MALUNET Systems

ESS47 TECHNICAL MANUAL





System's Technical Characteristics





Basic Characteristics

- 1. Stainless steel lamina on rail profiles for smooth sliding.
- 2. Straight line design.
- 3. Optional Lift & Slide mechanism.
- 4. Optional multilocking mechanism.
- 5. Plastic rail cover (PVC) for thermal insulation and protection from water.
- 6. Elastic rail block seals (EPDM) for successive and in-wall systems.
- 7. 30mm (maximum) double or triple glass for better thermal and sound insulation.
- 8. Rubber tubular gaskets (EPDM) providing absolute seal to the sashes.

9. Specially designed PVC profile addition in glass sash profiles for excellent adaptation of components and insulation improving.

10. Two levels of channelling water (to the outer side of the frame), providing better drainage for the rails.

11. Combined with EOS 60, EOS 68 & EUROPA 8500 Thermo for composite structures.

Construction Types

- Successive.
- In wall.
- Successive with external fixed window.
- Composite structures.
- Fix & Slide.

Certifications

QUALICOAT: Powder coating process certification.

EKANAL: Certified factor for air permeability, water tightness and resistance to wind load. IFT Rosenheim: Certified factor for air permeability, water tightness and resistance to wind load. DTI: Thermal coefficient.





Technical Characteristics

Aluminium Alloy EN AW 6060 T6 Hardness 12 Webster Minimum coating thickness 75Qm Profile thickness 1,4mm Tolerance according to EN 12020-02 Width of successive rail 120mm-183mm (two-three sashes) Width of glass sash 47mm Glazing thickness 24-30mm Polyamide width 22-26mm Thermal Coefficient of fr ame Uf from 2,7 to 5,4 W/(m2*K) Maximum sash dimensions 2,5m x 2,7m Maximum sash weight 300 Kgr

System's Thermal Conductivity Characteristics





Uf=4,18 W(m2K)





01a General Profile Tables

TH 8045

Adjoining Profile for Glass Sash







Length

6,0 m

Theor.Weight 1.177 gr/m

 I_{\times} =2,85cm⁴ $I_{\vee(s)}$ =11,47cm⁴

У,

TH 80113	Length 6,0 m	Theor.Weight 2.157 gr/m		
Double Rail (Successive)		l _× =13,93cm ⁴	I _{y(s)} =101,52cm ⁴	
TH 80411	Length 6,0 m	Theor 1.0	.Weight 27 gr/m	
Interlock Profile 50mm wi	th Clip	I _× =2,84cm ⁴	l _y =9,94cm ⁴	



TV 80402	Length 6,0 m	Theor.Weight 845 gr/m	
Interlock Profile 25mm		I _× =11,26cm ⁴	l _y =0,94cm ⁴
	57,3 56,8		У,

TV 12603	Length 6,0 m	Theor. 1.36	Weight 8 gr/m
Reinforcement Profile		l _× =5.00cm ⁴	l _y =32.50cm ⁴
25	75]	У,х
			У <u>,</u> х

Theor.Weight 721 gr/m	TV 80503	Length 6,0 m	Theor.Weight 133 gr/m
8cm ⁴ l _y =1.73cm ⁴	Clip for Glass Sash		
		4,7	v
У,			Y _A

TV 00628	Length 6,0 m	Theor 1.4	.Weight 89 gr/m
Reinforcement Profile		I _× =24.32 cm ⁴	$I_{y(s)}$ =12.23 cm ⁴
	c 3	58,1	У,

TV 00627	Length 6,0 m	Theor.Weight 721 gr/m	
Reinforcement Grip		I _× =1.88cm ⁴	l _y =1.73cm ⁴
	25		У,

→ 01.01





TV 80603	Length 6,0 m	Theor.Weight 203 gr/m	
Connector for Sash - Inter	lock 25mm	l _× =0,03cm ⁴	l _y =0,21cm ⁴
^{20,3} 7.6			



TV 12503	Length 6,0 m	Theor.Weight 119 gr/m	
Cover for Reinforcement F	Profile	I_{\times} =0.02cm ⁴	I _y =0.22cm ⁴
	+19,7-		
			У , х

TV 8011	Length 6,0 m	Theor.Weight 279 gr/m
Spacer for ROTO INLINE Lo	ock	
	21,3 16,6	y,

TV 80505	Length 6,0 m	1 neor. 279	weight gr/m
Clip for Interlock Profile !	50mm	l _× =0,04cm ⁴	l _y =3,53cm ⁴
	10,5		
	55,7-	4,8	Ул
			Ĺ



TV 47501	Length 6,0 m	Theor.Weight 408 gr/m	
Clip For Fixed Glass Sash		I×=0,13cm ⁴	l _y =5,33cm ⁴



TV 27501	Length	Theor	.Weight
	6,0 m	162	gr/m
Cover Cap		I_{\times} =0.01 cm ⁴	$I_{y(s)}$ =0.92 cm ⁴



TV	5050	Length 6,0 m	Theor.Weight 150 gr/m
Rod			







01b Profiles 1:1











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O2 Sections



Successive Doors with Rail Height of 42mm







Successive with Fixed Sash Sliding or Lift & Slide







Section 1

Scale 1:1







Section 2 Scale 1:1







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Section 3

Scale 1:1



02.04











































Scale 1:1

Section 13





















Inside









O3 Machining



Assembly of Sash on Successive's Interlock 25mm







Reinforcement Profiles for Interlock 25mm





Assembly of Sash on Successive's Interlock 50mm





Reinforcement Profiles for Interlock 50mm







Addition for Successive with Fixed Sash




Assembly Cover Profile For Rail with Fixed Sash





Milling Process of Adjoining Profiles for a Double Joint Sash

Plastic Cups for Adjoining Profiles of a Double Joint Sash





Installation of Damping Stopper and Rollers to Glass Sash





Glass Sash Milling for 25mm Interlock Profile







Milling for 25mm & 50mm Interlock Profile



Machining for cover PG-80210 fitting

Glass Sash Milling for 50mm Interlock Profile







Machining for assembling with TV 80411



Water Drainage Holes on Rails



Non-Return Vavle UN-11301 Installation for the Rails: TH 80113, TH 8022







Glass Sash Stopper for Successive





Sealing Plugs for Rails with 42mm Height for Simple Sliding Sash

With 25mm Interlock





Sealing Plugs for Rails with 42mm Height for Lift & Slide Sash

With 25mm Interlock



03.12



HAUTAU ATRIUM Alu-HS 200 Mechanism





See accessories page: 1.5.06



Cutting Instructions for HAUTAU ATRIUM Alu-HS 200 Locking Mechanism





HAUTAU ATRIUM Alu-HS 200 Lift & Slide Mechanism



KAIMAKA 0.5:1



ROTO IN LINE Mechanism for Glass Sash



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Handle Options per Locking Mechanism



Detail of Handle installation on Glass Sash profile

CASE 1

For the use of lever handle without external finger grip, the use of threaded rivets is essential.



H 8040 Inside HA-12730 CASE 2

For the use of lever handle with external finger grip, do not use threaded rivets.





Detail of Handle installation on Glass Sash profile



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Use of Dumping Stoppers Depending on Type of the Construction



The profiles TV 8003 & TV 80605 are placed on the out side of Successive Rail, as in the drawing.



04 Cutting Instructions





Double Sash Successive System | Rail 42mm Height | Interlock 25mm Sliding or Lift & Slide



NOTE: The cutting standards are theoretic. Calculations were based on ideal conditions and joining.



Double Sash Successive System | Rail 42mm Height | Interlock 50mm Sliding or Lift & Slide



	Sash width (Ws)	Profiles	Cutting Type	Sash height (Hs)	Profiles	Cutting Type
Glass Sash	$Ws = \frac{Wf-74mm}{2}$	TH 8040: 4 Pcs		Hs= Hf-66mm	TH 8040: 2 Pcs	

	Height (Hs)	Profiles	Cutting Type
Interlock	Hf - 66mm	TH 80411 Pcs TV 80505: 2 Pcs	

	Glass width (Wg)	Glass height (Hg)
Glazing	Wg= Ws-84mm	Hg= Hs-146mm

NOTE: The cutting standards are theoretic. Calculations were based on ideal conditions and joining.



Triple Sash Successive System | Rail 42mm Height | Interlock 25mm | Sliding



NOTE: The cutting standards are theoretic. Calculations were based on ideal conditions and joining



Triple Sash Successive System | Rail 42mm Height | Interlock 50mm | Sliding



NOTE: The cutting standards are theoretic. Calculations were based on ideal conditions and joining.



Quadruple Sash Successive Double Joint Sash System | Rail 42mm Height Sliding or Lift & Slide



NOTE: The cutting standards are theoretic. Calculations were based on ideal conditions and joining.





Quadruple Sash Successive Double Joint Sash System | Rail 42mm Height | Sliding or Lift & Slide





Accessories





Quadruple Sash Successive Double Joint Sash System | Rail 42mm Height | Sliding or Lift & Slide





Corner Joints and Alignment Corner for Sashes



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PP-80303 Συσκευασία - Package 6-meter TV 80402











	Sealing P	lugs for Rails with 4	42mm Height		
SR-009039 (PS-6)	SR-009040	SR-12717	t Crub arry	With 25mm li	nterlock
				Simple Sliding	Lift & Slide
			Upper	SR-009040 [x1]	SR-12717 [x1]
38.1mm		36.8mm	Lower	SR-009040 [x1]	IC-80407 [x1]
	39.5mm			With 50mm li	nterlock
IC-80408	IC-80407			Simple Sliding	Lift & Slide
			Upper	SR-009040 [x1]	SR-009039 [x1]
			Lower	SR-009040 [x1]	IC-80408 [x1]
100mm	30mm 40mm				

UN-80204 Glass sash Spacer (Use on the top horizontal side of the sash) GA-80405 Image: Colspan="2">Image: Colspan="2" Image: Colspan="" Image: Colspan="" Image: Colsp

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GA-004007 (FL-01)	GA-004005 (BL-05)	GA-12407 to GA-12412
8	1	GA-12407 2mm GA-12408 3mm GA-12409 4mm GA-12410 5mm GA-12411 6mm GA-12412 7mm
Cover Gasket for Rails	(E.P.D.M.) Glazing Gasket	Glass Weatherstripes (E.P.D.M): 2-7mm
GA-004016 (PS-35)	GA-80405	GA-12904
For every side of the sash except the top side	For Glass Sashes on 34 & 42mm rails	
Gasket for Lift & Slide Glass Sash	For the top horizontal side of lift & slide Sash	<u>L</u> Gasket for Interlock Profiles
GA-004006 (ENS-7)		6mm - 4P to 8mm - 4P
Casket for Profile TH 90/5		BR-009044: 6mm BR-009045: 7mm BR-009046: 8mm
Gasket for Profile TH 8045		Brush



Note:

The table shows the theoretically width for the glasses that can use. There can be many combinations for the total thickness of the glass. Also you can use 2 clips together in order to have the maximum thickness of glass. By the customers requirements, there are glasses at the market that offers very good thermal insulation and sound reduction.

Attention:

For the sealant of the glasses either inside or outside from the frame, use of silicone is not recommented.



TOTAL SPACE	OUTS	SIDE	GLASS	1	NSIDE
(mm)	CODE	A (mm)	B (mm)	C (mm)	CODE
37	GA-12408	3	30*	4	GA-12409
37	GA-004005	3	29	5	GA-12410
37	GA-004005	3	28	6	GA-12411
37	GA-004005	3	27	7	GA-12412
37	GA-004005	3	26	8	GA-004024
37	GA-004005	3	24	10	GA-004028

 Glass Weatherstripes GA-12408 (3mm) & GA-12409 (4mm) are recommended for Glass 30mm.
Numbers are not absolute



Wedges positioning on the glass Sash





Punching machine steps



- 1. Punching tool for rail and sash corner joints CJ-006014 (TH 80113,TH8022)
- 2. Punching tool for Interlock TV 8006, TV 80505
- 3. Punching tool for Water Drainage (TH 80113, TH 80110, TH 80111, TH 8022, TH 80112)
- 4. Punching tool for rail's weep hole TH 80113
- 5. Punching tool for TH 8040
- 6. Punching tool for rail's weep hole TH 8022.



For the correct and safe use of punching machine we care to lubricate the cutting tools often. Recommended that the pressure be above 6 bar





MC 80207	MC 80405	PS-15
Glass Sash Milling for 25mm Interlock	Milling for 25mm & 50mm Interlock	Milling for TH 8045 profile
		·
MC 80906	DP-00133	
MC 80906	DP-00133	

For the above milling disk tools contact the accessories department.



Instructions for the Casement's Constructions

-The aluminum-constructor should always know the profile gamut and their abilities.

-He has to provide solutions and give the right construction details/requirments in every project.

-To select the appropriate profile sections that meet the requirements of the project, based on the strength diagrams found in the technical catalogs.

-He also has to construct and put the right subframe based on the type of casement.

-He has to cut and mill the profile the right way and of course treat all these points of joint with anticorrosive materials, providing protection from corrosion.

-Place sealants on the profile flanges during assembly to create a seal and direct water to the exterior of the frame through the weep holes.

-Always calculate a gap of 5mm (minimum) on each side between the subframe and the frame, for easy installation and alignment of the frame and at the same time for better insulation with the addition of the sealing material inside the gap.

-During placement, put silicone at the bottom side between the subframe and the marble, in order to avoid water leaks.

-Construct all the necessary water weep holes, according to the position of casement. Create openings in order to flow out the sediments from the bottom side of every shutter sash, providing protection from corrosion.

-Use only the correct accessories, as published in the catalogues and use the appropriate welding adhesive depending on the material (epdm rubber, pvc plastic, etc.) for their joint, or welding with the profile to ensure waterproofing of the structure.

-To properly support the glass panes of the configuration for its proper operation and to fasten the construction to the masonry with stainless steel or galvanized screws to prevent corrosion as stated in the technical catalogs.

-In thermal break systems, in cases of heat with intense sunlight, on painted dark shades, linear expansion may appear on the outer side of the sash for the duration of the natural phenomenon. To deal with the above natural phenomenon, it is recommended to place reinforcing profiles (on the inside), at the heights of the sashes where the arc appears. Moreover, for further improvement of the phenomenon, the use of reinforced panel (for example sea plywood) or reinforced laminate glass pane on the internal part of the structure or/and security multipoint lock with conical hook bolts is suggested for opening systems. The use of reinforced laminate glass pane on the internal part of the structure is also suggested for sliding systems. The intensity of the phenomenon is restricted when there is enough shading or when the casement windows are painted in light-colored hues and it is changing according to the location of the structure.

-Never hesitate to ask for assistance from our technical advisors any time.



Instructions for the Casement's Constructions

-The regular cleaning of painted profile surfaces will keep them in satisfactory condition.

-Cleaning is considered necessary when dust and pollution are evident on the surface of the profile and should be done by using a soft sponge and a mixture of water and cleaning-product with a pH of 5.5-8, followed by washing with clean water.

-The cleaning products should not affect the surface or change its appearance, therefore hard sponge, sponge of wire, or diluters must be avoided. The frequency of cleaning depends on the location of the construction and the desired appearance.

-Especially in industrial and coastal areas, the frequency of cleaning should be proportional to the deposits of dirt or salts on the profile's surface, which are corrosive. We would like to point out that alkaline material, such as cement, lime, and gypsum should not stay adhered to the surface. Also not approved tapes should not be stuck directly on the painted surface.

-The protective film, which is put on when the profile leaves the production line, should be removed after casement installation, because its exposure to the sunlight could cause defects to the surface.

-Apart from cleaning the outer surface, in order to ensure the proper operation of the structure its required to clean the profile's internal elements, such as tires, brushes, mechanisms, etc.

-Especially the moving parts of the construction mechanisms should be lubricated at regular intervals for proper operation.

-Strict adherence to the instruction mentioned above, in combination with the use of a special glue directly to the points where the paint is scratched during the works, will keep the shiny appearance and strength of the profile, by avoiding as well, any possible problems of corrosion.

Electrostatic Paint

Look-Appearance

The covering of important surfaces must be examined under the correct visual angle from 2m distance (The QUALICOAT'S specifications rebates 3m distance). Various defects in the surface should not be visible from that distance.

Geometrical Characteristics

Dimensions

For a critical dimension of 50mm there is no tolerance of (+/-) 0.40mm, which means that the dimension varies from, 49.60 to 50.40mm.

Straightness

For a piece of metal 6m length the maximum swept allowed is 3mm. The check can be done by supporting the piece of metal on its two edges on a stable plane table, in a way that its variation will be restricted by its weight. Then, the maximum swept in the middle of the piece should not exceed 3mm.

Bending

For the medium dimensions profile the bending tolerance is 2mm at the edge of a 5-6 m long piece of metal. To check the bending, the piece of metal has to be put on a stable level table, one edge of the profile must be kept attached to the table's edge and the variation must be measured, from the table's level at the other end of the profile.

Weight of Profiles

The weight of profile is theoretical and it is based on profiles dimensions with tolerance according to EN12020-2. Also the stated weight of profiles does not include the weight of paint.



06 Static Diagrams

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Maximum Dimensions & Maximum Weight



*The ESS 47 allows constructions with a maximum weight per sash 300Kg. This limit should not be exceeded even if the rollers are able for more weight.

Example for Understanding the Diagram



Sash width (L) & height (H) calculation at wind load of 0.06 N/cm² 113 Km/h in the diagram below.



Note:

The glazing is not included in the diagrams calculation. Glazing depending on the type and thickness it increases the maximum dimensions of the sash.




Ανεμοπιέσεις / Wind loads 0.04N/cm² 92Km/h 0.06N/cm² 113Km/h 0.08N/cm² 130Km/h 0.12N/cm² 159Km/h

The figures shown in the strength diagrams are based on the assumption that the reinforcement profile TV 12603 must be screwed to the interlock profile with screws spaced no more than 200mm apart.



For constructions that their height is in the gray area, has to be calculated considering all the technical needs of the project.





Ανεμοπιέσεις / Wind loads

	•	
0.04N/cm ²	92Km/h	_
0.06N/cm ²	113Km/h	
0.08N/cm ²	130Km/h	(<u> </u>
0.12N/cm ²	159Km/h	

The figures shown in the strength diagrams are based on the assumption that the reinforcement profile TV 12603 must be screwed to the interlock profile with screws spaced no more than 200mm apart.







Ανεμοπιέσεις / Wind loads 0.04N/cm² 92Km/h 0.06N/cm² 113Km/h 0.08N/cm² 130Km/h 0.12N/cm² 159Km/h

The figures shown in the strength diagrams are based on the assumption that the reinforcement profile TV 12603 must be screwed to the interlock profile with screws spaced no more than 200mm apart.



For constructions that their height is in the gray area, has to be calculated considering all the technical needs of the project.





Ανεμοπιέσεις / Wind loads

0.04N/cm ²	92Km/h	
0.06N/cm ²	113Km/h	
0.08N/cm ²	130Km/h	
0.12N/cm ²	159Km/h	

The figures shown in the strength diagrams are based on the assumption that the reinforcement profile TV 00628 must be screwed to the interlock profile with screws spaced no more than 200mm apart.







The figures shown in the strength diagrams are based on the assumption that the reinforcement profile TV 00628 & TV 00627 must be screwed to the interlock profile with screws spaced no more than 200mm apart.



For constructions that their height is in the gray area, has to be calculated considering all the technical needs of the project.





ΑνεμοπιέσειςWind loads

The figures shown in the strength diagrams are based on the assumption that the reinforcement profile TV 00627 must be screwed to the interlock profile with screws spaced no more than 200mm apart.



07 Technical Bulletins



Inline Slider Lock





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