

VISTA BEST®

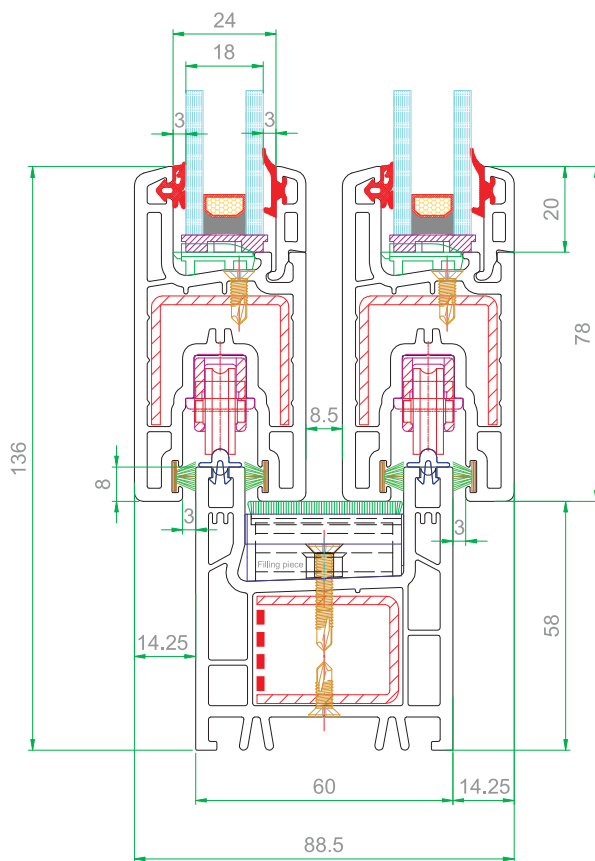
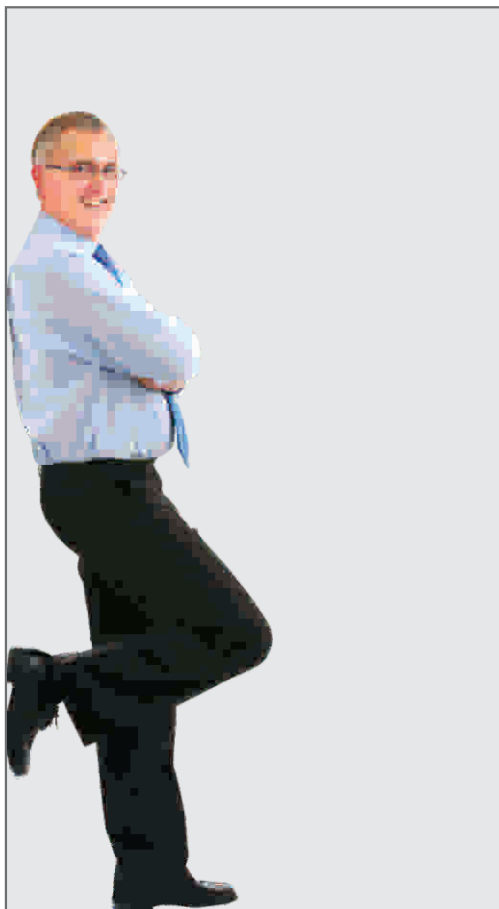
Best of the Best

UPVC Profile Producer

ویستا بست

(سهامی خاص)

تولیدکننده پروفیل یو پی وی سی



Sliding Profile System

VISTA BEST®

Best of the Best

UPVC Profile Producer

We offer a gem for you to create a jewel to adorn your buildings.

VISTA BEST a brand which is deeply embedded in everybody's mind.

VISTA BEST is a young team supported by a long line of production experience. Our products are produced on the basis of high quality, innovation and durability.

By implementing the best designs, the latest German and Austrian machinery and technology, employing the strongest professionals and using top European materials, we have been able to produce products that are easily approved by both European and Iranian research centers.

High market share in a short period and at a time of overwhelming foreign import has proven our ability to reach our goals. The use of our products by experienced UPVC window fabricators enforces us to continue and exceed all that we have achieved so far.

By complying with all the technical and production standards of high quality manufacturing we hope to boost our customers' confidence in Iranian quality.

ما گوهری در اختیار شما می‌گذاریم تا از آن جواهری بر سینه ساختمان‌ها بسازید.

«ویستا بست» برندی است که خود را در اعماق اذهان حک می‌کند.

«ویستا بست» متشکل از گروهی متخصص با تکیه بر تجربیات تولیدی طولانی بوده و محصولات خود را بر اصل مهم کیفیت، نوآوری و استمرار بنا نهاده است.

«ویستا بست» با بکار بردن طراحی مدرن روز، ماشین‌آلات و تکنولوژی پیشرفته کشورهای آلمان و اتریش، همراه با پرسنل متخصص و مواد اولیه برتر اروپایی توانسته است محصولاتی را تولید نماید که کیفیت آن‌ها توسط مراکز تحقیقاتی مرجع ایرانی و اروپایی به تایید رسیده است.

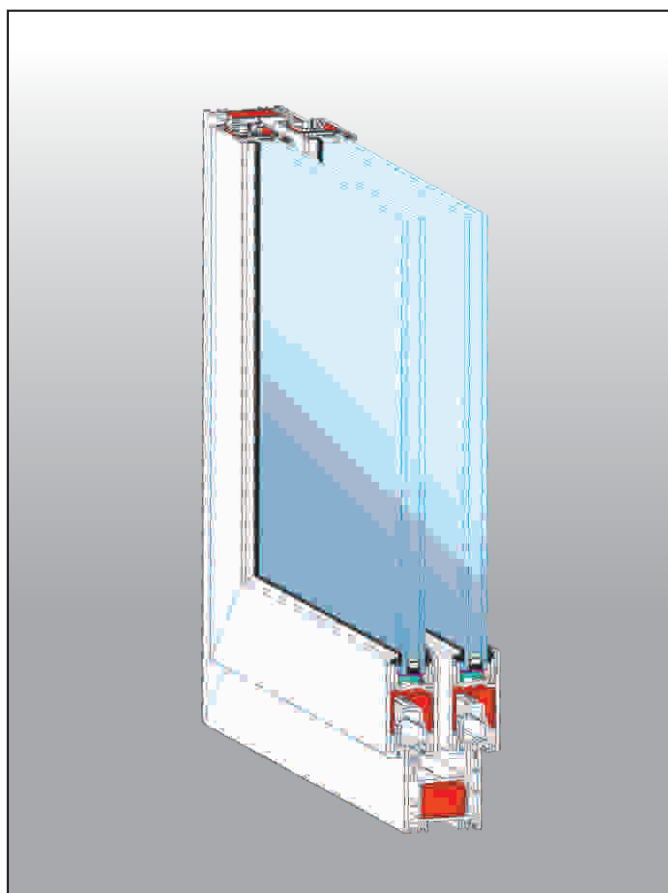
بدست آوردن سهم قابل توجهی از بازار در زمانی کوتاه در مقابله با سیل عظیم محصولات وارداتی؛ سندی بر تحقق اهداف «ویستا بست» بوده و بکار گرفتن این محصولات توسط سازندگان توانمند درب و پنجره‌های یو پی وی سی باعث تقویت انگیزه‌های «ویستا بست» برای استمرار و ارائه محصولات جدید می‌باشد.

امید است با رعایت نکات فنی و اصول ساخت، اعتماد مصرف‌کنندگان به محصولات با کیفیت ایرانی را افزون نماییم.

VISTA BEST®

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UPVC Profile Producer



With
Technology of



greiner
EXTRUSION

KRAUSSMAFFEI

Germany

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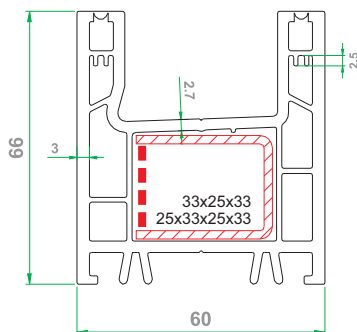
Dimension Limits 53

Chemical & Mechanical 63

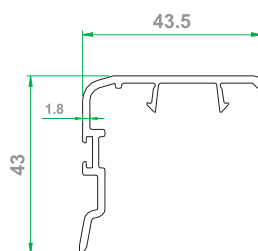
Installation 67

System Profiles And Auxiliary Products

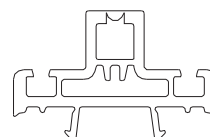
SI.Frame S-586.01
1,46 kg/m



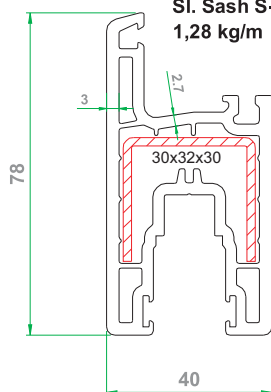
Interlock S-586.03
0,27 kg/m



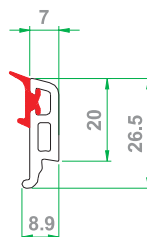
Interseal (AI)



SI. Sash S-586.02
1,28 kg/m

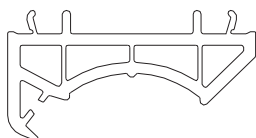


Glassbead S-586.04
0,15 kg/m
PCE: 38 g/m



Existing Profiles that can be used:

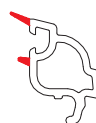
Bay & bow adaptor S-507.10 pole S-563.10 °
0.71 kg/m 1.60 kg/m



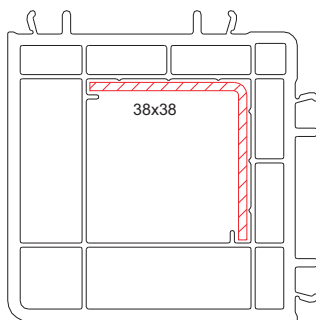
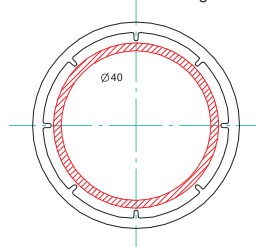
Glassbead 22 mm S-507.06
0.19 kg/m; Soft PVC 12.8 g/m

Glassbead 24 mm S-563.07
0.17 kg/m; Soft PCE 38 g/m

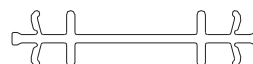
Coupling S-563.11
0.11 kg/m



Bay & bow pole S-507.11
0.56 kg/m



Coupling S-507.13
0.29 kg/m

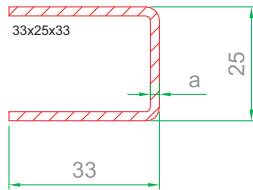


Cover S-507.14
0.14 kg/m

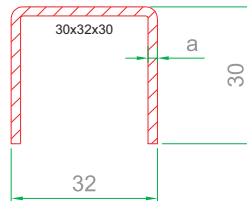


S-586TRE01

= S-563TRE02
= S-507TRE09

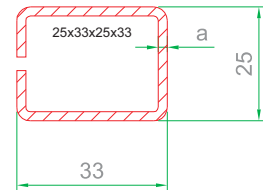


S-586TRE02

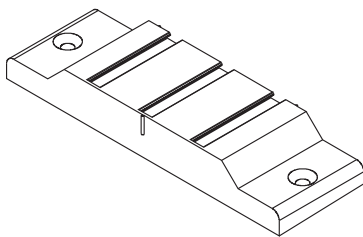


Option: S-586TRE03

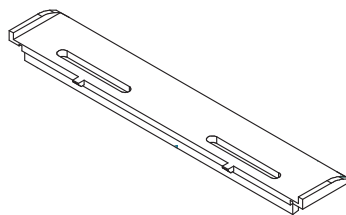
= S-563TRE03
= S-507TRE10



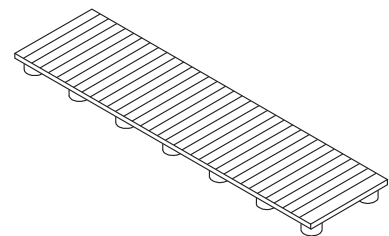
Filling Piece



Glazing Bridge



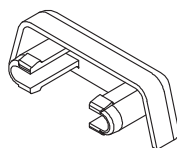
Glazing Block



Brush Gasket



Water Drainage Cover



Gasket 01



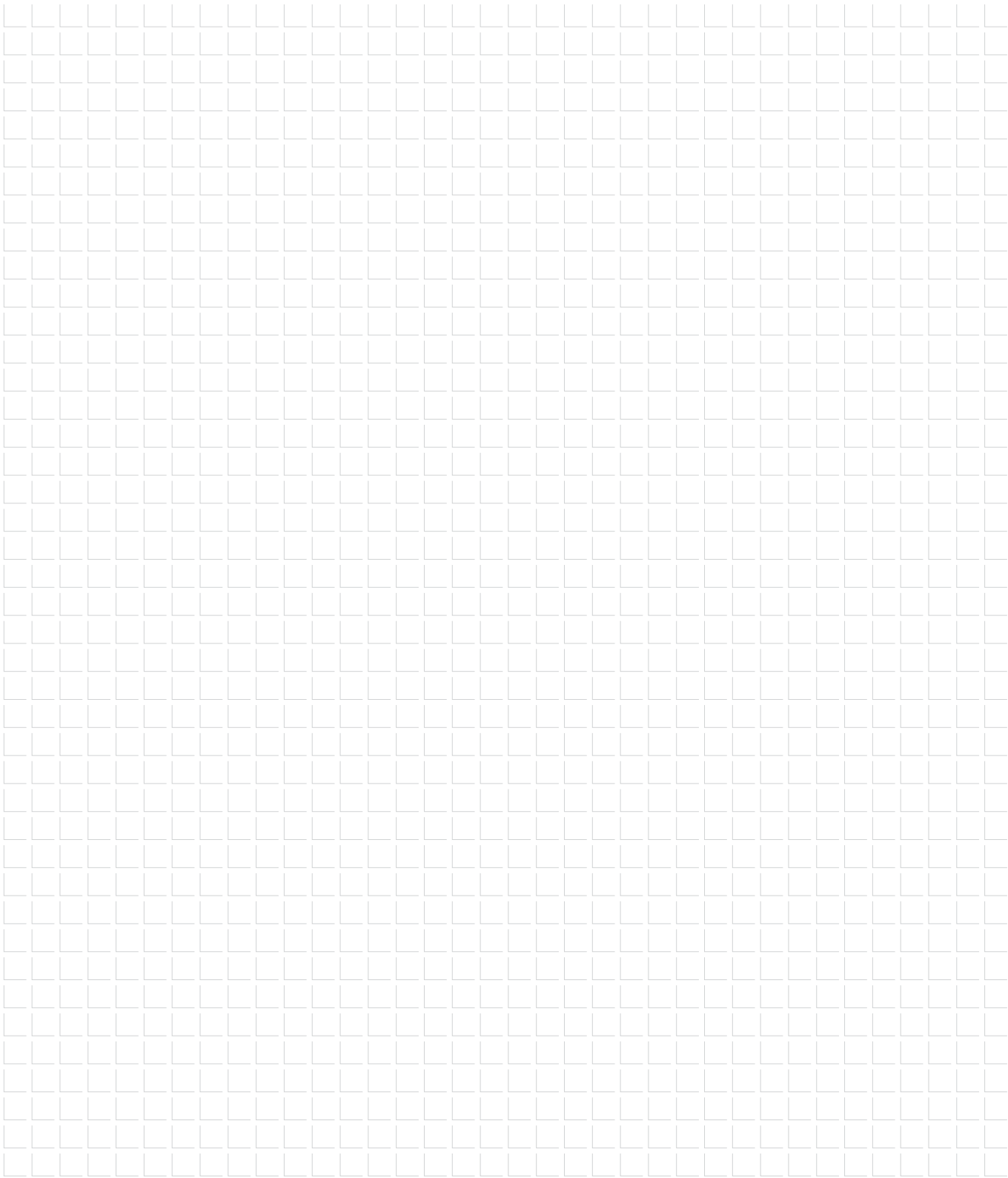
Gasket 02



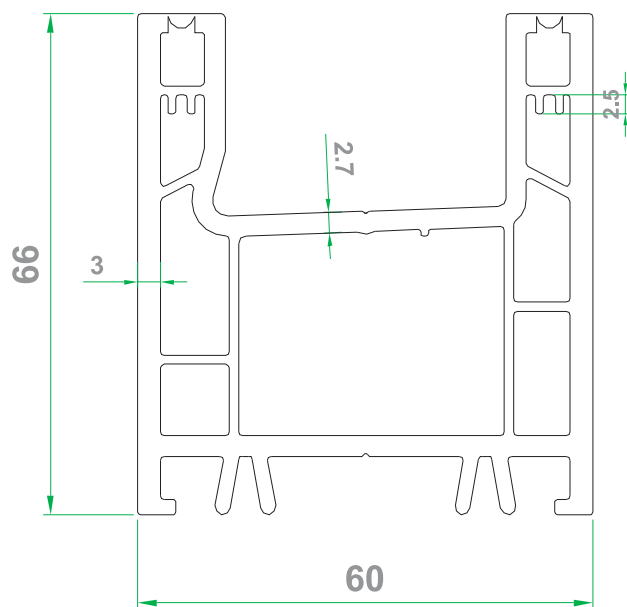
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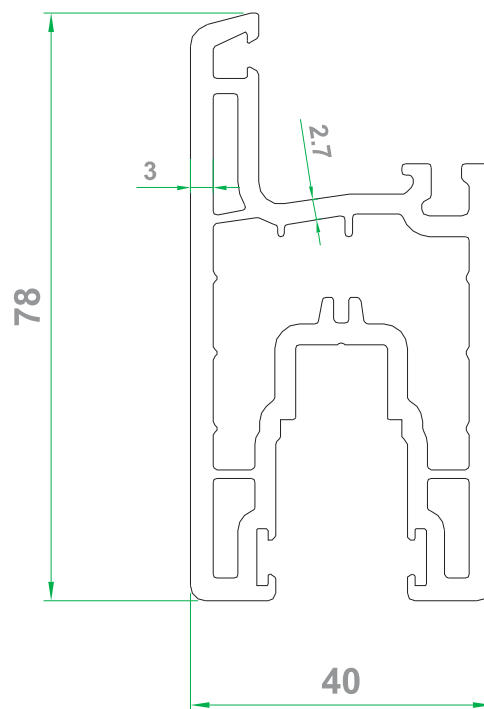
UPVC Profile Producer



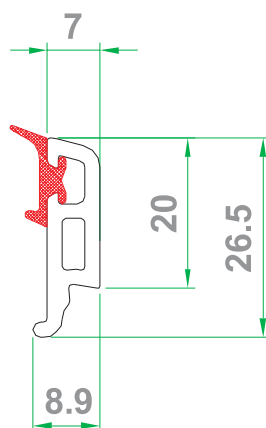
Profiles



SI.Frame S-586.01
1,46 kg/m



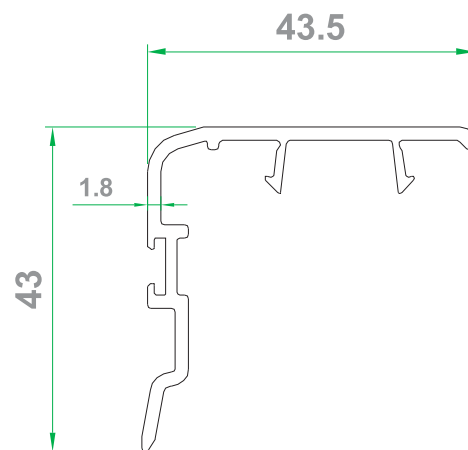
SI. Sash S-586.02
1,28 kg/m



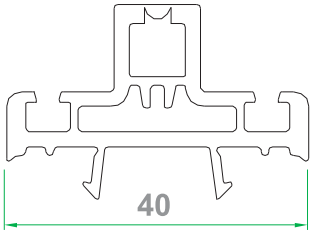
Glassbead S-586.04

0,15 kg/m

PCE: 38 g/m

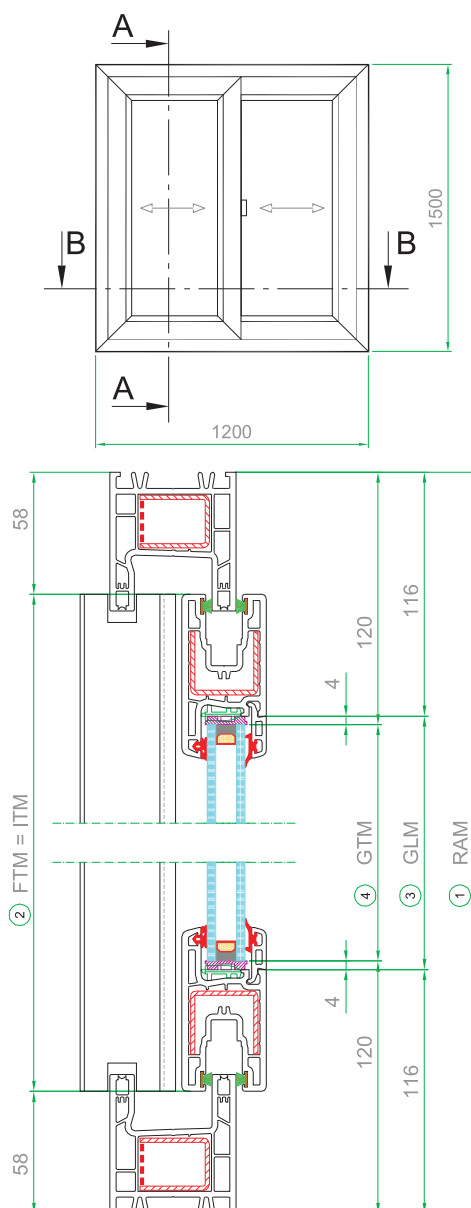


Interlock S-586.03
0,27 kg/m



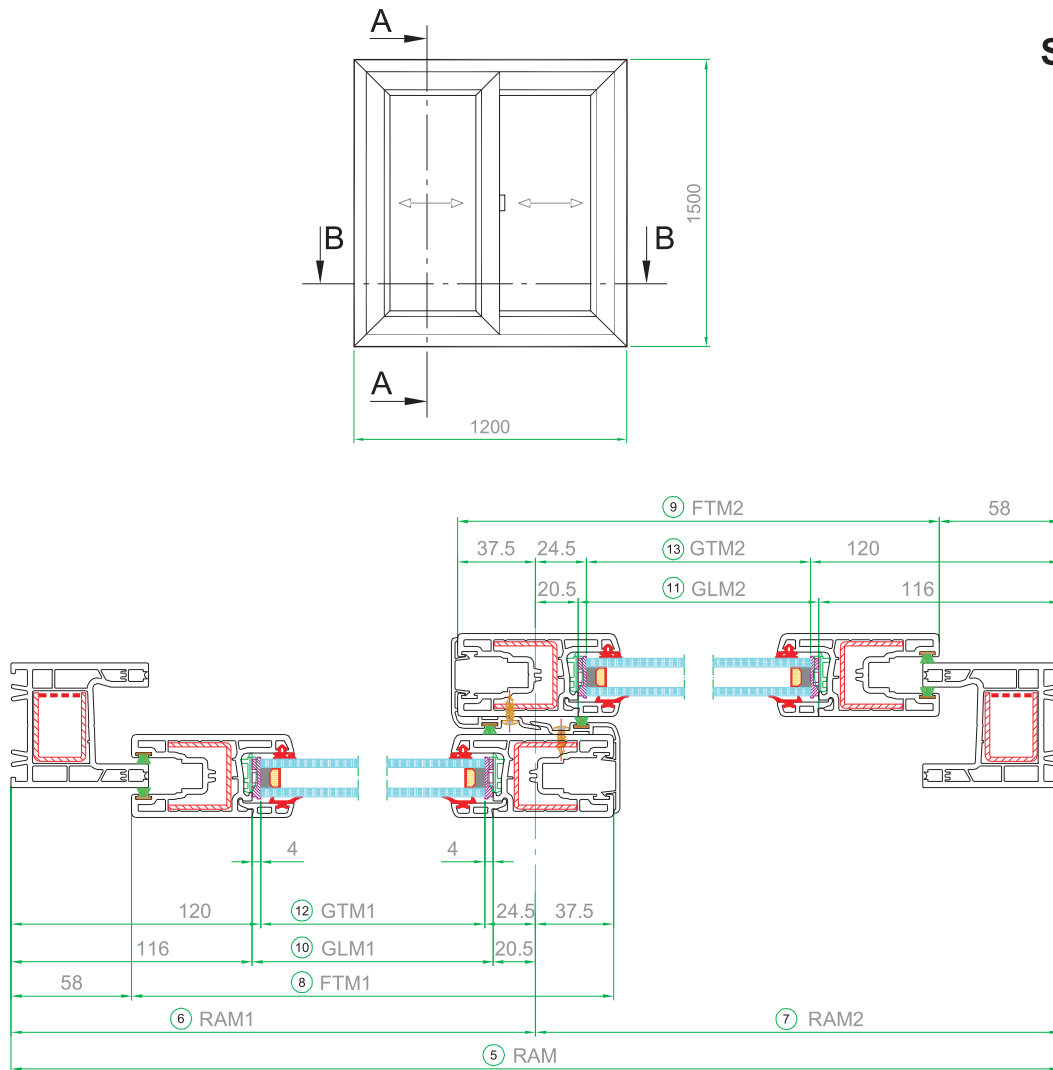
Inters(40)

Section A-A



Cutting dimensions - Section A-A (for window height e.g. 1500 mm)			
Pos.	Description	Formula	size mm (e.g.)
1	RAM = Frame reference size		1500.0
2	FTM = Sash size	RAM - 116.0	1384.0
2	ITM = Interlock size	RAM - 116.0	1384.0
3	GLM = Glassbead size	RAM - 232.0	1268.0
4	GTM = Glass size	RAM - 240.0	1260.0

Section B-B

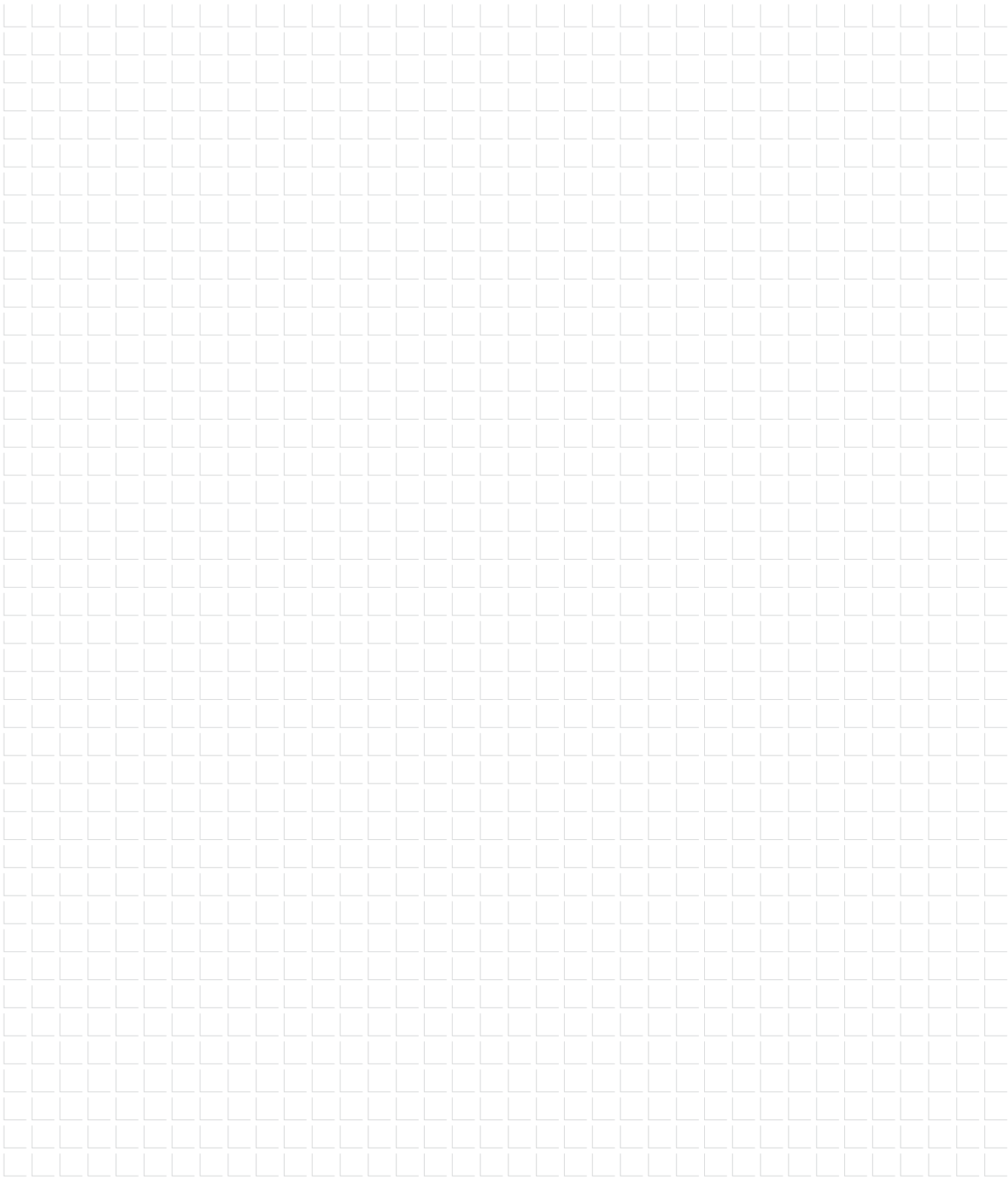


Cutting dimensions - Section B-B (for window width e.g. 1200 mm)			
Pos.	Description	Formula	size mm (e.g.)
5	RAM = Frame reference size		1200.0
6	RAM 1	$RAM / 2$	600.0
7	RAM 2	$RAM / 2$	600.0
8	FTM 1 = Sash size	$RAM 1 - 20.5$	579.5
9	FTM 2 = Sash size	$RAM 2 - 20.5$	579.5
10	GLM 1 = Glassbead size	$RAM 1 - 136.5$	463.5
11	GLM 2 = Glassbead size	$RAM 2 - 136.5$	463.5
12	GTM 1 = Glass size	$RAM 1 - 144.5$	455.5
13	GTM 2 = Glass size	$RAM 2 - 144.5$	455.5

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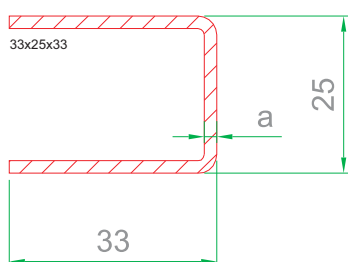


Reinforcement (Info & Cutting Dimensions)

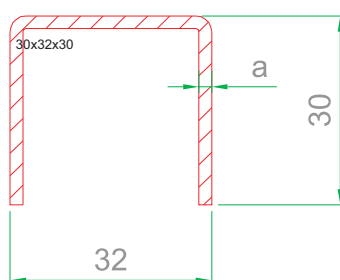
Option:

S-586TRE01

= S-563TRE02
= S-507TRE09

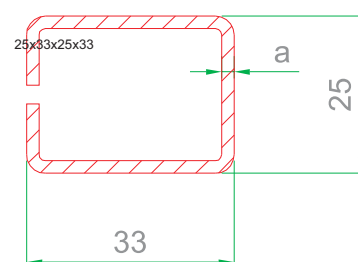


S-586TRE02

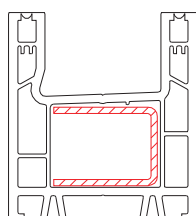


S-586TRE03

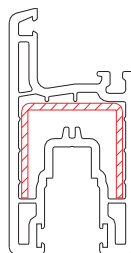
= S-563TRE03
= S-507TRE10



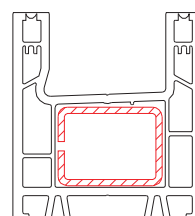
SI.Frame S-586.01



SI. Sash S-586.02



SI.Frame S-586.01



thickness a [mm]	weight [kg/m]
1,50	0,99
2,00	1,31
2,50	1,63
3,00	1,93

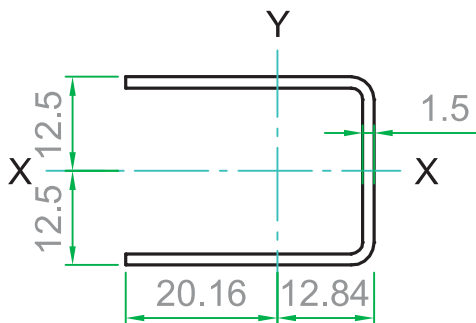
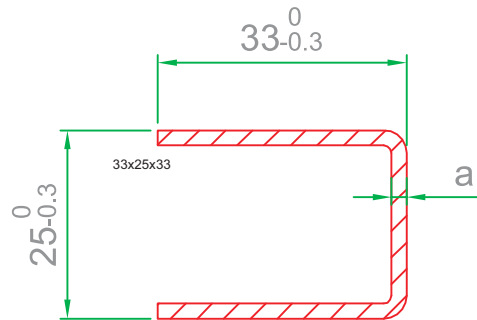
thickness a [mm]	weight [kg/m]
1,50	1,02
2,00	1,34
2,50	1,65
3,00	1,95

thickness a [mm]	weight [kg/m]
1,50	1,19
2,00	1,56
2,50	1,93
3,00	2,27

S-586TRE01

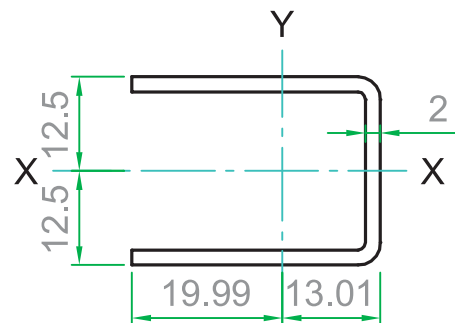
= S-563TRE02

= S-507TRE09



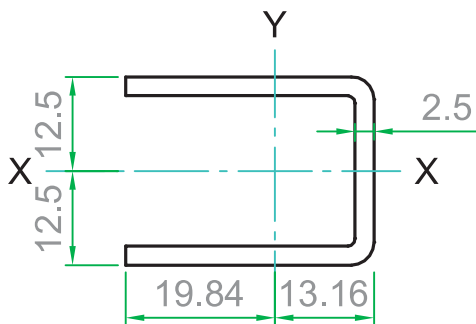
$$I_x = 1.46 \text{ [cm}^4\text{]}$$

$$I_y = 1.47 \text{ [cm}^4\text{]}$$



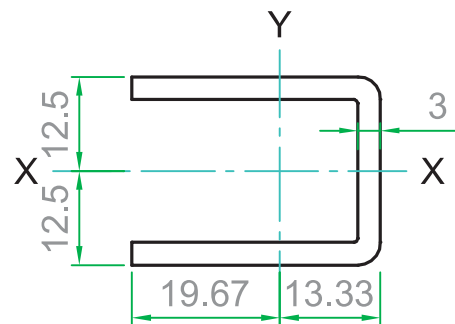
$$I_x = 1.85 \text{ [cm}^4\text{]}$$

$$I_y = 1.91 \text{ [cm}^4\text{]}$$



$$I_x = 2.21 \text{ [cm}^4\text{]}$$

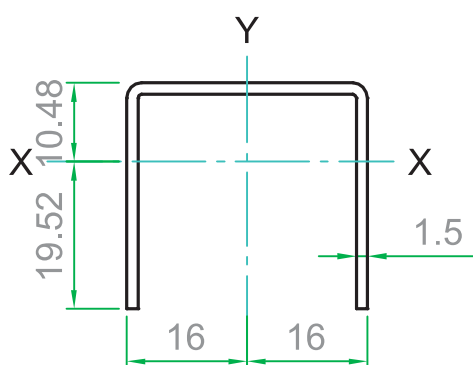
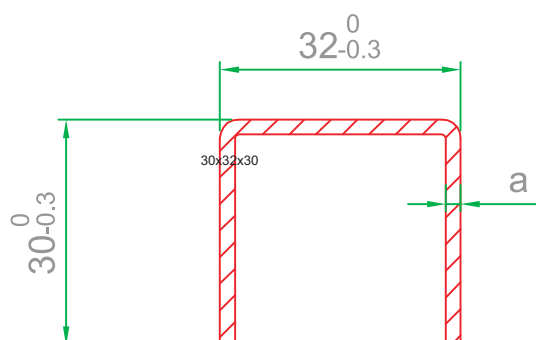
$$I_y = 2.34 \text{ [cm}^4\text{]}$$



$$I_x = 2.53 \text{ [cm}^4\text{]}$$

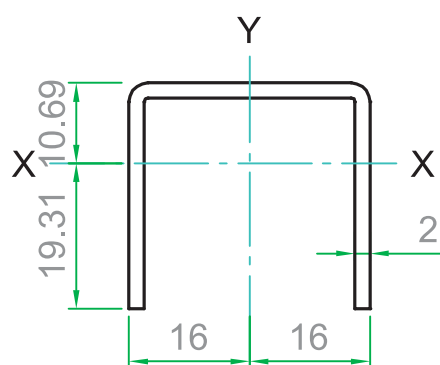
$$I_y = 2.74 \text{ [cm}^4\text{]}$$

S-586TRE02



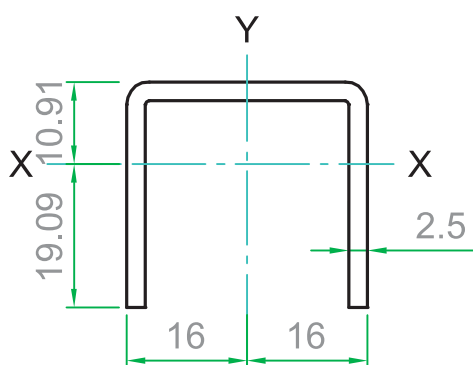
$$I_x = 1.26 \text{ [cm}^4\text{]}$$

$$I_y = 2.36 \text{ [cm}^4\text{]}$$



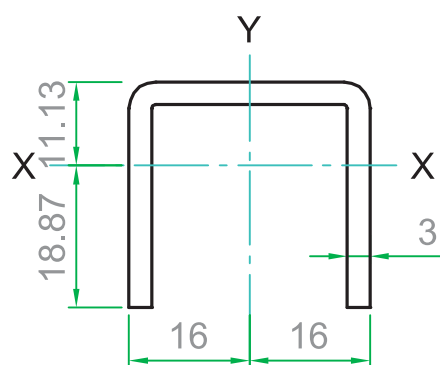
$$I_x = 1.62 \text{ [cm}^4\text{]}$$

$$I_y = 3.01 \text{ [cm}^4\text{]}$$



$$I_x = 1.97 \text{ [cm}^4\text{]}$$

$$I_y = 3.59 \text{ [cm}^4\text{]}$$

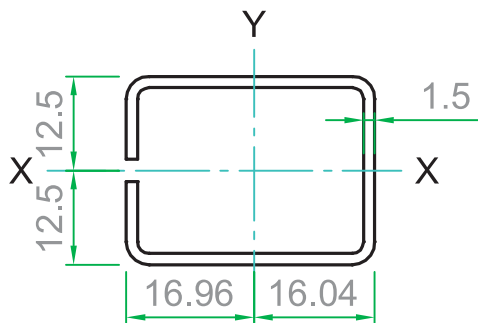
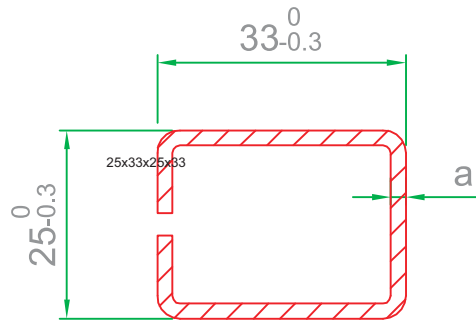


$$I_x = 2.29 \text{ [cm}^4\text{]}$$

$$I_y = 4.12 \text{ [cm}^4\text{]}$$

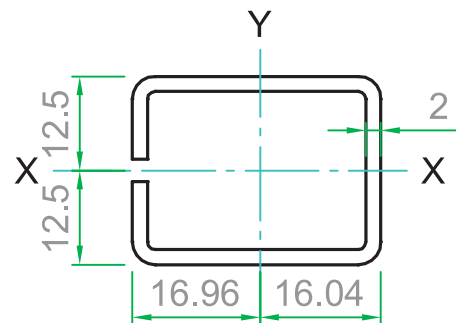
Option: S-586TRE03

= S-563TRE03
= S-507TRE10



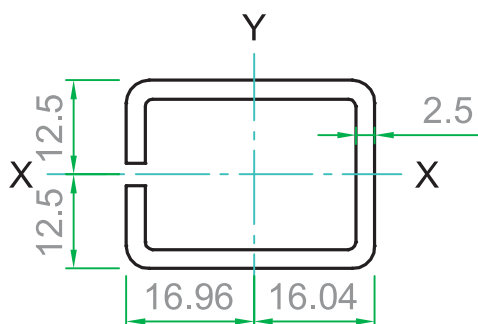
$$I_x = 1.55 \text{ [cm}^4\text{]}$$

$$I_y = 2.27 \text{ [cm}^4\text{]}$$



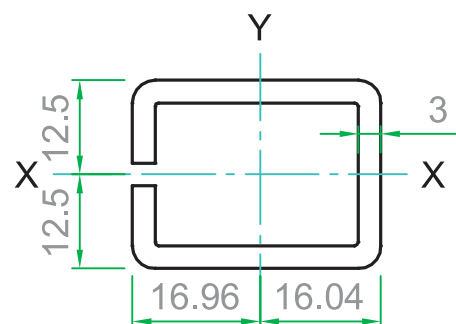
$$I_x = 1.96 \text{ [cm}^4\text{]}$$

$$I_y = 2.89 \text{ [cm}^4\text{]}$$



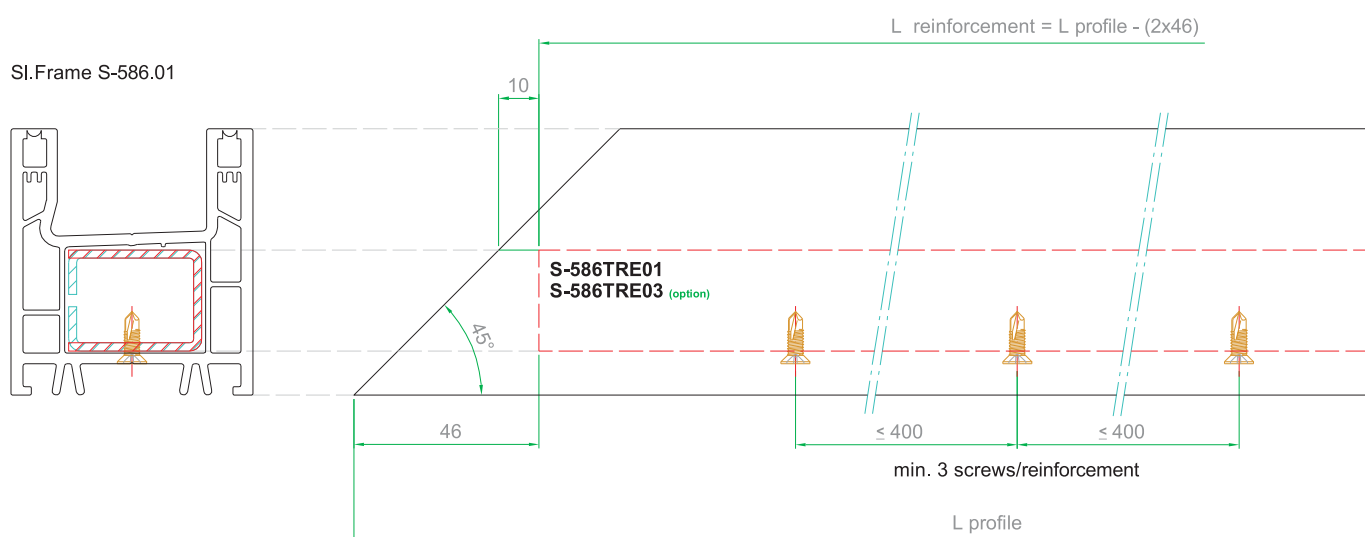
$$I_x = 2.33 \text{ [cm}^4\text{]}$$

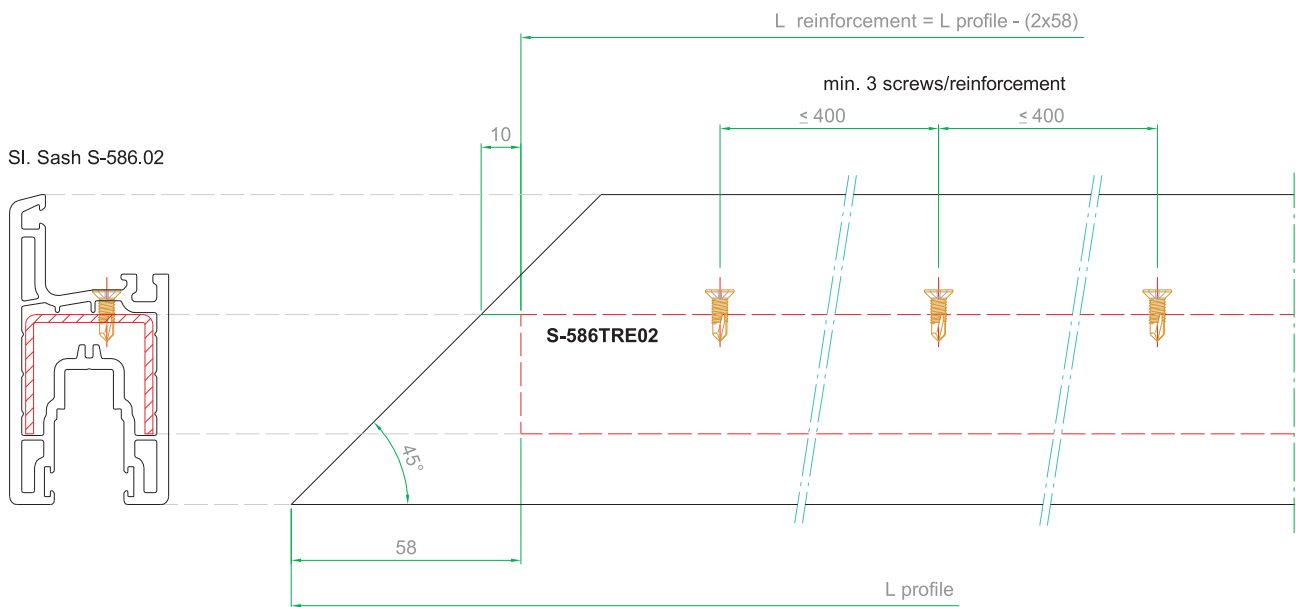
$$I_y = 3.47 \text{ [cm}^4\text{]}$$



$$I_x = 2.65 \text{ [cm}^4\text{]}$$

$$I_y = 3.97 \text{ [cm}^4\text{]}$$

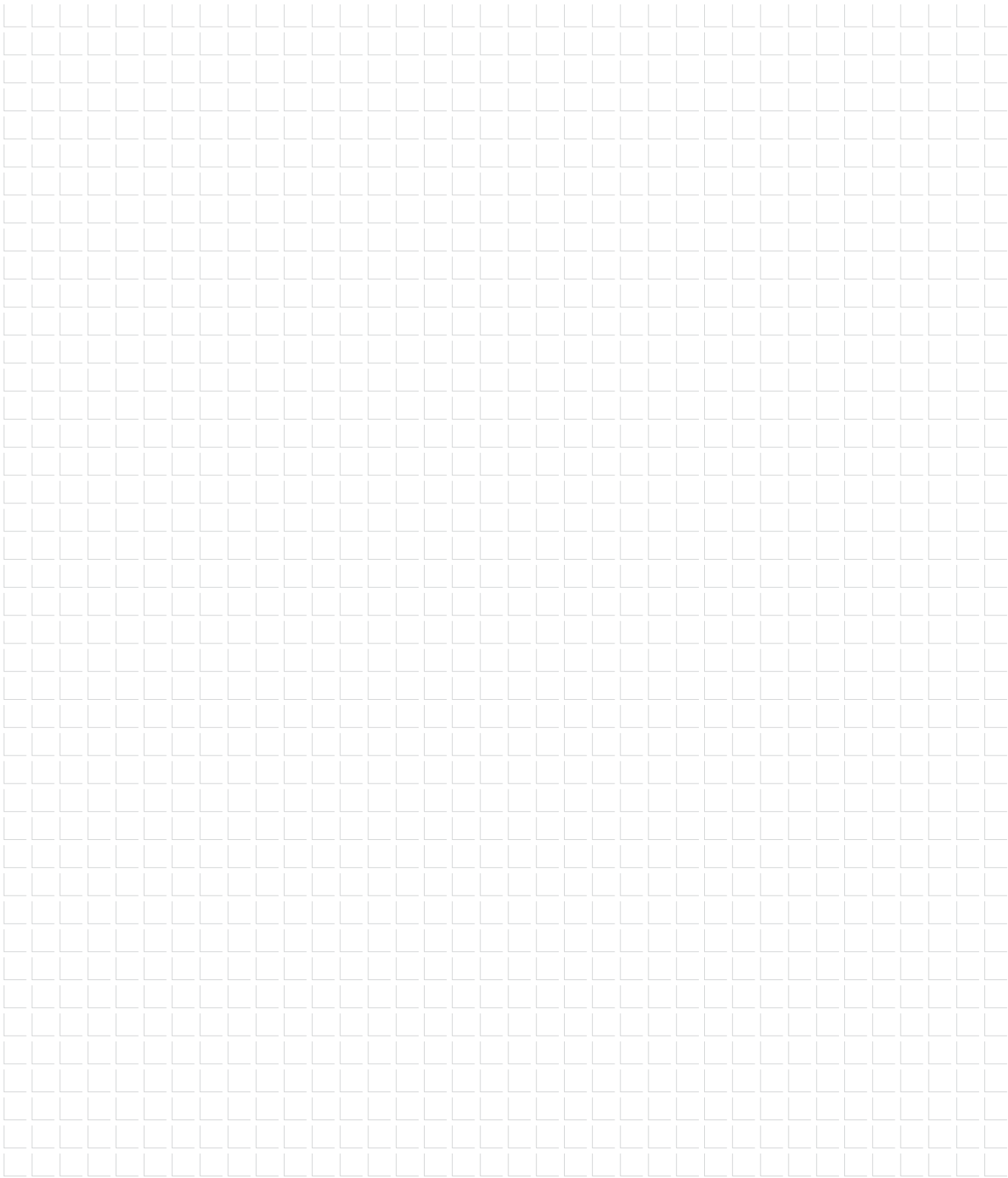




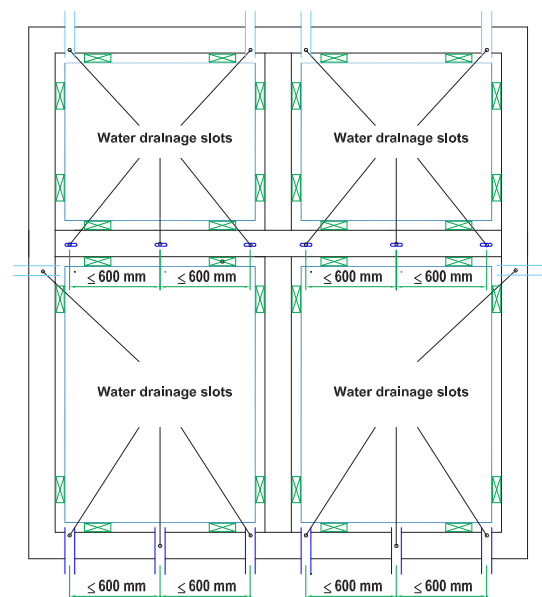
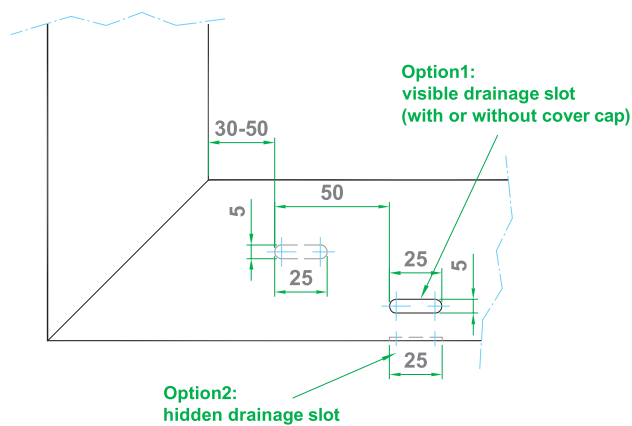
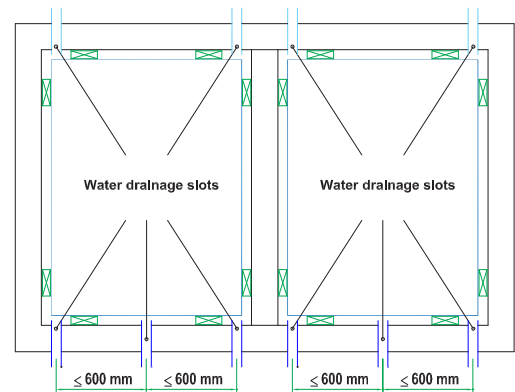
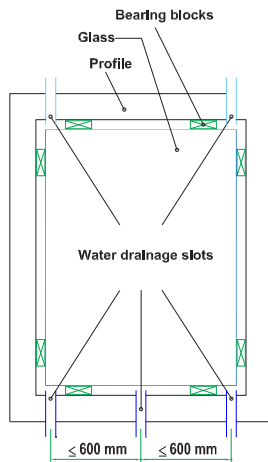
VISTA BEST®

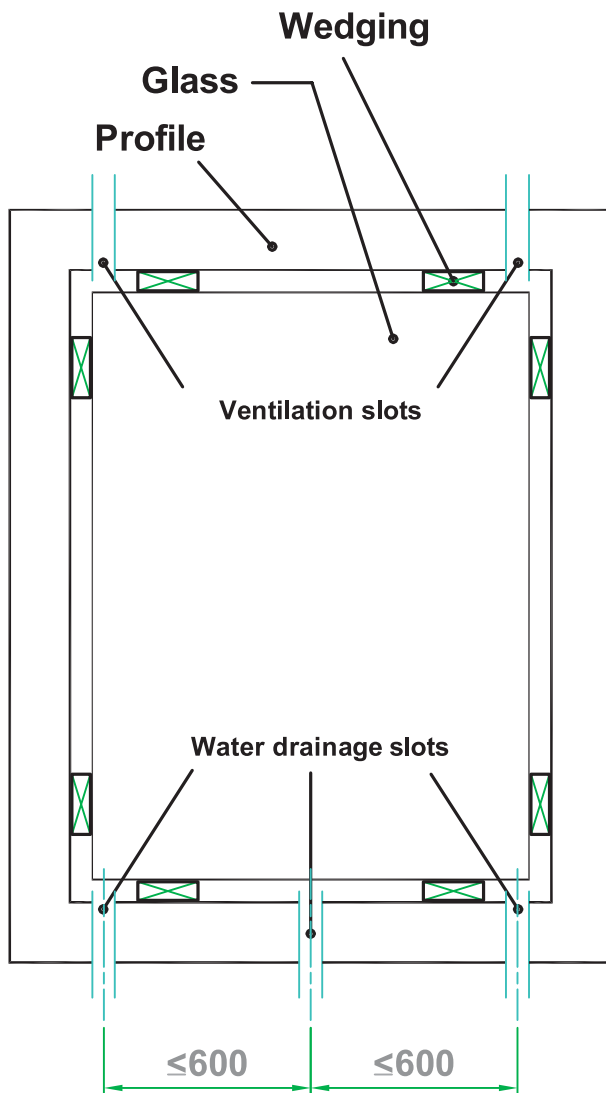
Best of the Best

UPVC Profile Producer

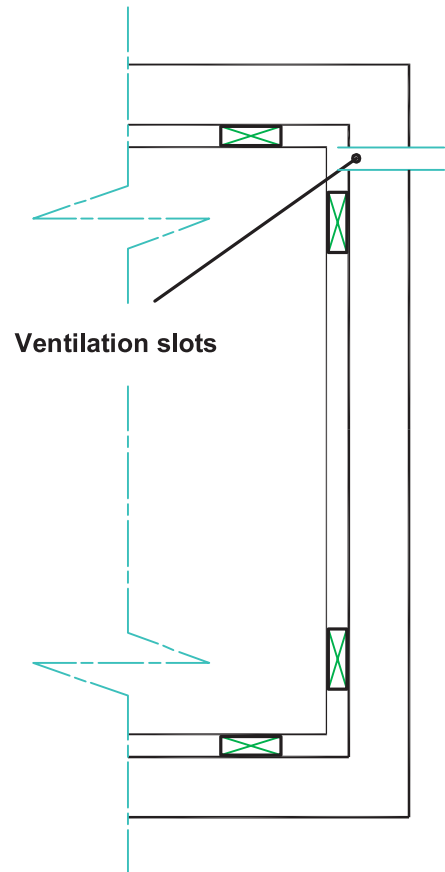


Drainage



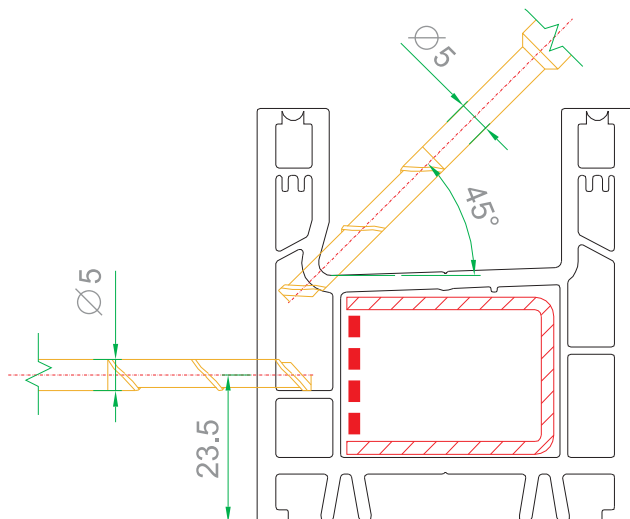


Variation

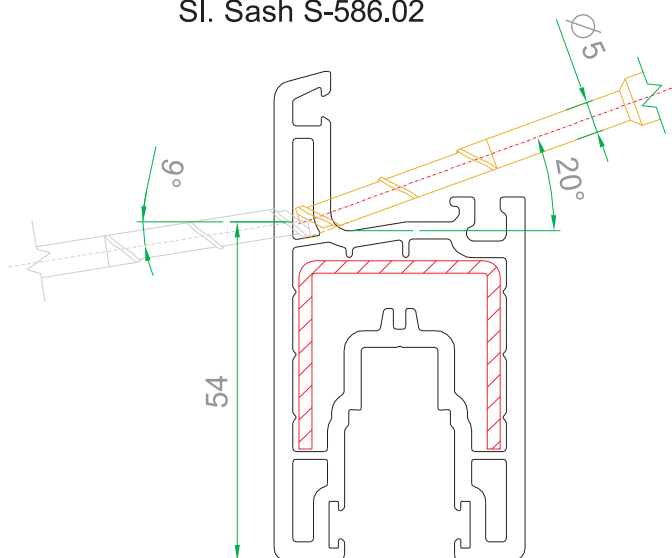


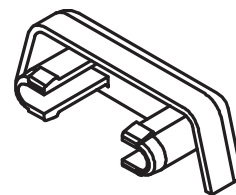
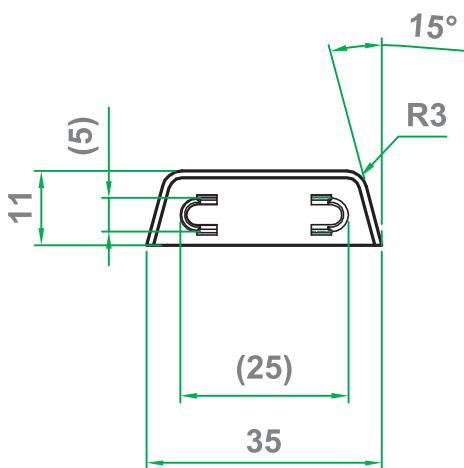
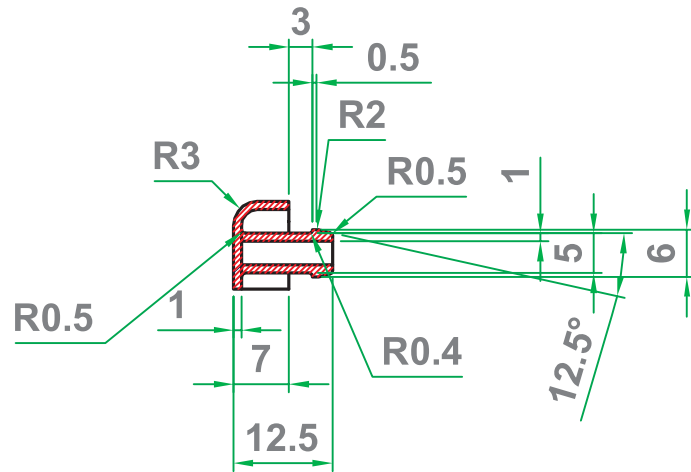
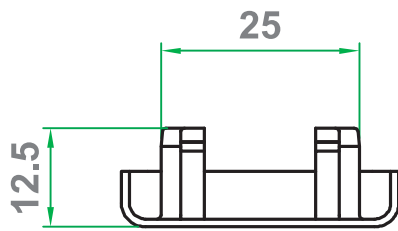
Minimum dimensions for water drainage slots/ventilation slots:
Slots: 5x25 mm or
Hole: $\varnothing 8$ mm ($\varnothing 5$ mm for ventilation slots)

SI.Frame S-586.01



SI. Sash S-586.02

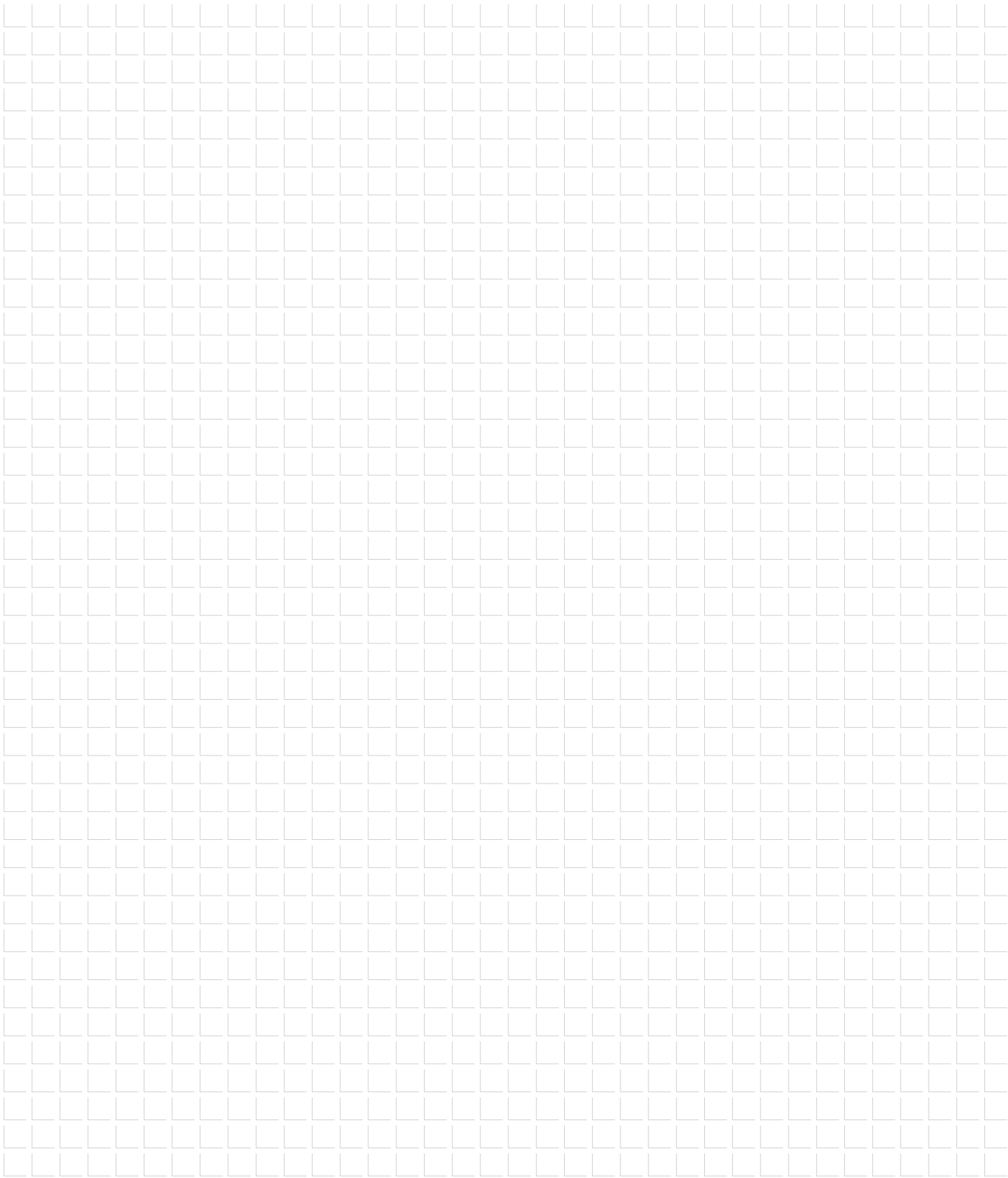


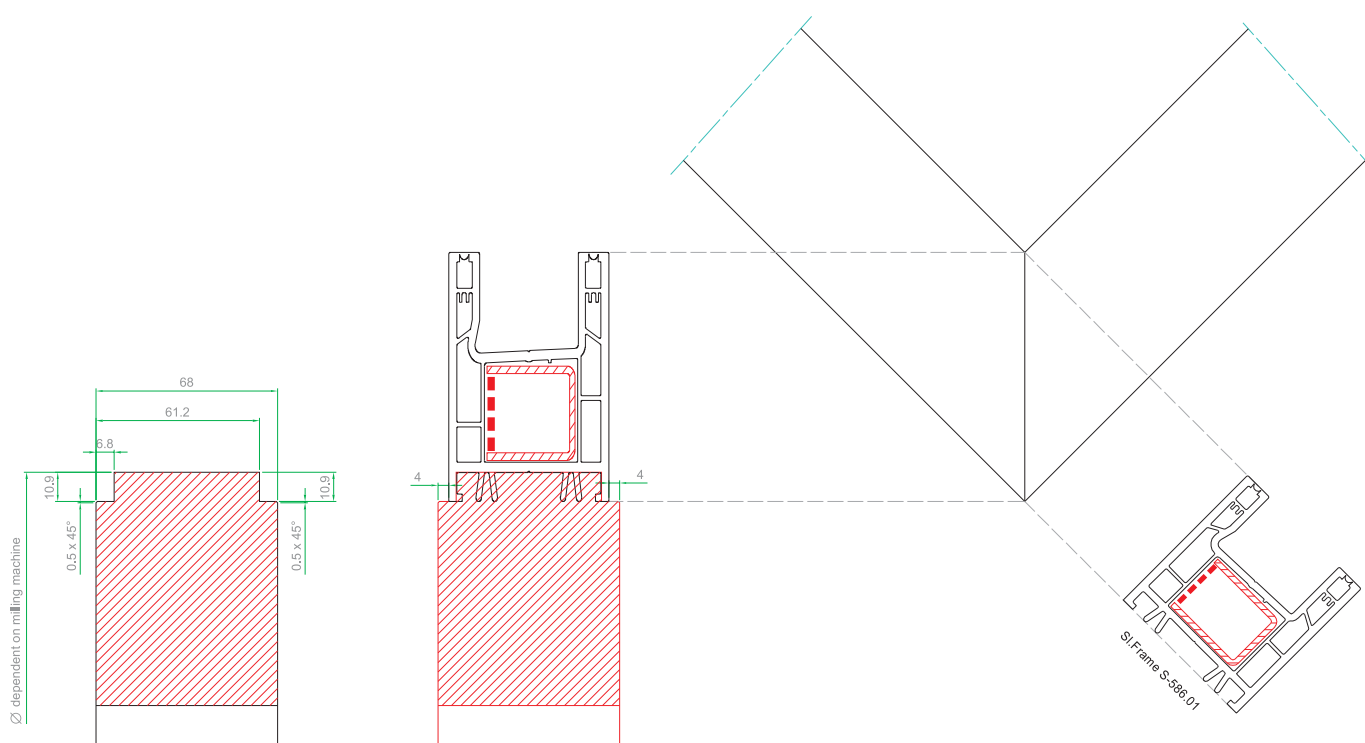


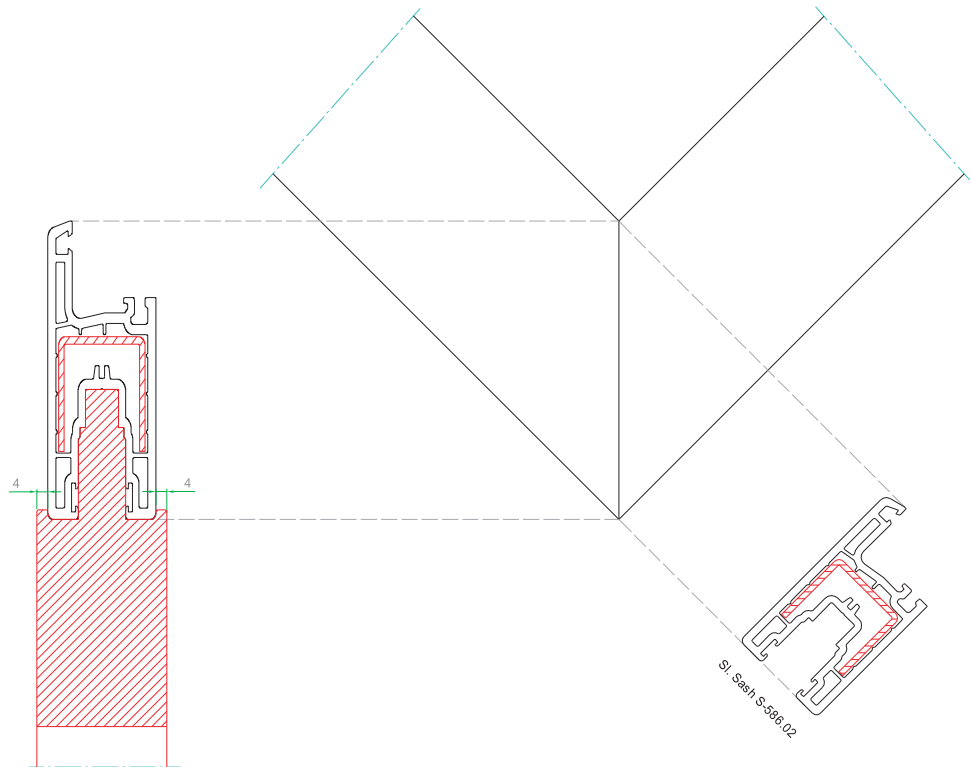
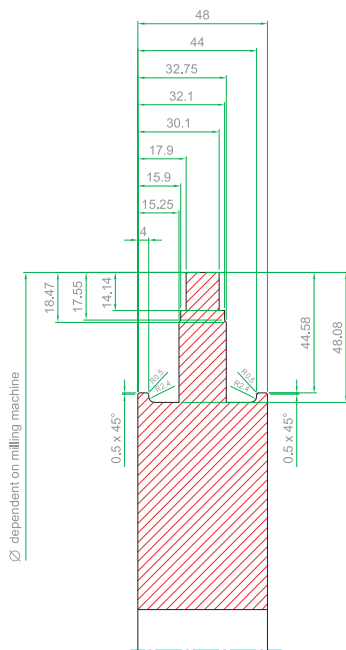
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UPVC Profile Producer



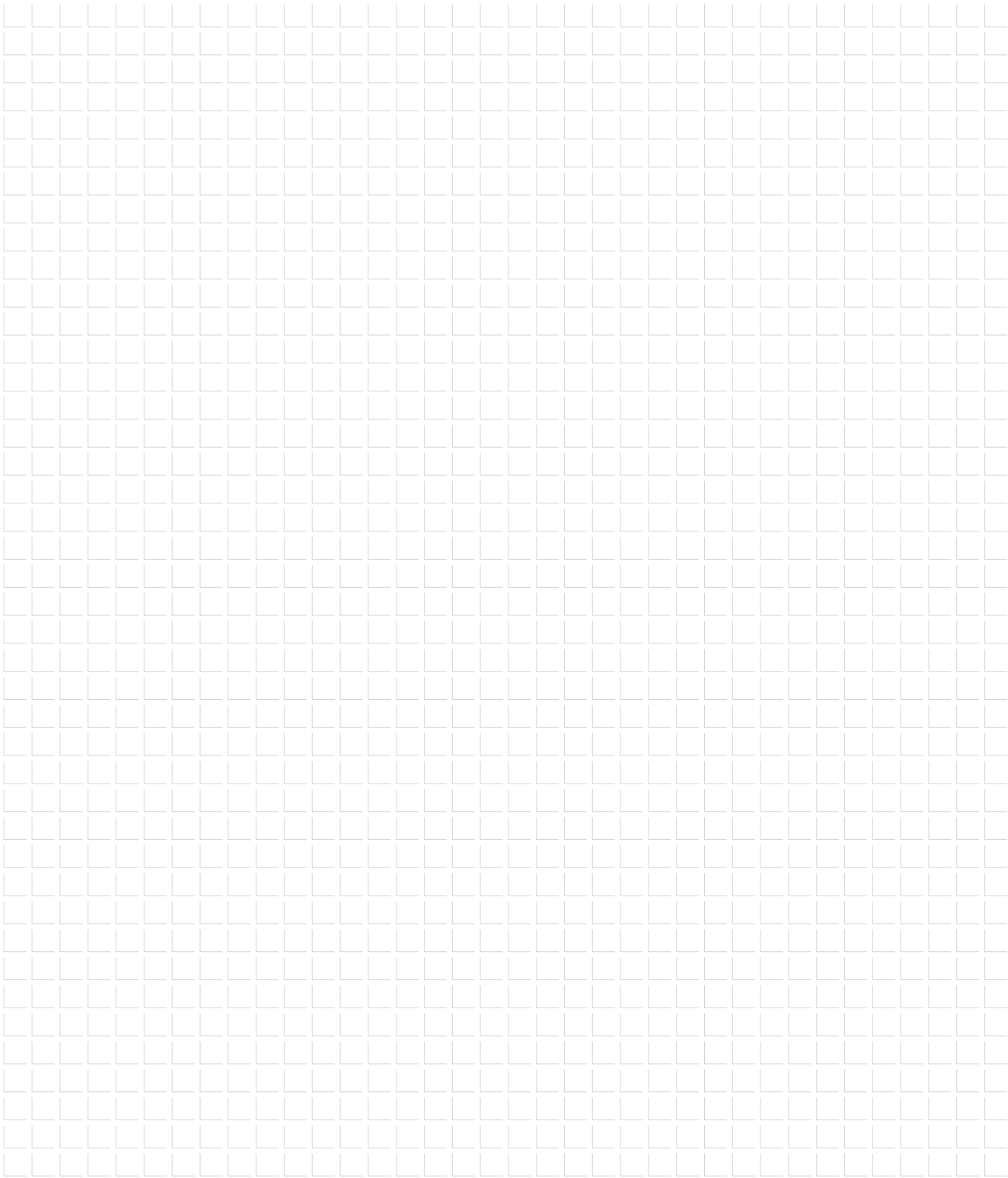




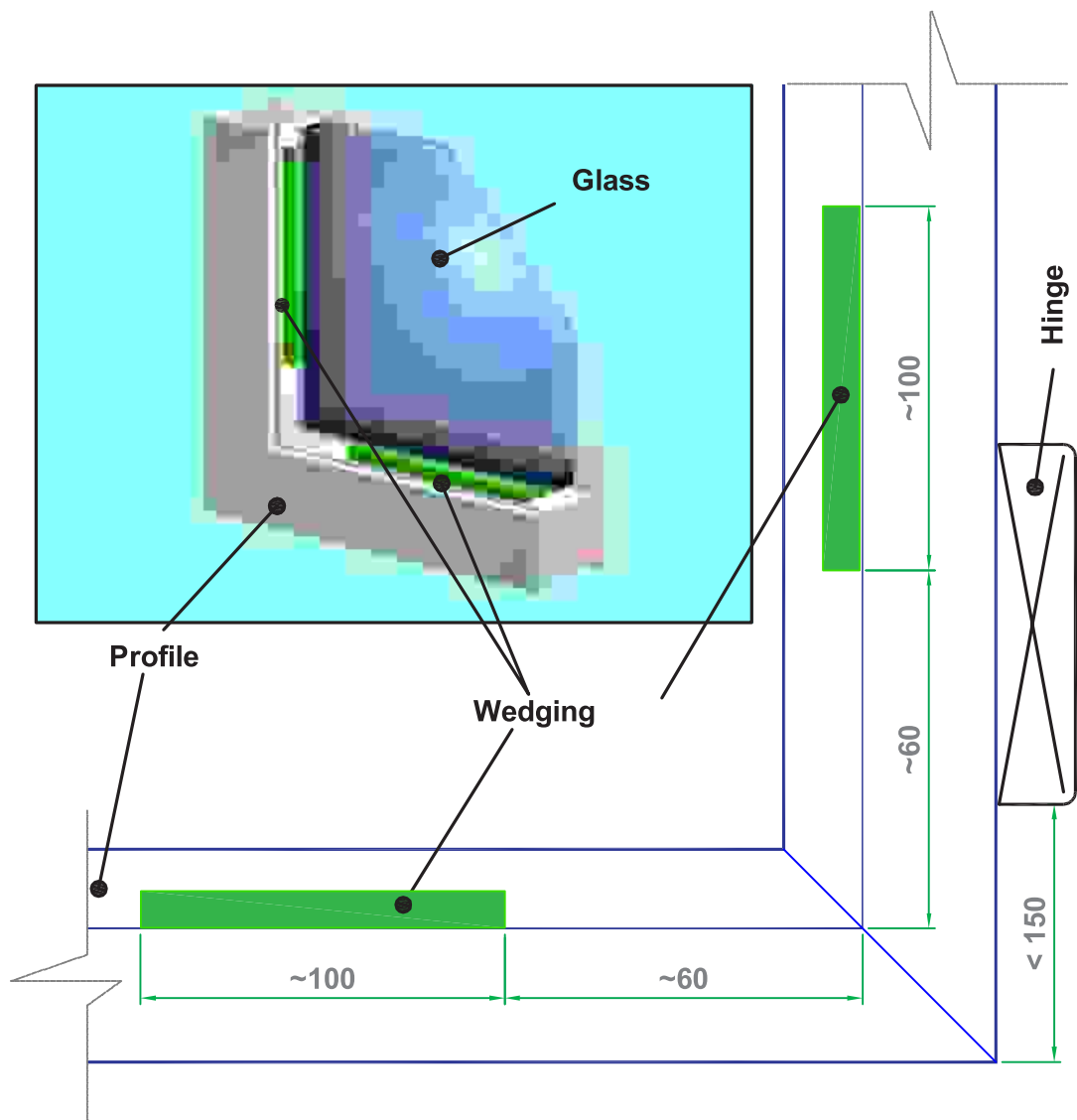
VISTA BEST®

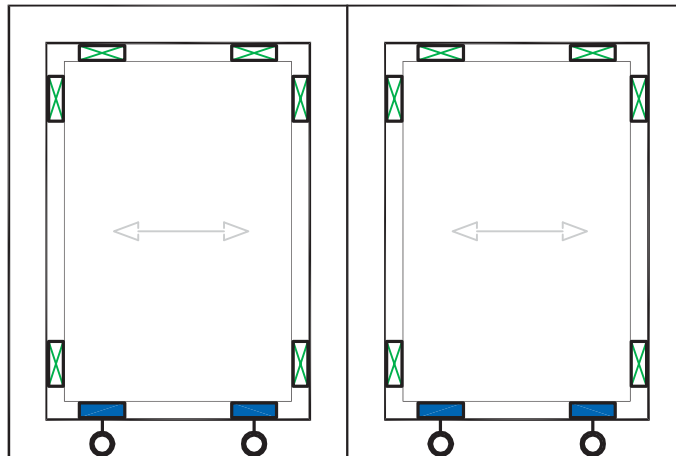
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Glazing Guide Lines





Sliding window horizontal

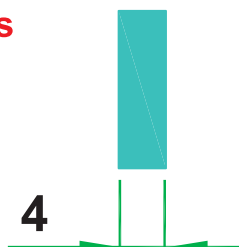
 = Distance block

 = Bearing block

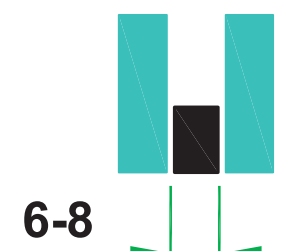
Heat transfer coefficient of various glazing units

$$U_g =$$

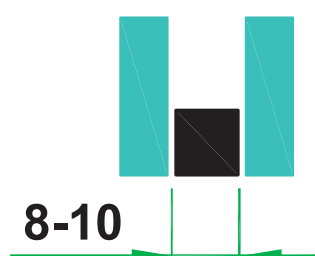
$$5,7 \text{ W/m}^2 \text{ K}$$



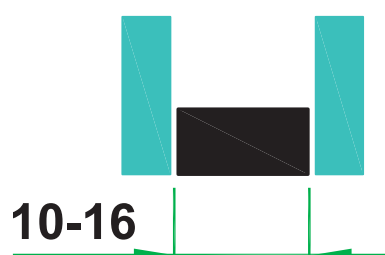
$$3,3 \text{ W/m}^2 \text{ K}$$



$$3,1 \text{ W/m}^2 \text{ K}$$



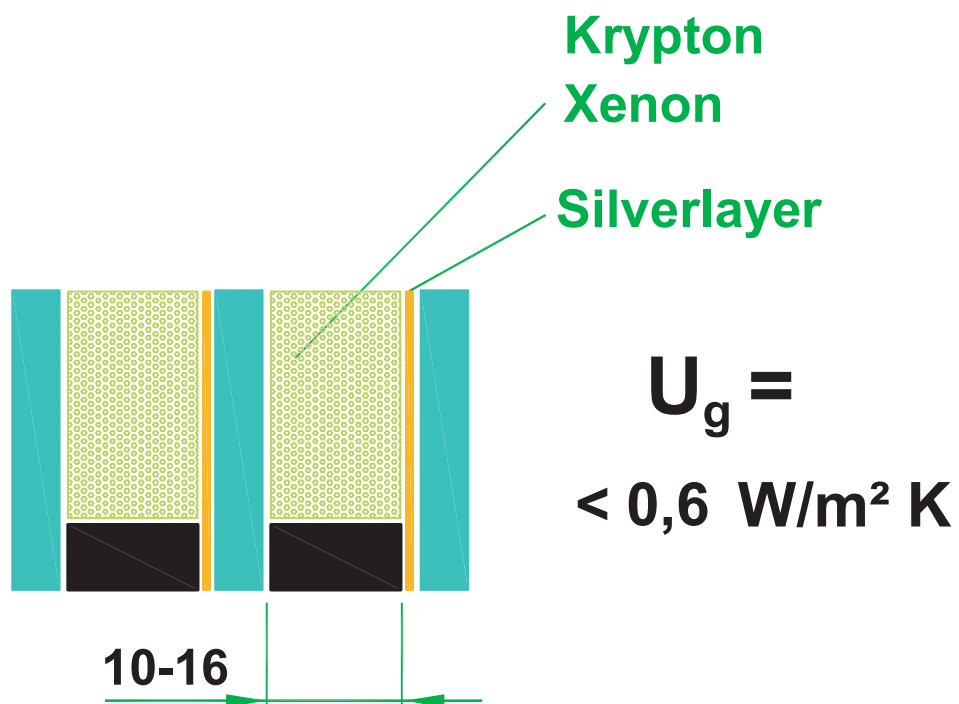
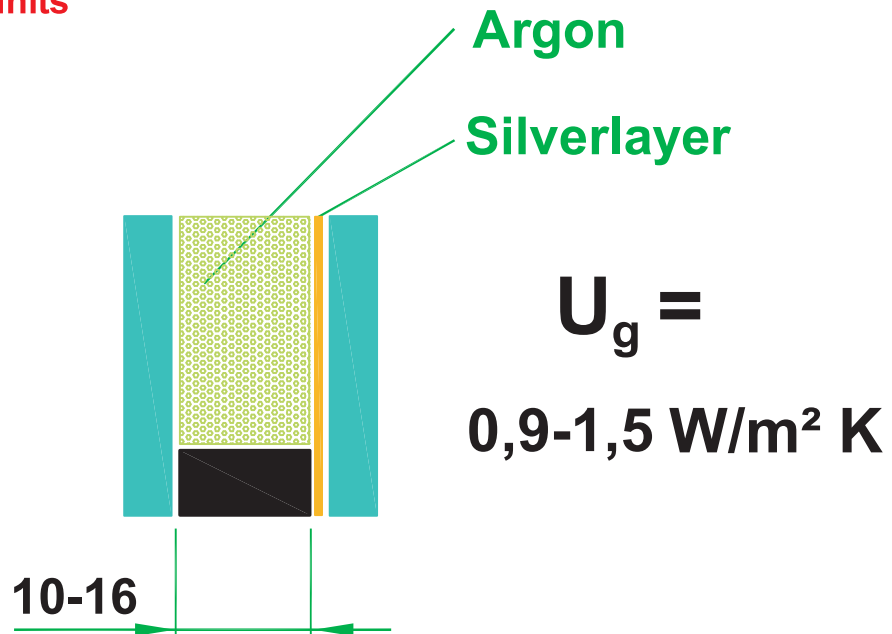
$$2,9 \text{ W/m}^2 \text{ K}$$

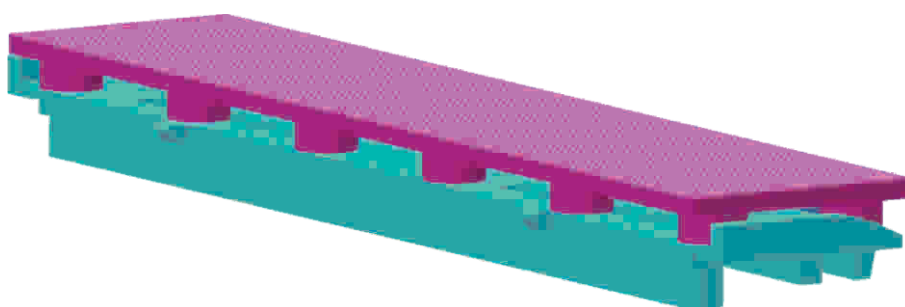
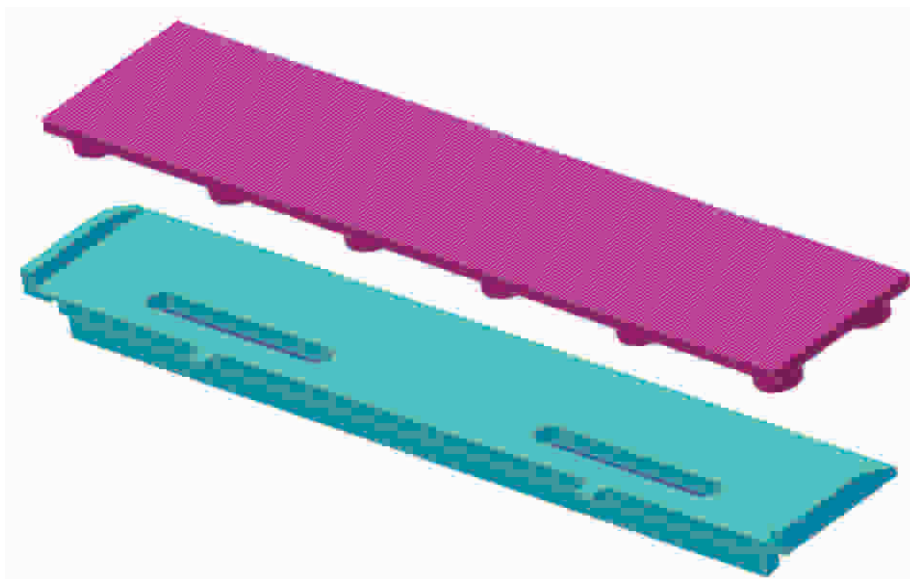


$$2,3 \text{ W/m}^2 \text{ K}$$



Heat transfer coefficient of various glazing units

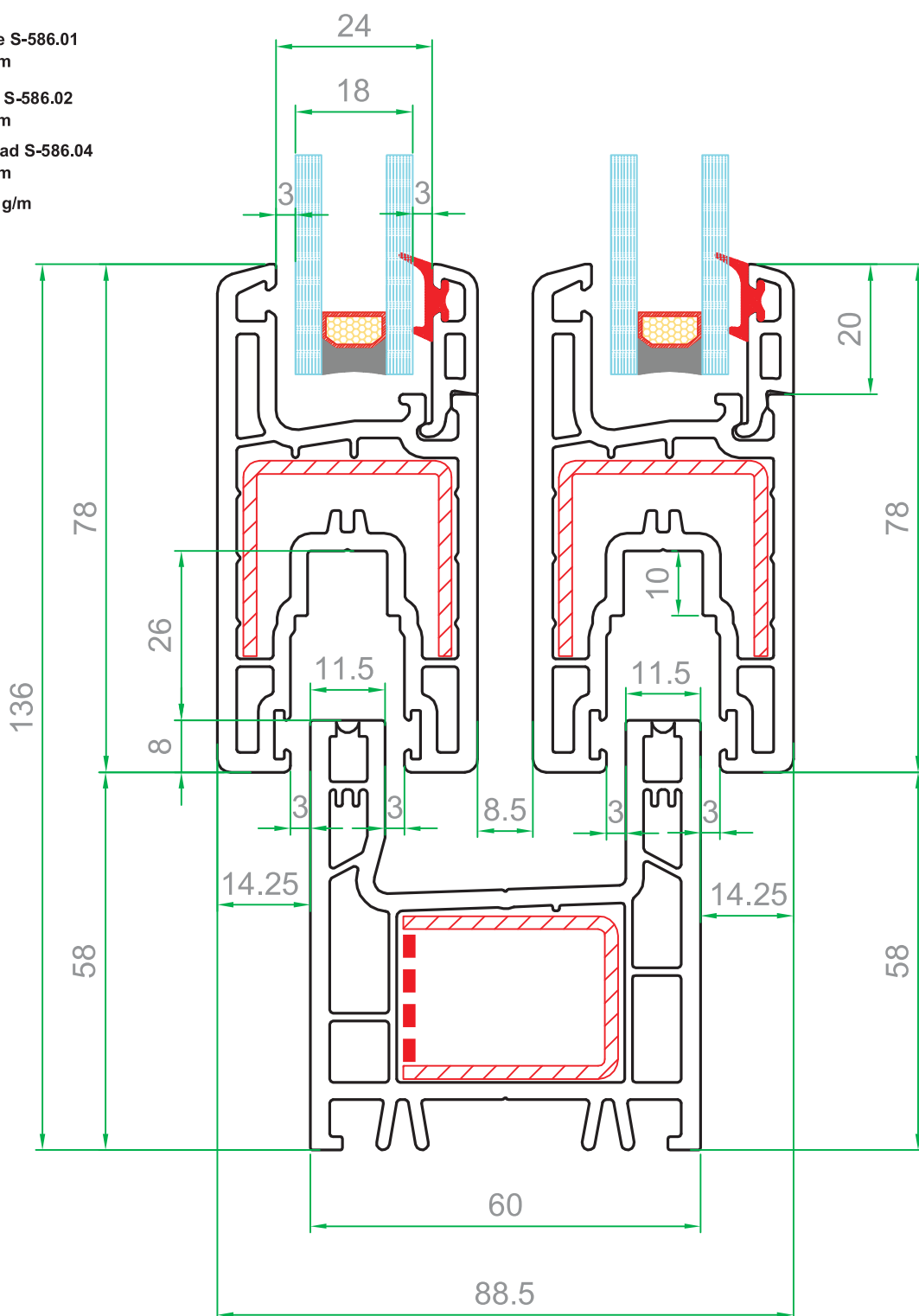




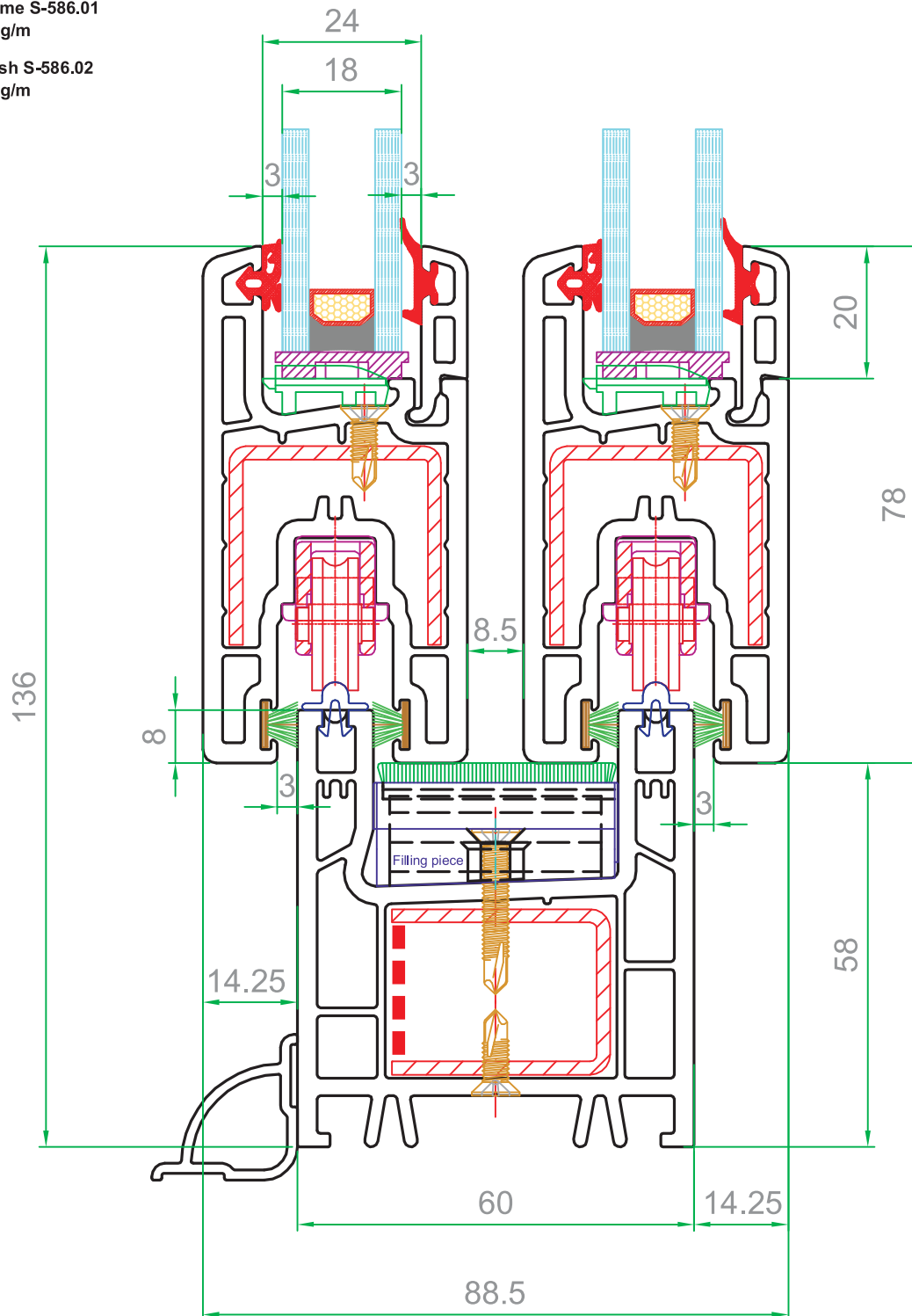
Sectional Drawings

Sectional Drawing

PCE: 38 g/m



over S-507.14
0.14 kg/m

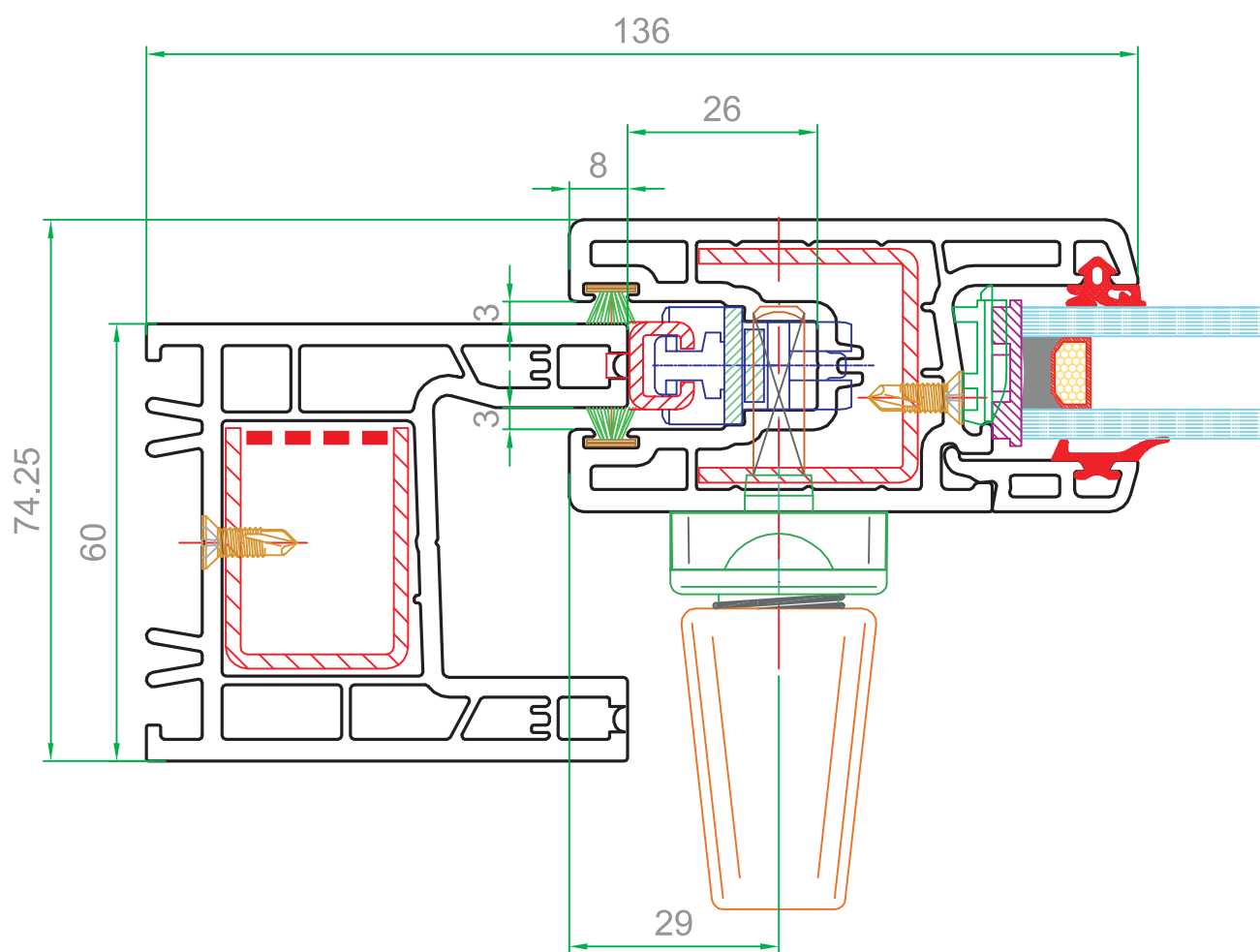


Sl.Frame S-586.01

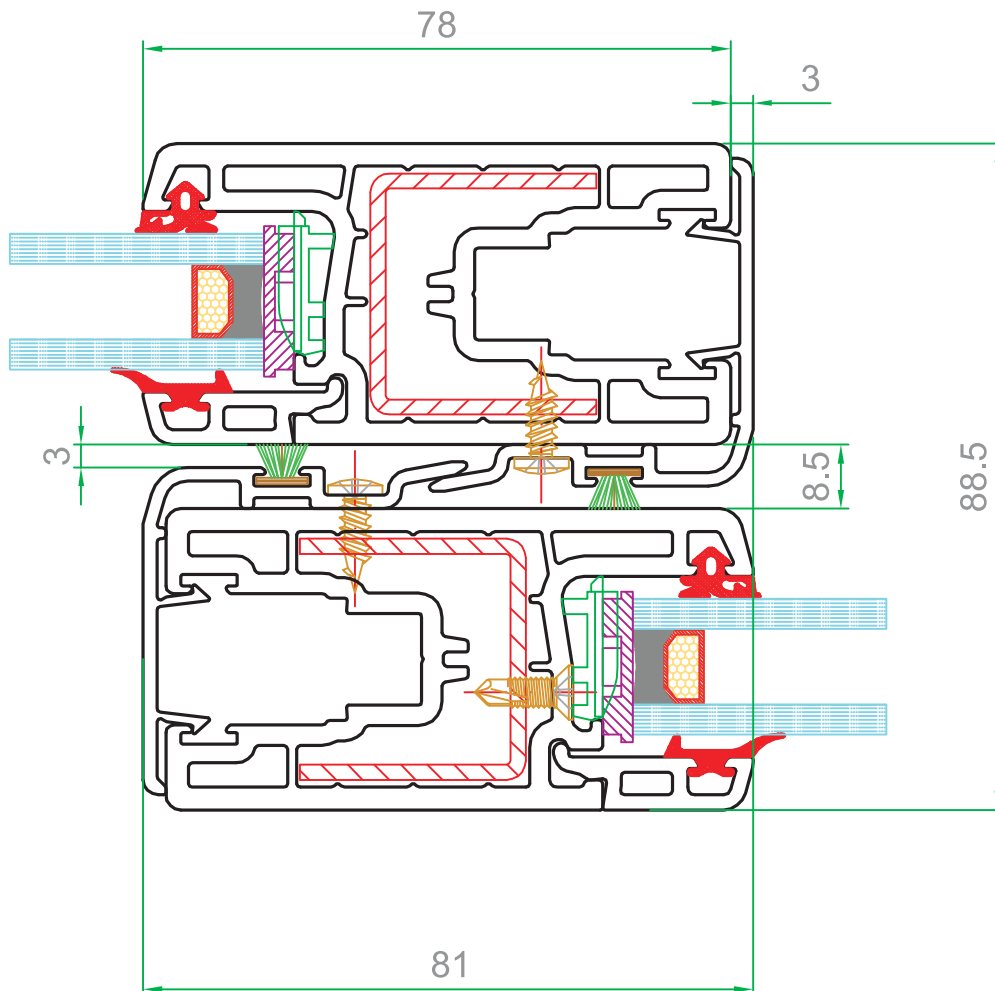
1,46 kg/m

Sl. Sash S-586.02

1,28 kg/m



Interlock S-586.03
0,27 kg/m



Sl.Frame S-586.01

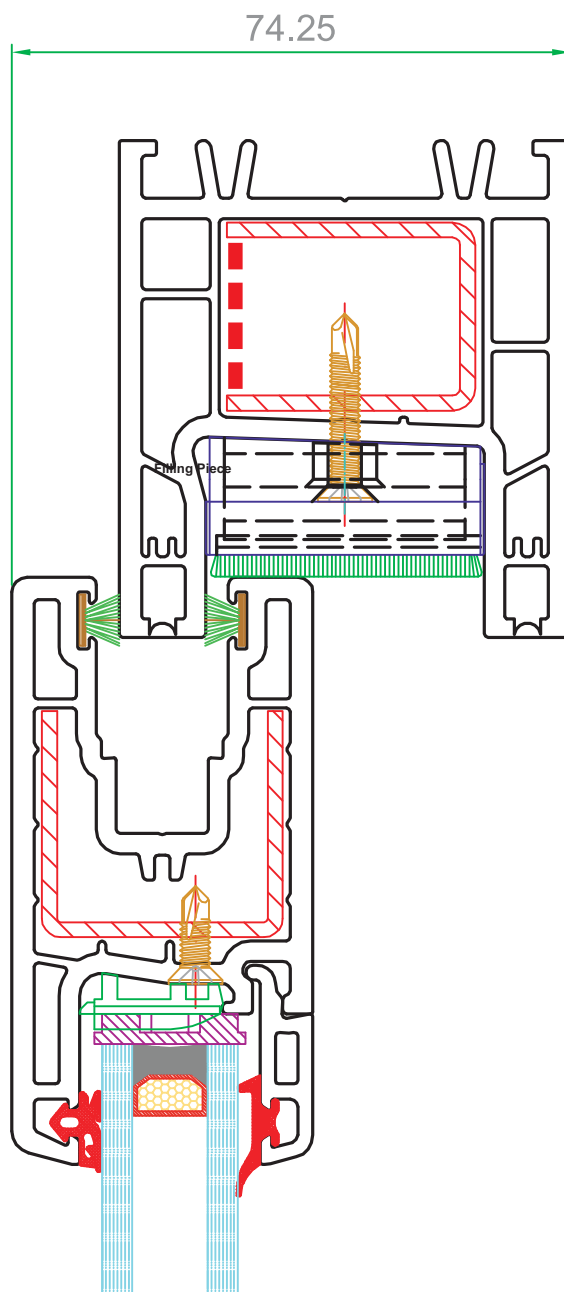
1,46 kg/m

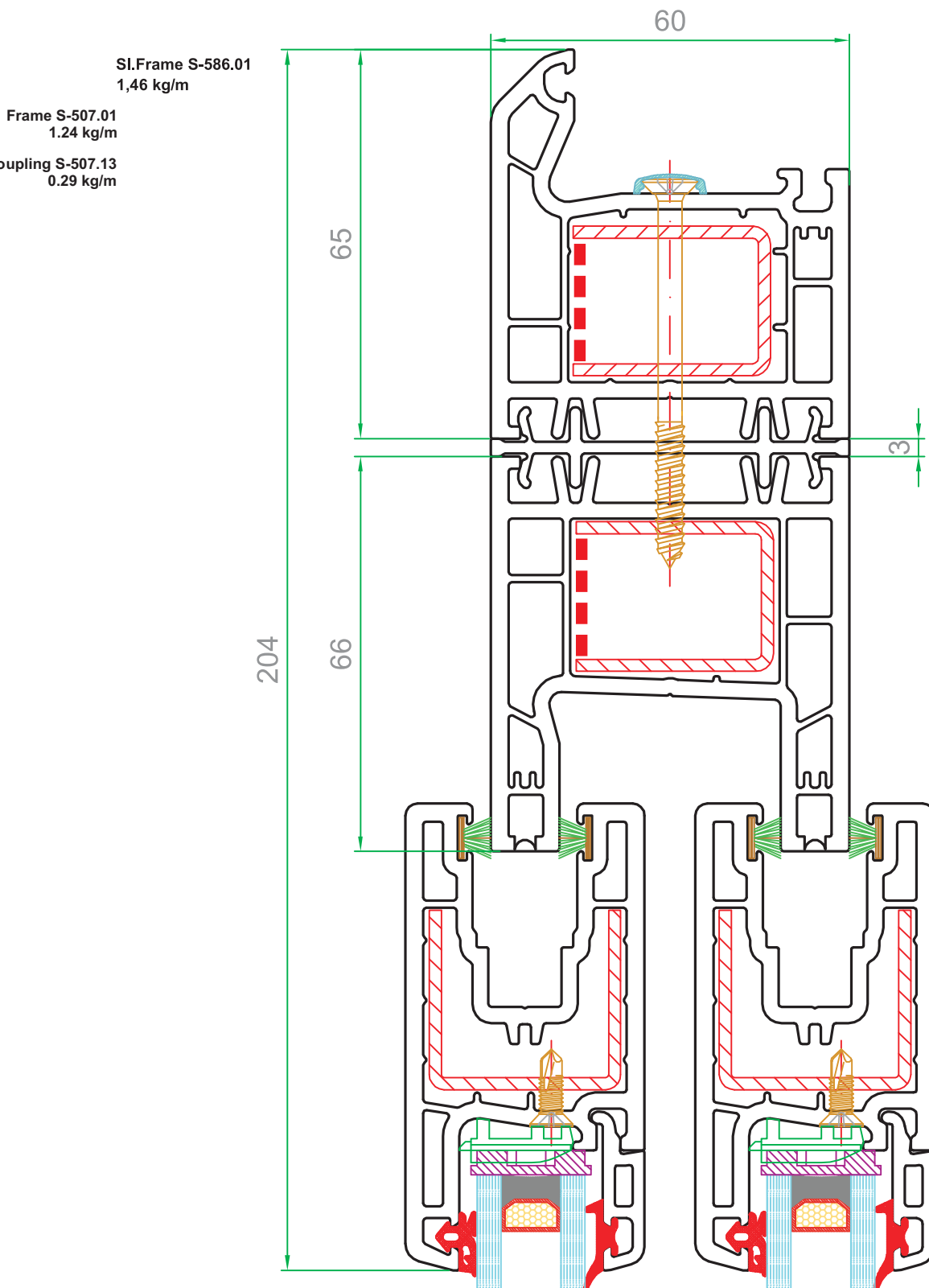
Sl. Sash S-586.02

1,28 kg/m

Filling Piece

Sectional Drawing





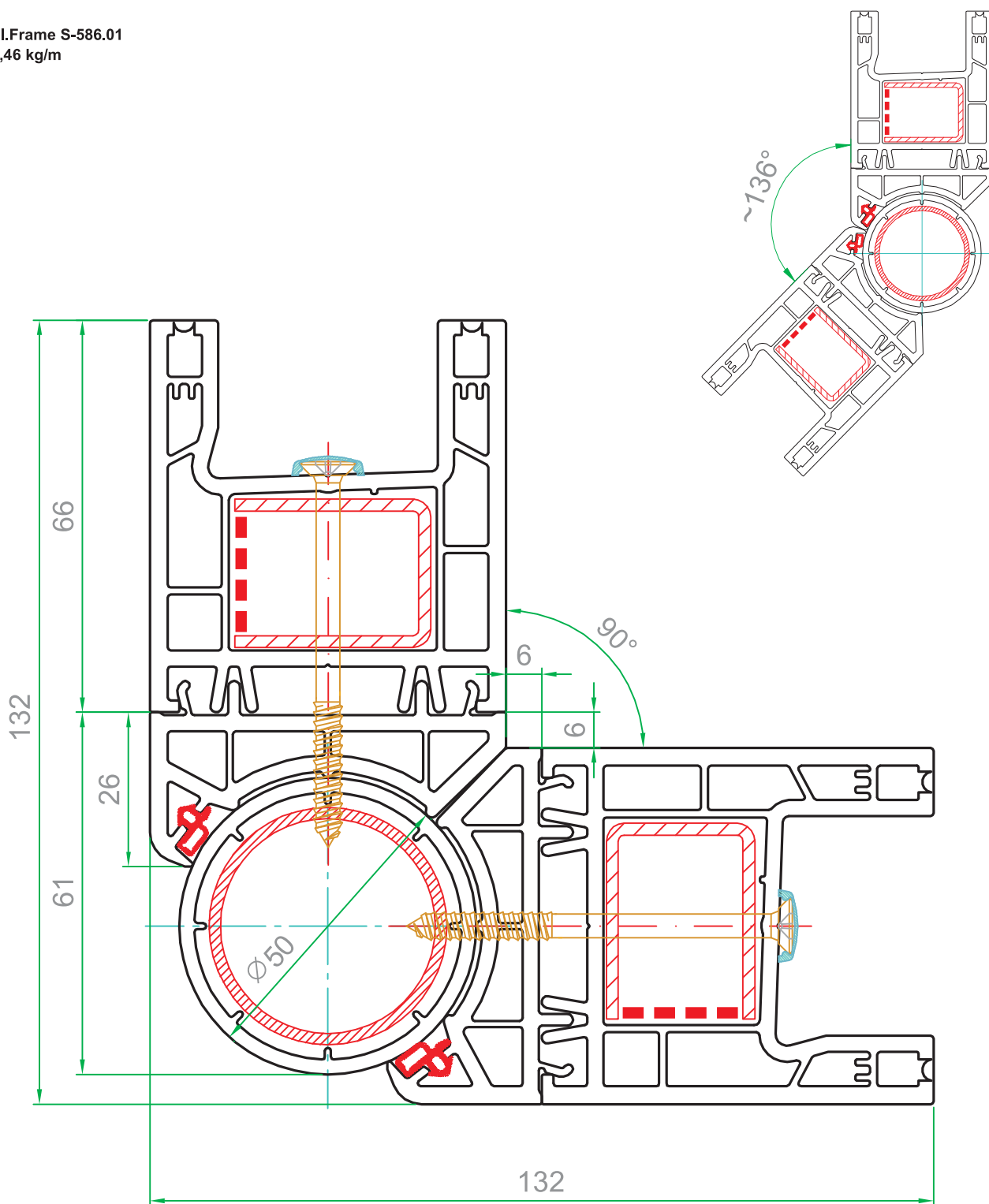
SI.Frame S-586.01

1,46 kg/m

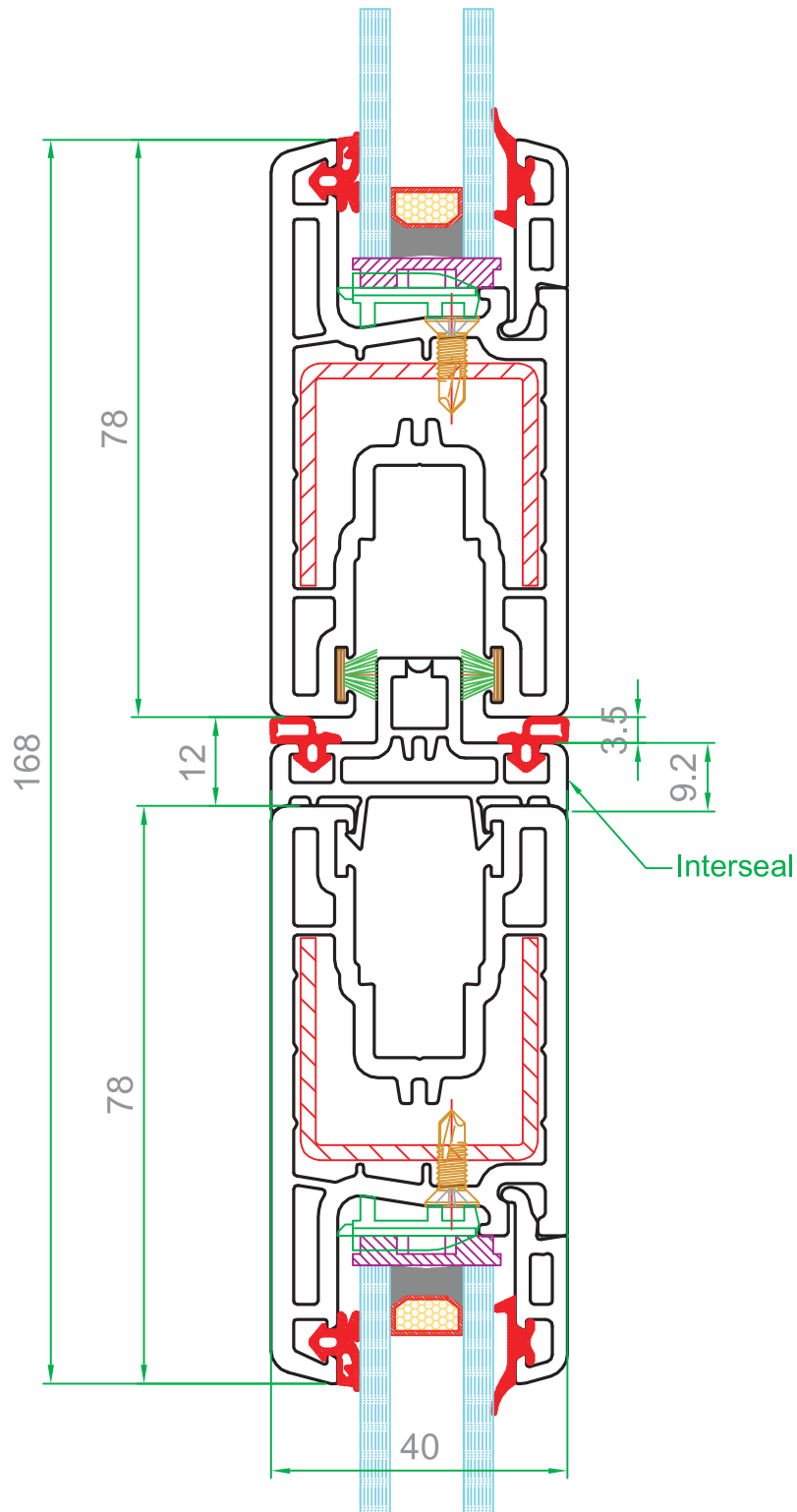
W pole S-507.11
0.56 kg/m

Adapter S-507.10
0.71 kg/m

Sectional Drawing



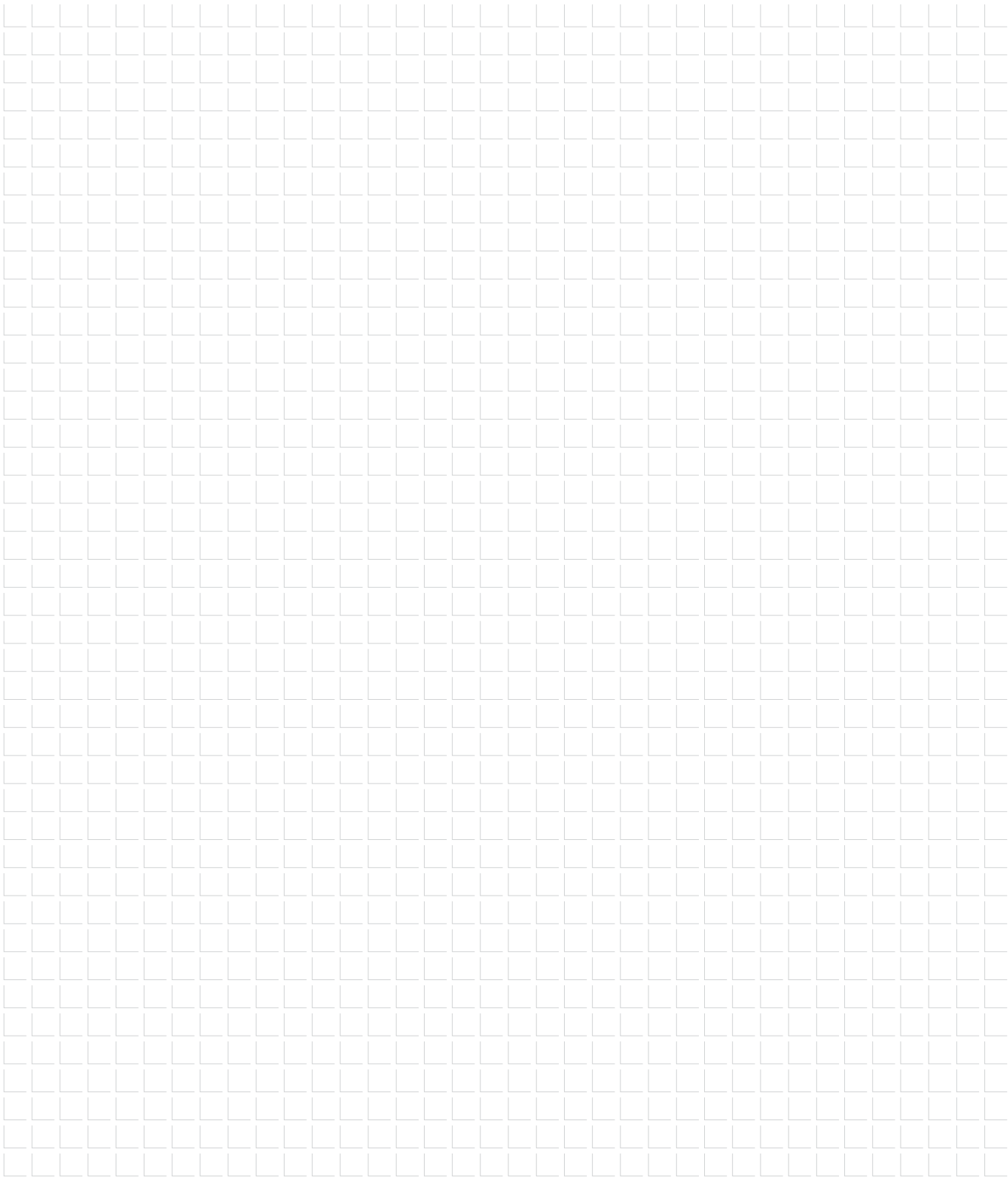
Sl. Sash S-586.02
1,28 kg/m



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Dimension Limits

dimension limits for white profiles

EN 12210

Manufacturer of profile :

VISTA BEST

System :

S-586 Sliding System

Profile label :

Sl. Sash S-586.02

Manufacturing plant :

A ----- windload = 400 [Pa]
(Wind speed = 91 km/h)

B -.-.-.-.- windload = 800 [Pa]
(Wind speed = 129 km/h)

C _____ windload = 1200 [Pa]
(Wind speed = 158 km/h)

reinforce profile

S-586TRE02 - 1,5mm

moment of inertia I_x

1.26 [cm⁴]

moment of inertia I_y

2.36 [cm⁴]

thickness of reinforcement

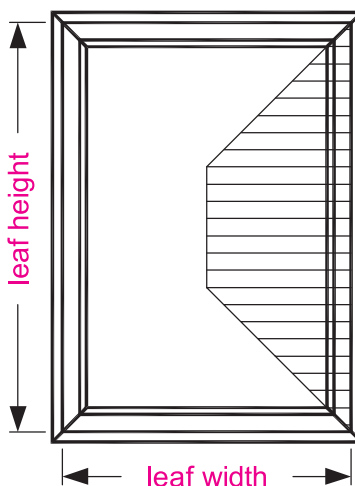
1.5 [mm]

max. deflection

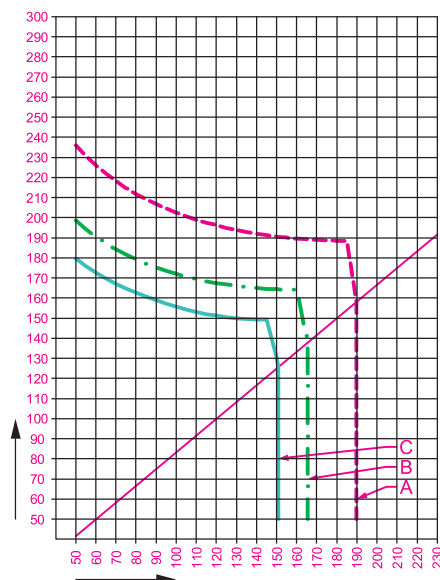
1 / 200

max. mount distance

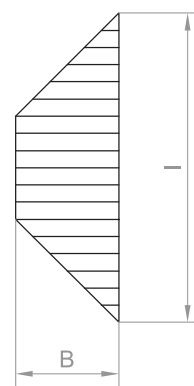
70 [cm]



height of window leaf in [cm]



width of window leaf in [cm]



B = load width
I = supportwidth
(lookup in index)

Caution ! Take limits of formats for window leaf (allowed leaf weights) from diagrams of fitting supplier and glass supplier.

dimension limits for white profiles

EN 12210

Manufacturer of profile :

VISTA BEST

System :

S-586 Sliding System

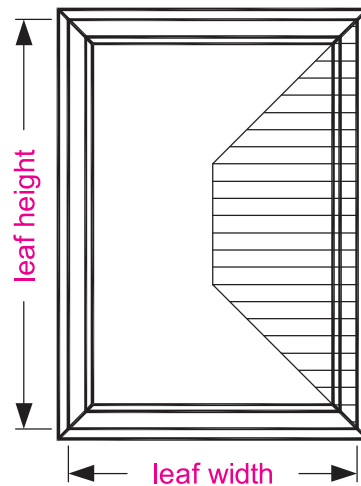
Profile label :

Sl. Sash S-586.02

Manufacturing plant :

A	-----	windload = 400 [Pa] (Wind speed = 91 km/h)
B	-.-.-.-.-	windload = 800 [Pa] (Wind speed = 129 km/h)
C	—————	windload = 1200 [Pa] (Wind speed = 158 km/h)

reinforce profile	S-586TRE02 - 2,0mm
moment of inertia I _x	1.62 [cm ⁴]
moment of inertia I _y	3.01 [cm ⁴]
thickness of reinforcement	2.0 [mm]
max. deflection	1 / 200
max. mount distance	70 [cm]

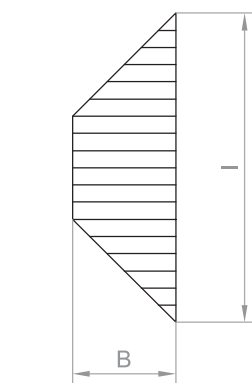


height of window leaf in [cm]



width of window leaf in [cm]

Caution ! Take limits of formats for window leaf (allowed leaf weights) from diagrams of fitting supplier and glass supplier.



B = load width
I = supportwidth
(lookup in index)

dimension limits for white profiles

EN 12210

Manufacturer of profile :

VISTA BEST

System :

S-586 Sliding System

Profile label :

Sl. Sash S-586.02

Manufacturing plant :

A ----- windload = 400 [Pa]
(Wind speed = 91 km/h)

B -.-.-.-.- windload = 800 [Pa]
(Wind speed = 129 km/h)

C _____ windload = 1200 [Pa]
(Wind speed = 158 km/h)

reinforce profile

S-586TRE02 - 2,5mm

moment of inertia I_x

1.97 [cm⁴]

moment of inertia I_y

3.59 [cm⁴]

thickness of reinforcement

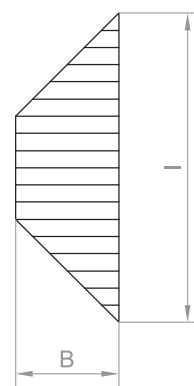
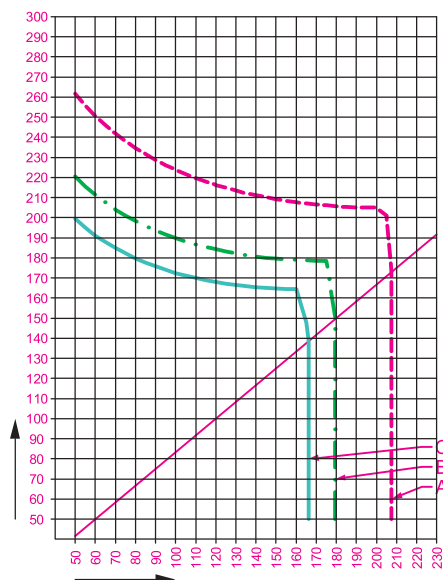
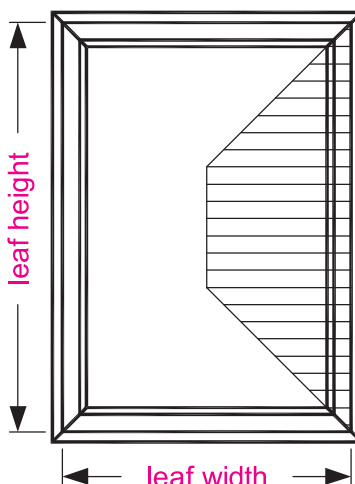
2.5 [mm]

max. deflection

1 / 200

max. mount distance

70 [cm]



B = load width
I = supportwidth
(lookup in index)

width of window leaf in [cm]

Caution ! Take limits of formats for window leaf (allowed leaf weights) from diagrams of fitting supplier and glass supplier.

dimension limits for white profiles

EN 12210

Manufacturer of profile :

VISTA BEST

System :

S-586 Sliding System

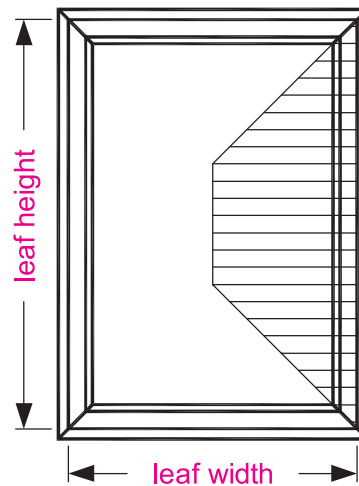
Profile label :

Sl. Sash S-586.02

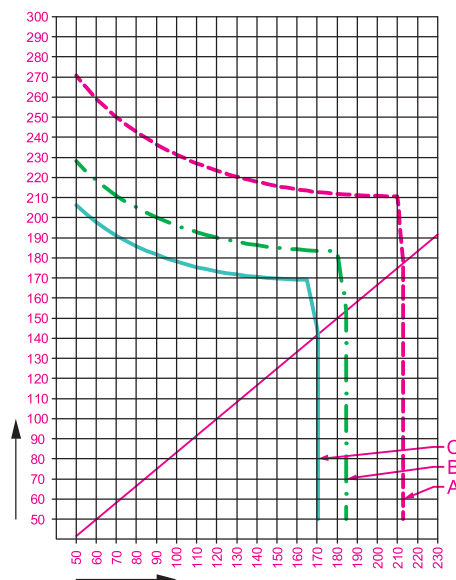
Manufacturing plant :

A	-----	windload = 400 [Pa] (Wind speed = 91 km/h)
B	-.-.-.-.-	windload = 800 [Pa] (Wind speed = 129 km/h)
C	—————	windload = 1200 [Pa] (Wind speed = 158 km/h)

reinforce profile	S-586TRE02 - 3,0mm
moment of inertia Ix	2.29 [cm ⁴]
moment of inertia Iy	4.12 [cm ⁴]
thickness of reinforcement	3.0 [mm]
max. deflection	1 / 200
max. mount distance	70 [cm]

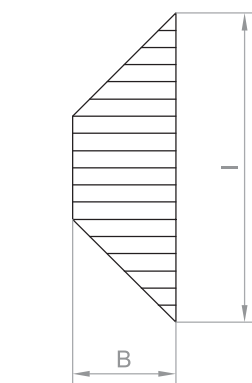


height of window leaf in [cm]



width of window leaf in [cm]

Caution ! Take limits of formats for window leaf (allowed leaf weights) from diagrams of fitting supplier and glass supplier.



B = load width
I = supportwidth
(lookup in index)

CLASSIFICATION OF WIND LOAD (DIN EN 12210) :

Class	P1 [Pa]	P2 [Pa] ^{a)} = 0,5xP1	P3 [Pa] = 1,5xP1
0	NOT TESTED		
1	400	200	600
2	800	400	1200
3	1200	600	1800
4	1600	800	2400
5	2000	1000	3000
E xxx ^{b)}	xxx		

This pressure having been repeated 50 times

Specimen tested with wind loading above class 5, classified Exxx - where xxx is the actual test pressure P1 (e.g. 2350 etc.)

(Table 1)

Classification shall be according to the results of wind resistance tests to positive and negative test pressures.

This classification can be used with other relevant standards or codes of practice and can thus be used to provide correlation with actual exposure requirements.

CLASSIFICATION OF RELATIVE FRONTAL DEFLECTION (DIN EN 12210):

Class	Relative frontal deflection
A	< 1/150
B	< 1/200
C	< 1/300

(Table 2)

The relative frontal deflection of the most deforming framing member of the specimen measured at test pressure P1 shall be classified as in table 2.

CLASSIFICATION FOR RESISTANCE TO WIND LOAD (DIN EN 12210):

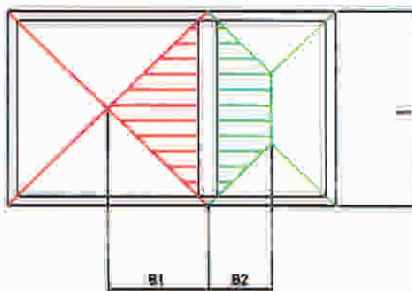
Wind loads and relative frontal deflection shall be combined into one overall classification as indicated in table 3.

Wind load class	Relative frontal deflection		
	A	B	C
1	A1	B1	C1
2	A2	B2	C2
3	A3	B3	C3
4	A4	B4	C4
5	A5	B5	C5
E xxx	AE xxx	BE xxx	CE xxx

NOTE: In the resistance to wind load classification the number refers to the wind load class, see table 1 and the letter to the relative frontal deflection, see table 2.

(Table 3)

WIND LOAD FORMULA



Calculation of the essential moment of inertia I_{ert} :

To calculate the load width B of the triangle- or trapezium load, the shorter side of the element field has to be halved.

In case of mullions and element connections you have to see to it that each of them get a load share of both of the adjoining element fields.

$$I_{ert} = \frac{W I^4 B}{1920 E f} \left[25 - 40 \left(\frac{B}{I} \right)^2 + 16 \left(\frac{B}{I} \right)^4 \right] \text{ cm}^4$$

- W** = Wind load
I = Support width (Profile length)
B = Load width
E = elastic modulus (for steel = 210.000 N/mm²)
f = max. deflection
 $f = I/200$; max. 8 mm, double glazing
 $f = I/175$; single glazing
 dependent at glass producer / single- or double glass

E-Modules of elasticity:

Material	Elastic module [N/mm ²]
PVC-U	ca. 2.700
Timber	ca. 10.000
Aluminium	ca. 70.000
Steel	ca. 210.000

WIND SPEED

The pressure exerted by the wind on a wall component is assumed to be uniformly distributed across the surface of the product.

Its magnitude is dependent on such factors as the geographical location, shape and surrounding of the building as well as the height of the product above grade and its location within the wall.

The jurisdiction where the windows or doors will be installed should be contacted to determine the wind load requirements that have been adopted and are enforced.

W = Wind load

L = Linear force at long pane edge

f_{max} = safe deflection $f_{max} = \frac{L}{175}$ or $\frac{L}{200}$

dependent at glass producer / single- or double glass

p = density of air (1,25 kg/m³)

v = wind speed

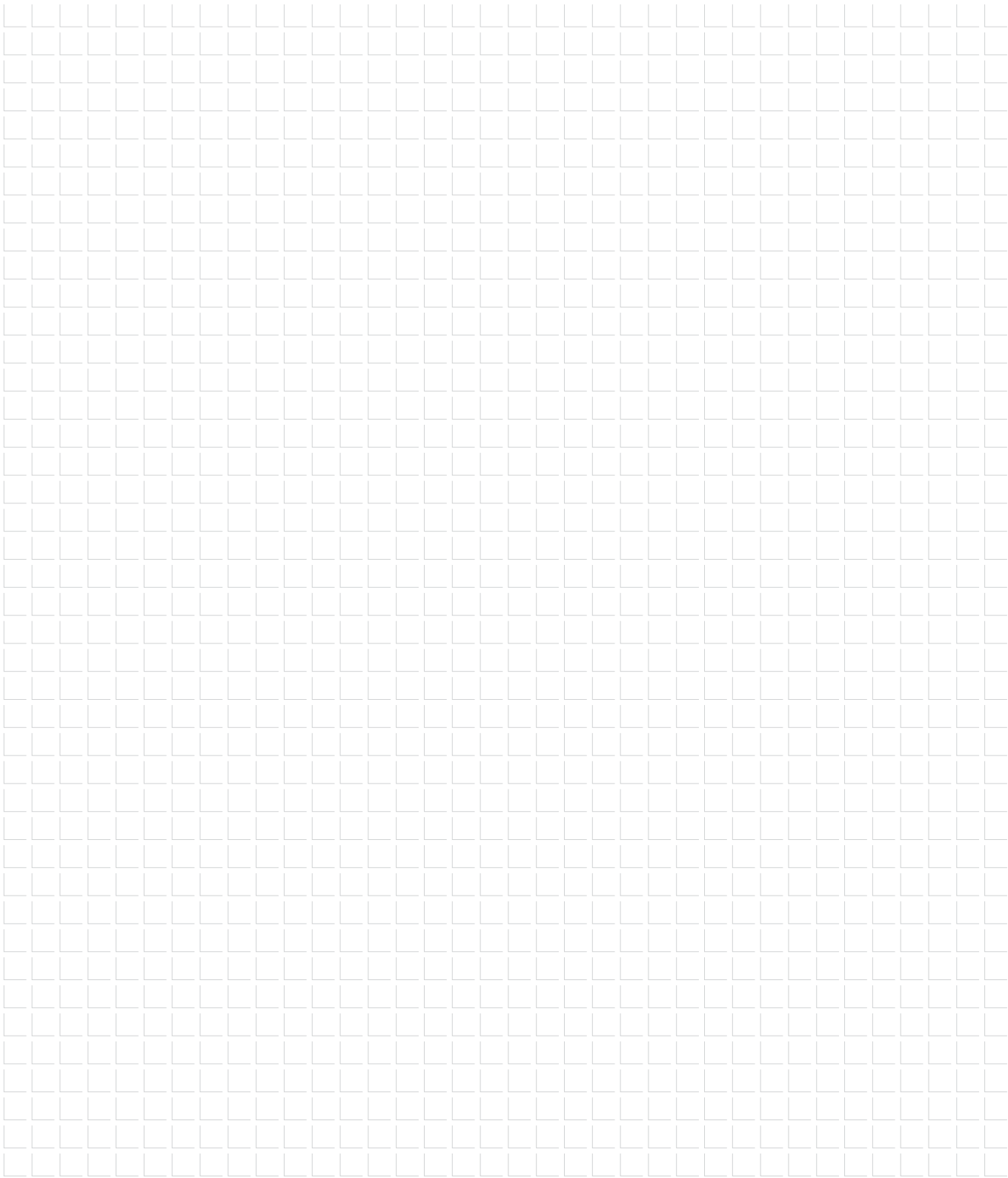
$$v = \sqrt{\frac{2 \times W}{p}} = \text{m / sec} \Rightarrow (\times 3,6) \approx \text{km / h}$$

Wind load W [Pa]	wind speed [m/s]	wind speed [km/h]
400	25,3	91
550	29,7	107
600	31	112
750	34,6	125
800	35,8	129
1000	40	144
1200	43,8	158
1500	49	176
1600	50,6	182
1800	53,6	193
2000	56,6	203
2400	62	223
2500	63,2	228
3000	69,3	249
3500	74,8	269

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Chemical & Mechanical

Chemical Properties

Substance	Concentration %	Temperature °C	Resistance of PVC-U
Formic acid	100	20	+
Ammonia, liquid	100	20	0
Ammonia, gaseous	100	60	+
Aniline, pure	100	20	-
Exhaust gas			
carbon monoxide containing	any	60	+
carbon dioxide containing	any	60	+
hydrochloric acid containing	any	60	+
sulphur trioxide containing	any	20	0
Aluminium salt, aqueous	any	60	+
Benzine (aliphatic Carbon hydride)	100	60	+
Benzene	100	20	-
Beer	any	60	+
Butanol (Butyl alcohol)	100	40	+
Benzine-Benzene-mixture	80/20	20	-
Brandy	any	20	+
1,3-Butadiene, gaseous	100	60	+
Barium salt, aqueous	any	60	+
Chromic acid (Chromium-(V)-oxide), aqueous	50	20	+
Cyclohexane	100	20	+
Chlorobenzene	100	60	-
Chromic acid /Water/ Sulphuric acid (Chromic-sulphuric acid)	50/35/15	40	+
Hydrogen chloride	any	20	+
Chromium alum Chromium(III)-potassium sulfat	any	60	+
Dekalin	100	60	+
Manuring salts, aqueous	10	60	+
Diesel fuel	-	20	+
Acetic acid	95	20	+
Fatty acid soap (from C ₄)	100	60	+
Fruit juice	ready-to-use	60	+
Glycol, aqueous	ready-to-use	60	+
Heptane	100	60	+
Hexane	100	60	+
Isooctane	100	60	+

Chemical Properties

Substance	Concentration %	Temperature °C	Resistance of PVC-U
Nitrohydrochloric acid (HCL/HNO ₃)	75/25	20	o
Caustic potash solution	60	60	+
Potassium permanganate	6	60	+
Potassium peroxodisulfide	aqueous	40	+
Common salt	saturated	60	+
Carbon monoxide, gaseous	100	60	+
Linseed oil	100	40	+
Liqueur	ready-to-use	20	+
Mineral oils, free from aromatics	-	60	+
Methanol	100	40	+
Caustic soda solution, aqueous	60	60	+
Nitroglycerine	diluted	20	o
Sodium chlorate	10	60	+
Oils and greases animal and vegetable	-	60	+
Oxalic acid, aqueous	saturated	60	+
Phosphoric acid, aqueous	85	60	+
Hydrochloric acid	up to 37	60	+
Sulphuric acid	80	60	+
Seawater	-	40	+
Toluene	100	20	-
Trilone	commercial	60	o
Hydrogen	100	60	+
Wine	-	60	+
Xylene	100	20	-
Citric acid	10	40	+

Legend:

- +
 -
 - o
- resistant
limited resistant
not resistant

Mechanical Properties

Property	Test method	Unit	PVC-U
Elastic modulus E	DIN 53 457	N/mm ² (kg/cm ²)	2 500 (25 000)
Notched impact test ak at 23°C at 0°C	DIN 53 453	KJ/m ² (kpcm/cm ²)	35 8
Impact strength an at 23°C at 0°C at -20°C at -40°C	DIN 53 453	KJ/m ² (kpcm/cm ²)	without breakage without breakage without breakage without breakage
Ball indentation hardness H 358/30	DIN 53 456	N/mm ² (kp/cm ²)	74 (740)
Tensile strength ss (yield stress**)	DIN 53 455	N/mm ² (kp/cm ²)	44 (440)
Tensile impact strength azn at 23°C at 0°C	DIN 53 488	KJ/m ² (kpcm/cm ²)	700 400
Flexural strength sbB (6 mm deflection)	DIN 53 452 Standard test piece	N/mm ² (kp/cm ²)	70 700
Heat resistance according Vicat VST/B50 according ISO 75 FISQ/A	DIN 53 460 DIN 53 461	°C °C	82 72
Coefficient of linear expansion α (-30°C, +30°C)	IN 53 752	1/k (1/grad)	7,0 · 10 ⁻⁵
Thermal conductivity λ	DIN 52 612 Sheet 1	W/(m · K) [kcal/(m · h · grad)]	0,20 (0,17)
Density ρ	DIN 53 479	g/cm ³	1,44
Water absorption WA	DIN 53 495	%	0,04

* The properties were determined at press plates according DIN 77 48 part 2 (June 1979)

** In case of U-PVC tensile force and yield stress are identical

Installation

PRODUCTION SCHEME

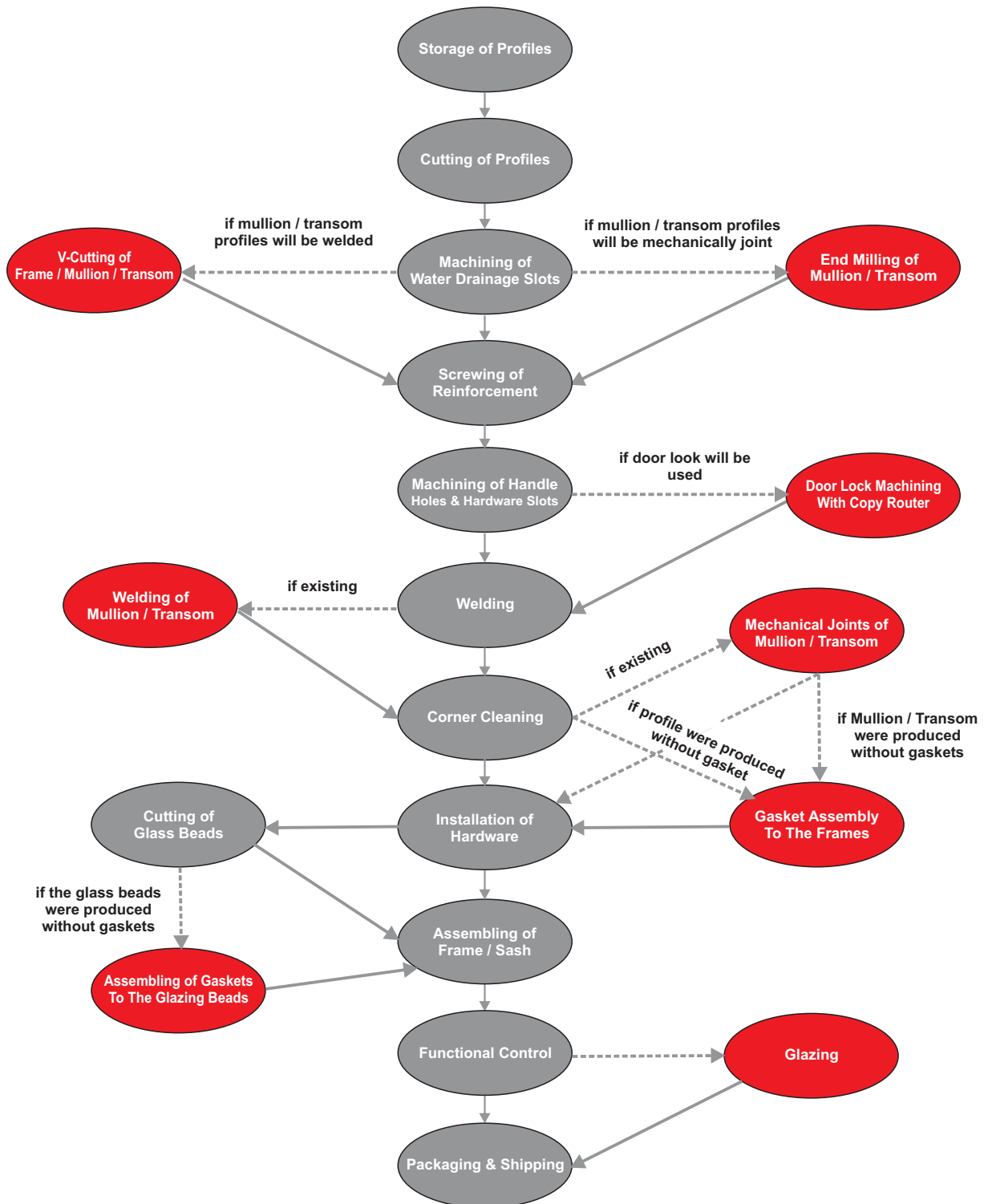
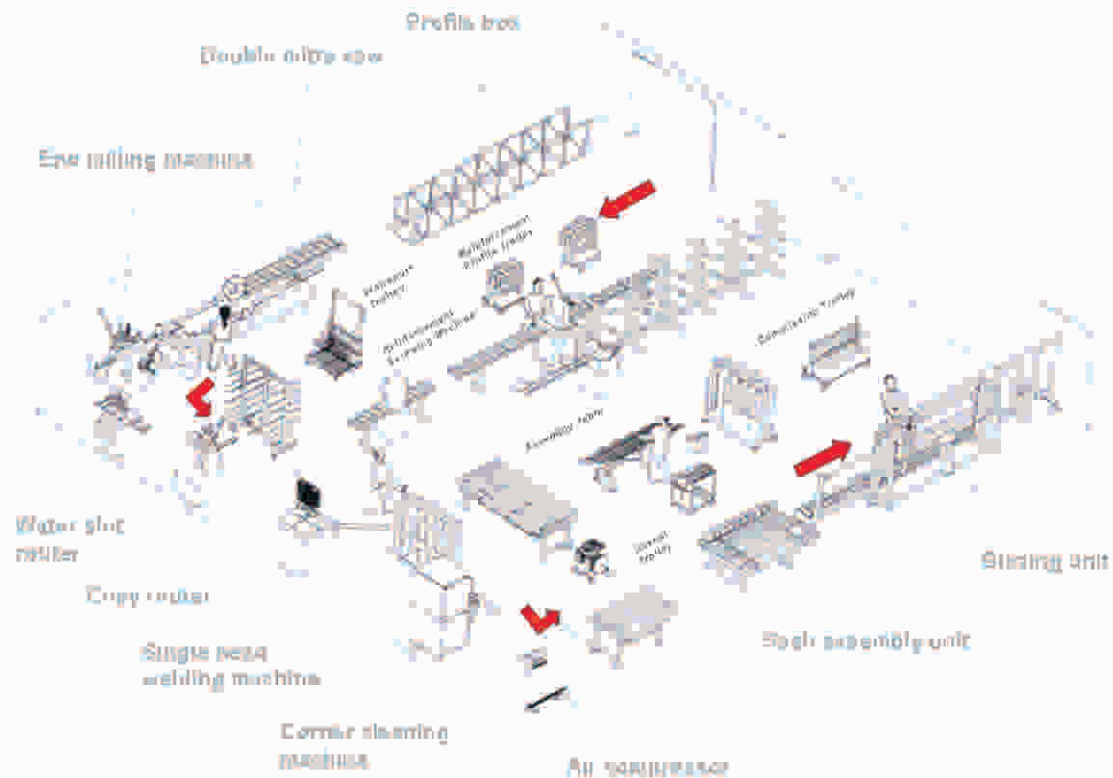


ILLUSTRATION OF A WINDOW WORKSHOP

30 Units / Shift (8 hours)



STEP BY STEP WINDOW MANUFACTURING

Storage of profiles

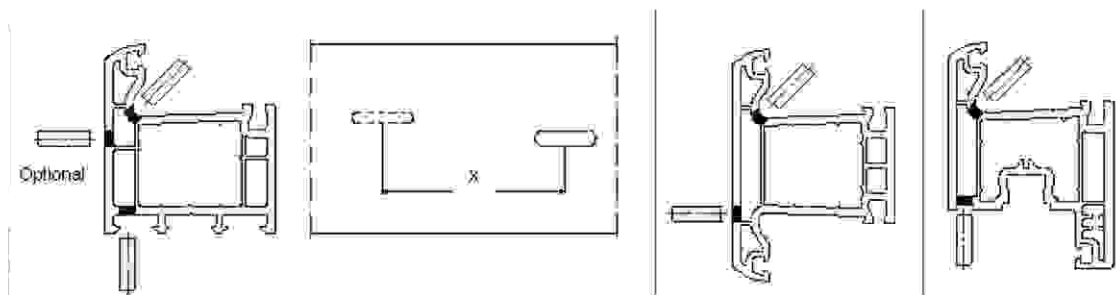
This must be located in an enlightened part of the workshop, readily accessible, and maintained at the same temperature ($>15^{\circ}\text{C}$) as the work stations. Lower temperatures may cause some problems in welding.

Cutting of profiles

This is a high-precision operation; the quality of the welding, consequently the end product, largely depends on the accuracy of the cutting. Cutting precision and optimization can be controlled by computer.

Machining of water drainage slots

Water drainage slots are machined to the horizontal profiles located at the bottom side of the window partitions. Preset milling machines are used for this purpose. Pictures below show the placement of slots for different profiles.

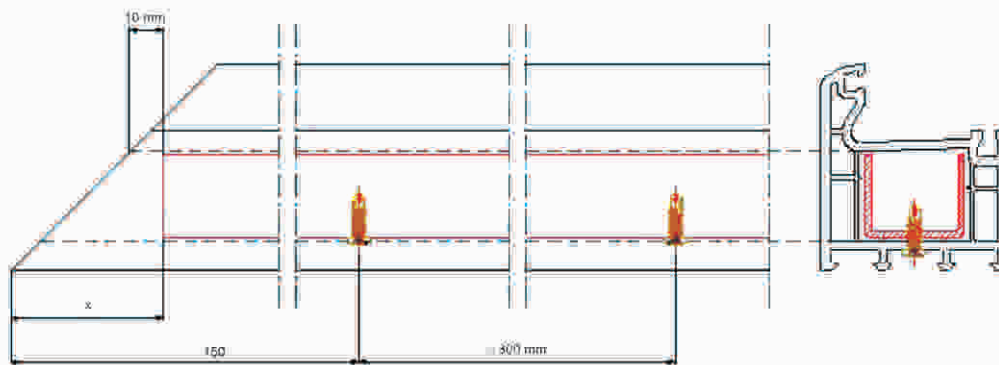


As can be seen from the pictures, there must be a certain distance (x) between the slots opened on the front side and the inner side. This distance should not be less than 50 mm.

Drainage slots for the door profile are machined like the sash profile. There shouldn't be any drainage slots in case of outward opening door sash.

Drainage from bottom is optional for the frame profiles. Widely used slot thickness is 5mm and slot length 20-25 mm.

Screwing on reinforcement profiles



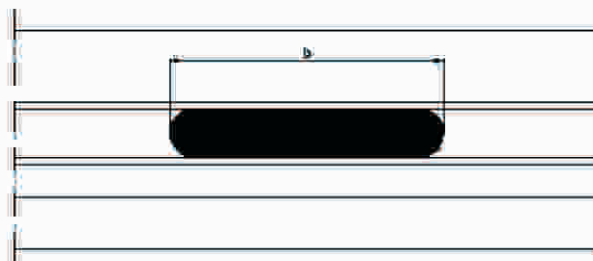
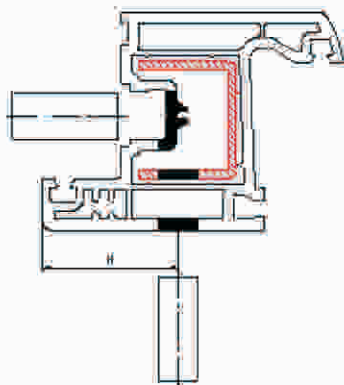
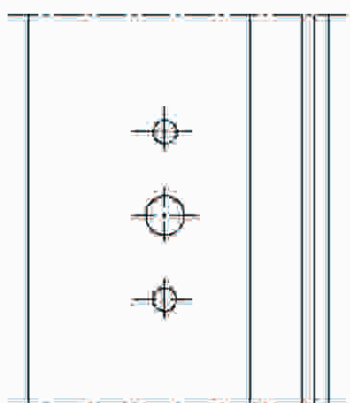
Reinforcement profiles are screwed on to the PVC profiles by self-tapping screws. Reinforcement profile cutting dimension is equal to (profile length - 2x). Determining the "x" dimension is quite important. After 45 ° cutting of the profile, a safety distance of 10mm can be measured from the wall which will be welded in the closest position to the reinforcement profile. The distance of this point to the profile edge will be the "x". This dimension should be determined for all the profiles, by this way, which will be welded while having reinforcement inside.

The distance of the first screw from the profile edge may be 150mm. The distance for the following screws should not be more than 300mm. For very short profile lengths, at least 3 screws should be used.

Machining of the hardware slots and handle holes

These two operations are held at the same machine. For the widely used hardware and handles, the placement of the slot and holes on the sash profile are shown on the following picture

The same process is valid also for the door profiles. In case of usage of locked espagnolettes or door locks, machining for the barrel is made by a copy router. Copy routers can also be used for all types of non-standard machining work on the profiles.

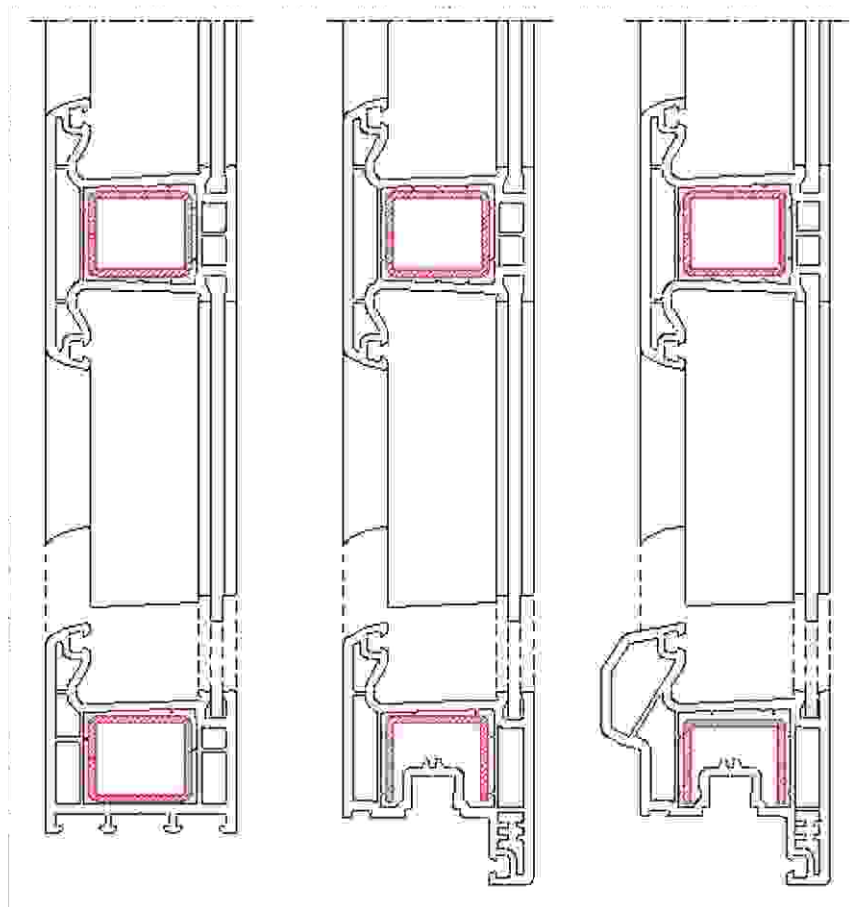


For the standard handles, the axis distance between the handle holes is 43 mm. The handle axis distance (a) and euro-groove machining width (b) depend on the hardware producer. After determination of the hardware, all these dimensions should be provided by the manufacturer.

Preparation of the mullion / transoms

Mullions and transoms are connected to the window frames by means of mechanical (mostly with metal or plastic injected parts) or welded joints. The widely used application is mechanical joint.

The mechanical connection calls for the mullion / transom profile to be end-milled. A special machine with specially designed rotating blades, according to the connection contour, is used for this purpose (see the following picture).

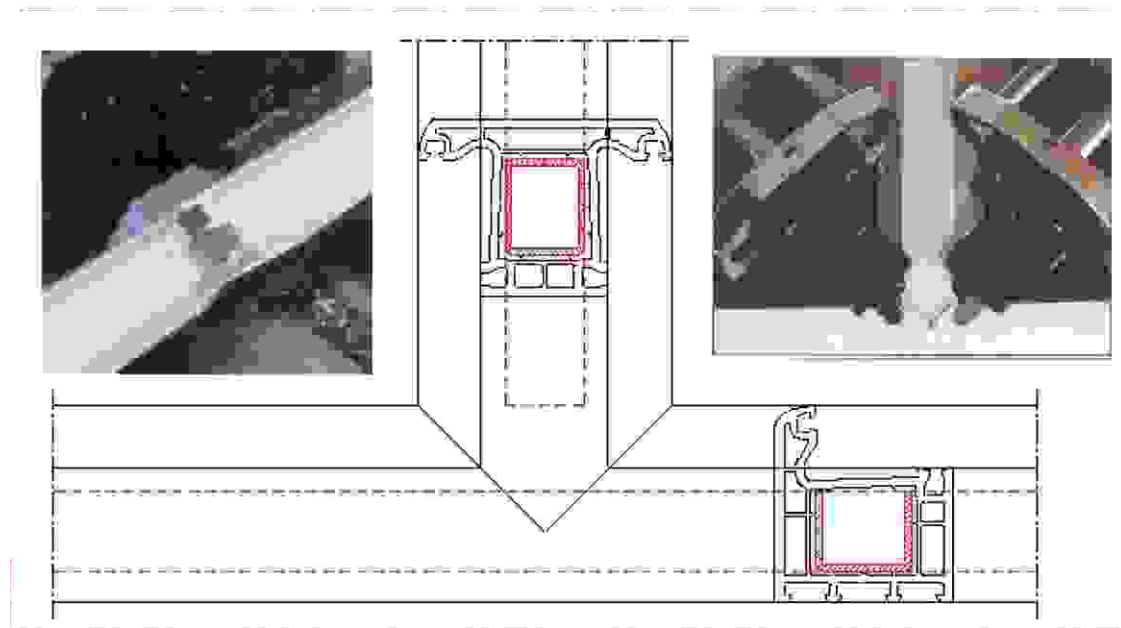


The end-machined profile mullion is assembled to the frame by means of injection parts which are mostly screwed to the reinforcement profile in the frame.

Regardless of the type of the frame (frame, sash, mullion, door etc.) which mullion / transom will be assembled, it would be very practical to have only one type of machining. In order to achieve this, the profile designer should check the connection of the mullion profile with the other profiles during the design stage (especially with the step sash and step door sash profiles).

Another concern is the screwing detail of the connection parts. To be able to screw the injection parts to the metal, the usage of the box reinforcement profile is important in the frame. The system should allow this application as can be seen on the picture above.

The welded connection of mullion / transom (T- and X-connections) necessitates 45° V-cuts in the mullion profile and 45° V-notched cuts on the framing profile. For these purposes, a special cutting machine is fitted with two blades working alternately. The accuracy of this V-cut is critical to the quality of the end product.



Welding of the profiles

This is a very important operation in PVC window construction, which makes it completely watertight.



There is a wide range of welding machines, varying from the single-head welder to the multi-head welders which simultaneously weld the mullions / transoms, crosses, corner butt welds, and angles.

Corner cleaning

After the welding operation, weld sprue is formed on the welded corners. These sprues can be cleaned with several hand tools, corner cleaning machines or fully-automatic corner cleaning units as well.



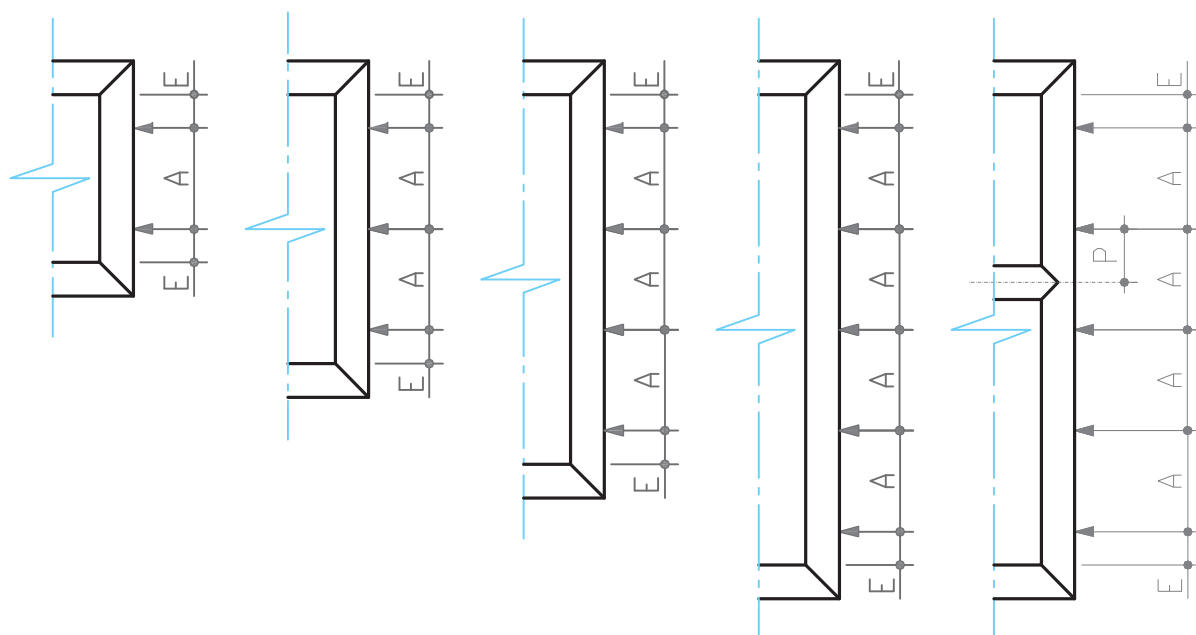
Hardware assembly

In window and door systems, all the accessories used for opening, closing and locking of the window sashes (espagnolettes, locks, locking bolts, hinges etc.) are called hardware.



Especially in the assembly of the tilt and turn opening systems, special jigs are used, mostly provided by the hardware manufacturer. Necessary holes on the frame and sash are opened by means of these jigs before the assembly of hardware.

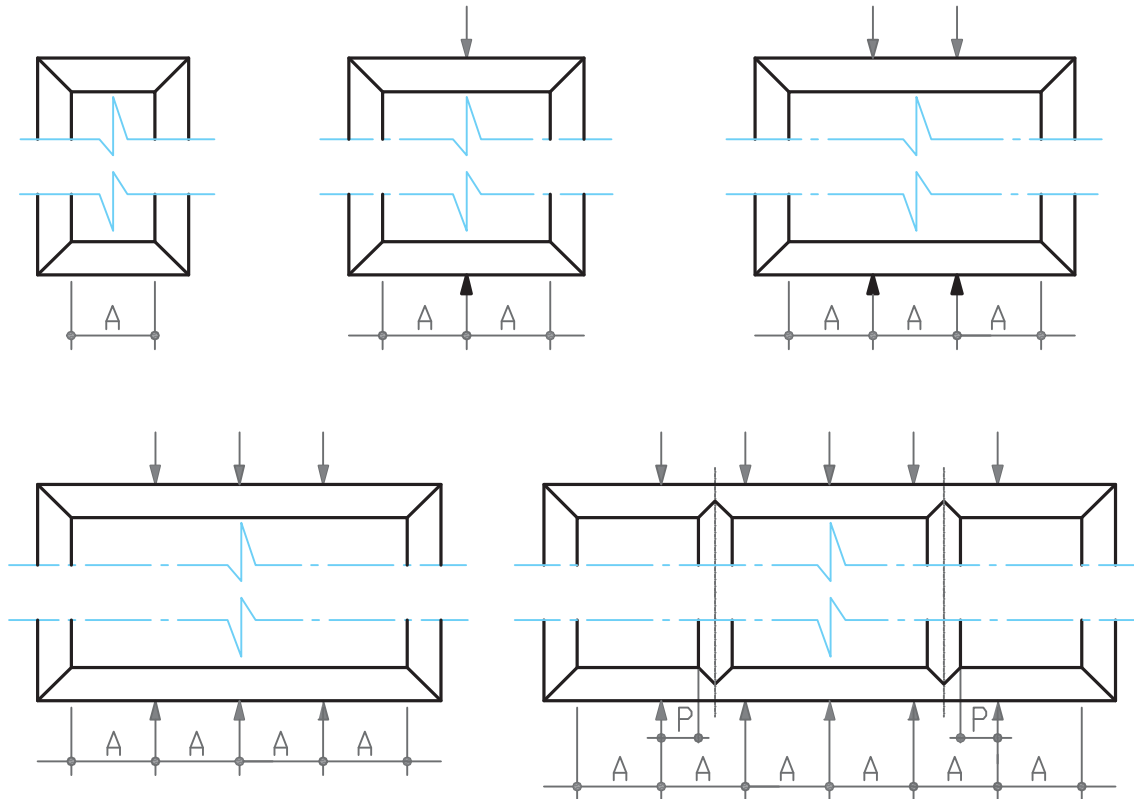
Structural installation



Anchorage distance of the vertical parts of the frame:

	for white profiles	for coloured profiles
A = distance betw. fixing points	max. 700 mm	max. 700 mm
E = distance to corner	ca. 150 mm	ca. 250 mm
P = distance to mullion	ca. 150 mm	ca. 250 mm

Structural installation

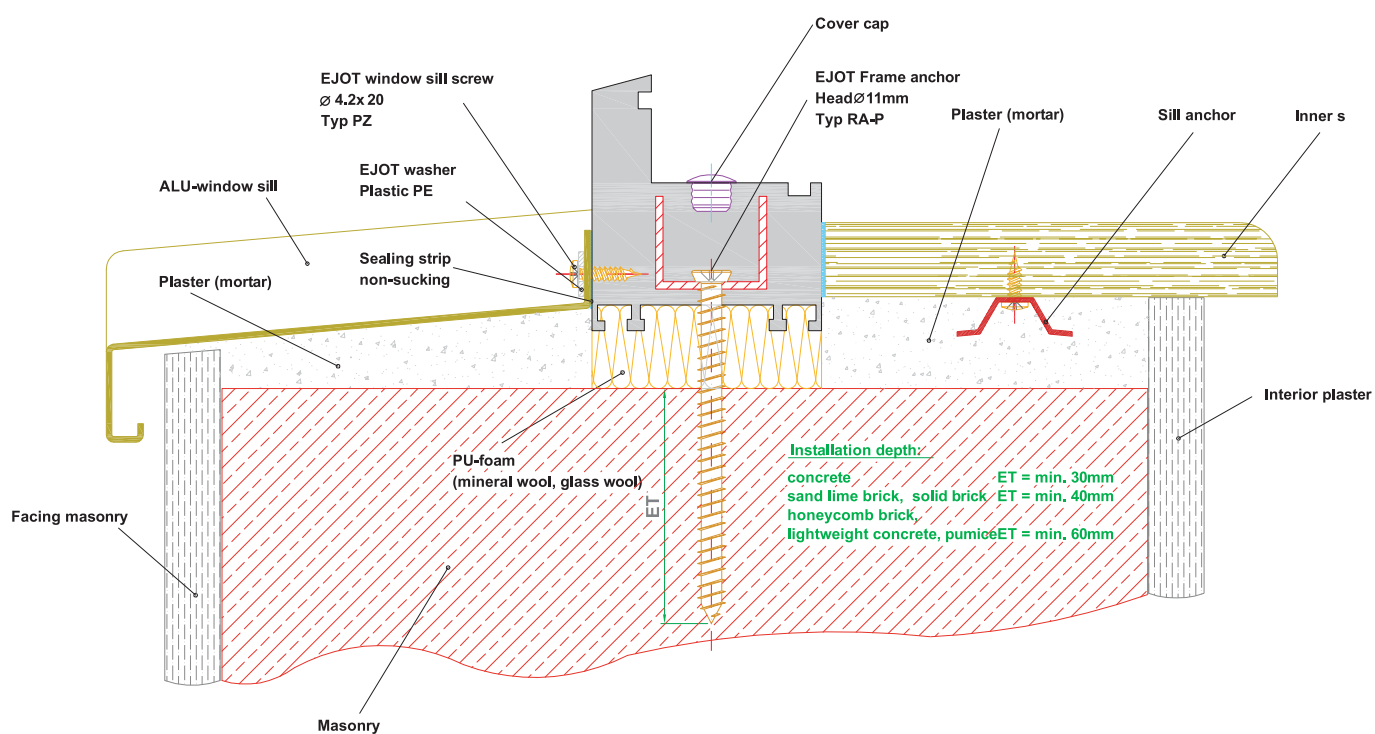


Anchorage distance of the horizontal parts of the frame:

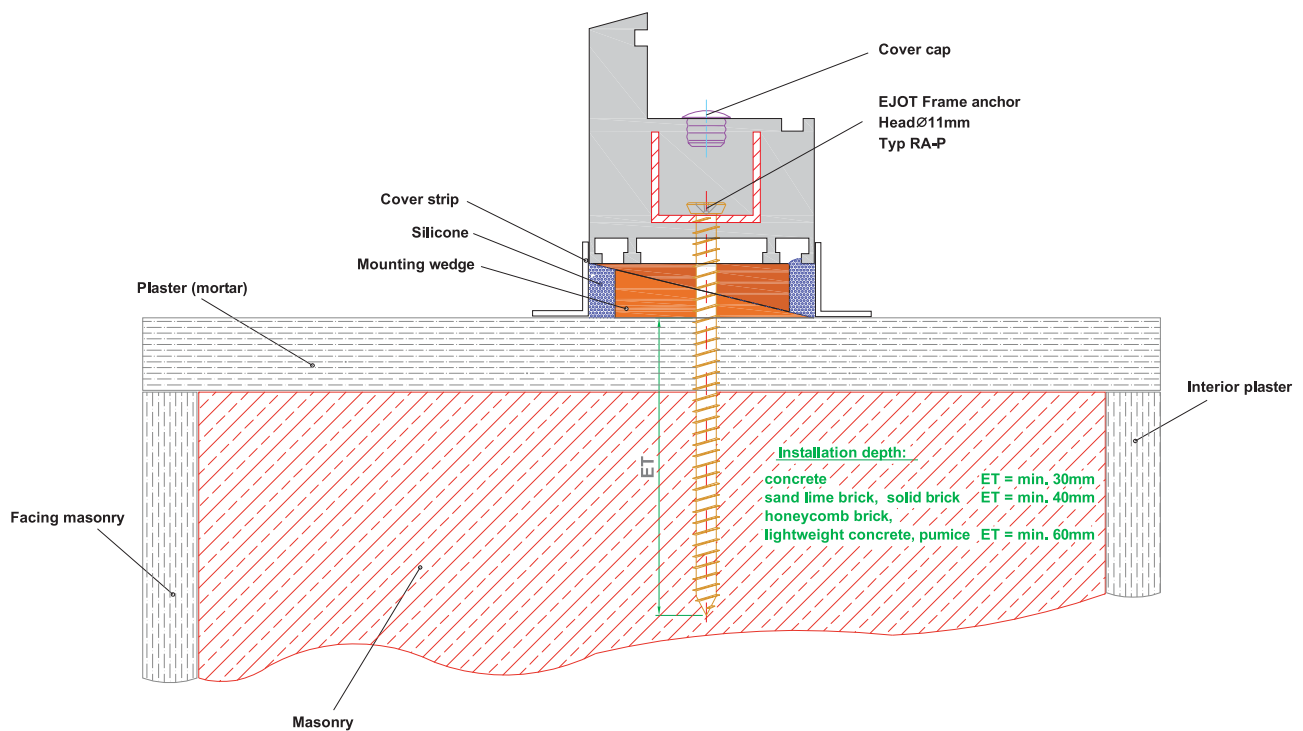
A = distance betw. fixing points
P = distance to mullion

for white profiles	for coloured profiles
max. 700 mm ca. 150 mm	max. 700 mm ca. 250 mm

Structure connection, at the bottom



Structure connection, laterally and on the top



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Head Office : No. 12, Shahid Taheri St., Africa Blvd., Tehran-IRAN
Tel (sales) : (+98 21) 2300 2100
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E-mail : info@vistabest.com

ویستا بست (سهامی خاص)

تولیدکننده پروفیل یو پی وی سی

دفتر مرکزی : تهران، بلوار آفریقا، خیابان شهید طاهری، پلاک ۱۲
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فکس : ۲۲۰۴۳ ۷۵۴ (۰۲۱)
ایمیل : info@vistabest.com