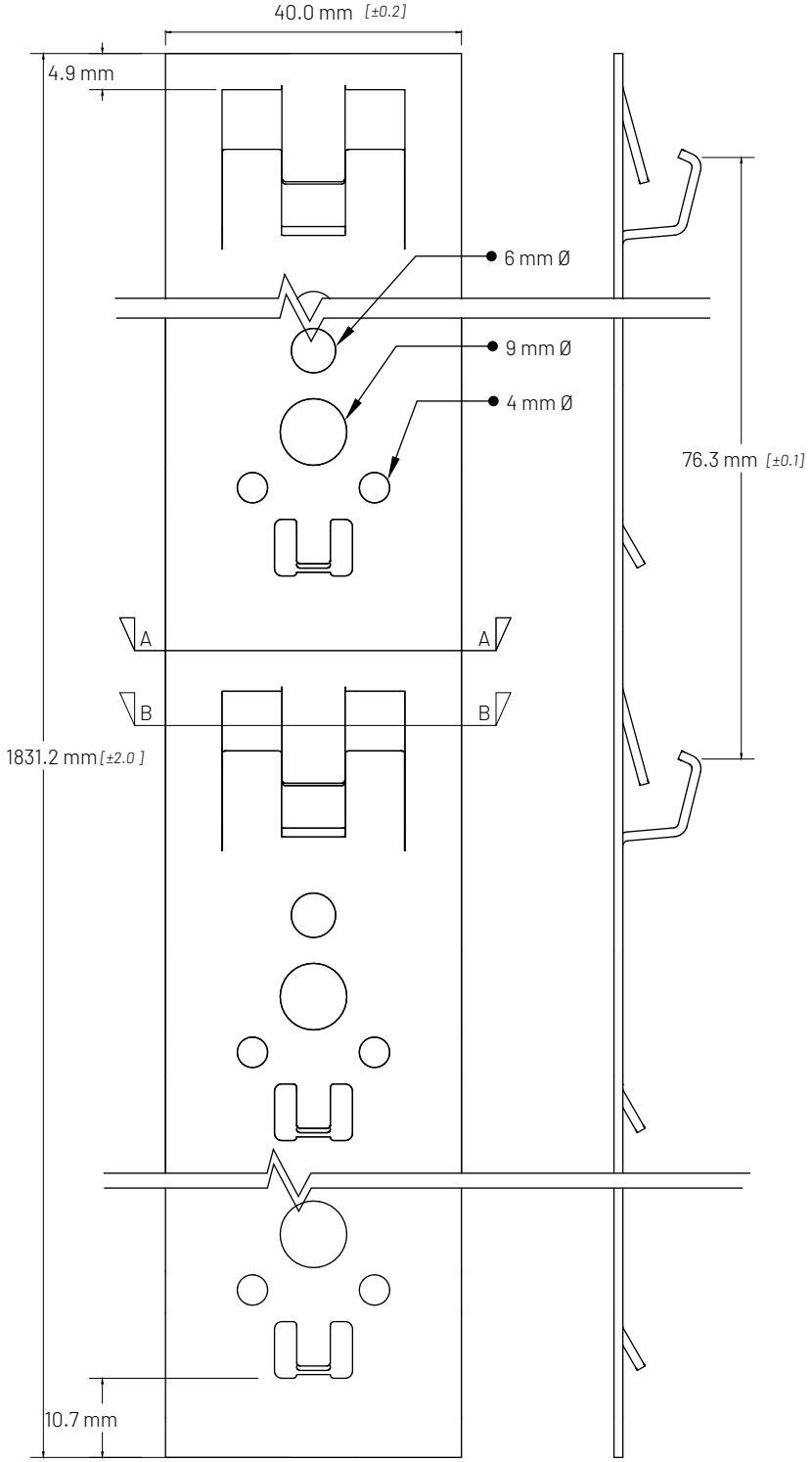






Profile properties

Product code	Channel
Sectional area (mm²)	105
Approximate mass (kg/m)	±0.8

Sectional properties

I_x(mm⁴)	*Section A*	5 820	*Section B*	3 775
I_y(mm⁴)		33 006		21 334
C_x(mm)		22.7		22.7
C_y(mm)		16.9		16.0
S_x(mm³)		345		235
S_y(mm³)		1 455		950

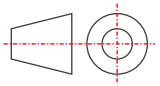
Drawing title

Cladding clip strip - Channel

File name

TDS - 2023-03-03 - Cladding

File details



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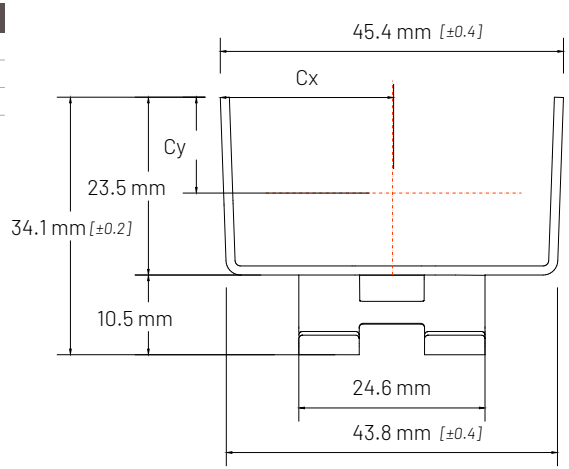
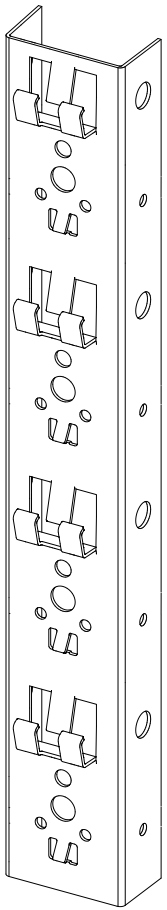
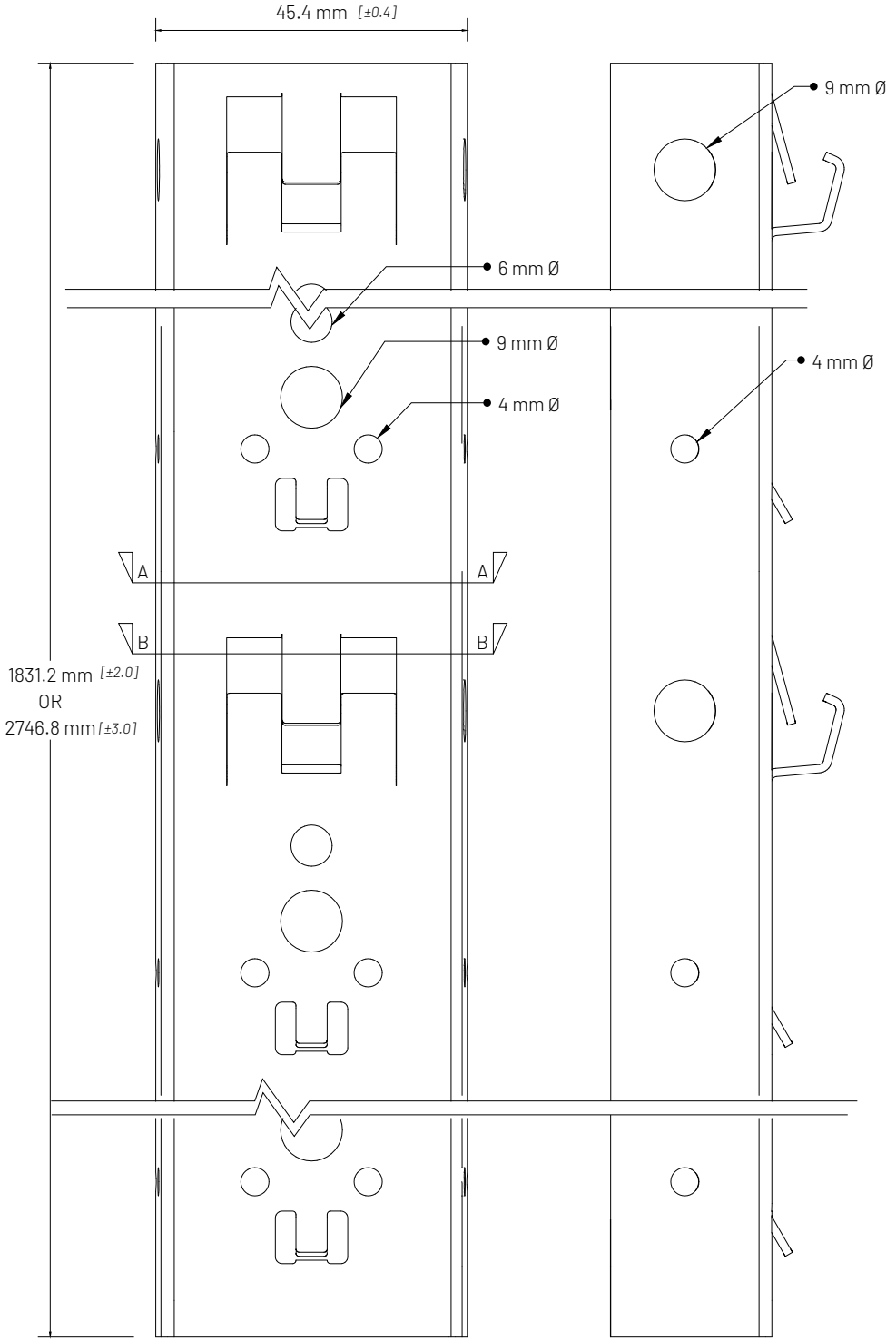






Profile properties

Product code	
Sectional area (mm²)	
Approximate mass (kg/m)	

Sectional properties

I_x (mm⁴)	*Section A*	17 166	*Section B*	9 446
I_y (mm⁴)		87 585		50 452
C_x (mm)		42.7		42.7
C_y (mm)		12.8		11.8
S_x (mm³)		1 338		802
S_y (mm³)		2 050		1 180

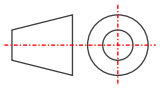
Drawing title

Cladding clip strip - Top hat

File name

TDS - 2023-03-03 - Cladding

File details



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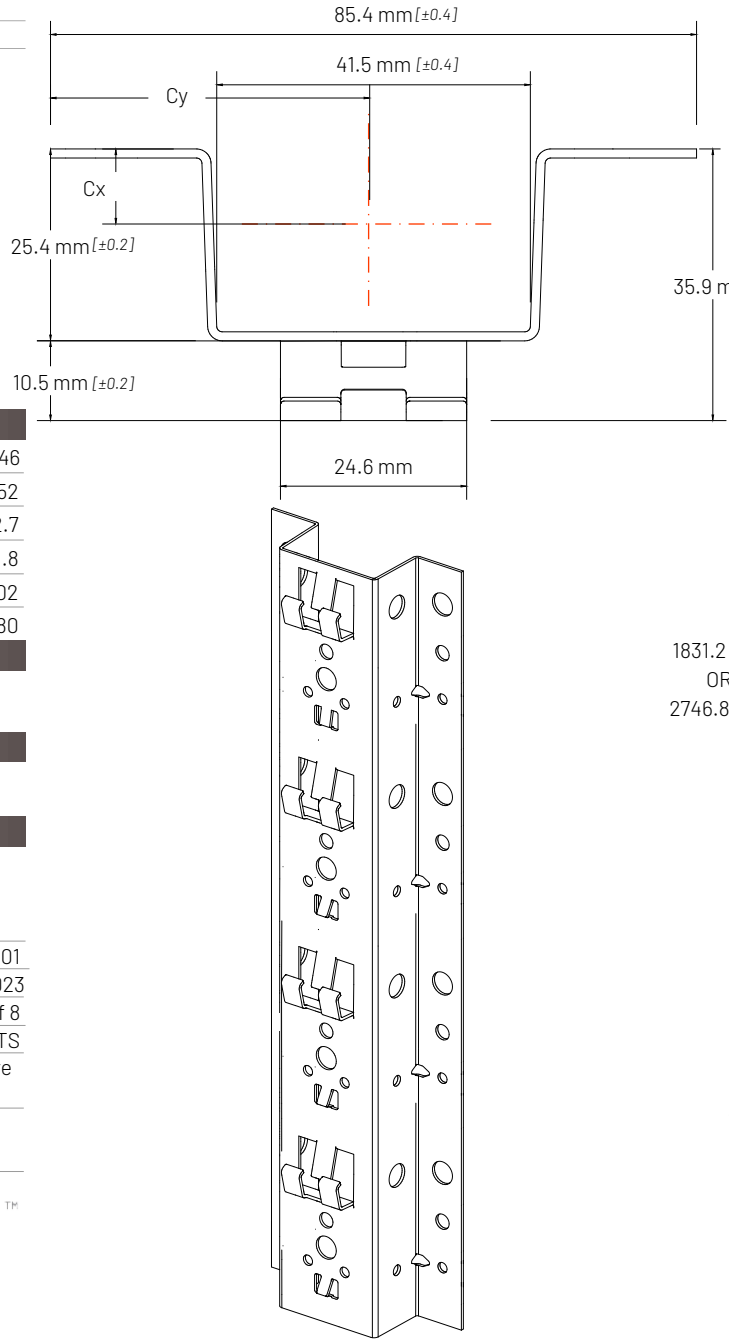
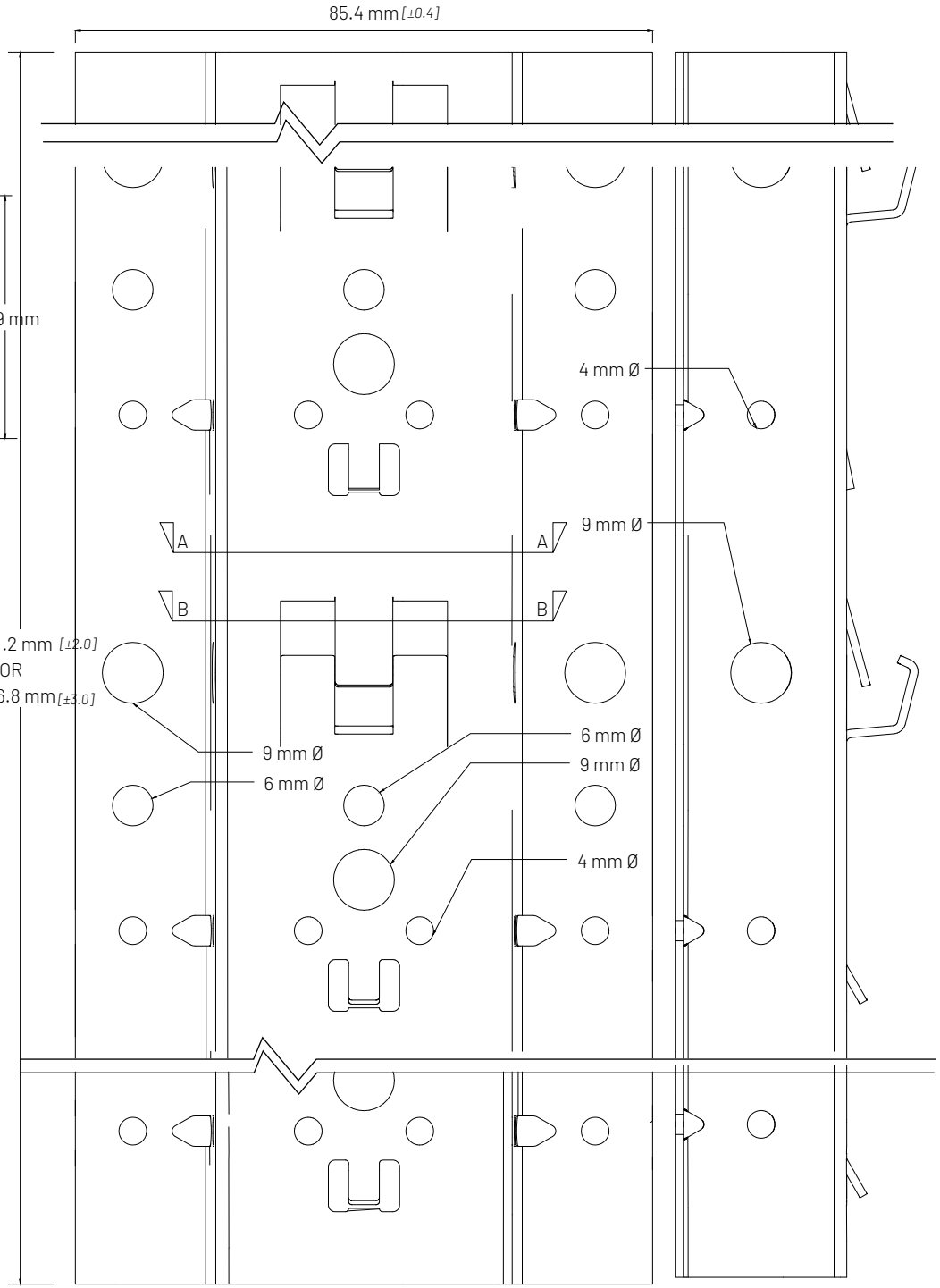




Profile properties

Product code	
Sectional area (mm^2)	
Approximate mass (kg/m)	

Sectional properties

I_x(mm^4)	
I_y(mm^4)	
C_x(mm)	
C_y(mm)	
S_x(mm^3)	
S_y(mm^3)	

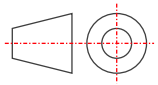
Drawing title

Cladding trim - Universal trim - top and bottom application

File name

TDS - 2023-03-03 - Cladding

File details



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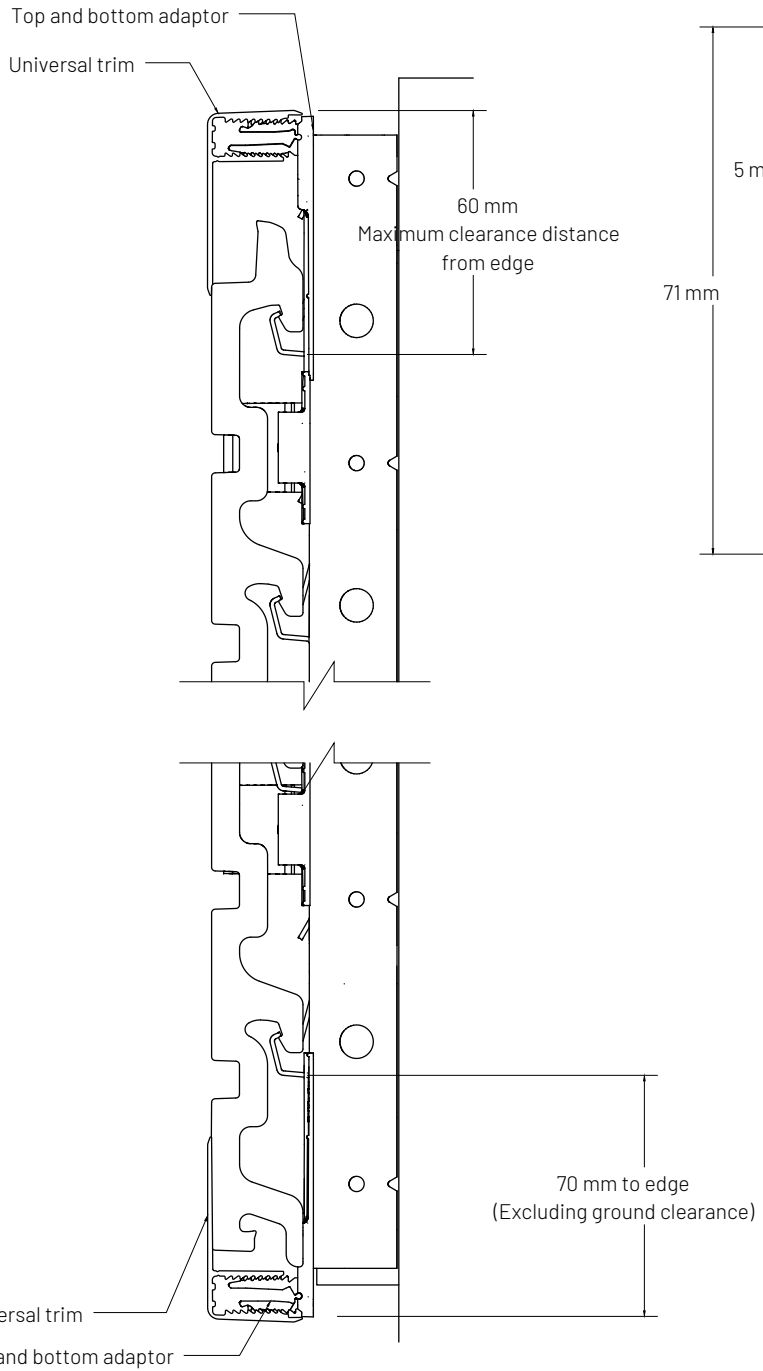
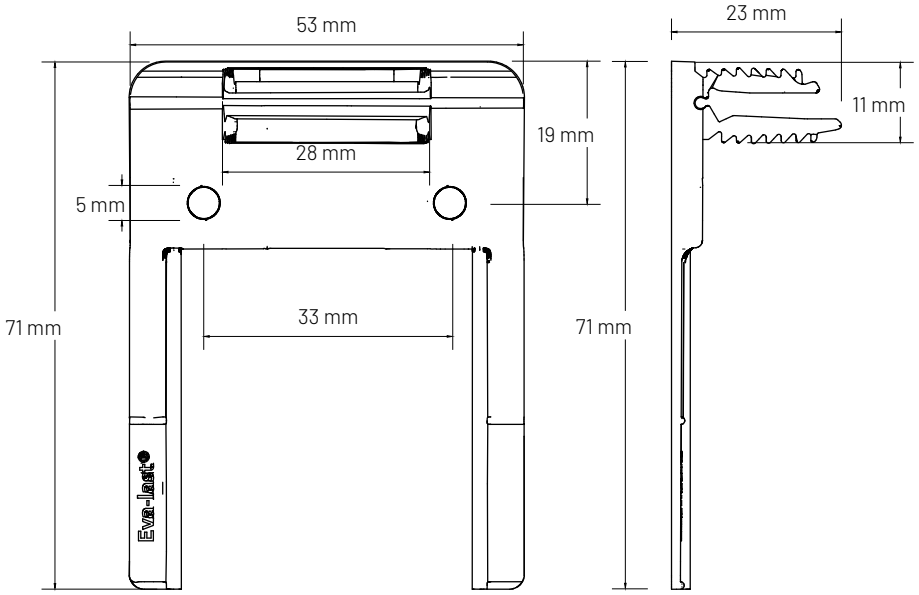
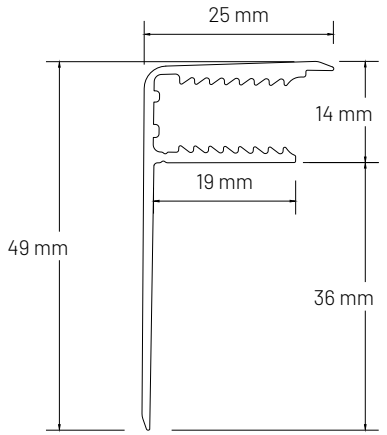


Top and bottom assemblies
Scale 1:1



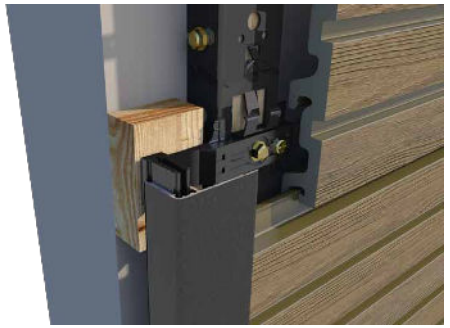
Nylon Top and bottom adaptor
Scale 1:1



Aluminium universal trim profile
Scale 1:1

Profile properties

Product code	
Sectional area (mm²)	
Approximate mass (kg/m)	



Sectional properties

I_x(mm⁴)	
I_y(mm⁴)	
C_x(mm)	
C_y(mm)	
S_x(mm³)	
S_y(mm³)	

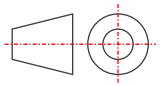
Drawing title

Cladding trim - Universal trim. edge application

File name

TDS - 2023-03-03 - Cladding

File details



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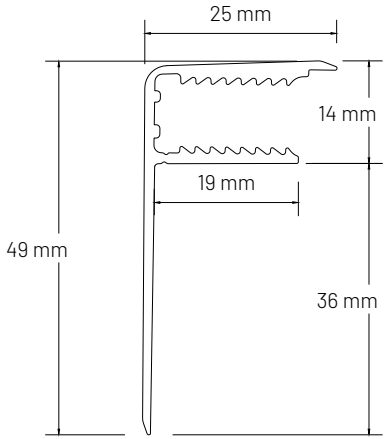
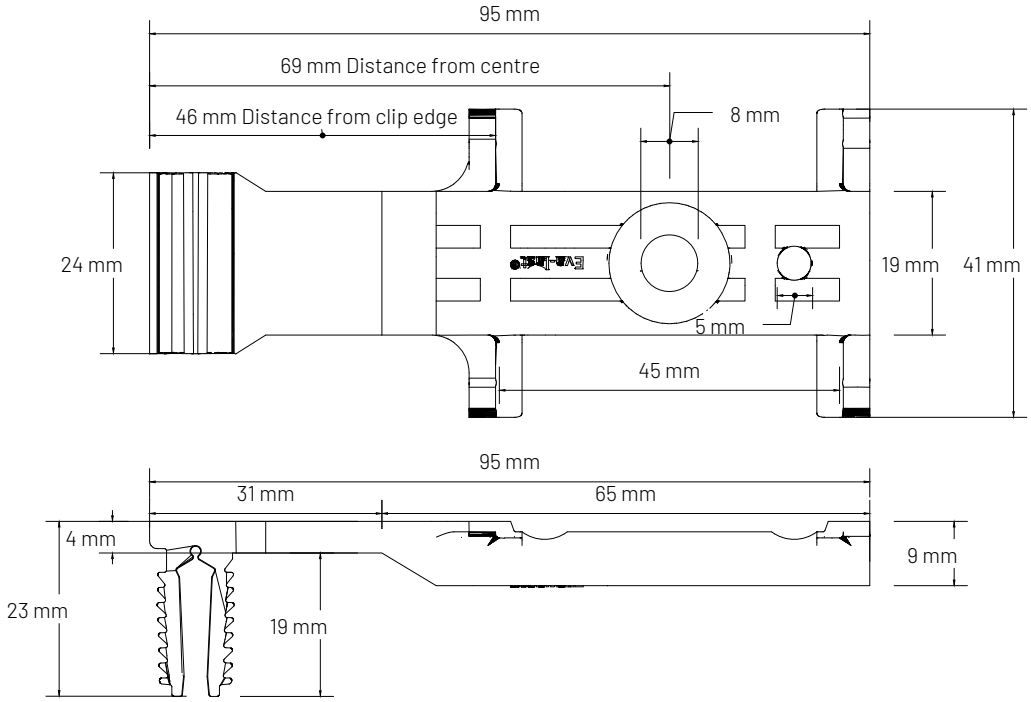
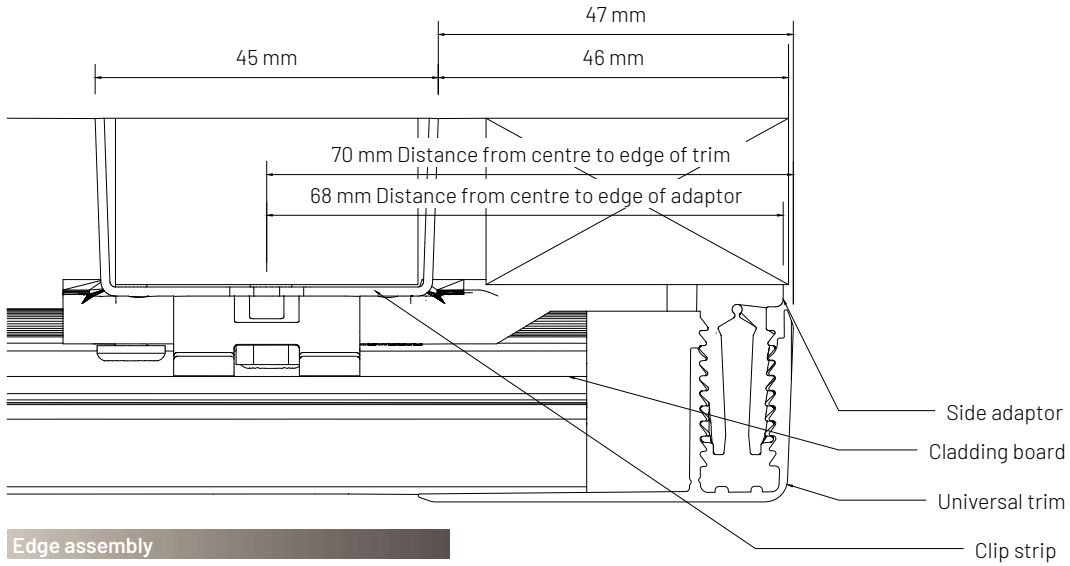


Aluminium universal trim profile
Scale 1:1



Nylon Side adaptor
Scale 1:1

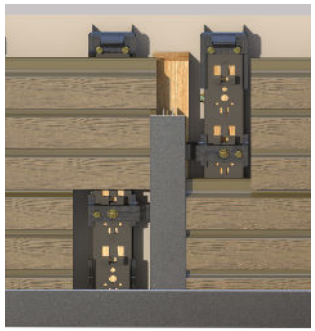


Edge assembly
Scale 1:1

Side adaptor

Profile properties

Product code	
Sectional area (mm^2)	
Approximate mass (kg/m)	



Sectional properties

I_x(mm^4)	
I_y(mm^4)	
C_x(mm)	
C_y(mm)	
S_x(mm^3)	
S_y(mm^3)	

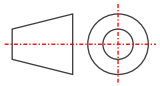
Drawing title

Cladding trim - T trim (Butt join) application

File name

TDS - 2023-03-03 - Cladding

File details



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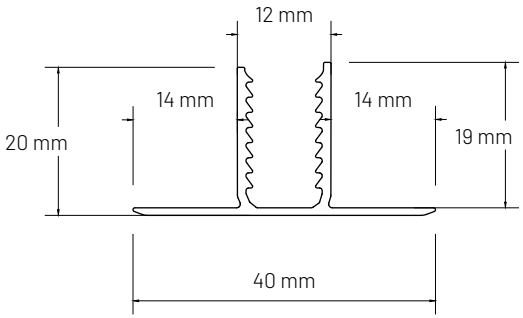
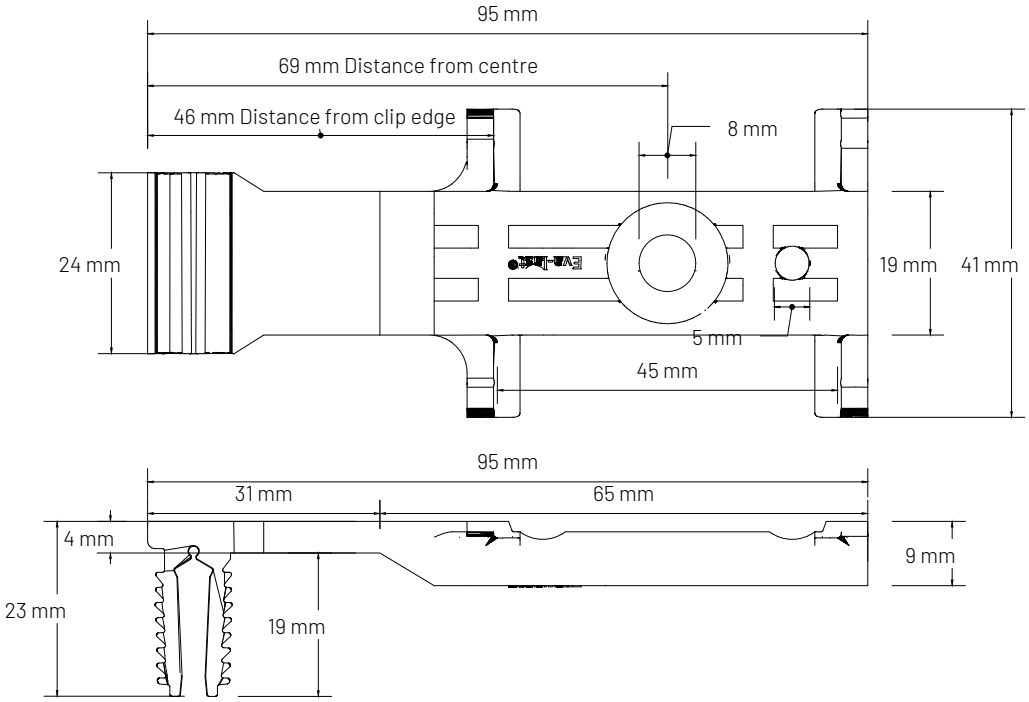
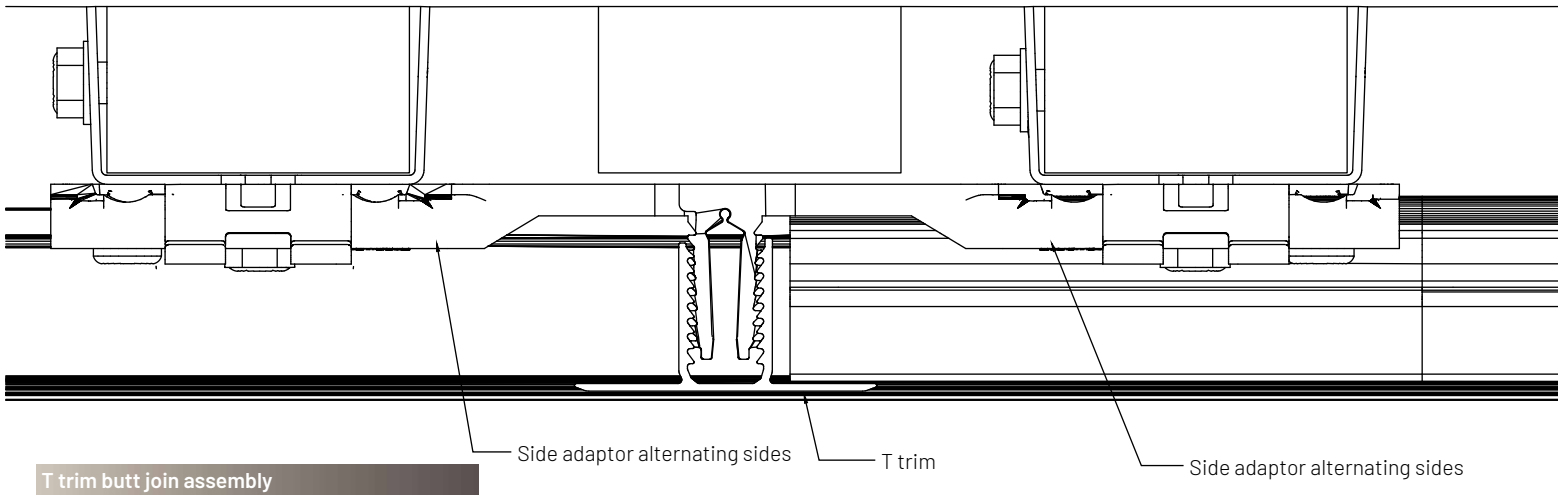


Aluminium T trim profile
Scale 1:1



Nylon Side adaptor
Scale 1:1



T trim butt join assembly
Scale 1:1

Profile properties

Product code	
Sectional area (mm^2)	
Approximate mass (kg/m)	

Sectional properties

I_x(mm^4)	
I_y(mm^4)	
C_x(mm)	
C_y(mm)	
S_x(mm^3)	
S_y(mm^3)	

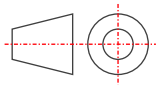
Drawing title

Cladding trim - U trim (Butt join) application

File name

TDS - 2023-03-03 - Cladding

File details



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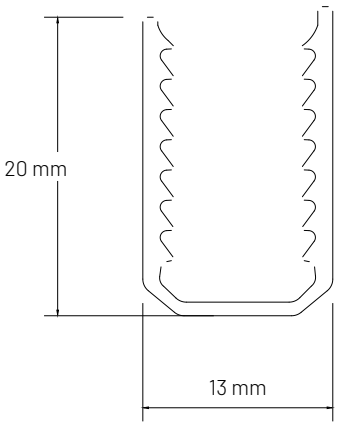
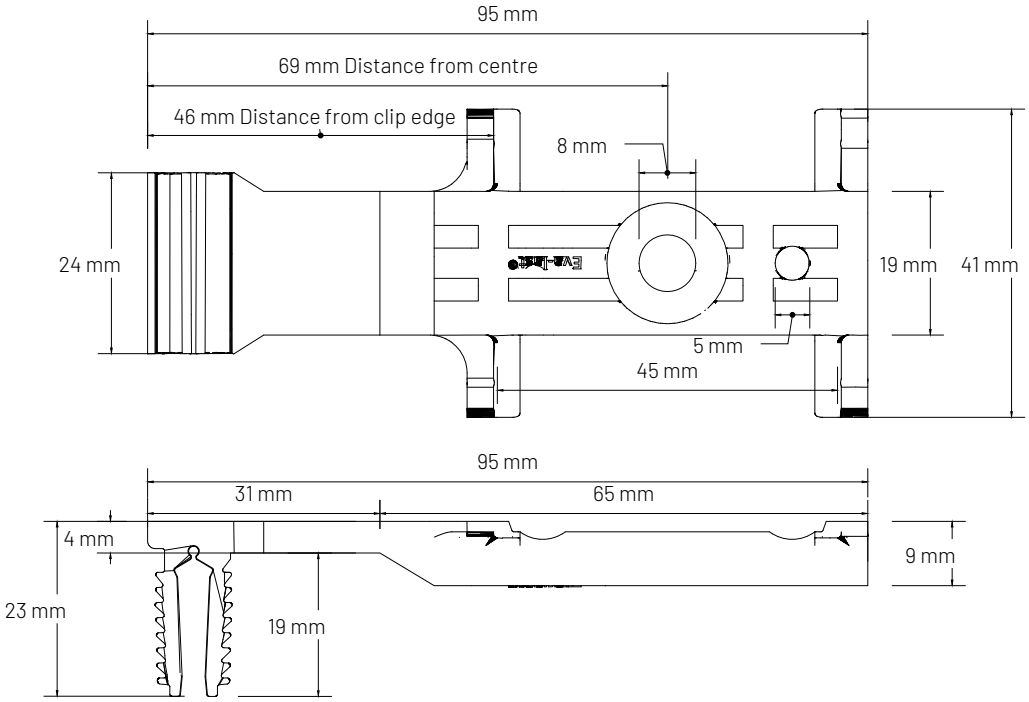


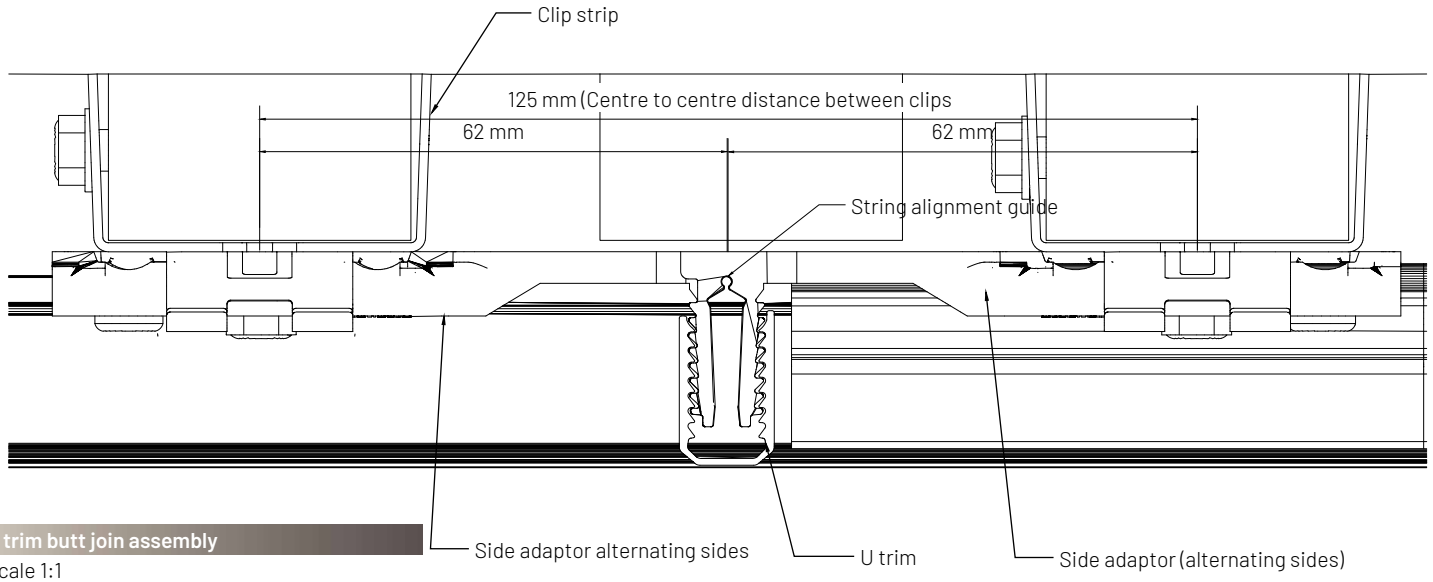
Aluminium U trim

Scale 2:1



Nylon Side adaptor

Scale 1:1



U trim butt join assembly

Scale 1:1

Profile properties

Product code	
Sectional area (mm^2)	
Approximate mass (kg/m)	

Sectional properties

I_x(mm^4)	
I_y(mm^4)	
C_x(mm)	
C_y(mm)	
S_x(mm^3)	
S_y(mm^3)	

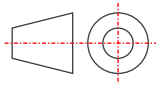
Drawing title

Cladding trim - Internal corner application

File name

TDS - 2023-03-03 - Cladding

File details



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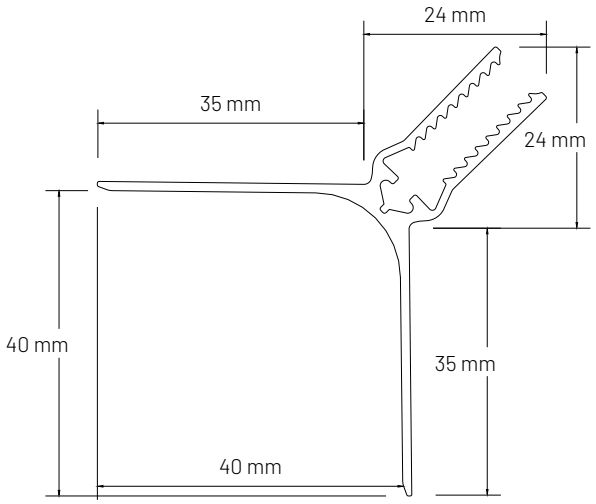
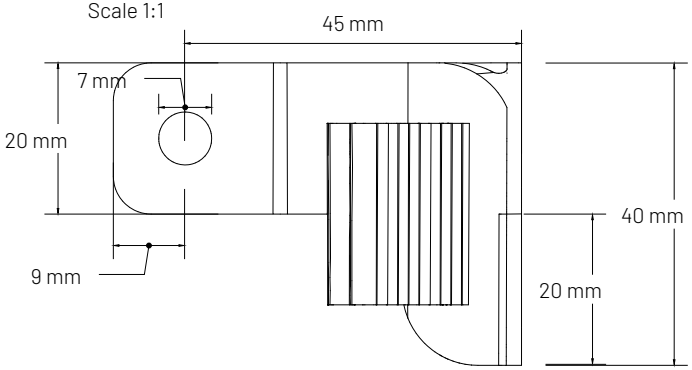
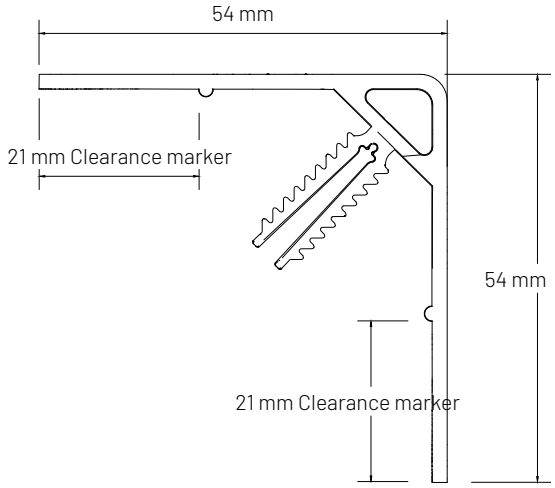
VistaClad™
Cladding inspired by nature

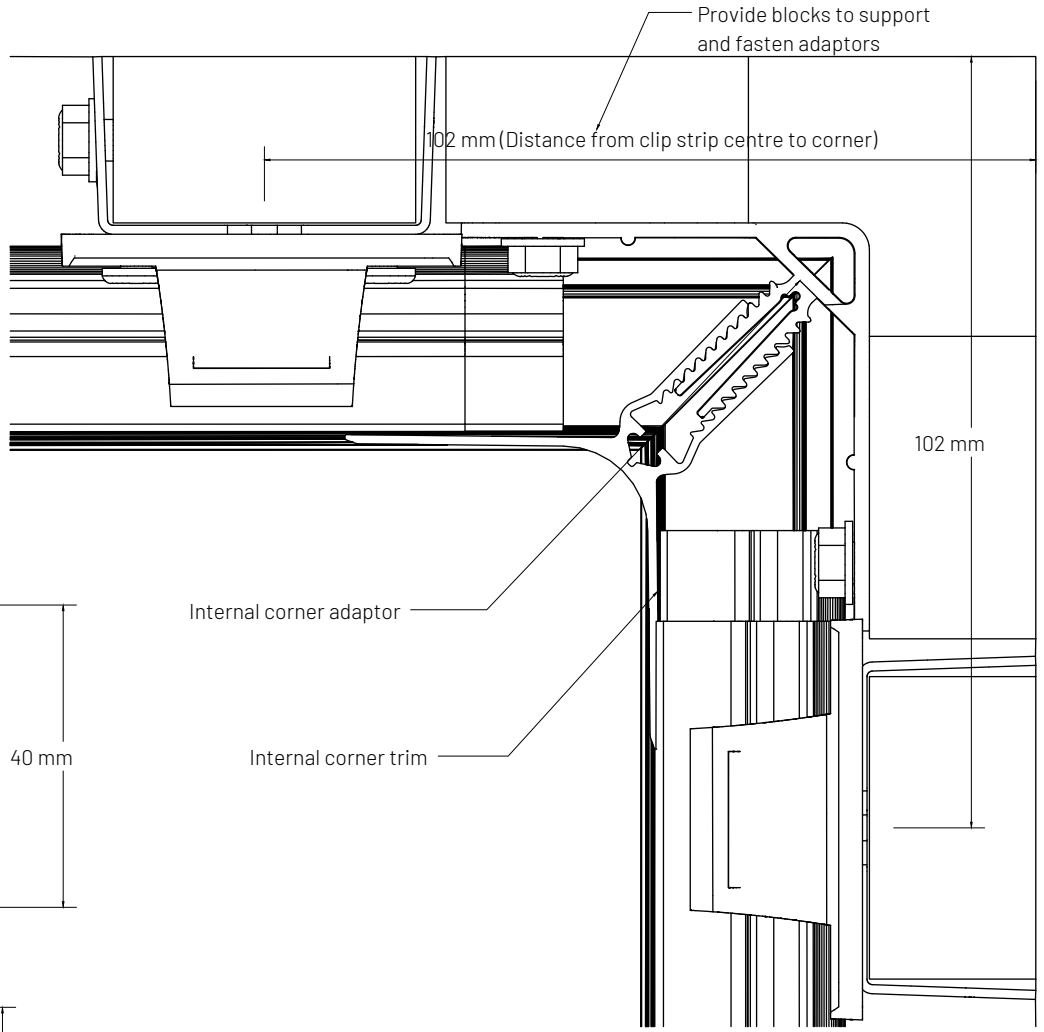


Aluminium Internal corner trim profile
Scale 1:1





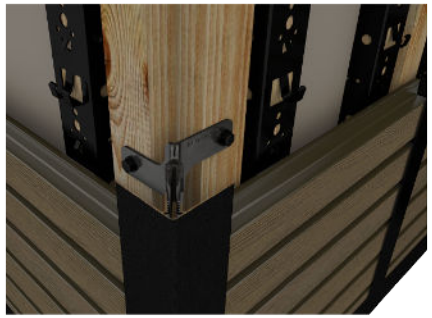
Nylon Internal corner adaptor
Scale 1:1



Internal corner assembly detail
Scale 1:1

Profile properties

Product code	
Sectional area (mm^2)	
Approximate mass (kg/m)	



Sectional properties

$I_x (mm^4)$	
$I_y (mm^4)$	
$C_x (mm)$	
$C_y (mm)$	
$S_x (mm^3)$	
$S_y (mm^3)$	

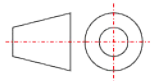
Drawing title

Cladding trim - External corner application

File name

TDS - 2023-03-03 - Cladding

File details



Drawing number	01
Date	March 3, 2023
Page	14 of 8
Scale	NTS

Unless otherwise specified all dimensions are in millimeters.

Issued for information. See supporting documentation for disclaimers and details.

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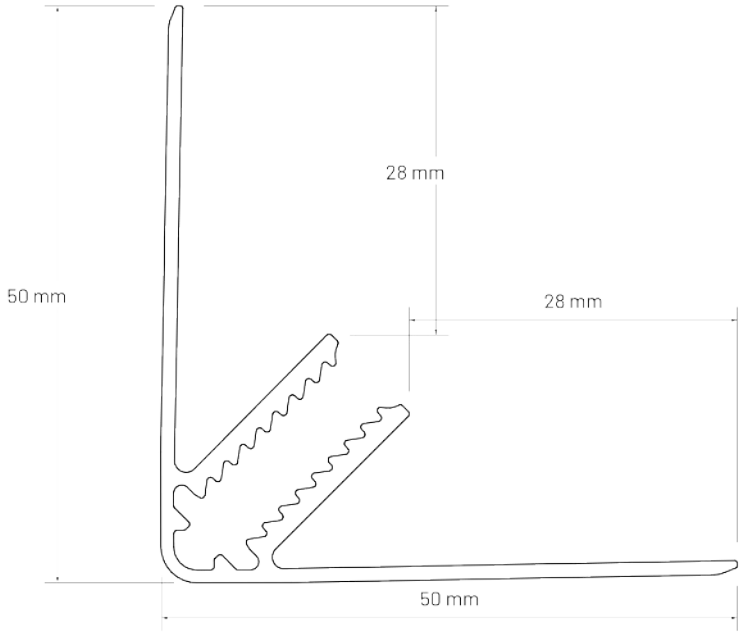
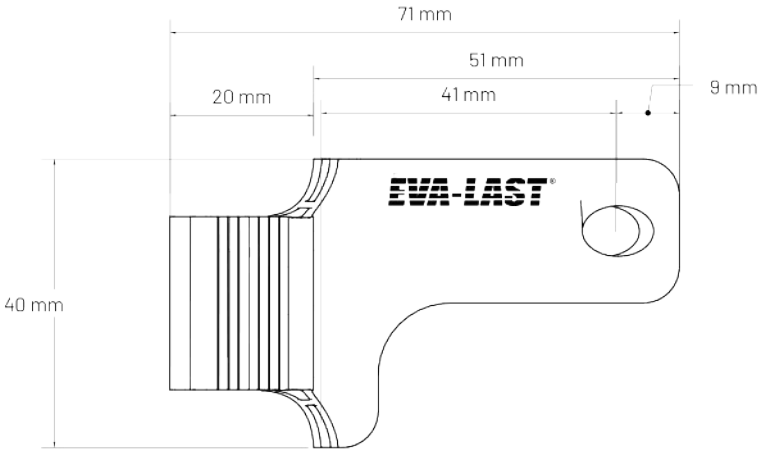
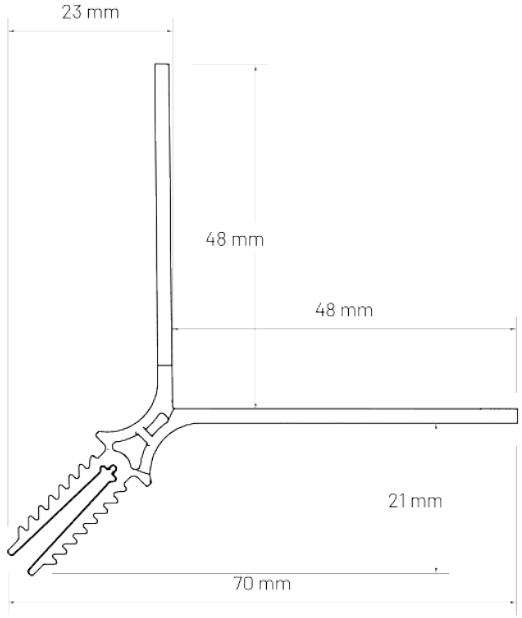
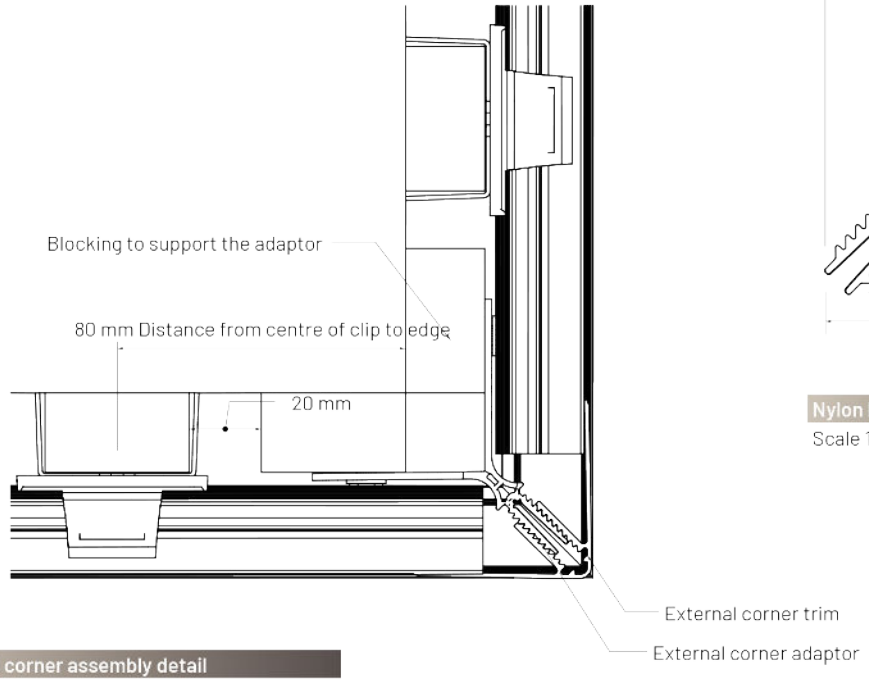


Aluminium External corner trim profile
Scale 1:1





Nylon External corner adaptor
Scale 1:1



External corner assembly detail
Scale 1:1

Appendix C
Material compatibility

The following information provides a list of substances that may negatively impact that Infinity cap material. Below is an extensive (not complete) list of common substances and solutions known to influence the surface of cap on Infinity. It is important to check material compatibility when choosing chemicals that the product may encounter, as they may prematurely degrade the product, these may include ingredients in cleaning products, pool additives and even oils and saps from local vegetation.

Symbol legend

The symbols and abbreviations used have the following meanings:

+ = Resistant over a period of months to years.

0 = Limited resistance: some swelling, solvation or environmental stress cracking is possible.

- = Not resistant: severe swelling, decomposition, solvation or environmental stress cracking.

soln. = Saturated aqueous solution.

Resistance definition

Good resistance: Water, aqueous salt solutions, detergent solutions, dilute acids, and alkalis.

Limited resistance: Alcohols, aliphatic hydrocarbons, oils, and fats.

Not resistant: Concentrated mineral acids, aromatic and/or halogenated hydrocarbons, esters, ethers, ketones.

Solvents: Examples are methyl ethyl ketone, tetrahydrofuran, toluene, dimethyl-formamide.

Source data:

BASF – Chemical resistance of styrene co-polymers - www.basf.de/plastics

REAGENT	CONC.	LDPE		HDPE	
		70°	140°	70°	140°
Acetone		o	-	o	
Acetaldehyde*	100%	o	-	o	
Acetic Acid*	10%	+	+	+	
Acetic Acid*	60%	+	o	+	
Acetic Anhydride*		-	-	-	
Air		+	+	+	
Aluminium Chloride	all conc	+	+	+	
Aluminium Fluoride	all conc	+	+	+	
Aluminium Sulphate	all conc	+	+	+	
Alums	all types	+	+	+	
Ammonia	100% dry gas	+	+	+	
Ammonium Carbonate		+	+	+	
Ammonium Chloride	sat'd	+	+	+	
Ammonium Fluoride	sat'd	+	+	+	
Ammonium Hydroxide	10%	+	+	+	
Ammonium Hydroxide	28%	+	+	+	
Ammonium Nitrate	sat'd	+	+	+	
Ammonium Persulphate	sat'd	+	+	+	
Ammonium Sulphate	sat'd	+	+	+	
Ammonium Metaphosphate	sat'd	+	+	+	
Ammonium Sulfide	sat'd	+	+	+	
Amyl Acetate#*	100%	-	-	-	
Amyl Alcohol#*	100%	+	+	+	
Amyl Chloride#	100%	-	-	-	
Aniline#*	100%	+	-	-	
Aqua Regia+		-	-	-	
Arsenic Acid	all conc	+	+	+	
Aromatic Hydrocarbons#*		-	-	-	
Ascorbic Acid	10%	+	+	+	
Barium Carbonate	sat'd	+	+	+	
Barium Chloride	sat'd	+	+	+	
Barium Hydroxide		+	+	+	
Barium Sulphate	sat'd	+	+	+	
Barium Sulphide	sat'd	+	+	+	
Beer		+	+	+	+
Benzene#*		-	-	-	-
Benzoic Acid	all conc	+	+	+	+
Bismuth Carbonate	sat'd	+	+	+	+
Bleach Lye	10%	+	+	+	+
Borax	sat'd	+	+	+	+
Boric Acid	all conc	+	+	+	+

Boron Trifluoride		+	+	+	+
Brine		+	+	+	+
Bromine+	liquid	-	-	-	-
Bromine Water#	sat'd	-	-	-	-
Butanediol*	10%	+	+	+	+
Butanediol*	60%	+	+	+	+
Butanediol*	100%	+	+	+	+
Butter*		+	+	+	+
n-Butyl Acetate#*	100%	o	-	+	o
n-Butyl Alcohol*	100%	+	+	+	+
Butyric Acid#	conc	-	-	-	-
Calcium Bisulphide		+	+	+	+
Calcium Carbonate	sat'd	+	+	+	+
Calcium Chlorate	sat'd	+	+	+	+
Calcium Chloride	sat'd	+	+	+	+
Calcium Hydroxide	conc	+	+	+	+
Calcium Hypochloride	bleach sol	+	+	+	+
Calcium Nitrate	50%	+	+	+	+
Calcium Oxide	sat'd	+	+	+	+
Calcium Sulphate		+	+	+	+
Camphor Oil#*		-	-	o	-
Carbon Dioxide	all conc	+	+	+	+
Carbon Disulphide		-	-	-	-
Carbon Monoxide		+	+	+	+
Carbon Tetrachloride#		-	-	o	-
Carbonic Acid		+	+	+	+
Castor Oil*	conc	+	+	+	+
Chlorine+	100% dry gas	o	-	-	-
Chlorine Liquid+		-	-	-	-
Chlorine Water+	2% sat'd sol	+	+	+	+
Chlorobenzene#*		-	-	-	-
Chloroform*#		-	-	o	-
Chlorosulphonic Acid	100%	-	-	-	-
Chrome Alum	sat'd	+	+	+	+
Chromic Acid	80%	-	-	-	
Chromic Acid	50%	+	o	+	
Chromic Acid	10%	+	+	+	
Cider*		+	+	+	
Citric Acid*	sat'd	+	+	+	
Coconut Oil Alcohols*		+	+	+	
Coffee		+	+	+	
Cola Concentrate*		+	+	+	
Copper Chloride	sat'd	+	+	+	
Copper Cyanide	sat'd	+	+	+	
Copper Fluoride	2%	+	+	+	
Copper Nitrate	sat'd	+	+	+	
Copper Sulphate	sat'd	+	+	+	
Corn Oil*		+	+	+	
Cottonseed Oil*		+	+	+	
Cuprous Chloride	sat'd	+	+	+	
Detergents Synthetic*		+	+	+	
Developers Photographic		+	+	+	
Dextrin	sat'd	+	+	+	
Dextrose	sat'd	+	+	+	
Diazo Salts		+	+	+	
Dibutylphthalate*		o	o	o	
Dichlorobenzene#*		-	-	-	
Diethyl Ketone#*		o	-	o	
Diethylene Glycol*		+	+	+	
Diglycolic Acid*		+	+	+	
Dimethylamine		-	-	-	
Disodium Phosphate		+	+	o	
Emulsions, Photographic*		+	+	+	
Ethyl Acetate#*	100%	o	-	o	
Ethyl Alcohol*	100%	+	+	+	
Ethyl Alcohol*	35%	+	+	+	
Ethyl Benzene#*		-	-	-	
Ethyl Chloride#		-	-	-	
Ethyl Ether#		-	-	-	
Ethylene Chloride#*		-	-	-	
Ethylene Glycol*		+	+	+	
Fatty Acids*		+	+	+	
Ferric Chloride	sat'd	+	+	+	
Ferric Nitrate	sat'd	+	+	+	+
Ferrous Chloride	sat'd	+	+	+	+
Ferrous Sulphate		+	+	+	+
Fish Solubles*		+	+	+	+
Fluoboric Acid		+	+	+	+
Fluosillcic Acid	conc	+	o	+	o
Fluosillcic Acid	32%	+	+	+	+
Formic Acid	all conc	+	+	+	+
Fructose	d	+	+	+	+

Fruit Pulp*		+	+	+	+
Furtural#	100%	-	-	o	-
Furturyl Alcohol#*		-	-	o	-
Gallic Acid*		+	+	+	+
Gasoline#*		-	-	o	o
Glucose		+	+	+	+
Glycerine*		+	+	+	+
Glycol*		+	+	+	+
Glycolic Acid*	30%	+	+	+	+
Grape Sugar		+	+	+	+
n-Heptane#*		-	-	o	o
Hexachlorobenzene		+	+	+	-
Hexanol Tertiary*		+	+	+	+
Hydrobromic Acid	50%	+	+	+	+
Hydrochloric Acid	all conc	+	+	+	+
Hydrocyanic Acid	sat'd	+	+	+	+
Hydrofluoric Acid*	60%	+	+	+	+
Hydrogen		+	+	+	+
Hydrogen Chloride	dry gas	+	+	+	+
Hydrogen Peroxide	30%	+	+	+	+
Hydrogen Peroxide	10%	+	+	+	+
Hydrogen Sulphide		+	+	+	+
Hydroquinone		+	+	+	+
Hypochlorous Acid conc.	conc.	+	+	+	+
Inks*		+	+	+	+
Iodine+ in KI sol'n	in KIsol'd	o	-	o	
Isopropyl Alcohol	100%	-	-	-	
Lead Acetate	sat'd	+	+	+	
Lead Nitrate		+	+	+	
Lactic Acid*	20%	+	+	+	
Linseed Oil*	100%	o	-	o	
Magnesium Carbonate	sat'd	+	+	+	
Magnesium Chloride	sat'd	+	+	+	
Magnesium Hydroxide	sat'd	+	+	+	
Magnesium Nitrate	sat'd	+	+	+	
Magnesium Sulphate	sat'd	+	+	+	
Mercuric Chloride	40%	+	+	+	
Mercuric Cyanide	sat'd	+	+	+	
Mercury		+	+	+	
Methyl Alcohol*	100%	+	+	+	
Methylethyl Ketone#*	100%	o	-	o	

Methylene Chloride#*	100%	-	-	o	
Milk		+	+	+	
Mineral Oils#		o	-	o	
Molasses		+	+	+	
Naphtha#*		o	-	o	
Naphthalene#*		-	-	o	
Nickel Chloride	conc	+	+	+	
Nickel Nitrate	sat'd	+	+	+	
Nickel Sulphate	conc	+	+	+	
Nicotine*	dilute	+	+	+	
Nitric Acid	0-30%	+	+	+	
Nitric Acid+	30-50%	+	o	+	
Nitric Acid+	70%	+	o	+	
Nitric Acid+	95-98%	-	-	-	
Nitrobenzene#*	100%	-	-	-	
n-Octane		+	+	+	
Oleic Acid		o	-	o	
Oxalic Acid*	sat'd	+	+	+	
Perchloroethylene#		-	-	-	
Phosphoric Acid	95%	+	o	+	
Photographic Solutions		+	+	+	
Plating Solutions*					
Brass		+	+	+	+
Cadmium		+	+	+	+
Chromium		+	+	+	+
Copper		+	+	+	+
Gold		+	+	+	+
Indium		+	+	+	+
Lead		+	+	+	+
Nickel		+	+	+	+
Rhodium		+	+	+	+
Sliver		+	+	+	+
Tin		+	+	+	+
Zinc		+	+	+	+
Potassium Bicarbonate	sat'd	+	+	+	+
Potassium Bromide	sat'd	+	+	+	+

Potassium Bromate	10%	+	+	+	+
Potassium Carbonate		+	+	+	+
Potassium Chlorate	sat'd	+	+	+	+
Potassium Chloride	sat'd	+	+	+	+
Potassium Chromate	40%	+	+	+	+
Potassium Cyanide	sat'd	+	+	+	+
Potassium Dichromate	40%	+	+	+	+
Potassium Ferri/Ferro	Ferro				
Cyanide	sat'd	+	+	+	+
Potassium Fluoride		+	+	+	+
Potassium Hydroxide	conc	+	+	+	+
Potassium Nitrate	sat'd	+	+	+	+
Potassium Perborate	sat'd	+	+	+	+
Potassium Perchlorate	10%	+	+	+	+
Potassium Permanganate	20%	+	+	+	+
Potassium Persulphate	sat'd	+	+	+	+
Potassium Sulphate	conc	+	+	+	+
Potassium Sulphide	conc	+	+	+	+
Potassium Sulphite	Conc100%	+	+	+	+
Propargyl Alcohol*		+	+	+	+
n-Propyl Alcohol*		+	+	+	+
Propylene Dichloride#*		-	-	-	-
Propylene GlyCol*	sat'd	+	+	+	+
Pyridine*		+	-	+	-
Resorcinol		+	+	+	+
Salicylic Acid	sat'd	+	+	+	+
Sea Water		+	+	+	+
Selenic Acid Shortening*	any conc	+	+	+	+
Sliver Nitrate Sol'n		+	+	+	+
Soap Solutions*	any conc	+	+	+	+
Sodium Acetate	sat'd	+	+	+	+
Sodium Benzoate	35%	+	+	+	+
Sodium Biscarbonate	sat'd	+	+	+	+
Sodium Bisulphate	sat'd	+	+	+	+
Sodium Bisulphite	sat'd	+	+	+	+
Sodium Borate	dilute	+	+	+	+
Sodium Bromide	dilute	+	+	+	+
Sodium Carbonate	conc	+	+	+	+
Sodium Chlorate	sat'd	+	+	+	+
Sodium Chloride	sat'd	+	+	+	+
Sodium Cyanide	sat'd	+	+	+	+
Sodium Dichromate	sat'd	+	+	+	+