



Technical dossier Starpur

Data 03-03-07 Rev.1

1. THE PRODUCT

1.1. Features

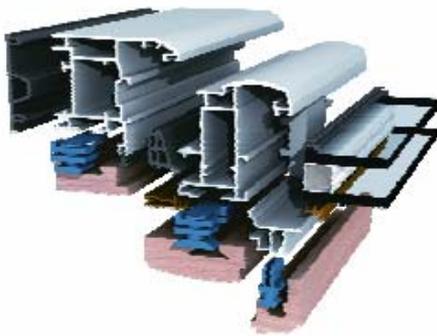


The decision to go with an aluminium-wood product comes both from experience and also from market research results carried out by the company's owners. Evidence coming from the window frame market led to the creation of the product, which is an aluminium-wood mix which combines both aesthetics and security, elegance for the interior and good looks for the outside, and with less maintenance than is traditionally required. The product has both the appearance as well as the technical-physical properties required by a market that is increasingly attentive to quality, combining innovation and practicality. The aluminium-wood mix, composed of aluminium profiles clad with wood laths on the inside, successfully captured the attention of the market, leading to the creation of a new medium-high niche, where the focus is on quality and elegance.

The outer aluminium provides solidity and strength, since it is the load-bearing part of the frame, and the system was designed to ensure high standards of reliability, providing stability for the mechanical joints that have loads up to 100 Kg in the swing-leaf solution and 250 kg for the sliding solution, and one of the important characteristics of this material is that it is low-maintenance and can be cheaply recycled.

The solid wood on the interior side, which has a purely decorative function, giving a warm and hospitable look, has been treated with a binder protective coat which makes it resistant to moulds, insects and mildew.

1.2. Technical characteristics



The originality of the system that combines materials with very different physical properties encouraged the production engineering division to carefully analyse the problems and draw up appropriate solutions for the system.

- The wood-aluminium coupling is carried out using patented nylon clips, set discontinuously, which guarantee the complete surface separation between the two materials and make allowances for the movement coming from the different thermal behaviours of the materials.

- The aluminium glazing bead holds the glass firm in its chamber and is connected to the load-bearing structure by means of a snap element connection, absorbing the mechanical stresses caused by the wind. It is covered by a wood moulding fixed without screws, but with suitable discontinuous nylon joints.
- To further enhance the heat insulation between the frame and the support surface there are special elements like suspensions and gaskets around the edges.
- The open joint has a broad chamber that slopes towards the outside, which makes it easier for water to run out through specially-made slots on the lower framework.
- To keep the seal watertight slots have been made on the wing that allow air to come in and condensation to be drained away.
- The hardware around the perimeter is a system with multi-point locks that allows the window to be adjusted around three axes, thereby ensuring greater protection, security and reliability.

2. THE PROPERTIES OF THE COMPONENTS

2.1. Aluminium

The profiles are made from EN AW-6060 aluminium alloy (complying with UNI EN 573/3), and this alloy represents the best compromise in terms of the requirements of both profile manufacturers, who exploit its excellent extrusion properties, as well as those of users because of the good mechanical properties and its resistance to pollutants. It should nevertheless be pointed out that the properties of this alloy in terms of corrosion resistance can vary depending on its chemical composition when admissible impurities (especially copper and zinc) reach and go beyond established weight percentages, even though within admitted limits in the alloy. The suppliers we work with ensure current regulations are respected, supplying us with a high performance product, and the type of test certificate is shown in the picture.

One of the stages that should not be neglected is the surface finishing of the profiles, since the coating or the oxidisation, in addition to being something that makes a powerful aesthetic impression, have protective functions that prevent the profiles from corrosion, the colours fading and a loss of shine. For this reason Starpur works with companies that provide high levels of quality which are guaranteed by certified processes like QUALICOAT, QUALANOD, etc.

ATTESTATO DI COLLAUDO

Test Certificate

Norma UNI EN 10204 Tipo 2.2

Documento N°
Document N°
Cliente
Customer
Rif. Ns. Articolo
V.E. PR.AL Article N°
Rif. Bolla Nr.
Delivery Note N°
Rif. Vs. Ordine N°
Customer Order N°
Peso Totale Kg
Net Weight Kg
Produttore Billette:
Aluminium Billets
Lega: AW 6060
Alloy

Data di emissione
Date of issue
? Campionatura
Sampling
? Lotto di produzione
Manufacture/Production
del
Date
del
Date
Barre Totali N° Lunghezza mm
Profiles N° Length mm
Colata N°
Cast N°
Stato : T5
Temper

Composizione Chimica

Chemical Analysis

Rif. Norma UNI EN 573-3

Cu% Rame Copper	Fe % Ferro Iron	Mg% Magnesio Magnesium	Mn % Manganese Manganese	Si % Silicio Silicon	Zn % Zinco Zinc	Ti % Titanio Titanium	Cr% Cromo Chromium
0.1	0.1-0.3	0.35-0.60	0.1	0.3-0.6	0.15	0.1	0.05

Caratteristiche Meccaniche

Mechanical Characteristics

Rif. Norma UNI EN 755-2

Carico di Rottura Tensile Strength Rm (N/mm ²)	Carico Unitario di Snervamento Yield Strength Rp 0.2 (N/mm ²)	Allungamento Elongation (%) A50	Durezza Webster Hardness
Min - 160	Min- 120	Min- 6	Min- 9

Dichiarazione di Conformità

Conformity Declaration

Si attesta che i profili sono estrusi con lega EN AW 6060, (rif. norma UNI EN 573-3) e le tolleranze dimensionali applicate per il controllo dei campioni in estrusione sono conformi alla Norma UNI EN 755

We attest that the material described above has been extruded with aluminium alloy EN AW 6060 (European Standard EN 573-3) and dimension tolerances used to inspect extruded samples are according with European Standard EN 755.

Nocera Inferiore

Controllo Qualità
Quality Control

ISTITUTO DI CERTIFICAZIONE INDUSTRIALE DELL'ALLUMINIO



QUALITAL

Si attesta che/This is to certify that

In accordo con il sistema di certificazione 3 (ISO IEC guida 67)
According to certification system 3 (ISO IEC guide 67)

LA QUALITA' DELL'ALLUMINIO VERNICIATO DELLA DITTA
THE QUALITY OF THE ALUMINIUM COATED OF

GAMA
Via Nuova Consortile Z.I.
84131 SALERNO SA

è conforme alle specifiche tecniche del QUALICOAT
per applicazioni architettoniche ed è in possesso di una linea conforme alla classe
SEASIDE

*Has been found to conform to the QUALICOAT directory
for architectural purposes and is capable of providing products for SEASIDE class*

Licenza QUALICOAT n° 744
QUALICOAT licency n° 744
(Rilasciata il 01.03.1999)

Il presente certificato è valido
fino al 31 dicembre 2007.

IL PRESIDENTE
QUALITAL
(Silvio Pozzoli)

Cameri 1 gennaio 2007

Silvio Pozzoli

SIN&ERT
ISTITUTO ITALIANO DI CERTIFICAZIONE INDUSTRIALE

accreditamento n° 10/B

ISTITUTO DI CERTIFICAZIONE INDUSTRIALE DELL'ALLUMINIO



QUALITAL

Si attesta che/This is to certify that

In accordo con il sistema di certificazione 3 (ISO IEC guida 67)
According to certification system 3 (ISO IEC guide 67)

LA QUALITA' DELL'ALLUMINIO ANODIZZATO DELLA DITTA
THE QUALITY OF THE ALUMINIUM ANODISED OF

GAMA
Via Nuova Consortile Z.I.
84131 SALERNO SA

è conforme alle specifiche tecniche del QUALANOD
per applicazioni architettoniche
Has been found to conform to the QUALANOD directory
for architectural purposes

Licenza EURAS-EWAA QUALANOD n° 739
EURAS-EWAA QUALANOD licency n° 739
(Rilasciata il 24.02.1999)

Il presente certificato è valido
fino al 31 dicembre 2007

IL PRESIDENTE
QUALITAL
(Silvio Pozzoli)

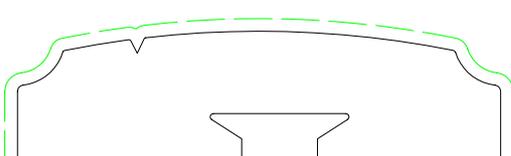
Camerti 1 gennaio 2007

SINCERT

accreditamento n° 10/B

2.2. Wood

Careful market research helped the suppliers decide on their choice of wood profiles, which are subject to tests regarding properties of hardness, strength, flexion, humidity (between 6% and 13%) and are certified as to their place of origin. The woods that offer the best guarantees come from the USA, and are: solid durmast; stained durmast; solid cherry; maple. Wood is a very porous material and therefore unstable, it continually absorbs and secretes moisture, something that can give rise to moulds, cracks and swelling. To remedy these drawbacks, protective surface treatments are carried out in order to provide better dimensional stability. All the profiles have special hollows that allow a nylon joint with opposing locks to be inserted without altering their integrity (no use of screws).

TREATMENTS	
<p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p>  <p>-----</p> <p>-----</p> <p>-----</p>	Exposed part
	Transparent protective film
	Finish with 30gloss matt.
	2 nd coat of primer and thorough sanding.
	1 st coat of primer and thorough sanding.
	Stain
	Sanding
	Unframed profile
	Non-exposed part
	Stain
Anti-mildew treatment	
profile brand and code	

2.3. Corner joints

- Aluminium profiles, where assembly is carried out with tight clamping that ensures optimal overlapping between the cut sections and perfectly flush adjacent surfaces, thereby avoiding corrosion and oxidation of untreated parts, and to this end die-cast aluminium (EN



AC-46100) alignment and pull frames are used, preventing contact between two different materials, the cause of electrochemical phenomena (galvanization), which can eventually give rise to corrosion.

- Wood profiles, where the wood frames are closed using glueing and crimping; the glueing operation uses a vinyl glue and the crimping operation uses double-edged conical crimpers that create a transversal compression in the corners of the two joined parts, thereby providing an excellent seal against any kind of stress the frame might be subjected to.

2.4. Gaskets

The gaskets used are made both of EPDM, an inoxidisable elastomer whose properties are long-lasting, and of Purene silicon rubber with its excellent properties, resistance to ageing caused by atmospheric agents, UV rays, ozone and temperatures of -40°C to +120°C.

		TECHNICAL DATA SHEET		
SPECIFICATION OF COMPOUND Limits of acceptance				
- Compound:	CEP70			
- Reference specification:	Norm DIN 7863.			
- Use:	Gaskets for the building trade.			
- Particularity	Peroxide curing system. Maintenance of physical and mechanical characteristics at low temperature.			
PROPERTY	Test Method	Units	Specification COMPLASTEX	Specification DIN 7863, TypeB
HARDNESS	DIN 53519	ShA	70 ± 3	70 ± 5
TENSILE STRENGTH (min.)	DIN 53504	N/mm ²	7,5	7,5
ELONGATION AT BREAK (min.)	DIN 53504	%	200	200
COMPRESSION SET 22h to 100°C (max.)	DIN 53517	%	35	35
COMPRESSION SET 22h to -25°C (max.)	DIN 53517	%	80	80
AFTER THERMIC AGEING : (7 Days at 100±3°C)	DIN 53508			
- a) VARIATION OF HARDNESS	DIN 53519	ShA	-5 / +10	-5 / +10
- b) VAR. TENSILE STRENGTH	DIN 53504	% from initial value	max. -25	max. -25
- c) VAR. ELONGATION AT BREAK	DIN 53504	% from initial value	max. -50	max. -50
VARIAT. OF HARDNESS AT LOW TEMP. (168h A -10°C)	DIN 53541	ShA	max. +10	max. +10
OZONE REACTION.	DIN 53509	Degree of break	0	0
Above mentioned value are those limit of specification. Variations are possible in this limits.				

Printed 03/05/2007

DEVENTER

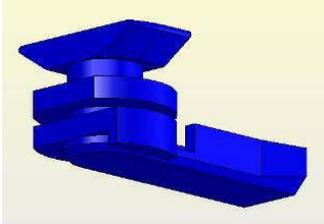
TABELLA CARATTERISTICHE DEL MATERIALE

10.05.1993

TABLE CHARACTERISTICS OF THE MATERIAL

Tipo di materiale: <i>Type of material :</i>	TPE (Elastomero termoplastico) <i>TPE (Thermoplastic elastomer)</i>		
Caratterizzazione chimica: <i>Chemical characterization :</i>	Caucciù poliolefinico interamente vulcanizzato in una matrice termoplastica <i>Poliolitinic rubber complitely vulcanized in a thermoplastic matrix</i>		
Denominazione commerciale: <i>Commercial denomination :</i>	Purene S		
Densità: <i>Density :</i>	DIN 53479	g/cm ³	0,98
Durezza Shore : <i>Hardness Shore :</i>	DIN 53505	A	62 +/-5
Resistenza a trazione: <i>Traction resistance :</i>	DIN 53504	N/mm ²	5,8
Allungamento a strappo: <i>Elongation at tear</i>	DIN 53504	%	420
Resistenza ad ulteriore strappo: <i>Resistance to more tear :</i>	DIN 53515	KN/m	17,8
Compression set: 72h / 23°C	DIN 53517	%	19
Compression set: 24h / 100°C	DIN 53517	%	35
Campo di applicazione Temperature: <i>Range of application temperatures :</i>		°C	- 40 +120
Compatibilità con le vernici: le guarnizioni in Purene S sono compatibili con vernici acriliche idrosolubili nonché vernici a base di resine alchiliche con diluenti tradizionali. <i>Compatibility with the paints :</i> <i>The gaskets are compatible with the water-soluble acrylic paints as well as paints to base of alchiliche resins with traditional diluent</i>			

2.5. Nylon spacers



Patented PA6 nylon components connect the wood to the aluminium, using a rotating lock system, and ensure there is no contact whatsoever between the two frames, allowing the different expansion properties of the two materials to be respected. The retainers are inserted without screws every 15 – 20 cm, allowing the wood to breathe also on the surface on the inside.

PA6 is a low-viscosity technopolymer that has the ability to modify its crystalline structure, with an enhancement of its properties. It is usually used to make insulators, slides, rollers, cogs and electronic components. Up to a temperature of about 300 °C it preserves its properties, at higher temperatures it tends to liquefy and decompose.

Preliminary Datasheet

07/2004

Capron® BG40C
(PA6)

 **BASF**
The Chemical Company

Product description

Capron® BG40C is a low viscosity polyamide 6 injection moulding grade possessing a modified crystalline structure for increased property performance and faster cycles. It is available in natural and pigmented versions. Capron® BG40C is ideally suited for applications such as insulators, bushings, slides, valves, relays, window hardware, gears, fittings, furniture casters, wiring devices and other electrical components.

Physical form and storage

Capron is supplied dry and ready to use in moisture-proof packaging in the form of cylindrical pellets. Standard packs are the special 25 kg bag and the 1000 kg bulk container (octagonal IBC = intermediate bulk container made from corrugated board with a liner bag). Subject to agreement other forms of packaging and shipment in tankers by road or rail are also possible. All containers are tightly sealed and should only be opened shortly before processing. To ensure that the perfectly dry material cannot absorb moisture from the air the containers must be stored in dry rooms and must always be carefully sealed again after portions of material have been taken out. Capron can be kept indefinitely in the undamaged bags. Experience has shown that product supplied in IBCs can be stored for about 3 months without any adverse effects on processing properties due to moisture absorption. Containers stored in cold rooms should be allowed to equilibrate to normal temperature so that no condensation forms on the pellets.

Product safety

Capron melts are thermally stable at the usual temperature up to 310 °C and do not give rise to hazards due to molecular degradation or the evolution of gases and vapours. Like all thermoplastic polymers Capron decomposes on exposure to excessive thermal load, e.g. when it is overheated or as a result of cleaning by burning off. In such cases gaseous decomposition products are formed. Decomposition accelerates above 310 °C, the initial products formed being mainly carbon monoxide, ammonia and in the case of PA6 products caprolactam. At temperatures above about 350 °C small quantities of pungent smelling vapour of aldehydes, amines and other nitrogenous decomposition products are also formed. For further safety information please see the safety datasheet of the individual product.

Note

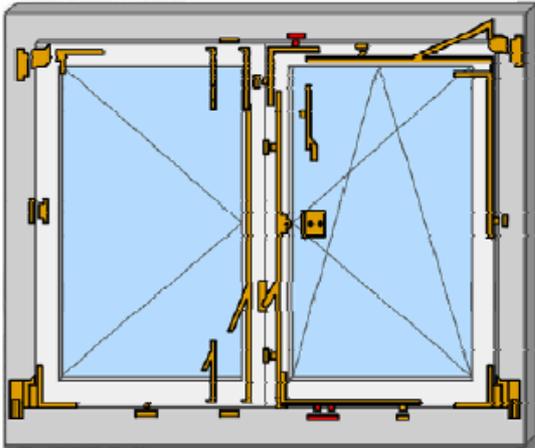
The information submitted in this publication is based on our current knowledge and experience. In view of the many factors that may affect processing and application, these data do not relieve processors of the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. It is the responsibility of those to whom we supply our products to ensure that any proprietary rights and existing laws and legislation are observed. In order to check the availability of products please contact us or our sales agency.

BASF Aktiengesellschaft
67056 Ludwigshafen, Deutschland

Typical values at 23°C ¹⁾	Test method	Unit	Condition	Values
Properties				
Abbreviated term	ISO 1043	-	-	PA6
Density	ISO 1183	g/cm ³	-	1,13
Viscosity number (solution 0.005 g/ml sulfuric acid)	ISO 307	ml/g	-	148
Colour: natural (n), coloured (c), black (bk)	-	-	-	n
Processing				
Melting temperature, DSC	ISO 3146	°C	-	220
Melt volume rate MVR 275/5	ISO 1133	cm ³ /10 min	-	-
Melt temperature, injection moulding/extrusion	-	°C	-	240 - 270
Mould temperature, injection moulding	-	°C	-	80 - 95
Flammability				
UL94 rating at 1.5 mm thickness	UL 94	class	-	V-2 ²⁾
Automotive materials (thickness d ≥ 2mm)	FMVSS 302	-	-	-
Mechanical properties				
Tensile modulus	ISO 527-2	MPa	dry	3,800
Yield stress (v = 50 mm/min), Stress at break (v = 5 mm/min)*	ISO 527-2	MPa	dry	90
Yield strain (v = 50 mm/min)	ISO 527-2	%	dry	3.5
Nominal strain at break, Strain at break*	ISO 527-2	%	dry	9
Flexural modulus	ISO 178	MPa	dry	2,900
Flexural strength	ISO 178	MPa	dry	100
Charpy unnotched impact strength ³⁾ +23°C	ISO 179/1eU	kJ/m ²	dry	N
Charpy notched impact strength ³⁾ +23°C	ISO 179/1eA	kJ/m ²	dry	2.5
Ball indentation hardness H 358/30, H 96 1/30*	ISO 2039-1	MPa	dry	140
Thermal properties				
Deflection temperature 1.8 MPa (HDT A)	ISO 75-2	°C	-	70
Deflection temperature 0.45 MPa (HDT B)	ISO 75-2	°C	-	-

Footnotes:
 1) for uncoloured product, unless defined otherwise in the product name
 2) N = no break
 3) N = no break
 *) official UL listing initiated

2.6. Hardware



Made of steel, die-cast zinc (zamak), stainless steel for the springs for the corners and high quality plastic for the small parts. All the metallic parts are varnished with zinc and passivated according to DIN 50941. All the passivated silver components are later given a layer of high quality wax that considerably increases the anti-corrosion protection and also the smooth functioning of the individual pieces. On the basis of the RAL mark of quality

RAL-RG 607/3 (frames and hardware for windows) or RAL-RG 660 (galvanised products) for class III of stress, there are at least 72 hours of protection against white rust, and 240 hours against red rust. Testing is carried out in accordance with DIN 50021 (salt spray test). Anti-corrosion protection of the Maico surfaces meets RAL standards.

The galvanization, passivation and waxing treatments are used to further protection window mechanisms against corrosion. Nevertheless, these mechanisms (including among other things cremone bolts, pawls, scissor hinges etc.) are protected only against problems involving dampness that is normally present.

2.7. Glass

Housed in the frame or in the wing using an aluminium glazing bead or inside an insert profile, they are held in place by an PVC gasket on the inside, and an EPDM one on the outside, this latter being composed of a rigid part inserted in the profile and a soft part in direct contact with the glass, guaranteeing excellent waterproofing without the need for silicon. Special small blocks that were designed for our system have the task of supporting the glass, and they prevent not only the panel coming into direct contact with the metallic frame but also prevent the formation of thermal bridges, the transmission of vibrations and the breakage of the glass. The glass used bears the CE marking and therefore subjected to all the controls set out in the regulations, and the glass is also guaranteed for 10 years. Low emissive glass is used as standard which helps to reduce heating costs, preventing the outward dispersion of heat, reducing the formation of condensation; in hot countries it is possible to use sun-control glass which also allows air-conditioning costs to be reduced.

2.8. Measures for coastal areas

Most materials corrode (the return of the material to its original state), and this phenomenon is heightened in areas near the sea because of the presence of water and the high percentage of salt in the air.

Starpur is aware that this phenomenon could degenerate if not taken seriously and so to protect its frames from corrosion it has acquired components that are suitably treated and guaranteed.

- Of the various surface finishes it better to use oxidized profiles in coastal areas, and if there is need of varnished profiles then they should be treated before being varnished, and there are two types of treatments: 5 microns open pore oxidation; SEASIDE. The suppliers selected by Starpur already uses the SEASIDE system guaranteed for 10 years, and which is recognised throughout the entire European Union. With specially formulated coatings and a relative increase in costs, it is possible to get products that are guaranteed for up to 20 years.

- Die-cast aluminium alignment frames, treated with the Montix method;



La ditta LM dei f.lli Monticelli srl

The LM of Monticelli brothers srl

in seguito a ricerche e studi sulla stabilità dei serramenti metallici ed accessori di accoppiamento

following research and studies on the stability of the metallic ironware and joining accessories in nebbio/salina chamber

in camera nebbio/salina, secondo le norme ASTM-B117.1 ISO 9227/92 tipo N SS,

according the norms ASTM-B117.1 ISO 9227/92 type NSS.

RENDE DISPONIBILI

MAKE AVAILABLE

i seguenti risultati di resistenza all'ossidazione:

the following results about resistance at the oxidation:

- squadretta in alluminio pressofuso EN1706 AC46100-D: 150h
Aluminium die-cast corner cleat
- ferri K2 con zincatura a freddo: 160/180h
Tools K2 with galvanization at cold :
- viti e minuteria standard rivestita dacromet: 800h
screws and small standard tools covered dacromet :
- squadretta in alluminio pressofuso trattata  : >1000h
Aluminium die-cast corner cleat

Informiamo che su ogni squadretta sottoposta a trattamento , vengono sempre

We inform that on every die-cast corner cleat with treatment MONTIX, all INOX steel componets are always assembled to guarantee

assemblati tutti i componenti in acciaio inox al fine di garantire la massima resistenza

all INOX steel componets are always assembled to guarantee the maximum resistance at oxidation.

all'ossidazione.

Teniamo a precisare che montare solamente la vite inox e non gli altri componenti è sconsigliato. Si

We specify that to climb on only the screws and non the other componets is dissuaded

avrebbe infatti una squadretta con minore resistenza meccanica (una vite inox è meno resistente del

The die-cast corner cleat could have a lower mechanical resistance (a inox screw cuold have a 42% resistance in less copared to normal

42% circa rispetto ad una normale*) e non sarebbero risolti a pieno i problemi dell'ossidazione (che
situation) and the oxidation problems would non be totally resolved (caused by the other componets).

verrebbe innescata dagli altri componenti).

** carico di rottura per vite inox: 58Kg/mm² - per vite acciaio 10.9: 100Kg/mm²*

Luogo e data
Osimo (AN), 10/11/06

Resp. Tecnico
Vladimiro Monticelli

- All the screws used for fixing the hardware and the profiles have to be made of stainless steel.
- Protection of cut and machined edges (untreated exposed part) with special pastes or sprays that form a protective film (conforming to DIN 50021);
- Hardware (opening and closing mechanisms) subjected to a special anti-corrosion treatment, duplex treatment (consisting of a double barrier), which ensures the durability



of the system, composed of galvanization, the conservation layer and the coating.



Description of project

Salt spray test according to ASTM B117-02 on tilt- and turn fittings with MACO "TRICOAT" surface.
Temporal sequence of the removal of the samples:: 240, 360, 480, 576, 696, 816, 912 und 1000 h.

Requirements for the MACO "TRICOAT" surface:

Rate of white rust after 600h: max. 5%
Rate of red rust after 1000 h: max. 5%

Test objects

8 pcs. ArtNr. 20621 Trend Drive Gear , size.0
8 pcs. ArtNr. 20635 Corner Element, size A
8 pcs. ArtNr. 202107 Rebated Scissor Stay, size 0
8 pcs. ArtNr. 201486 Tilt Lock Bolt
8 pcs. ArtNr. 97543 Spindle Bar
8 pcs. ArtNr. 201477 Rebated Scissor Stay Support Arm DT 12/18/9
8 pcs. ArtNr. 201475 Scissor Stay Hinge DT 12/18
8 pcs. ArtNr. 201601 Pivot Post DT
8 pcs. ArtNr. 201602 Corner Support DT
8 pcs. ArtNr. 30898 French Casement Tilt Lock

Date of delivery : 22 December 2005
Date of test: 22 December 2005 - 10 February 2006

Test equipment:

Salt spray chamber Heraeus Vötsch SC 1000

Test result

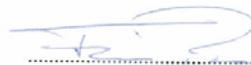
The requirements of the MACO „TRICOAT“surface was fulfilled.
Only on 1 out of 10 Beschlagsteilen (sample Trend gear fix, size.0) corrosion could be noticed after 1000 h of salt spray test. (see Pic. 10, page 8 of this report)

The corrosion (ca. 1%) was below the requirements for the MACO "TRICOAT" surface.

Project Manager

Head of Business Field

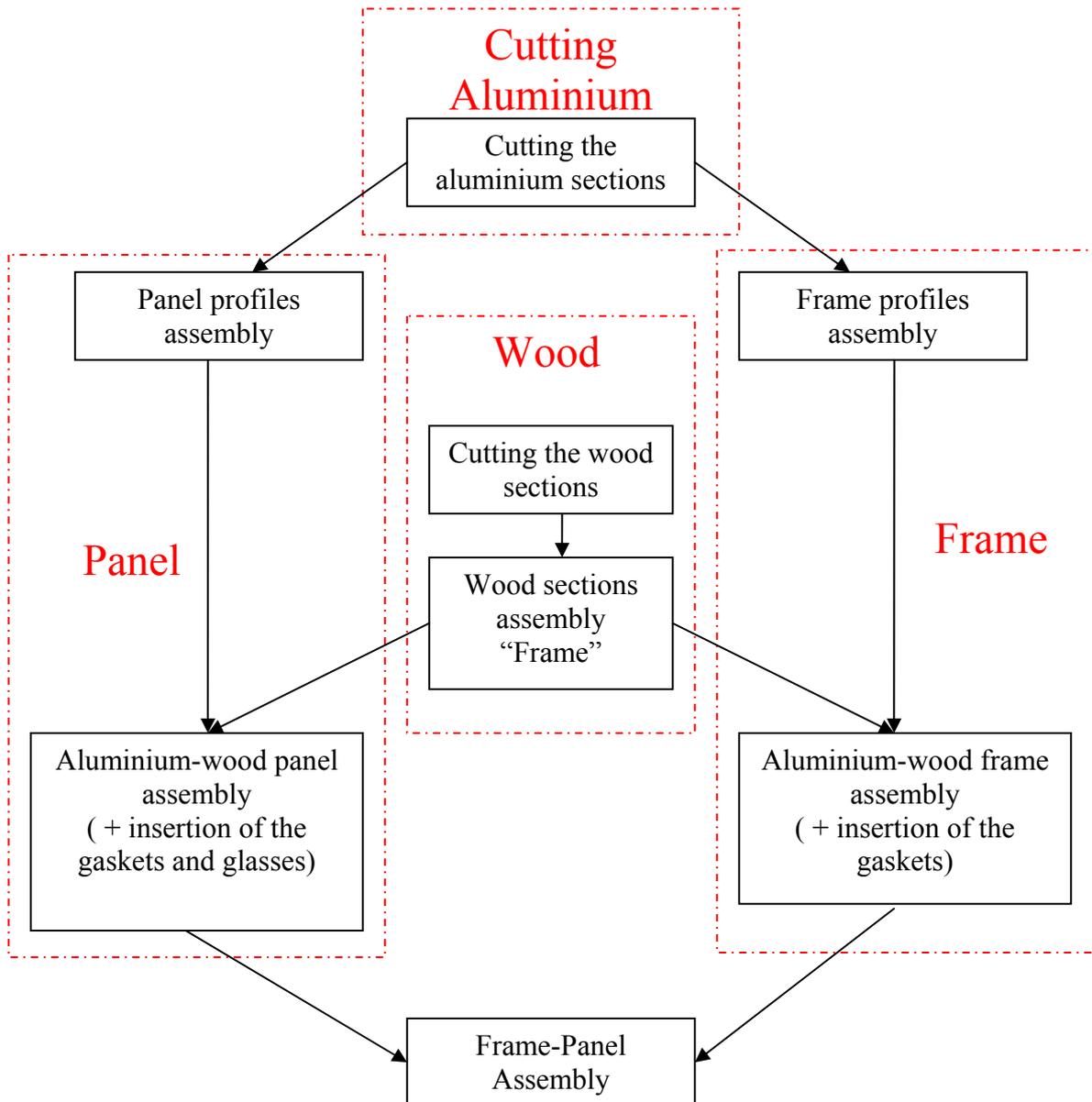

.....


.....

3. THE PRODUCTION PROCESS

The company is divided into three lines:

- panel
- frame
- wood



All the information for the individual orders are processed by the production office, which sends it through the network to the various area heads.

Production processes:

Cutting aluminium	Cutting wood	Processing aluminium	Assembly wood	Installing aluminium	Installing hardware	Applying wood	Putting in glass	Registr.
-------------------	--------------	----------------------	---------------	----------------------	---------------------	---------------	------------------	----------

3.1. Cutting the aluminium

The aluminium cutting operations are carried out using a numeric control work station, which downloads all the information from the network; all the processed cuts are identified with a reference number or label for type and then put on the order trolley.

3.2. Cutting the wood

The operator takes the material from the area containing wood ready for processing and starts to cut it and put identifying marks on it. After this the wood is put on the trolley.

3.3. Processing the aluminium

The operator in the LAV area takes the pieces from the trolley and carries out the remaining work on the individual profiles in line with what is indicated in the relative work instructions,

3.4. Wood assembly

After the cutting work, the wood assembly bench operator takes the wood profiles from the trolley and on the basis of the work order he proceeds with the assembly of the frame and then puts it in the storage area.

3.5. Installation of the aluminium profiles

After the cutting work the aluminium assembly bench operator takes the aluminium profiles from the trolley and on the basis of the table of types he proceeds with the installation of the panels and frames and then puts them in the storage area.

3.6. Hardware assembly

On the basis of type and the relative work orders the operators put the frames and the panels on the assembly benches. They then proceed with the installation of the hardware on the basis of the work order.

3.7. Application of the wood

The operator trained for this procedure gets the latches ready used to securely attach the wood frame. On the basis of type and the relative work orders the operator takes the wood frame and positions it on the aluminium frame/panel and secures it. At this point he proceeds with the insertion of the gaskets.

3.8. Application of the glass

The operator trained for this procedure puts the window on the relative work bench, takes the glass and positions it inside the frame or panel, securing it with glass stops and gaskets.

3.9. Registration

The operator responsible for this procedure puts the window frame on the relative work bench, takes the wing and inserts it into the frame, and then registers it by filling out the appropriate form.

3.10. Testing

Checking the proper functioning is carried out by the person in charge of testing who reports all the tests, highlighting any that does not meet the proper standards. The tester sends a copy to the production manager who then issues the Certificate of Conformity.

4. CONTROLS

4.1. On acceptance

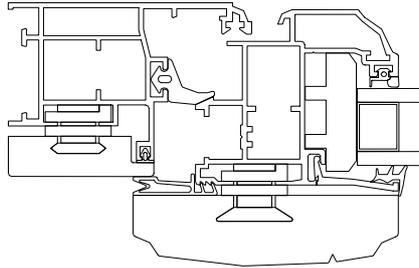
When materials first arrive, and before being included in the work cycle, they are subjected to various controls and the warehouseman, once the checks have been carried out, records the checks carried out on the newly arrived goods on the appropriate form. In the event of problems with incoming goods, the warehouseman then proceeds with what is set out in the quality control procedures.

4.2. In production

In this phase Starpur has activated an in-process control service that provides monitoring procedures, which are displayed on the check cards, for each work process in the production division. Measurements and controls ensure uniform results of the work carried out with automated machinery. The formal evidence of the state of the measures is provided by the examination forms on which are recorded any problems arising in the quality assessment procedure.

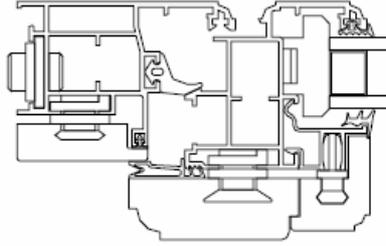
5. STARPUR PRODUCTS

SW40



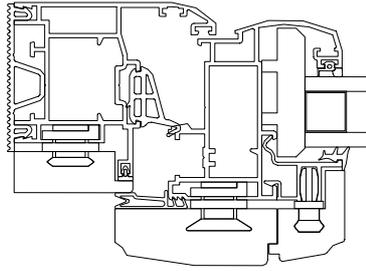
Series:	STARWOOD SW40 ALUMINIUM/WOOD
Extruded alloy profiles:	6060 UNI 3569 (Outer part of the frame)
Physical state:	TA 16
Woods:	3 types of solid woods are used: Durmast, Cherry wood and Maple; Varnished durmast: Natural and Walnut; Varnished cherry: Natural; Varnished maple: Natural; For the lacquering untreated Ramin wood is used.
Dimensional and thickness tolerances:	½ UNI 3879
Type seal against air, water and wind:	Open joint
Application of glass:	With glass stop fixture
Net height of glass seat:	31 mm
Glass chamber:	23 mm
Type of assembly:	Retainers every 20 cm. By means of rotating spindles with pawl.
Open joint chamber:	580 mm ³
Basic dimensions of the system:	Fixed frame section 50.5 mm Moving frame section 74.5 mm Overlap between the fixed frame and the mobile frame 6 mm. Outside interspace 7.5 mm Ledge on the wall 23.5 mm
Use:	The system described above lets you make windows, French windows, doors with one or more panels and fixed mirrors; it allows the following types of manoeuvre; parallel sliding, folding, tilt-and-turn and bottom-hinged.

SW50



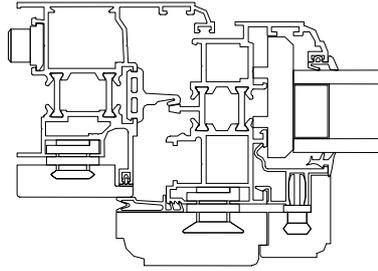
Series:	STARWOOD SW50 ALUMINIUM/WOOD
Extruded alloy profiles:	6060 UNI 3569 (Outer part of the frame)
Physical state:	TA 16
Woods:	3 types of solid woods are used: Durmast, Cherry wood and Maple; Varnished durmast: Natural and Walnut; Varnished cherry: Natural; Varnished maple: Natural; For the lacquering untreated Ramin wood is used.
Dimensional and thickness tolerances:	½ UNI 3879
Type seal against air, water and wind:	Open joint
Application of glass:	With aluminium snaplock glass stop covered with a snaplock wood frame.
Net height of glass seat:	30 mm
Glass chamber:	23 mm
Type of assembly:	Retainers every 20 cm. By means of rotating spindles with pawl.
Open joint chamber:	575 mm ³
Basic dimensions of the system:	Fixed frame section 50.5 mm Moving frame section 75.5 mm Overlap between the fixed frame and the mobile frame 6 mm. Outside interspace 7.5 mm Ledge on the wall 23.5 mm
Use:	The system described above lets you make windows, door-windows, doors, centre fixed windows, opening towards the outside, swing windows, with one or more wings and fixed mirrors; it allows the following types of manoeuvre; parallel sliding, folding, tilt-and-turn and bottom-hinged.

SK65



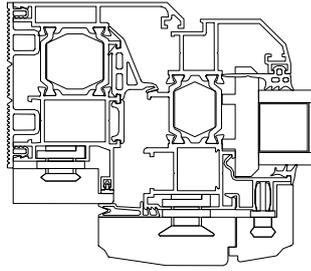
Series:	STARWOOD SK65 ALUMINIUM/WOOD
Extruded alloy profiles:	6060 UNI 3569 (Outer part of the frame)
Physical state:	TA 16
Woods:	3 types of solid woods are used: Durmast, Cherry wood and Maple; Varnished durmast: Natural and Walnut; Varnished cherry: Natural; Varnished maple: Natural; For the lacquering untreated Ramin wood is used.
Dimensional and thickness tolerances:	½ UNI 3879
Type of seal against air, water and wind:	Open joint
Application of glass:	With aluminium snaplock glass stop covered with a snaplock wood frame.
Net height of glass seat:	31,5 mm
Glass chamber:	23 mm
Type of assembly:	Retainers every 20 cm. By means of rotating spindles with pawl.
Open joint chamber:	845 mm ³
Basic dimensions of the system:	Fixed frame section 65 Moving frame section 84.5 Overlap between the fixed frame and the mobile frame 6 mm. Outside interspace 6.5 mm Ledge on the wall 25.5 mm
Use:	The system described above lets you make windows, door-windows, doors with one or more wings and fixed mirrors; it allows the following types of manoeuvre; parallel sliding, folding, tilt-and-turn and bottom-hinged.

SW70TT



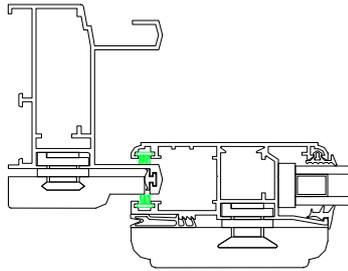
Series:	STARWOOD SW70 TT ALUMINIUM/WOOD
Extruded alloy profiles:	6060 UNI 3569 (Outer part of the frame)
Physical state:	TA 16
Woods:	3 types of solid woods are used: Durmast, Cherry wood and Maple; Varnished durmast: Natural and Walnut; Varnished cherry: Natural; Varnished maple: Natural; For the lacquering untreated Ramin wood is used.
Dimensional and thickness tolerances:	½ UNI 3879
Type of seal against air, water and wind:	Open joint
Heat insulation:	By means of 16 mm long and 2 mm thick polyamide laths
Application of glass:	With aluminium snaplock glass stop covered with a snaplock wood frame.
Net height of glass seat:	38 mm
Glass chamber:	29 mm
Type of assembly:	Retainers every 20 cm. By means of rotating spindles with pawl.
Open joint chamber:	800 mm ³
Basic dimensions of the system:	Fixed frame section 71 mm Moving frame section 89 mm Overlap between the fixed frame and the mobile frame 6 mm. Outside interspace 7.5 mm Ledge on the wall 23.5 mm
Use:	The system described above lets you make windows, door-windows, doors with one or more wings and fixed mirrors; it allows the following types of manoeuvre; parallel sliding, folding, tilt-and-turn and bottom-hinged.

SK80TT



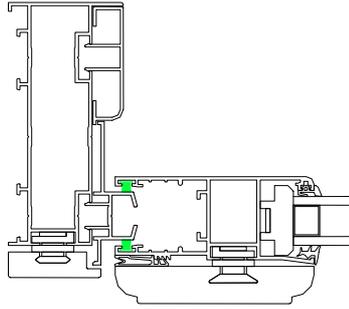
Series:	STARWOOD SK80 TT ALUMINIUM/WOOD
Extruded alloy profiles:	6060 UNI 3569 (Outer part of the frame)
Physical state:	TA 16
Woods:	3 types of solid woods are used: Durmast, Cherry wood and Maple; Varnished durmast: Natural and Walnut; Varnished cherry: Natural; Varnished maple: Natural; For the lacquering untreated Ramin wood is used.
Heat insulation:	By means of 27.5 mm long and 2 mm thick polyamide laths and the insertion of high density, closed cell polystyrene bars.
Dimensional and thickness tolerances:	½ UNI 3879
Type of seal against air, water and wind:	Open joint
Application of glass:	With aluminium snaplock glass stop covered with a snaplock wood frame.
Net height of glass seat:	41 mm
Glass chamber:	29 mm
Type of assembly:	Retainers every 20 cm. By means of rotating spindles with pawl.
Open joint chamber:	665 mm ³
Basic dimensions of the system:	Fixed frame section 80.8 mm Moving frame section 99.5 mm Overlap between the fixed frame and the mobile frame 6 mm. Outside interspace 6.5 mm Ledge on the wall 25.5 mm
Use:	The system described above lets you make windows, door-windows, with one or more wings and fixed mirrors; it allows the following types of manoeuvre; parallel sliding, folding, tilt-and-turn and bottom-hinged.

SW75S



Series:	STARWOOD SW75s ALUMINIUM/WOOD
Extruded alloy profiles:	6060 UNI 3569 (Outer part of the frame)
Physical state:	TA 16
Woods:	3 types of solid woods are used: Durmast, Cherry wood and Maple; Varnished durmast: Natural and Walnut; Varnished cherry: Natural; Varnished maple: Natural; For the lacquering untreated Ramin wood is used.
Dimensional and thickness tolerances:	½ UNI 3879
Application of glass:	On the aluminium wing insert.
Net height of glass seat:	21.8 mm
Glass chamber:	17 mm
Type of assembly:	Retainers every 20 cm. By means of rotating spindles with pawl.
Basic dimensions of the system:	Fixed frame section 76.2 mm Moving frame section 46.8 mm
Use:	The system described above lets you make straight-line, light sliding fixtures with 2 or more wings with a maximum load-bearing capacity of 80 Kg. per wing, with the possibility of being used with SW40 and SW50 systems for veranda solutions and other combinations.

SW130S



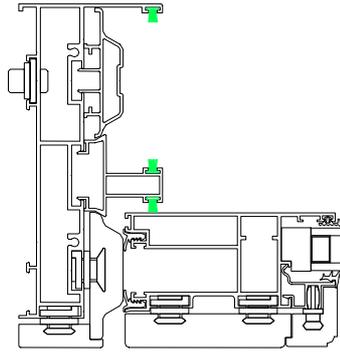
Series: STARWOOD SW130s TT ALUMINIUM/WOOD
Extruded alloy profiles: 6060 UNI 3569 (Outer part of the frame)
Physical state: TA 16
Woods: 3 types of solid woods are used:
Durmast, Cherry wood and Maple;
Varnished durmast: Natural and Walnut;
Varnished cherry: Natural;
Varnished maple: Natural;
For the lacquering untreated Ramin wood is used.

Dimensional and thickness tolerances: ½ UNI 3879
Application of glass: On the aluminium wing insert.
Net height of glass seat: 30.9 mm
Glass chamber: 23 mm
Type of assembly: Retainers every 20 cm. By means of rotating spindles with pawl.

Basic dimensions of the system: Fixed frame section 126 mm
Moving frame section 58 mm
Ledge on the wall 23.5 mm

Use: The system described above lets you make medium straight-line sliding fixtures with 2 or more wings with a maximum load-bearing capacity of 150 Kg. per wing.

SW180S



Series: STARWOOD SW180s TT ALUMINIUM/WOOD
Extruded alloy profiles: 6060 UNI 3569 (Outer part of the frame)
Physical state: TA 16
Woods: 3 types of solid woods are used:
Durmast, Cherry wood and Maple;
Varnished durmast: Natural and Walnut;
Varnished cherry: Natural;
Varnished maple: Natural;
For the lacquering untreated Ramin wood is used.

Dimensional and thickness tolerances: ½ UNI 3879

Application of glass: With aluminium snaplock glass stop covered with a snaplock wood frame.

Net height of glass seat: 30 mm

Glass chamber: 23 mm

Type of assembly: Retainers every 20 cm. By means of rotating spindles with pawl.

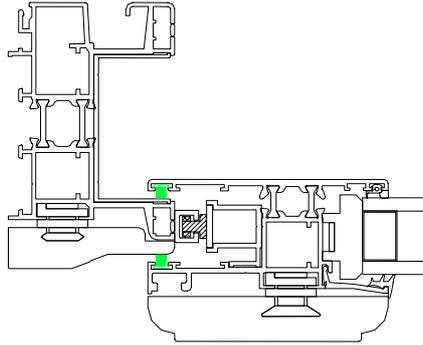
Basic dimensions of the system: Fixed frame section 173.8

Moving frame section 68

Ledge on the wall 23.5 mm

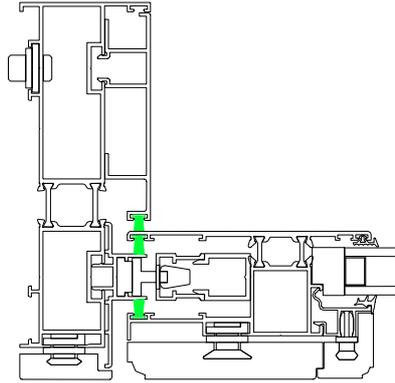
Use: The system described above lets you make lift and slide fixtures with 2 or more wings with a maximum load-bearing capacity of 250 Kg. per wing.

SK100STT



Series:	STARWOOD SK100s TT ALUMINIUM/WOOD
Extruded alloy profiles:	6060 UNI 3569 (Outer part of the frame)
Physical state:	TA 16
Woods:	3 types of solid woods are used: Durmast, Cherry wood and Maple; Varnished durmast: Natural and Walnut; Varnished cherry: Natural; Varnished maple: Natural; For the lacquering untreated Ramin wood is used.
Dimensional and thickness tolerances:	½ UNI 3879
Heat insulation:	By means of 18 mm long and 2 mm thick polyamide laths
Application of glass:	With glass stop
Net height of glass seat:	36.5 mm
Glass chamber:	29 mm
Type of assembly:	Retainers every 20 cm. By means of rotating spindles with pawl.
Basic dimensions of the system:	Fixed frame section 100.7 Moving frame section 61.3
Use:	The system described above lets you make medium straight-line sliding fixtures with 2 or more wings with a maximum load-bearing capacity of 150 Kg. per wing.

SK180STT



Series:	STARWOOD SK180s TT ALUMINIUM/WOOD
Extruded alloy profiles:	6060 UNI 3569 (Outer part of the frame)
Physical state:	TA 16
Woods:	3 types of solid woods are used: Durmast, Cherry wood and Maple; Varnished durmast: Natural and Walnut; Varnished cherry: Natural; Varnished maple: Natural; For the lacquering untreated Ramin wood is used.
Dimensional and thickness tolerances:	½ UNI 3879
Heat insulation:	By means of 20 mm long and 2 mm thick polyamide laths
Application of glass:	With aluminium snaplock glass stop covered with a snaplock wood frame.
Net height of glass seat:	30.3 mm
Glass chamber:	23 mm
Type of assembly:	Retainers every 20 cm. By means of rotating spindles with pawl.
Basic dimensions of the system:	Fixed frame section 173 mm Moving frame section 68 mm Ledge on the wall 23.5 mm
Use:	The system described above lets you make medium straight-line sliding fixtures with 2 or more wings with a maximum load-bearing capacity of 150 Kg. per wing, lift and slide fixtures with 2 or more wings with a maximum load-bearing capacity of 150 Kg. or 250 Kg. per wing.

6. PERFORMANCES

Starpur products, conceived with the attention to the smallest details, have passed category tests, obtaining the excellent levels of performance reported below.

Series:	Type	L x H	UNI EN 1026 Air Class	UNI EN 1027 Water Class	UNI EN 12211 Wind Class	UNI EN 10077-2 Transm.
SW40	Window with 2 tilt-and-turn wings	1200 x 1400	4	9A	C5	3.63
SW50	Window with 2 tilt-and-turn wings		4	9A	C5	3.89
SK65	Window with 2 tilt-and-turn wings		4	9A	C5	3.8
SW70TT	Window with 2 tilt-and-turn wings		4	9A	C5	2.84
SK80TT	Window with 1 tilt-and-turn wing		4	E1500	C5	1.8
	Window with 2 tilt-and-turn wing		4	E1200	C5	
SW75s	Underway					4.43
SW130s						4.47
SW180s						4.26
SK100s TT						3.16
SK180sTT						3.74

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529
 SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762
 PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705
 LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217
 SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it
 E-mail: info@istedil.it

TEST REPORT n° 0329/2006-C

Guidonia M. 24/02/2006

Results of the air permeability, watertightness and wind resistance tests performed on 23/02/2006, on a two opening window test-piece received on 14/02/2006.

Geometrical and structural characteristics of the test-piece are given in the attached description sheet that is an integral part of this test report and it was supplied by the Customer.

Customer : STARPUR S.r.l. -Nocera Inferiore- (SA)



DECLARED DATA

Product name : SW40
 Opening type : ANTA/RIBALTA
 Frame : WOOD-ALUMINUM
 Dimensions (mm) : 1200 x 1400 (total) ; 1128 x 1328 (openings)

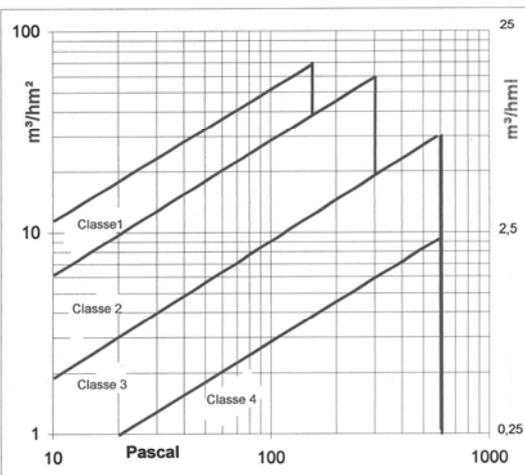
TEST RESULTS

Environmental conditions: 18 °C 57% R.H.

AIR PERMEABILITY - UNI EN 1026

Surface m² 1,7 Perimeter lin. m 6,2

Pascal	m ³ /h	m ³ /hm ²	m ³ /hml
50	0,0	0,0	0,0
100	0,0	0,0	0,0
150	0,0	0,0	0,0
200	0,0	0,0	0,0
250	0,0	0,0	0,0
300	0,0	0,0	0,0
450	0,2	0,1	0,0
600	1,0	0,6	0,2



Air permeability: Classification according to UNI EN 12207 : Class 4

WATERTIGHTNESS UNI EN 1027 - Method A

No water leakage at 600 Pa

Watertightness : Classification according to UNI EN 12208 : Class 9A

pag. 12

Partial reproduction of this Report forbidden without Istedil prior authorization

Capitale Sociale € 1.040.000,00 int. versato - Trib. di Roma n. 1256/72 - C.C.I.A.A. n. 358813 - Partita I.V.A. 00887271005 - Codice Fiscale 00422700585
 Inserito nell'albo dei laboratori altamente qualificati di cui all'art. 4 della legge 17-2-1982 n. 46 - con decreto del Ministero per il Coordinamento delle iniziative per la Ricerca Scientifica e Tecnologica - Iscritto all'Albo



TEST REPORT n° 0329/2006-C

pag. 2/2

WIND RESISTANCE - UNI EN 12211

Frontal deflection (P1)

Most deformable window element (mm) : **1200**

		Pressure P1 (Pa)					
		0	2000	0	0	-2000	0
deflection (mm)	A →	Ao	Ap	A residuo	Ao	Ap	A residuo
	M →	0,0	1,6	0,1	0,0	-0,1	0,0
	B →	Bo	Bp	B residuo	Bo	Bp	B residuo
		0,0	3,6	0,1	0,0	-0,2	0,0
		0,0	1,3	0,1	0,0	-0,1	0,0
Frontal deflection (mm)		Fp			Fp		
		2,15			-0,10		
Relative frontal deflection (mm)		1/ 558			1/ -12000		
CLASS		A		B		C	
Frontal deflection limits (mm)		<1/150	8,0	<1/200	6,0	<1/300	4,0

Repeated pressure test (P2)

N° 50 pulsations at **1000 Pascal** were applied (101 kg/m² and 145 km/h); at the end of the test, there was no alteration in the casing functionality.

After P1 and P2 tests, air permeability did not have variations greater than **20 %**.

Security test (P3)

A **3000 Pascal** (304 kg/m² and 252 km/h) pulsation was applied; at the end of the test, there was no alteration in the casing functionality.

Wind resistance : Classification according to UNI EN 12210 : Class C5

TEST OPERATOR

Geom. Antonio Liberatore



DIRECTOR

Dott. Ing. Giovanni Lapolla




Partial reproduction of this Report forbidden without Istedil prior authorization

TEST REPORT n° 203/2006

Guidonia M. 02/02/2006

Results of calculation of thermal transmittance of frame profile, with numerical method, carried out on 02/02/2006.

Geometrical and structural characteristics of the text-piece are given in the attached description sheet, supplied by the Customer, which form an integral part of this test report.

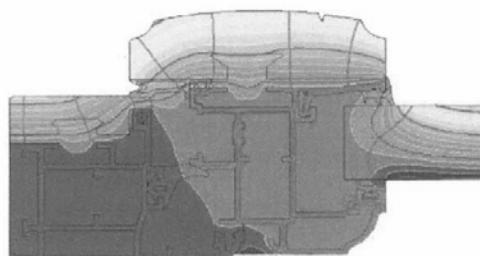
Customer : STARPUR S.r.l.

DECLARED DATA

Product name : SW 40
Frame : ALUMINUM-WOOD

Thermal conductivity of materials:

Aluminum	160.000	W/m°K
EPDM	0.250	W/m°K
Soft Wood	0.130	W/m°K
Insulation panel	0.035	W/m°K



TEST PROCEDURE

Reference standard: UNI EN ISO 10077-2
Calculation program: PHISIBEL BISCO vers. 7.0w

TEST RESULTS

BISCO data file: sw40.bsc

THERMAL TRANSMITTANCE OF FRAME (UNI EN ISO 10077-2)

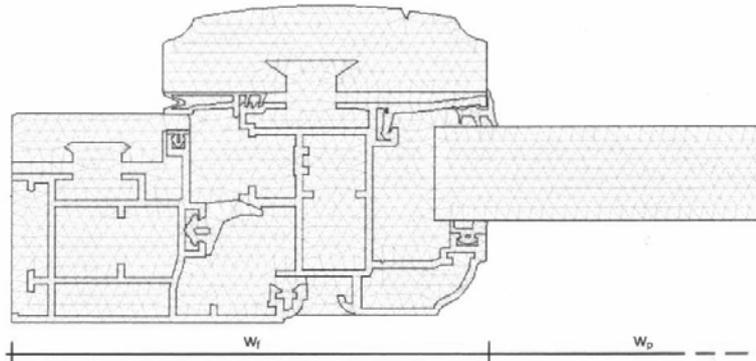
$$U_f = (Q/(t_i - t_e) - U_p * w_p) / w_f$$

with:

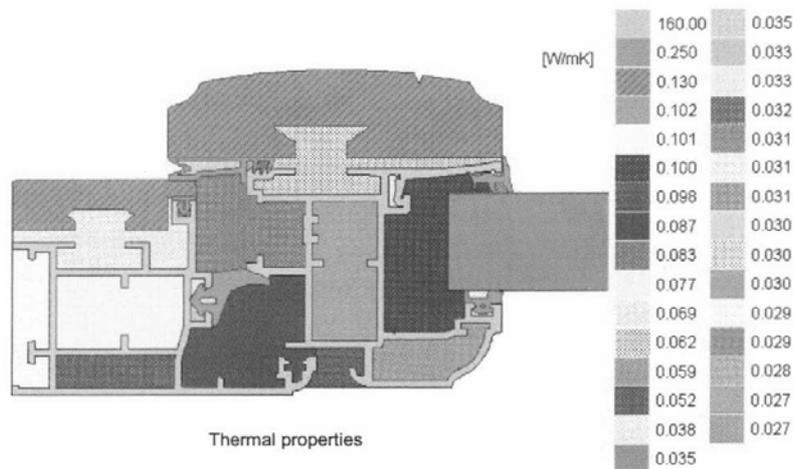
- Q = 23.79 W/m [total heat flow (frame+panel)]
- t_i = 20.00 °C [internal temperature]
- t_e = 0.00 °C [external temperature]
- U_p = 1.219 W/(m².K) [thermal transmittance of the insulation panel]
- w_p = 0.6408 m [projected width of insulation panel]
- w_f = 0.1125 m [projected width of frame]

THERMAL TRANSMITTANCE OF FRAME U_f = 3.63 W/m² K

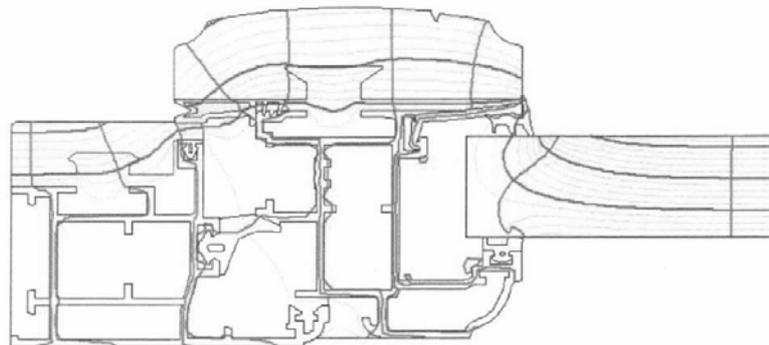
TEST REPORT n° 203/2006



Geometrical description and triangulation mesh

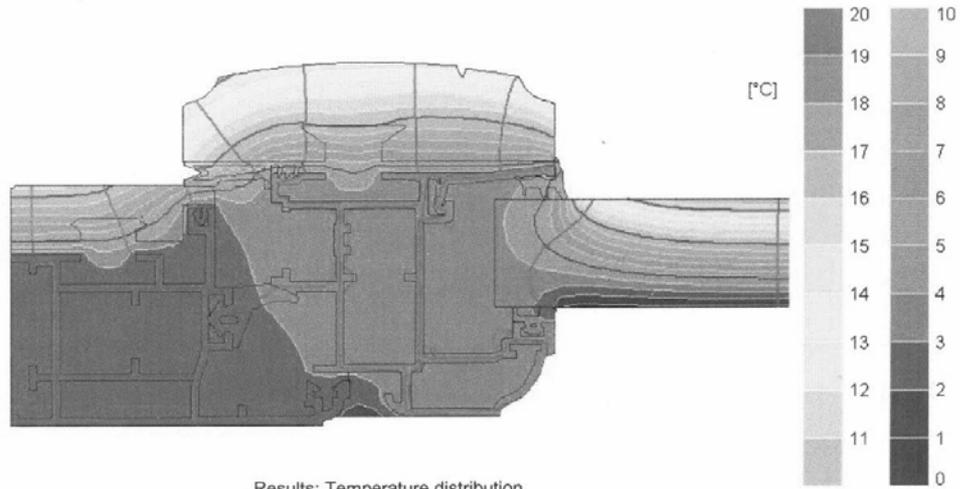


Thermal properties

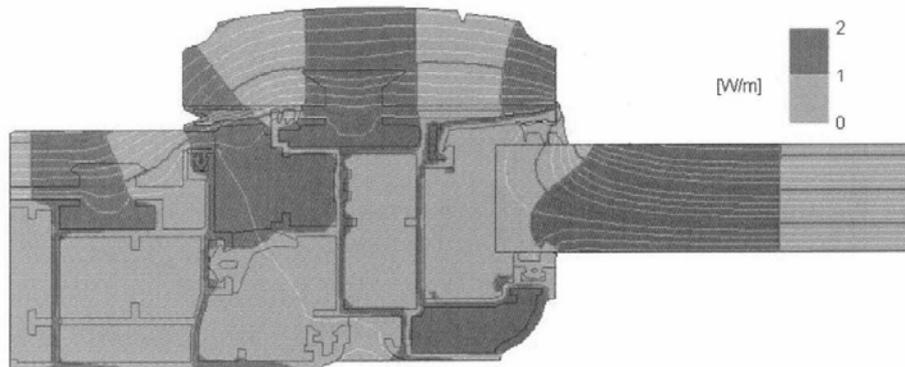


Results: Isotherms and heat-flow lines

TEST REPORT n° 203/2006



Results: Temperature distribution



Results: Heat-flow distribution

TEST OPERATOR

Dott. Ing. Camillo Orsi



DIRECTOR

Dott. Ing. Giovanni Lapolla

SW50

istituto sperimentale per l'edilizia s.p.a.

ISTEDIL

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529

SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762

PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705

LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217

SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it

E-mail: info@istedil.it

TEST REPORT n° 0329/2006-B

Guidonia M. 24/02/2006

Results of the air permeability, watertightness and wind resistance tests performed on 23/02/2006, on a two opening window test-piece received on 14/02/2006.

Geometrical and structural characteristics of the test-piece are given in the attached description sheet that is an integral part of this test report and it was supplied by the Customer.

Customer : STARPUR S.r.l. -Nocera Inferiore- (SA)



DECLARED DATA

Product name : SW50
 Opening type : ANTA/RIBALTA
 Frame : WOOD-ALUMINUM
 Dimensions (mm) : 1200 x 1400 (total) ; 1128 x 1328 (openings)

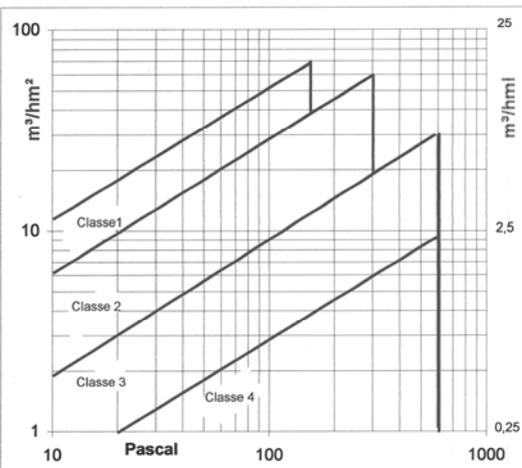
TEST RESULTS

Environmental conditions: 17 °C 55% R.H.

AIR PERMEABILITY - UNI EN 1026

Surface m² 1,7 Perimeter lin. m 6,2

Pascal	m ³ /h	m ³ /hm ²	m ³ /hml
50	0,0	0,0	0,0
100	0,0	0,0	0,0
150	0,0	0,0	0,0
200	0,0	0,0	0,0
250	0,0	0,0	0,0
300	0,0	0,0	0,0
450	0,0	0,0	0,0
600	0,9	0,5	0,1



Air permeability: Classification according to UNI EN 12207 : Class 4

WATERTIGHTNESS UNI EN 1027 - Method A

No water leakage at 600 Pa

Watertightness : Classification according to UNI EN 12208 : Class 9A

pag. 1/2



Partial reproduction of this Report forbidden without Istedil prior authorization

Capitale Sociale € 1.040.000,00 int. versato - Trib. di Roma n. 1256/72 - C.C.I.A.A. n. 358813 - Partita I.V.A. 00887271005 - Codice Fiscale 00422700865

Inserito nell'albo dei laboratori altamente qualificati di cui all'art. 4 della legge 17-2-1982 n. 46 - con decreto del Ministero per il Coordinamento delle iniziative per la Ricerca Scientifica e Tecnologica - Iscritto alla RILEM

TEST REPORT n° 0329/2006-B

pag. 2/2

WIND RESISTANCE - UNI EN 12211

Frontal deflection (P1)

Most deformable window element (mm) : **1200**

deflection (mm)	Pressure P1 (Pa)					
	0	2000	0	0	-2000	0
A	Ao	Ap	A residuo	Ao	Ap	A residuo
M	0,0	1,5	0,1	0,0	-0,4	-0,3
B	Mo	Mp	M residuo	Mo	Mp	-0,1
	0,0	4,9	0,2	0,0	-0,7	-0,4
	Bo	Bp	B residuo	Bo	Bp	B residuo
	0,0	5,3	0,2	0,0	-0,8	-0,3
Frontal deflection (mm)	Fp			Fp		
	1,50			-0,10		
Relative frontal deflection (mm)	1/ 800			1/ -12000		
CLASS	A		B		C	
Frontal deflection limits (mm)	<1/150	8,0	<1/200	6,0	<1/300	4,0

Repeated pressure test (P2)

N° 50 pulsations at **1000 Pascal** were applied (101 kg/m² and 145 km/h); at the end of the test, there was no alteration in the casing functionality.

After P1 and P2 tests, air permeability did not have variations greater than **20 %**.

Security test (P3)

A **3000 Pascal** (304 kg/m² and 252 km/h) pulsation was applied; at the end of the test, there was no alteration in the casing functionality.

Wind resistance : Classification according to UNI EN 12210 : Class C5

TEST OPERATOR

Geom. Antonio Liberatore



DIRECTOR

Dott. Ing. Giovanni Lapolla



Partial reproduction of this Report forbidden without Istedil prior authorization

Capitale Sociale € 1.040.000,00 int. versato - Trib. di Roma n. 1256/72 - C.C.I.A.A. n. 358813 - Partita I.V.A. 00887271005 - Codice Fiscale 00422780585

Inserito nell'albo dei laboratori altamente qualificati di cui all'art. 4 della legge 17-2-1982 n. 46 - con decreto del Ministero per il Coordinamento delle iniziative per la Ricerca Scientifica e Tecnologica - Iscritto alla RILEM

TEST REPORT n° 203/2006-A

Guidonia M. 02/02/2006

Results of calculation of thermal transmittance of frame profile, with numerical method, carried out on 02/02/2006.

Geometrical and structural characteristics of the text-piece are given in the attached description sheet, supplied by the Customer, which form an integral part of this test report.

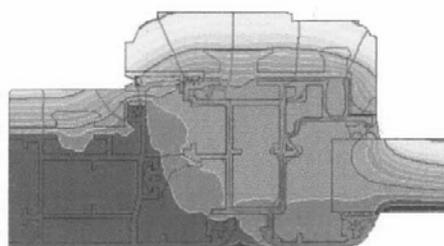
Customer : STARPUR S.r.l.

DECLARED DATA

Product name : SW 50
Frame : ALUMINUM-WOOD

Thermal conductivity of materials:

Aluminum	160.000	W/m°K
EPDM	0.250	W/m°K
Soft Wood	0.130	W/m°K
Insulation panel	0.035	W/m°K



TEST PROCEDURE

Reference standard: UNI EN ISO 10077-2
Calculation program: PHISIBEL BISCO vers. 7.0w

TEST RESULTS

BISCO data file: sw50.bsc

THERMAL TRANSMITTANCE OF FRAME (UNI EN ISO 10077-2)

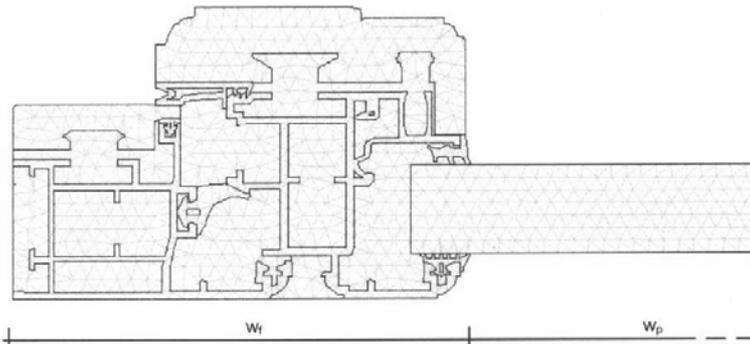
$$U_f = (Q/(t_i - t_e) - U_p * w_p) / w_f$$

with:

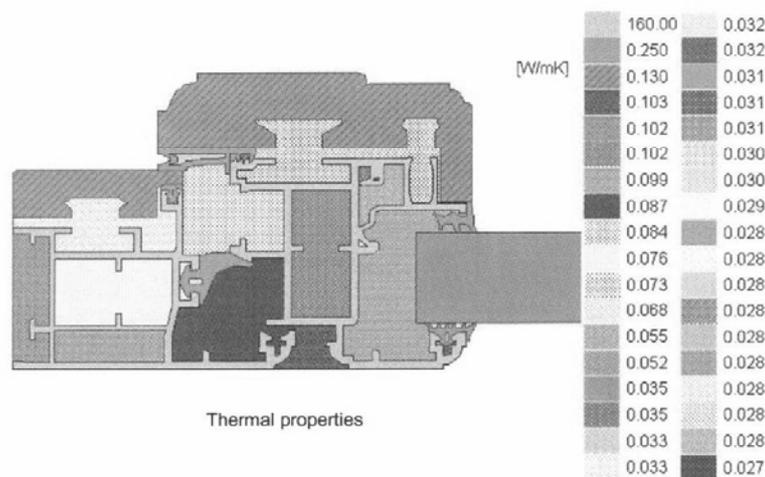
Q = 26.30 W/m	[total heat flow (frame+panel)]
t _i = 20.00 °C	[internal temperature]
t _e = 0.00 °C	[external temperature]
U _p = 1.211 W/(m².K)	[thermal transmittance of the insulation panel]
w _p = 0.7239 m	[projected width of insulation panel]
w _f = 0.1125 m	[projected width of frame]

THERMAL TRANSMITTANCE OF FRAME U_f = 3.89 W/m² K

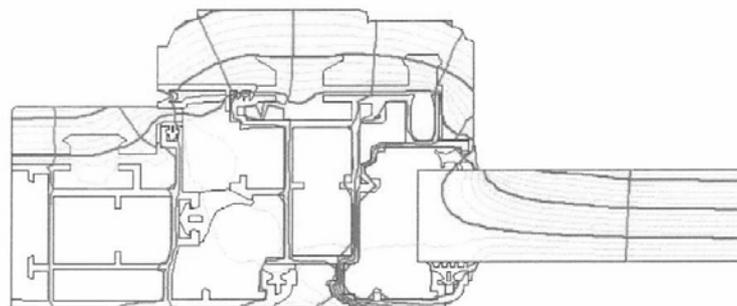
TEST REPORT n° 203/2006-A



Geometrical description and triangulation mesh

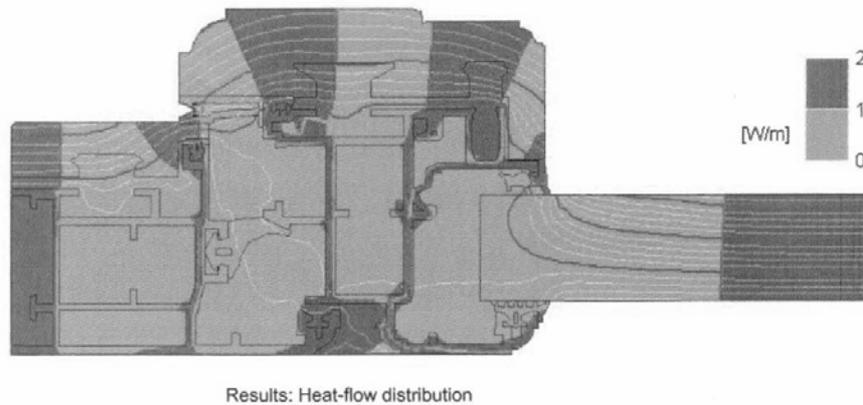
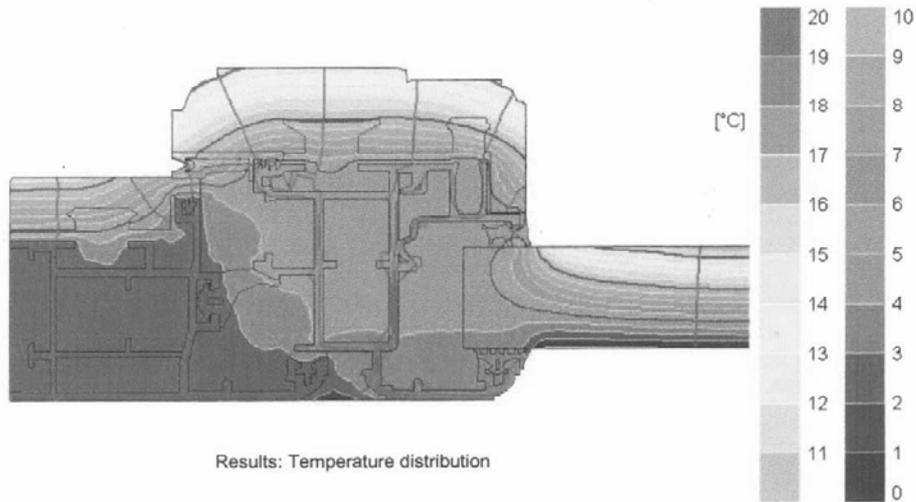


Thermal properties



Results: Isotherms and heat-flow lines

TEST REPORT n° 203/2006-A



TEST OPERATOR
Dott.-Ing. Camillo Orsi

DIRECTOR
Dott.-Ing. Giovanni Lapolla

SK65

istituto sperimentale per l'edilizia s.p.a.

ISTEDIL

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529

SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762

PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705

LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217

SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it

E-mail: info@istedil.it

TEST REPORT n° 1870/2005

Guidonia M. 12/12/2005

Results of the air permeability, watertightness and wind resistance tests performed on 29/11/2005, on a two opening window test-piece.

Geometrical and structural characteristics of the test-piece are given in the attached description sheet that is an integral part of this test report and it was supplied by the Customer.

Customer : STARPUR S.r.l. -Nocera Inferiore- (SA)

DECLARED DATA

Product name : STW/SK65-B2AR
 Opening type : ANTA/RIBALTA
 Frame : WOOD-ALUMINUM
 Dimensions (mm) : 1447 x 2323 (total) ; 1340 x 2228 (openings)

Water exit point



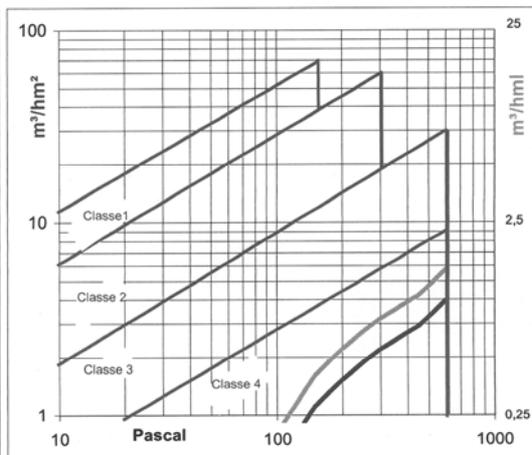
TEST RESULTS

Environmental conditions: 18 °C 53% R.H.

AIR PERMEABILITY - UNI EN 1026

Surface m² 3,4 Perimeter lin. m 9,4

Pascal	m ³ /h	m ³ /hm ²	m ³ /hml
50	0,0	0,0	0,0
100	1,9	0,6	0,2
150	3,8	1,1	0,4
200	5,2	1,5	0,6
250	6,4	1,9	0,7
300	7,5	2,2	0,8
450	9,9	2,9	1,1
600	13,5	4,0	1,4



Air permeability: Classification according to UNI EN 12207 : Class 4

WATERTIGHTNESS UNI EN 1027 - Method A

4' and 10" after a pressure of 750 Pa was reached, water seeped out of the arris inferior.

Watertightness : Classification according to UNI EN 12208 : Class



Partial reproduction of this Report forbidden without Istedil prior authorization

Capitale Sociale € 1.040.000,00 int. versato - Trib. di Roma n. 1256/72 - C.C.I.A.A. n. 358813 - Partita I.V.A. 00887271005 - Codice Fiscale 0042970586
 Inserito nell'albo dei laboratori altamente qualificati di cui all'art. 4 della legge 17-2-1982 n. 46 - con decreto del Ministero per il Coordinamento delle iniziative per la Ricerca Scientifica e Tecnologica - Iscritto alla RILEM

TEST REPORT n° 1870/2005

pag. 2/2

WIND RESISTANCE - UNI EN 12211

Frontal deflection (P1)

Most deformable window element (mm) : 2200

		Pressure P1 (Pa)					
		0	1600	0	0	-1600	0
deflection (mm)	A	Ao	Ap	A residuo	Ao	Ap	A residuo
	M	Mo	Mp	M residuo	Mo	Mp	M residuo
	B	Bo	Bp	B residuo	Bo	Bp	B residuo
		0,0	3,5	0,5	0,0	-4,9	-9,0
		0,0	10,3	0,6	0,0	-9,6	-2,0
		0,0	3,4	0,4	0,0	-4,2	-1,1
Frontal deflection (mm)		Fp			Fp		
		6,85			-5,05		
Relative frontal deflection (mm)		1/ 321			1/ -436		
CLASS		A		B		C	
Frontal deflection limits (mm)		<1/150	14,7	<1/200	11,0	<1/300	7,3

Repeated pressure test (P2)

N° 50 pulsations at 800 Pascal were applied (81 kg/m² and 130 km/h); at the end of the test, there was no alteration in the casing functionality.

After P1 and P2 tests, air permeability did not have variations greater than 20 %.

Security test (P3)

A 2400 Pascal (243 kg/m² and 225 km/h) pulsation was applied; at the end of the test, there was no alteration in the casing functionality.

Wind resistance : Classification according to UNI EN 12210 : Class C4

TEST OPERATOR

Geom. Antonio Liberatore

DIRECTOR

Dot. Ing. Giovanni Lapolla

RAPPORT D'ESSAI n° 1661/2005

Guidonia M. 14/10/2005

Résultat de la mesure de transmission thermique d'un dormant pour huisserie effectuée le 13/10/2005 par la méthode numérique.

Les caractéristiques géométriques et structurales du dormant sont indiquées sur le dessin en annexe, fourni par le commettant, qui constitue partie intégrante du présent rapport de test.

COMMETTANT : STARPUR S.r.l.

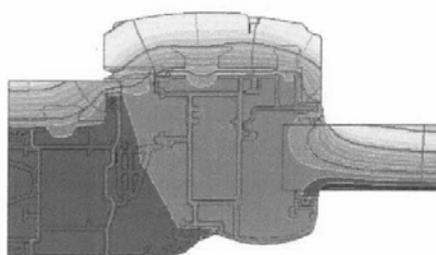
DONNÉES DÉCLARÉES

Désignation de l'échantillon : SK 65

Structure du dormant: ALUMINIUM-BOIS

Conduction thermique des matériaux utilisés:

Aluminium	160.000	W/m°K
EPDM	0.250	W/m°K
Polyamide renforcé	0.300	W/m°K
Bois	0.130	W/m°K
Isolant	0.035	W/m°K



MODALITÉ DE TEST

Normes de référence : UNI EN ISO 10077-2

Programme de calcul : PHISIBEL BISCO vers. 7.0w

RÉSULTAT DE LA MESURE

BISCO data file: sk65.bsc

TRANSMISSION THERMIQUE DU DORMANT (UNI EN ISO 10077-2)

$$U_f = (Q/(t_i - t_e) - U_p * w_p) / w_f$$

avec:

Q = 16.54 W/m [flux de chaleur total (profilé+panneau)]

t_i = 20.00 °C [temp. interne]

t_e = 0.00 °C [temp. externe]

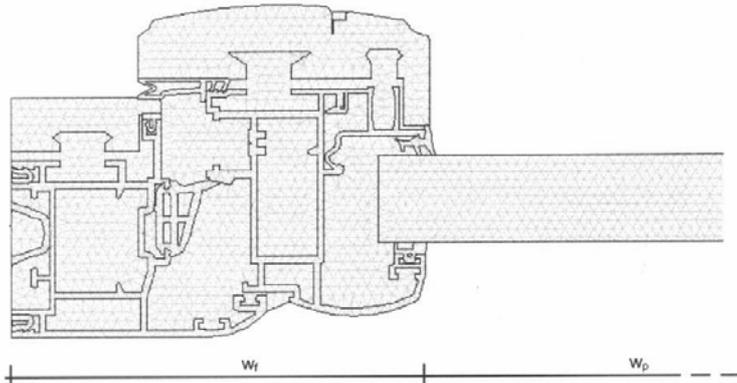
U_p = 1.14 W/(m².K) [transm. thermique du panneau isolant]

w_p = 0.348 m [larg. côté panneau isolant]

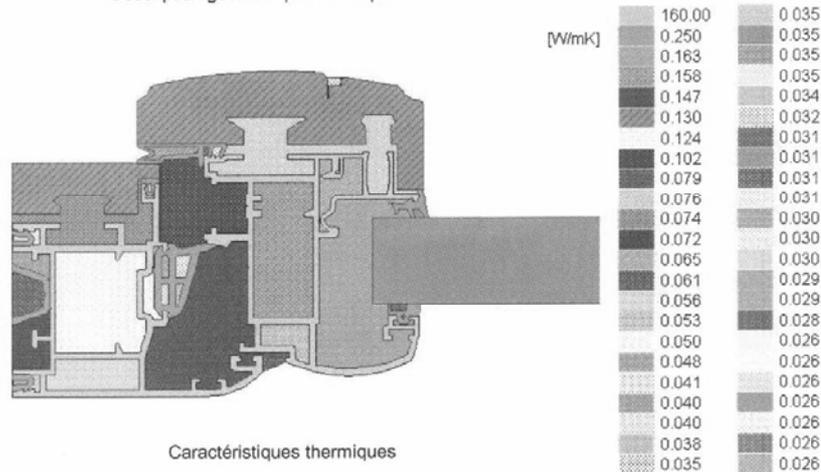
w_f = 0.113 m [larg. côté profilé]

TRANSMISSION THERMIQUE UNITAIRE U_f = 3.80 W/m² K

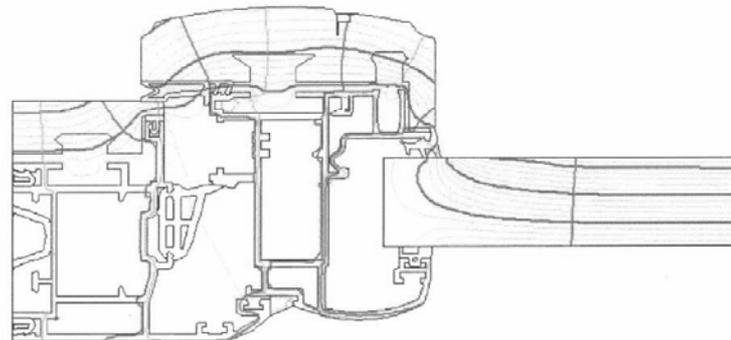
RAPPORT D'ESSAI n° 1661/2005



Description géométrique et interpolation



Caractéristiques thermiques

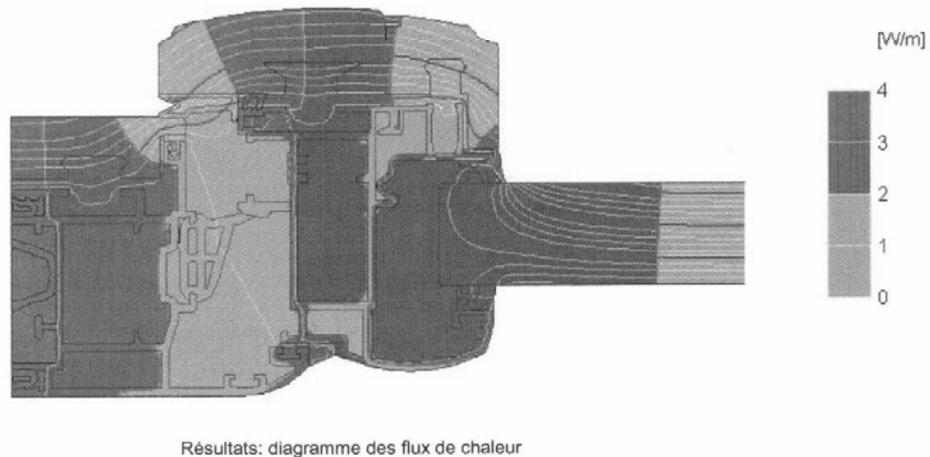
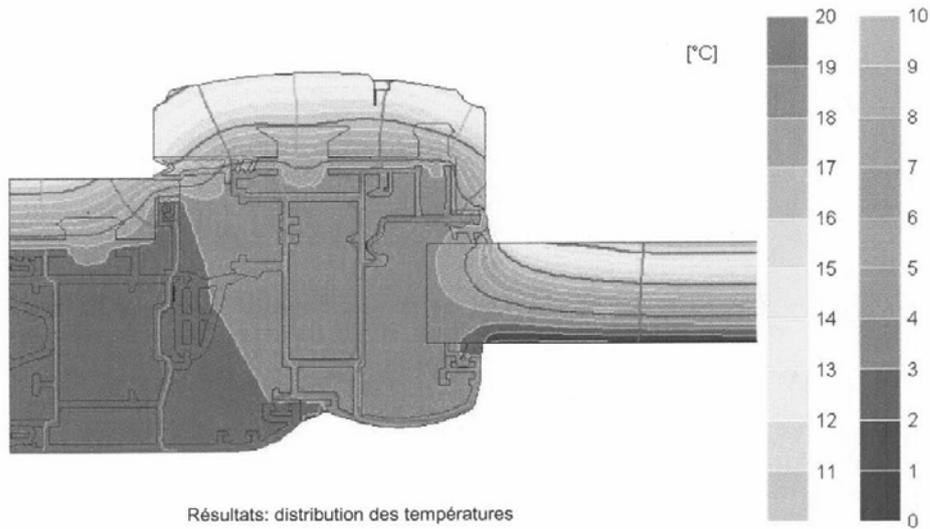


Résultats: lignes de flux et isothermes

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529
SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762
PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705
LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. Fax 0773/630217
SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it
E-mail: info@istedil.it

RAPPORT D'ESSAI n° 1661/2005



LE PRÉPOSÉ
Dott. Ing. Camillo Orsi
Camillo Orsi

LA DIRECTION
Dott. Ing. Giovanni Lapolla
Giovanni Lapolla

ISTITUTO SPERIMENTALE PER L'EDILIZIA S.p.A.
Via Tiburtina
Km. 18,300
GUIDONIA
Montecelio - RM



- altezza utile = 1315 mm;
- larghezza anta = 565+596 mm su una battuta di 1199 mm;
- altezza anta = 1346 mm su una battuta di 1373 mm;

La finestra in particolare è composta da:

- telaio fisso e telai delle ante realizzati con profili estrusi in lega d'alluminio UNI 9006/1 6060, assemblati agli angoli a 45° mediante squadrette in alluminio e rivestiti internamente con profili di legno massello in rovere accoppiati tramite particolari perni rotanti in nylon inseriti a passo 10 cm; la traversa inferiore del telaio fisso e del telaio apribile presentano due fori, sezione 30 × 5 mm ciascuno, per lo scarico dell'acqua;
- specchiature vetrate realizzate con vetri SGG STADIP PROTECT 412/9/5, tenute mediante fermavetro in alluminio con funzionamento a scatto e apposito kit coperto con cornice legno ed inserimento ad incastro;
- guarnizione interna del vetro in EPDM;
- guarnizione esterna del vetro in EPDM alveolare coestruso;
- guarnizione di battuta in Purene posta lungo il perimetro esterno delle ante;
- guarnizione di tenuta del giunto aperto in EPDM posta lungo il perimetro interno del telaio fisso;
- sistema di chiusura tramite ferramenta perimetrale MAICO anti-effrazione a più punti di chiusura posta sui telai apribili nell'apposita cava ferramenta;
- cerniere e supporti forbice applicati sui telai fissi tramite kit di accessori in alluminio estruso;
- riscontri sui telai fissi applicati tramite kit di accessori in alluminio estruso;
- ferramenta MAICO anti-effrazione aria 12.

La serratura di produzione Maico ha il comando dell'apertura solo dal lato interno del battente ed è dotata di maniglia dotata di chiusura a chiave quindi ininfluenza dal punto di vista della sicurezza.

Il campione è dotato di una vetratura costituita da "vetro stratificato rif. SGG STADIP PROTECT 412" con dichiarazione di conformità alla classe "UNI EN P4A" della norma UNI EN 356.

Il campione presenta infine una cornice perimetrale di contenimento in acciaio per l'adattamento ed il bloccaggio all'impianto di prova.





Classificazione.

Il campione in esame, denominato "SK 65 T" e presentato dalla ditta "Starpur S.r.l. - Via Crucinola, 124 - Località Invio - 84083 Castel San Giorgio (SA)" risulta appartenere alla

Classe 2

Il Responsabile
Tecnico di Prova
(Geom. Roberto Porta)

Il Responsabile del Laboratorio
di Fisica Tecnica
(Dott. Ing. Vincenzo Iommi)

Il Presidente o
l'Amministratore Delegato

SW70TT

istituto sperimentale per l'edilizia s.p.a.

ISTEDIL

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529
 SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762

PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705

LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217

SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it
 E-mail: info@istedil.it

TEST REPORT n° 0329/2006

Guidonia M. 15/02/2006

Results of the air permeability, watertightness and wind resistance tests performed on 14/02/2006, on a two opening window test-piece received on 14/02/2006.

Geometrical and structural characteristics of the test-piece are given in the attached description sheet that is an integral part of this test report and it was supplied by the Customer.

Customer : STARPUR S.r.l. -Nocera Inferiore- (SA)



DECLARED DATA

Product name : SW70TT
 Opening type : ANTA/RIBALTA
 Frame : WOOD-ALUMINUM
 Dimensions (mm) : 1200 x 1400 (total) ; 1128 x 1328 (openings)

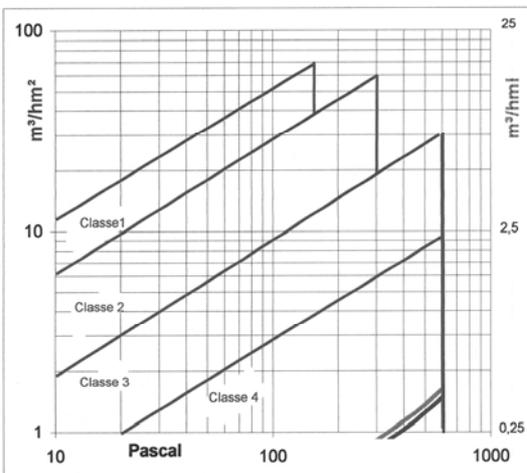
TEST RESULTS

Environmental conditions: 16 °C 52% R.H.

AIR PERMEABILITY - UNI EN 1026

Surface m² 1,7 Perimeter lin. m 6,2

Pascal	m ³ /h	m ³ /hm ²	m ³ /hml
50	0,0	0,0	0,0
100	0,0	0,0	0,0
150	0,0	0,0	0,0
200	0,8	0,5	0,1
250	1,0	0,6	0,2
300	1,4	0,8	0,2
450	1,9	1,1	0,3
600	2,5	1,5	0,4



Air permeability: Classification according to UNI EN 12207 : Class 4

WATERTIGHTNESS UNI EN 1027 - Method A

No water leakage at 600 Pa

Watertightness : Classification according to UNI EN 12208 : Class 9A



TEST REPORT n° 0329/2006

pag. 2/2

WIND RESISTANCE - UNI EN 12211

Frontal deflection (P1) Most deformable window element (mm) : 1200

		Pressure P1 (Pa)					
		0	2000	0	0	-2000	0
deflection (mm)	A →	Ao	Ap	A residuo	Ao	Ap	A residuo
	M →	0,0	2,4	0,4	0,0	-3,5	-0,5
	B →	Mo	Mp	M residuo	Mo	Mp	M residuo
		0,0	3,7	0,7	0,0	-4,4	-0,9
		Bo	Bp	B residuo	Bo	Bp	B residuo
		0,0	2,7	0,6	0,0	-2,6	-0,7
Frontal deflection (mm)		Fp			Fp		
		1,15			-1,35		
Relative frontal deflection (mm)		1/ 1043			1/ -889		
CLASS		A		B		C	
Frontal deflection limits (mm)		<1/150	8,0	<1/200	6,0	<1/300	4,0

Repeated pressure test (P2)

N° 50 pulsations at **1000 Pascal** were applied (101 kg/m² and 145 km/h); at the end of the test, there was no alteration in the casing functionality.

After P1 and P2 tests, air permeability did not have variations greater than 20 %.

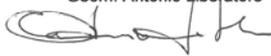
Security test (P3)

A **3000 Pascal** (304 kg/m² and 252 km/h) pulsation was applied; at the end of the test, there was no alteration in the casing functionality.

Wind resistance : Classification according to UNI EN 12210 : Class C5

TEST OPERATOR

Geom. Antonio Liberatore



DIRECTOR

Dott. Ing. Giovanni Lapolla



Partial reproduction of this Report forbidden without Istedil prior authorization

Capitale Sociale € 1.040.000,00 Int. versato - Trib. di Roma n. 1256/72 - C.C.I.A.A. n. 358813 - Partita I.V.A. 00887271005 - Codice Fiscale 00422780585

Inserito nell'albo dei laboratori altamente qualificati di cui all'art. 4 della legge 17-2-1982 n. 46 - con decreto del Ministero per il Coordinamento delle iniziative per la Ricerca Scientifica e Tecnologica - Iscritto alla RILEM

TEST REPORT n° 203/2006-B

Guidonia M. 02/02/2006

Results of calculation of thermal transmittance of frame profile, with numerical method, carried out on 02/02/2006.

Geometrical and structural characteristics of the test-piece are given in the attached description sheet, supplied by the Customer, which form an integral part of this test report.

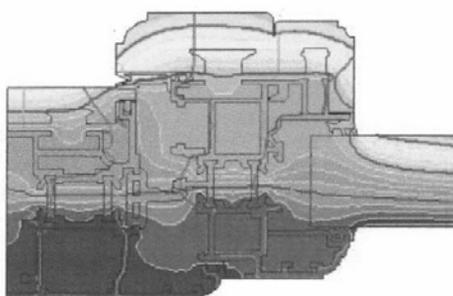
Customer : STARPUR S.r.l.

DECLARED DATA

Product name : SW 70 TT
Frame : ALUMINUM-WOOD

Thermal conductivity of materials:

Aluminum	160.000	W/m°K
EPDM	0.250	W/m°K
Polyamid reinf.	0.300	W/m°K
Soft Wood	0.130	W/m°K
Insulation panel	0.035	W/m°K



TEST PROCEDURE

Reference standard: UNI EN ISO 10077-2
Calculation program: PHISIBEL BISCO vers. 7.0w

TEST RESULTS

BISCO data file: sw70tt.bsc

THERMAL TRANSMITTANCE OF FRAME (UNI EN ISO 10077-2)

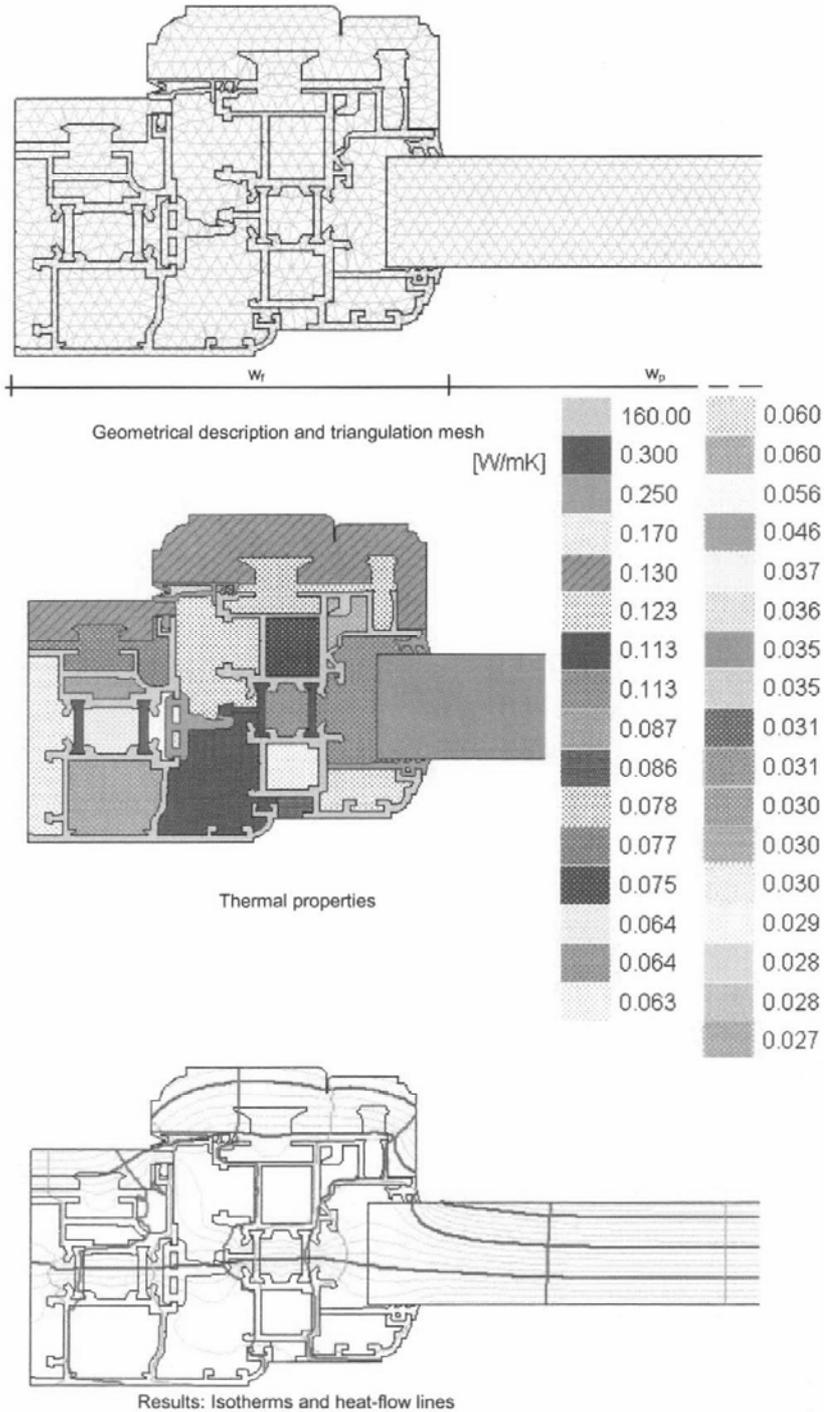
$$U_f = (Q/(t_i - t_e) - U_p * w_p) / w_f$$

with:

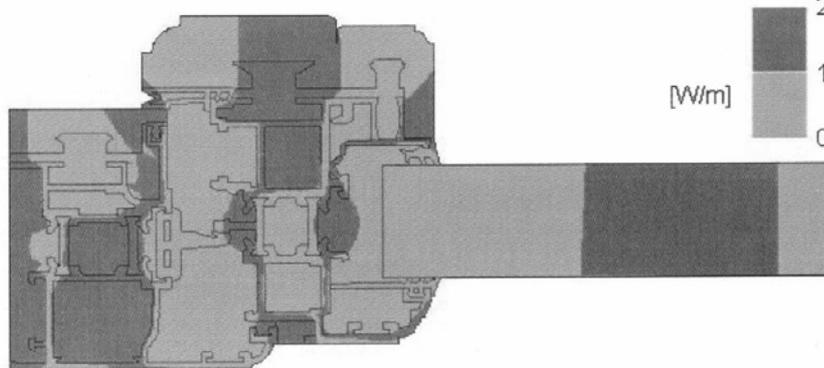
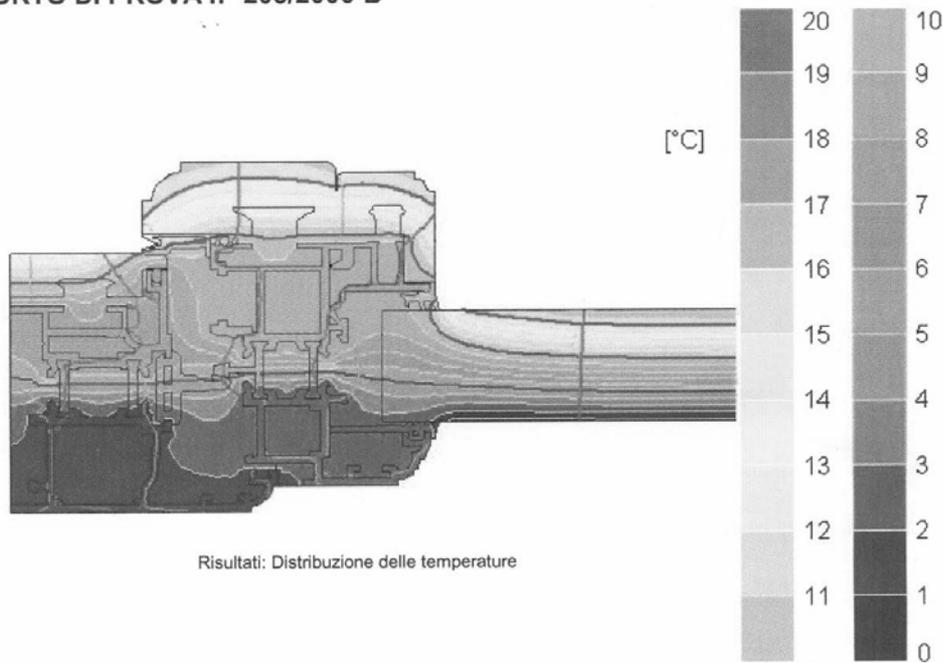
- Q = 17.213 W/m [total heat flow (frame+panel)]
- t_i = 20.00 °C [internal temperature]
- t_e = 0.00 °C [external temperature]
- U_p = 0.943 W/(m².K) [thermal transmittance of the insulation panel]
- w_p = 0.5673 m [projected width of insulation panel]
- w_f = 0.1146 m [projected width of frame]

THERMAL TRANSMITTANCE OF FRAME U_f = 2.84 W/m² K

TEST REPORT n° 203/2006-B



RAPPORTO DI PROVA n° 203/2006-B



LO SPERIMENTATORE

Dott. Ing. Camillo Orsi

Camillo Orsi



LA DIREZIONE

Dott. Ing. Giovanni Lapolla

Giovanni Lapolla

SK80TT

istituto sperimentale per l'edilizia s.p.a.

ISTEDIL

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529
 SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762

PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705
 LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217
 SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it
 E-mail: info@istedil.it

TEST REPORT n° 0329/2006

Guidonia M. 15/02/2006

Results of the air permeability, watertightness and wind resistance tests performed on 14/02/2006, on a two opening window test-piece received on 14/02/2006.

Geometrical and structural characteristics of the test-piece are given in the attached description sheet that is an integral part of this test report and it was supplied by the Customer.

Customer : STARPUR S.r.l. -Nocera Inferiore- (SA)



DECLARED DATA

Product name : SW70TT
 Opening type : ANTA/RIBALTA
 Frame : WOOD-ALUMINUM
 Dimensions (mm) : 1200 x 1400 (total) ; 1128 x 1328 (openings)

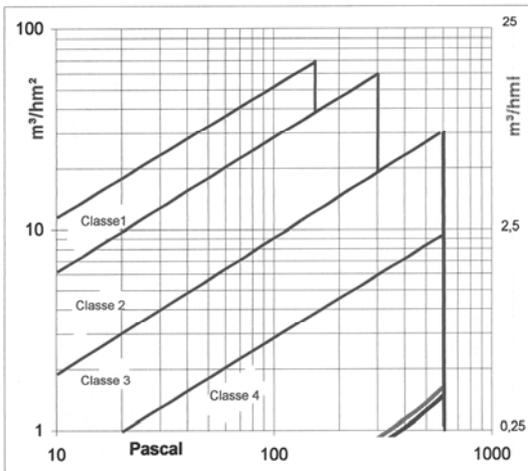
TEST RESULTS

Environmental conditions: 16 °C 52% R.H.

AIR PERMEABILITY - UNI EN 1026

Surface m² 1,7 Perimeter lin. m 6,2

Pascal	m ³ /h	m ³ /hm ²	m ³ /hml
50	0,0	0,0	0,0
100	0,0	0,0	0,0
150	0,0	0,0	0,0
200	0,8	0,5	0,1
250	1,0	0,6	0,2
300	1,4	0,8	0,2
450	1,9	1,1	0,3
600	2,5	1,5	0,4



Air permeability: Classification according to UNI EN 12207 : Class 4

WATERTIGHTNESS UNI EN 1027 - Method A

No water leakage at 600 Pa

Watertightness : Classification according to UNI EN 12208 : Class



pag 1/2

TEST REPORT n° 0329/2006

pag. 2/2

WIND RESISTANCE - UNI EN 12211

Frontal deflection (P1) Most deformable window element (mm) : **1200**

		Pressure P1 (Pa)					
		0	2000	0	0	-2000	0
deflection (mm)	A →	Ao	Ap	A residuo	Ao	Ap	A residuo
	M →	0,0	2,4	0,4	0,0	-3,5	-0,5
	B →	Mo	Mp	M residuo	Mo	Mp	M residuo
		0,0	3,7	0,7	0,0	-4,4	-0,9
		Bo	Bp	B residuo	Bo	Bp	B residuo
		0,0	2,7	0,6	0,0	-2,6	-0,7
Frontal deflection (mm)		Fp 1,15			Fp -1,35		
Relative frontal deflection (mm)		1/ 1043			1/ -889		
CLASS		A		B		C	
Frontal deflection limits (mm)		<1/150	8,0	<1/200	6,0	<1/300	4,0

Repeated pressure test (P2)

N° 50 pulsations at **1000 Pascal** were applied (101 kg/m² and 145 km/h); at the end of the test, there was no alteration in the casing functionality.

After P1 and P2 tests, air permeability did not have variations greater than 20 %.

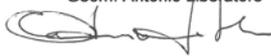
Security test (P3)

A **3000 Pascal** (304 kg/m² and 252 km/h) pulsation was applied; at the end of the test, there was no alteration in the casing functionality.

Wind resistance : Classification according to UNI EN 12210 : Class C5

TEST OPERATOR

Geom. Antonio Liberatore



DIRECTOR

Dott. Ing. Giovanni Lapolla



Partial reproduction of this Report forbidden without Istedil prior authorization

Capitale Sociale € 1.040.000,00 int. versato - Trib. di Roma n. 1256/72 - C.C.I.A.A. n. 358813 - Partita I.V.A. 00887271005 - Codice Fiscale 00422780585

Inserito nell'albo dei laboratori altamente qualificati di cui all'art. 4 della legge 17-2-1982 n. 46 - con decreto del Ministero per il Coordinamento delle iniziative per la Ricerca Scientifica e Tecnologica - Iscritto alla RILEM

Nachweis

Energieeinsparung und Wärmeschutz

Prüfbericht 402 26669/1



Auftraggeber **Starpur S.r.l.**
Via Crucinola 124

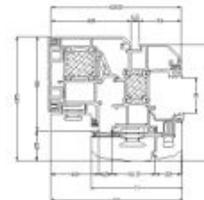
84083 Castel San Giorgio
Italien

Grundlagen

prEN 12412-2 : 1997-10
Bestimmung des Wärmedurchgangskoeffizienten mittels des Heizkastenverfahrens, Teil 2: Rahmen
Entspricht der nationalen Fassung E DIN EN.

Produkt	Flügel-/Blendrahmen-Profilkombination
Bezeichnung	Starwood SK 80 TT
Bautiefe	Bautiefe Blendrahmen 80 mm Bautiefe Flügelrahmen 100 mm
Ansichtsbreite	111 mm
Material	Holz-Aluminium-Verbundprofil
Art und Material der Dämmzone	durchgehende Stege aus PA 66 GF 25 mit Dämmstoffeinlage aus Polystyrol ($\lambda < 0,032 \text{ W/m K}$) in der Dämmzone,
Besonderheiten	raumseitig mit Deckschale aus Holz (Esche)

Darstellung



Verwendungshinweise

Dieser Prüfbericht dient zum Nachweis des Wärmedurchgangskoeffizienten U_f

Gültigkeit

Die genannten Daten und Ergebnisse beziehen sich ausschließlich auf den geprüften und beschriebenen Gegenstand. Das der Prüfung zugrunde liegende Verfahren basiert auf einem Normentwurf. Bis zur Endfassung der Norm können sich Änderungen ergeben, welche die Messergebnisse beeinflussen.

Die Prüfung des Wärmedurchgangskoeffizienten ermöglicht keine Aussage über weitere leistungs- und qualitätsbestimmenden Eigenschaften der vorliegenden Konstruktion.

Veröffentlichungshinweise

Es gilt das ift-Merkblatt „Hinweise zur Benutzung von ift-Prüfberichten“.

Das Deckblatt kann als Kurzfassung verwendet werden.

Inhalt

Der Nachweis umfasst insgesamt 5 Seiten

- 1 Gegenstand
- 2 Durchführung
- 3 Einzelergebnisse

Wärmedurchgangskoeffizient



$$U_f = 1,8 \text{ W/(m}^2 \cdot \text{K)}$$

ift Rosenheim
13. März 2003

Dr. Helmut Hohenstein
Institutsleiter



I. A. Hans-Jürgen Hartmann
Leiter Prüffeld Wärmeschutz & Energietechnik

ift Rosenheim GmbH
Geschäftsführer: Dr. Helmut Hohenstein
Zertifizierungsstelle, PUZ Stelle
Leiter: Dipl.-Ing. (FH) Ulrich Sieberath
03-01 / 383

Theodor-Gietl-Straße 7-9
83026 Rosenheim
Tel. +49 (0) 8031 261-0
Fax +49 (0) 8031 261-290
http: www.ift-rosenheim.de

Sparkasse Rosenheim
Kto. 38 22, BLZ 711 500 00
AG Traunstein, HRB: 14763
IBAN: DE9071150000000003822



DAP-PL-0808.01
DAP-ZE-2288.00
TGA-ZM-16-93-00
TGA-ZM-16-93-60

SW75s

istituto sperimentale per l'edilizia s.p.a.

ISTEDIL

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529

SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762

PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705

LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217

SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it
E-mail: info@istedil.it

TEST REPORT n° 203/2006-G

Guidonia M. 11/05/2006

Results of calculation of thermal transmittance of frame profile, with numerical method, carried out on 27/04/2006.

Geometrical and structural characteristics of the text-piece are given in the attached description sheet, supplied by the Customer, which form an integral part of this test report.

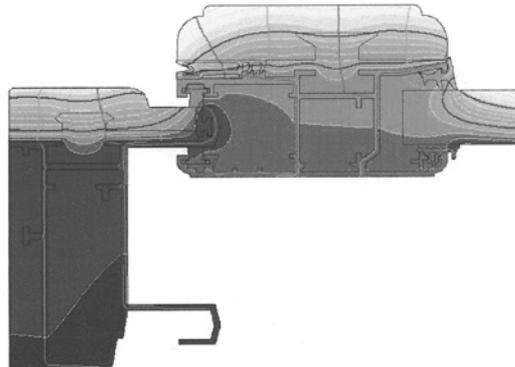
CUSTOMER : STARPUR S.r.l.

DECLARED DATA

Product name : SW 75s side joint
Frame : ALUMINUM-WOOD

Thermal conductivity of materials:

Aluminum	160.000	W/m°K
EPDM	0.250	W/m°K
Soft Wood	0.130	W/m°K
Insulation panel	0.035	W/m°K



TEST PROCEDURE

Reference standard: UNI EN ISO 10077-2

Calculation program: PHISIBEL BISCO vers. 7.0w

TEST RESULTS

BISCO data file: sw75slaterale.bsc

THERMAL TRANSMITTANCE OF FRAME (UNI EN ISO 10077-2)

$$U_f = (Q / (t_i - t_e) - U_p * w_p) / w_f$$

with:

Q = 18.632 W/m [total heat flow (frame+panel)]

t_i = 20.00 °C [internal temperature]

t_e = 0.00 °C [external temperature]

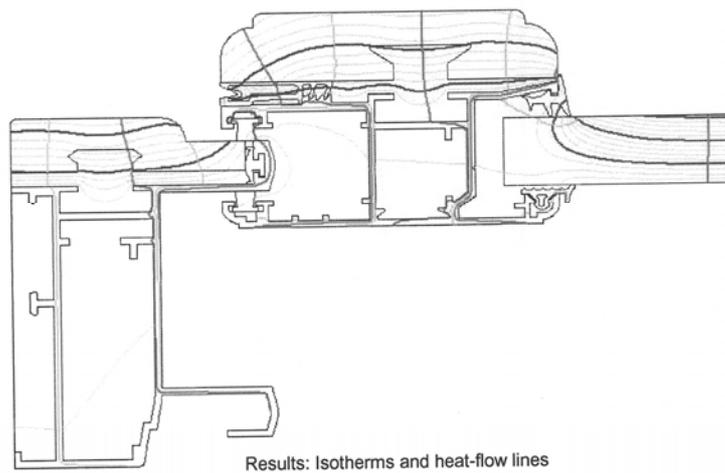
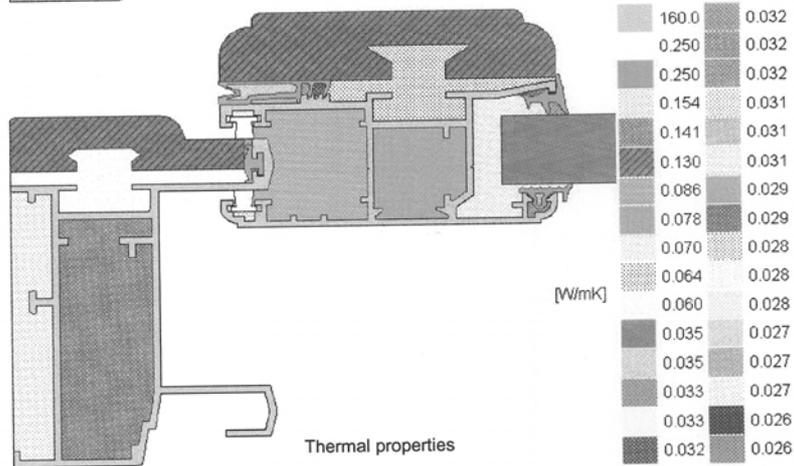
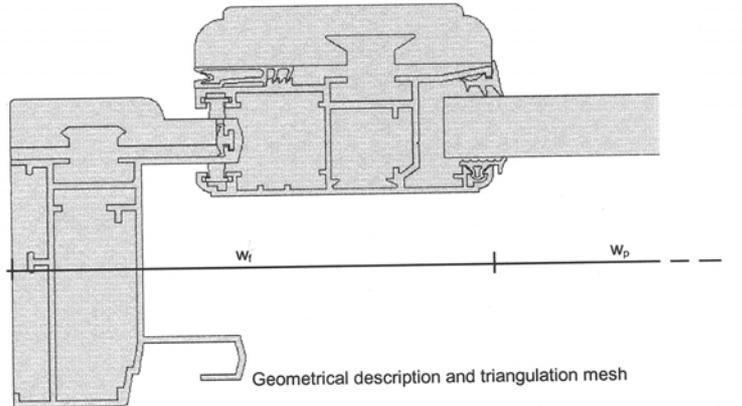
U_p = 1.705 W/(m².K) [thermal transmittance of the insulation panel]

w_p = 0.2387 m [projected width of insulation panel]

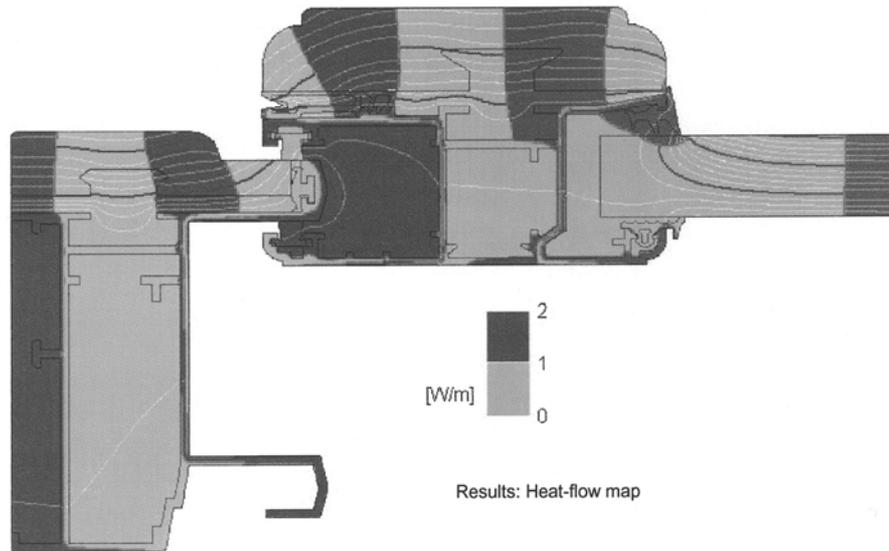
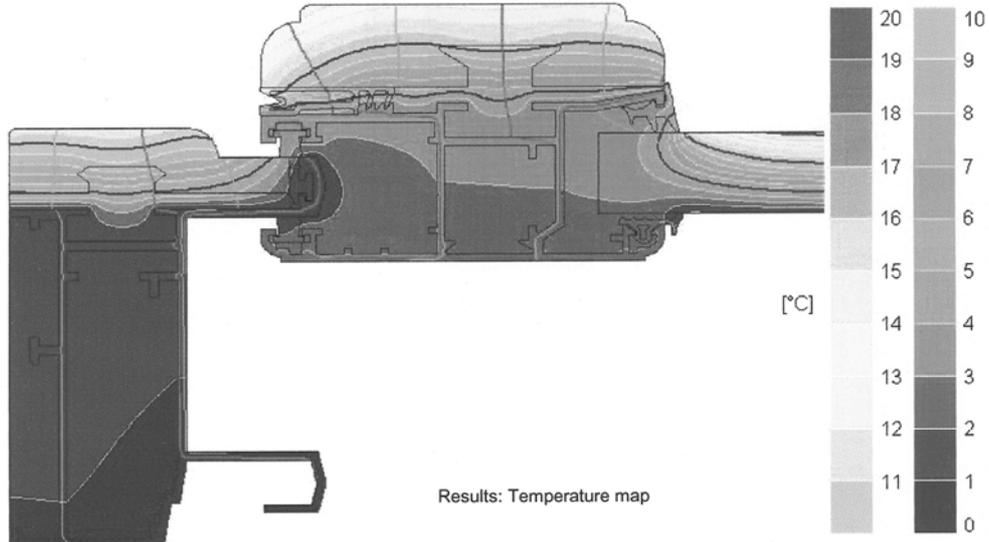
w_f = 0.1183 m [projected width of frame]

THERMAL TRANSMITTANCE OF FRAME U_f = 4.43 W/m² K

TEST REPORT n° 203/2006-G



TEST REPORT n° 203/2006-G



TEST OPERATOR
Dott. Ing. Camillo Orsi

Camillo Orsi



DIRECTOR
Dott. Ing. Giovanni Lapolla

Giovanni Lapolla

SW130s

istituto sperimentale per l'edilizia s.p.a.

ISTEDIL

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529

SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762

PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705

LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217

SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it
E-mail: info@istedil.it

TEST REPORT n° 203/2006-C

Guidonia M. 11/05/2006

Results of calculation of thermal transmittance of frame profile, with numerical method, carried out on 27/04/2006.

Geometrical and structural characteristics of the test-piece are given in the attached description sheet, supplied by the Customer, which form an integral part of this test report.

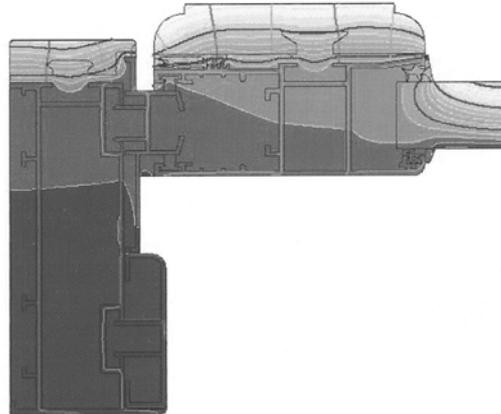
CUSTOMER : STARPUR S.r.l.

DECLARED DATA

Product name : SW 130s side joint
Frame : ALUMINUM-WOOD

Thermal conductivity of materials:

Aluminum	160.000	W/m°K
EPDM	0.250	W/m°K
Soft Wood	0.130	W/m°K
Insulation panel	0.035	W/m°K



TEST PROCEDURE

Reference standard: UNI EN ISO 10077-2

Calculation program: PHISIBEL BISCO vers. 7.0w

TEST RESULTS

BISCO data file: sw130slaterale.bsc

THERMAL TRANSMITTANCE OF FRAME (UNI EN ISO 10077-2)

$$U_f = (Q/(t_i - t_e) - U_p * w_p) / w_f$$

with:

Q = 21.530 W/m [total heat flow (frame+panel)]

t_i = 20.00 °C [internal temperature]

t_e = 0.00 °C [external temperature]

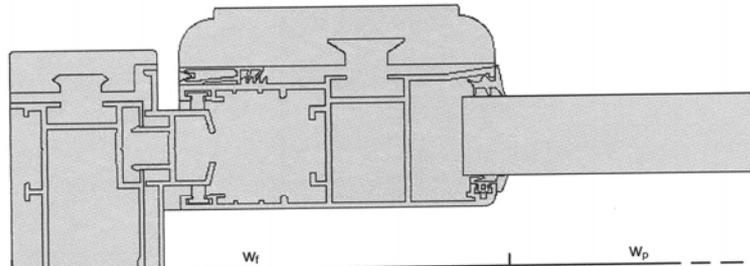
U_p = 1.258 W/(m².K) [thermal transmittance of the insulation panel]

w_p = 0.3784 m [projected width of insulation panel]

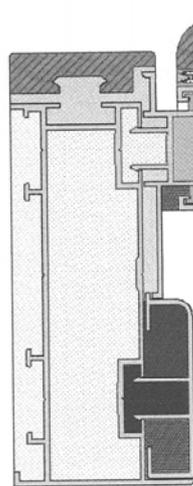
w_f = 0.1345 m [projected width of frame]

THERMAL TRANSMITTANCE OF FRAME U_f = 4.47 W/m² K

TEST REPORT n° 203/2006-C



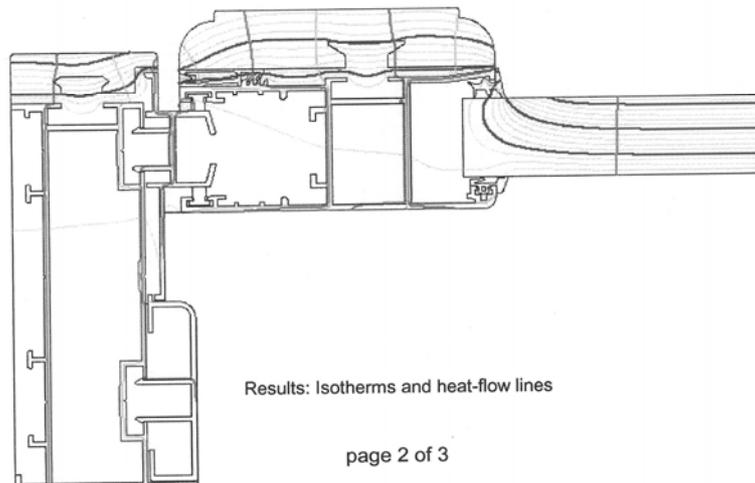
Geometrical description and triangulation mesh



Thermal properties

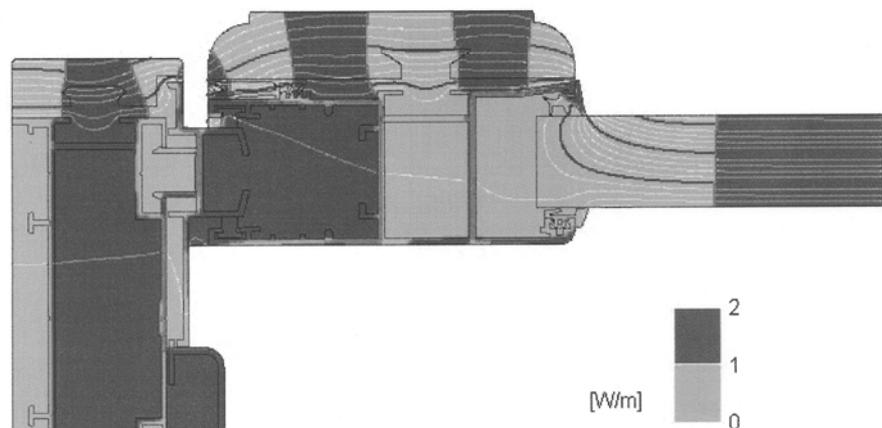
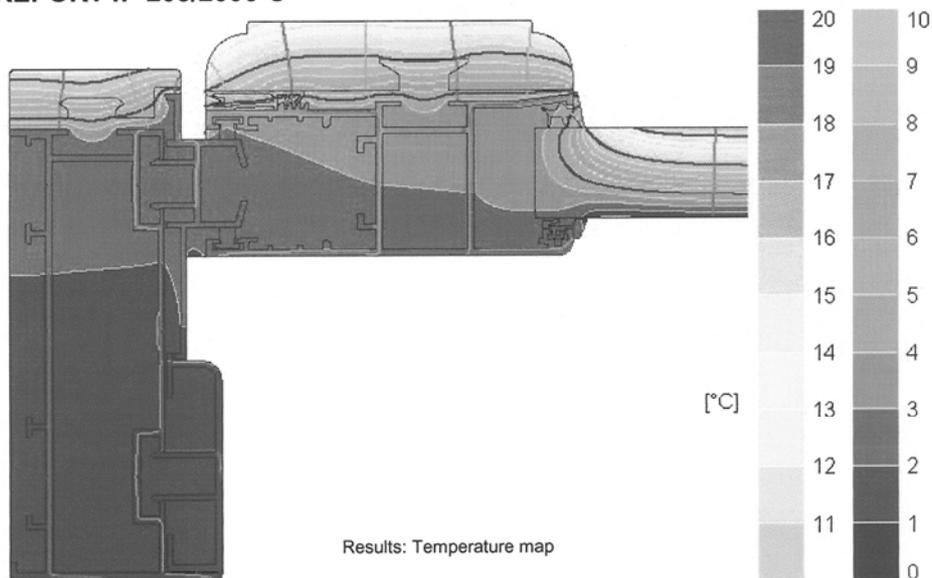
160.0	0.033
0.272	0.032
0.264	0.032
0.250	0.032
0.130	0.032
0.111	0.032
0.100	0.032
0.097	0.031
0.084	0.030
0.081	0.029
0.074	0.029
0.068	0.029
0.066	0.029
0.065	0.029
0.063	0.026
0.062	0.026
0.035	0.026
0.035	0.026

[W/mK]



Results: Isotherms and heat-flow lines

TEST REPORT n° 203/2006-C



TEST OPERATOR

Dott. Ing. Camillo Orsi



DIRECTOR

Dott. Ing. Giovanni Lapolla

SW180S

istituto sperimentale per l'edilizia s.p.a.

ISTEDIL

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529
SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762

PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705

LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217

SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it
E-mail: info@istedil.it

TEST REPORT n° 203/2006-E

Guidonia M. 11/05/2006

Results of calculation of thermal transmittance of frame profile, with numerical method, carried out on 03/05/2006.

Geometrical and structural characteristics of the test-piece are given in the attached description sheet, supplied by the Customer, which form an integral part of this test report.

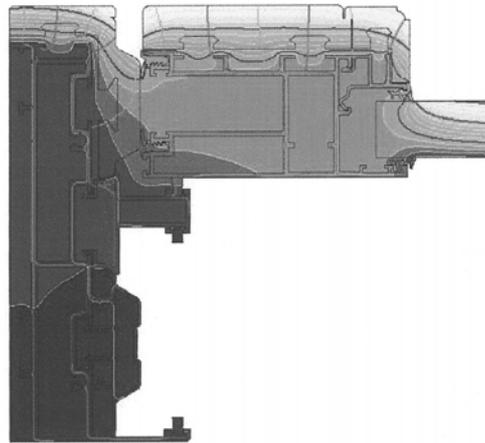
CUSTOMER : STARPUR S.r.l.

DECLARED DATA

Product name : SW 180s side joint
Frame : ALUMINUM-WOOD

Thermal conductivity of materials:

Aluminum	160.000	W/m°K
EPDM	0.250	W/m°K
Soft Wood	0.130	W/m°K
Insulation panel	0.035	W/m°K



TEST PROCEDURE

Reference standard: UNI EN ISO 10077-2
Calculation program: PHISIBEL BISCO vers. 7.0w

TEST RESULTS

BISCO data file: sw180slaterale.bsc

THERMAL TRANSMITTANCE OF FRAME (UNI EN ISO 10077-2)

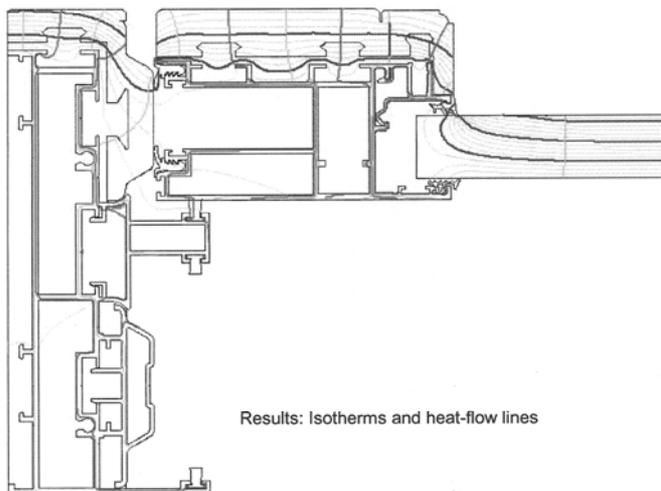
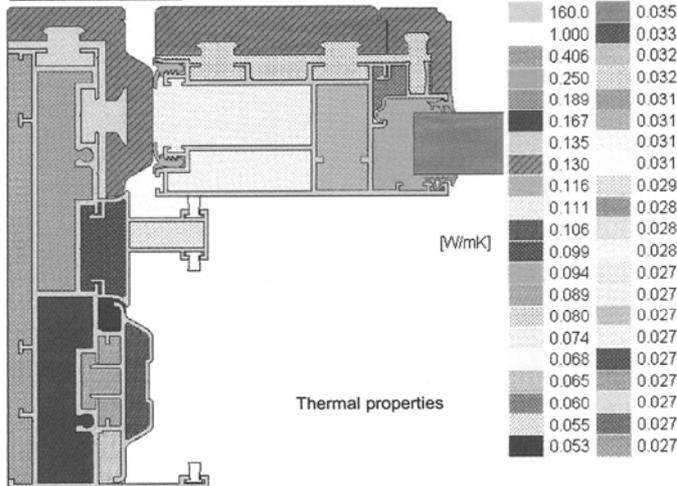
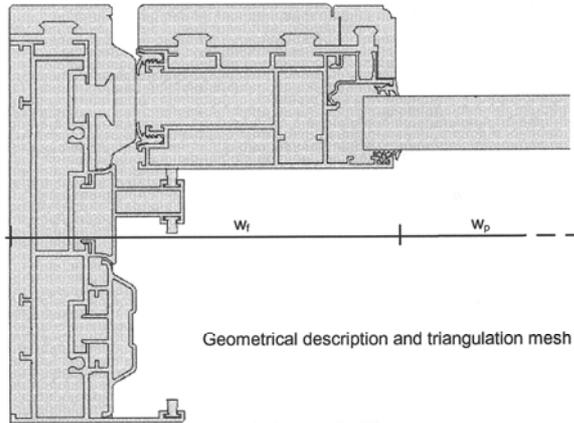
$$U_f = (Q/(t_i - t_e) - U_p * w_p) / w_f$$

with:

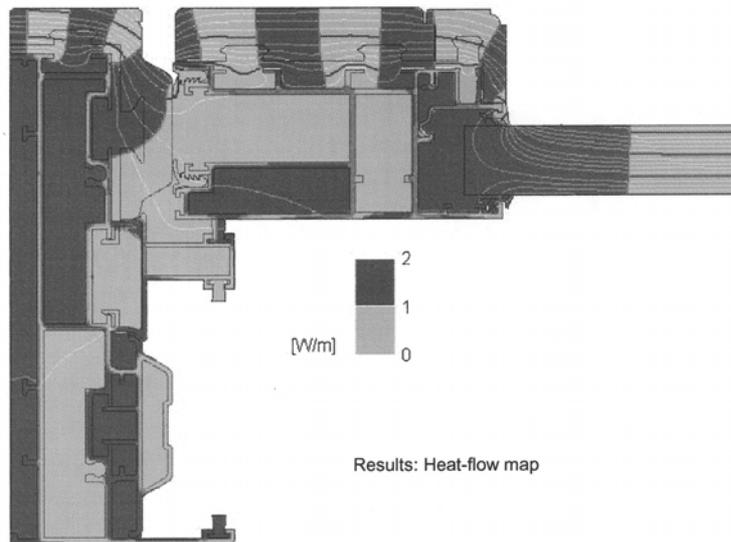
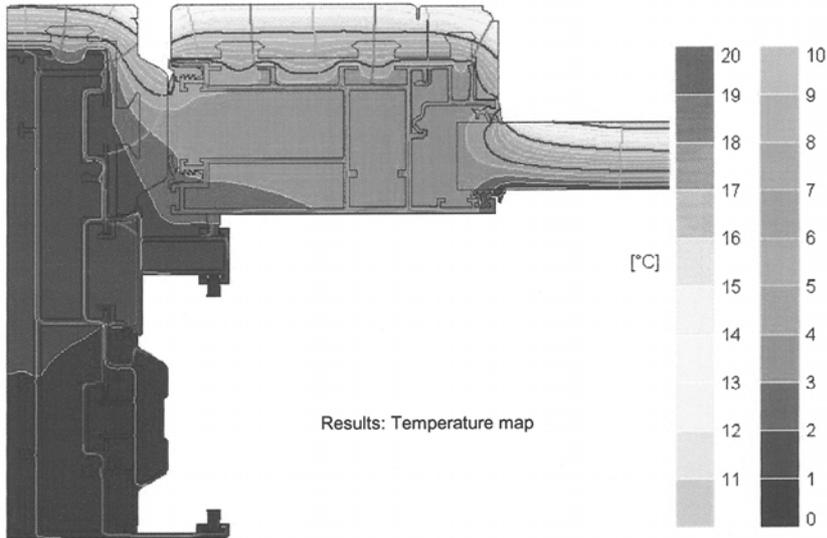
Q = 24.000 W/m	[total heat flow (frame+panel)]
t _i = 20.00 °C	[internal temperature]
t _e = 0.00 °C	[external temperature]
U _p = 1.243 W/(m ² .K)	[thermal transmittance of the insulation panel]
w _p = 0.4247 m	[projected width of insulation panel]
w _f = 0.1578 m	[projected width of frame]

THERMAL TRANSMITTANCE OF FRAME U_f = 4.26 W/m² K

TEST REPORT n° 203/2006-E



TEST REPORT n° 203/2006-E



TEST OPERATOR

Dott. Ing. Camillo Orsi



DIRECTOR

Dott. Ing. Giovanni Lapolla

SK100TTs

istituto sperimentale per l'edilizia s.p.a.

ISTEDIL

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529

SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762

PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705

LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217

SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it
E-mail: info@istedil.it

TEST REPORT n° 203/2006-E

Guidonia M. 11/05/2006

Results of calculation of thermal transmittance of frame profile, with numerical method, carried out on 03/05/2006.

Geometrical and structural characteristics of the test-piece are given in the attached description sheet, supplied by the Customer, which form an integral part of this test report.

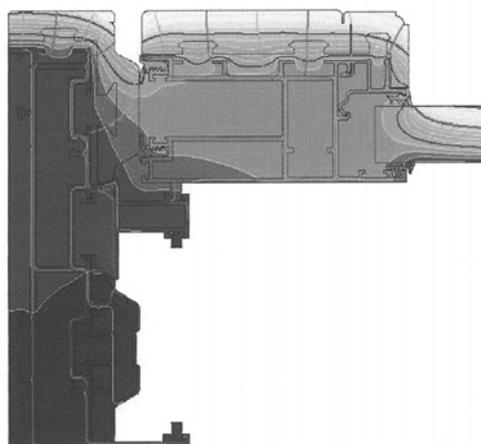
CUSTOMER : STARPUR S.r.l.

DECLARED DATA

Product name : SW 180s side joint
Frame : ALUMINUM-WOOD

Thermal conductivity of materials:

Aluminum	160.000	W/m°K
EPDM	0.250	W/m°K
Soft Wood	0.130	W/m°K
Insulation panel	0.035	W/m°K



TEST PROCEDURE

Reference standard: UNI EN ISO 10077-2

Calculation program: PHISIBEL BISCO vers. 7.0w

TEST RESULTS

BISCO data file: sw180slaterale.bsc

THERMAL TRANSMITTANCE OF FRAME (UNI EN ISO 10077-2)

$$U_f = (Q/(t_i - t_e) - U_p * w_p) / w_f$$

with:

Q = 24.000 W/m [total heat flow (frame+panel)]

t_i = 20.00 °C [internal temperature]

t_e = 0.00 °C [external temperature]

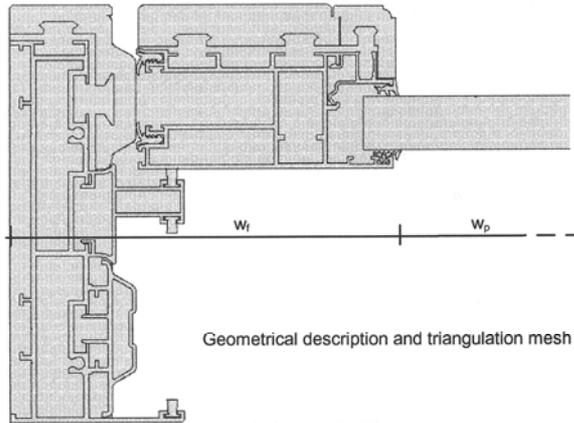
U_p = 1.243 W/(m².K) [thermal transmittance of the insulation panel]

w_p = 0.4247 m [projected width of insulation panel]

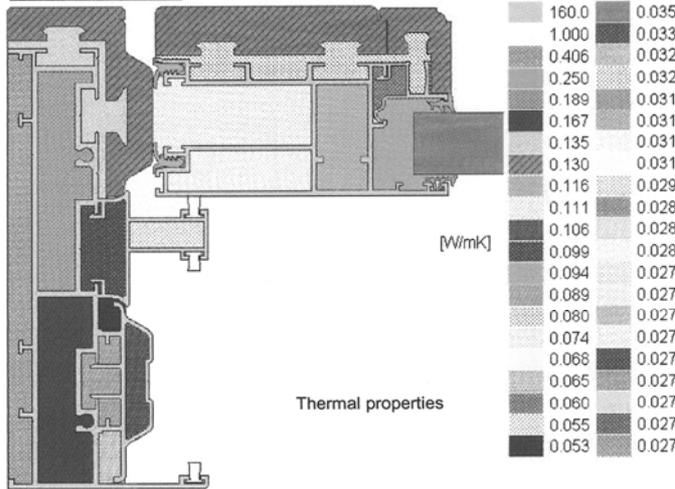
w_f = 0.1578 m [projected width of frame]

THERMAL TRANSMITTANCE OF FRAME U_f = 4.26 W/m² K

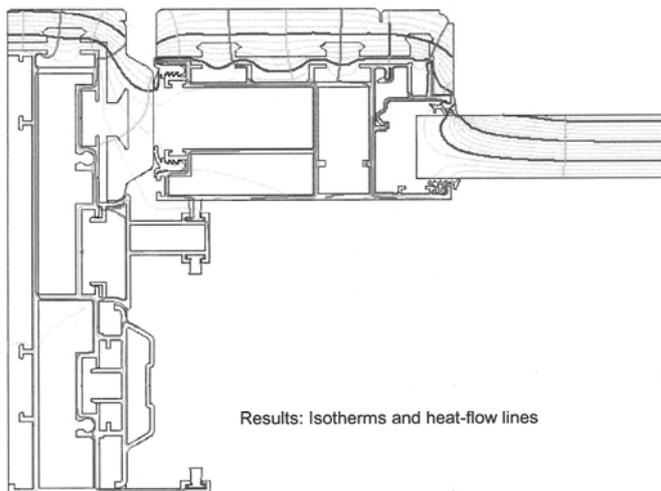
TEST REPORT n° 203/2006-E



Geometrical description and triangulation mesh

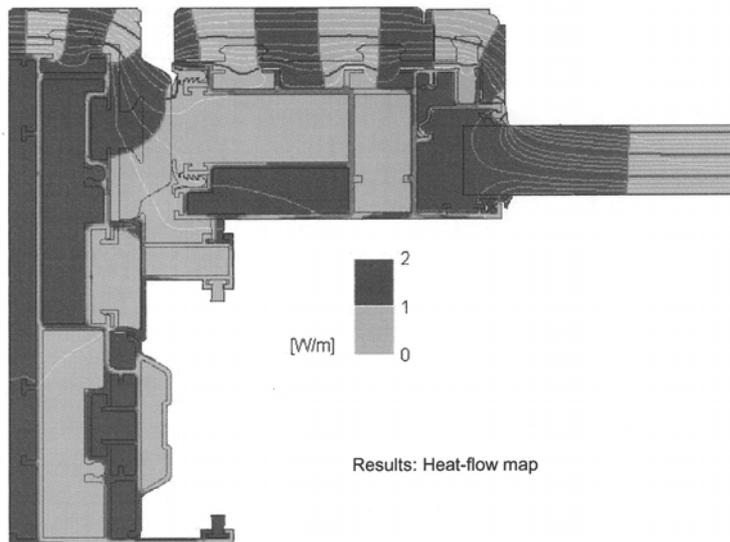
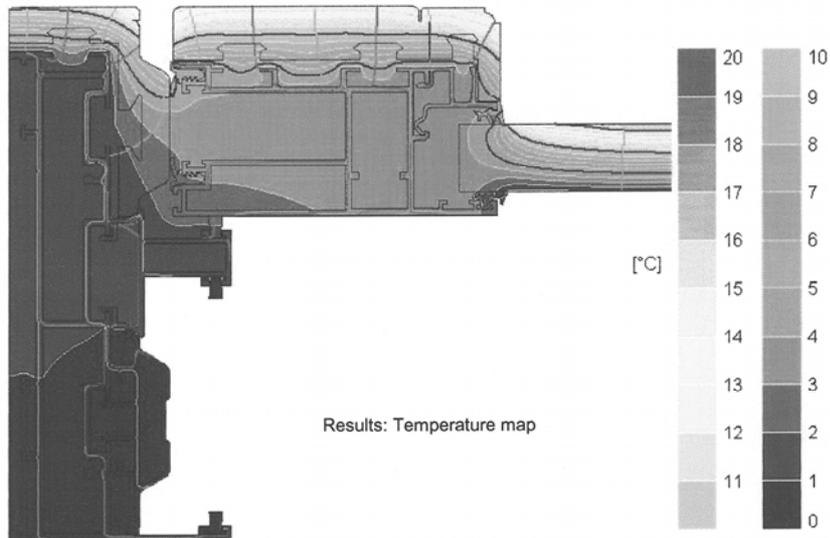


Thermal properties



Results: Isotherms and heat-flow lines

TEST REPORT n° 203/2006-E



TEST OPERATOR

Dott. Ing. Camillo Orsi



DIRECTOR

Dott. Ing. Giovanni Lapolla

SK180TTs

istituto sperimentale per l'edilizia s.p.a.

ISTEDIL

Autorizzato all'esecuzione delle prove ai sensi e per gli effetti dell'Art. 20 della legge del 5-11-71 n. 1086 con Decreti Ministero LL. PP. Autorizzato alle certificazioni CE - Notificato CEE n. 0529
SEDE LEGALE - UFFICI E LABORATORI: 00012 Guidonia M. (Roma) Loc. Setteville - Via Tiburtina Km 18,300 - Tel. 0774/353580 r.a. - Fax 0774/353762
PERUGIA - 06132 S. Sisto Loc. S. Andrea delle Fratte - Via Maccheroni s.n.c. - Tel. 075/5271717 - Fax 075/5271705
LATINA SCALO - 04013 Loc. Tor Tre Ponti - Via Carrara, 12/a - Tel. 0773/630137 - Tel. e Fax 0773/630217
SASSARI - 07100 Loc. Predda Niedda - Strada 25 - Tel. e Fax 079/260581

www.istedil.it
E-mail: info@istedil.it

RAPPORTO DI PROVA n° 203/2006-I

Guidonia M. 11/05/2006

Risultato del calcolo della trasmittanza termica di un telaio per serramenti eseguito il giorno 03/05/2006 con il metodo numerico.

Le caratteristiche geometriche e strutturali del telaio sono riportate nel disegno allegato, fornito dal Committente, che costituisce parte integrante del presente rapporto di prova.

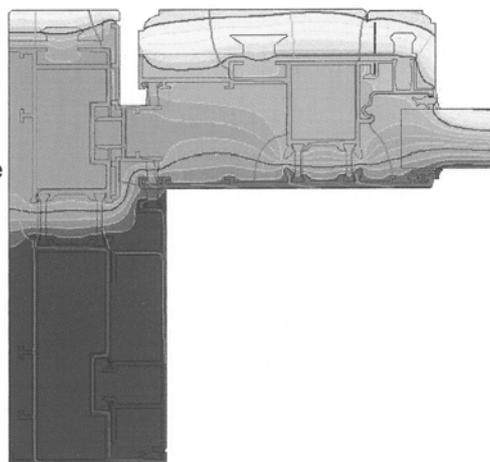
COMMITTENTE : STARPUR S.r.l.

DATI DICHIARATI

Denominazione : SW 180sTT nodo laterale
Struttura telaio : ALLUMINIO-LEGNO

Conducibilità termica dei materiali utilizzati:

Alluminio	160.000	W/m°K
EPDM	0.250	W/m°K
Poliammide rinf.	0.300	W/m°K
Legno	0.130	W/m°K
Isolante	0.035	W/m°K



MODALITA' DI PROVA

Normativa di riferimento: UNI EN ISO 10077-2
Programma di calcolo : PHISIBEL BISCO vers. 7.0w

RISULTATO DELLA MISURA

BISCO data file: sw180sttlaterale.bsc

TRASMITTANZA TERMICA DEL TELAIO (UNI EN ISO 10077-2)

$$U_f = (Q / (t_i - t_e) - U_p * w_p) / w_f$$

con:

Q = 19.216 W/m [flusso di calore totale (profilato+pannello)]

t_i = 20.00 °C [temp. interna]

t_e = 0.00 °C [temp. esterna]

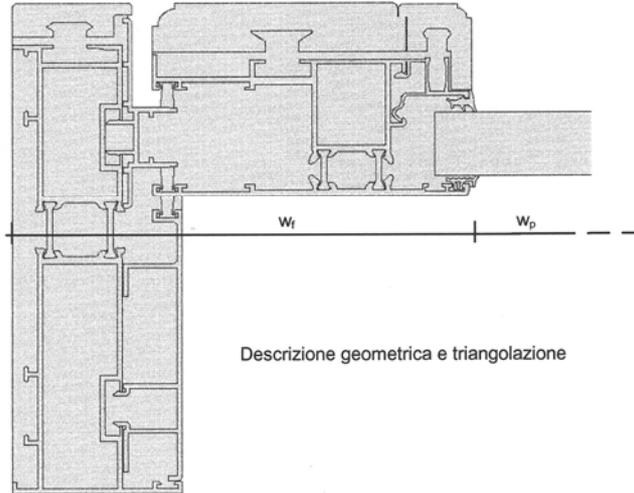
U_p = 1.268 W/(m².K) [trasm. termica del pannello isolante]

w_p = 0.2969 m [largh. lato pannello isolante]

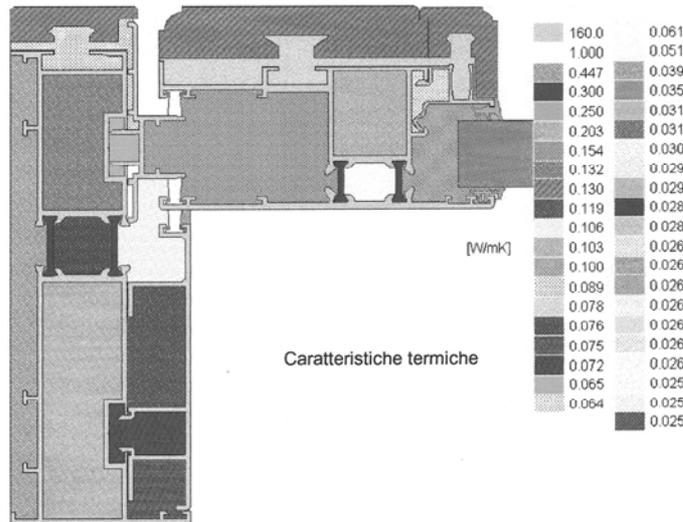
w_f = 0.1561 m [largh. lato profilato]

TRASMITTANZA TERMICA UNITARIA U_f = 3.74 W/m² K

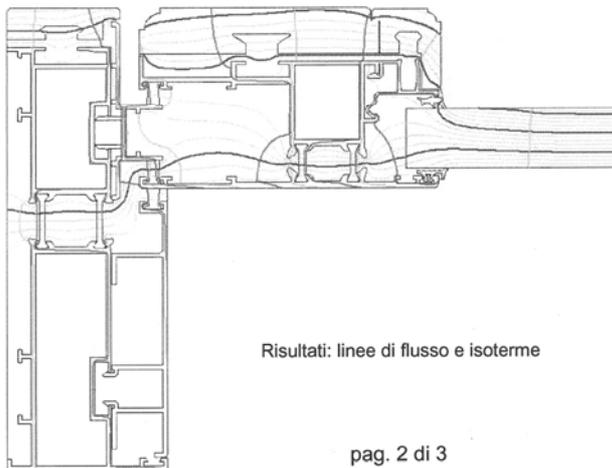
RAPPORTO DI PROVA n° 203/2006-I



Descrizione geometrica e triangolazione

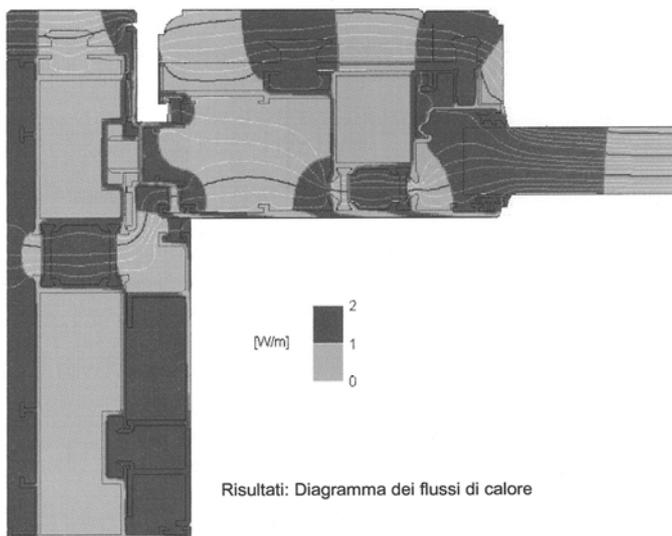
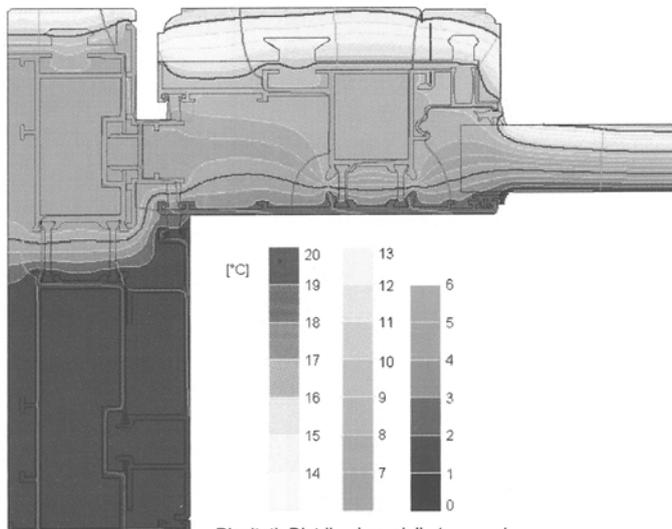


Caratteristiche termiche



Risultati: linee di flusso e isoterme

RAPPORTO DI PROVA n° 203/2006-I



LO SPERIMENTATORE
Dott. Ing. Camillo Orsi



LA DIREZIONE
Dott. Ing. Giovanni Lapolla

7. CERTIFICATION

7.1. For the product

- **UNI**

In 2005 Starpur was the first company in the aluminium-wood sector to obtain UNI markings for the SK65, SW70TT, SK80TT products, which certifies conformity of the product to technical standards set out in the regulations for the UNI marking, particular rules for the granting of the right to use the marking for conformity with UNI regulations for exterior metallic and aluminium-wood frames UNI EN 12207-12208-12210-1522 - UNI ENV 1627 - UNI 9158-3952). UNI marking attests to the level of quality of the products indicating that the performances (air permeability, waterproofing, wind resistance, mechanical strength) of the product have been certified through lab tests carried out on a frame representative of those applying for the marking.

Moreover, UNI marking is a distinctive and exclusive mark that tells designers and the end user that the product they have chosen is a Quality Product. Therefore, the designer who has the task of establishing the quality of the construction products has the assurances that come from a product certified with the UNI marking. It is the customer, both public and private, small and large, who in any event is the final judge of the quality of the work and who can finally count on a broad-ranging certification of quality and a vast assortment of frames.

- **CE**

February 1, 2007 was the start of a period of coexistence, for outdoor frames, with the CE marking, which will be compulsory from February 1st 2009. Starpur, from January 2007, has already made provisions for the certification of the SK65, SW70TT, SK80TT series and preparations are underway also for the remaining series. CE marking covers all the legal technical requirements dealt with by the pertinent harmonized technical specifications in force in all the member states of the European Union. It establishes a common field of action, providing manufacturers with test methods, procedures and evaluation criteria that are shared by all the European states. The addition of the CE mark presupposes the suitability for use of all the products that have been made to be incorporated permanently in building works (Directive on construction products 89/106)CEE).



CSICERT

Sistema di Certificazione

Viale Lombardia 20 - 20021 Bollate (MILANO) - ITALY
Tel. +39.2.383301 - Fax +39.2.3503940 - www.csi-spa.com

CERTIFICAZIONE DI PRODOTTI INDUSTRIALI

Concessione del diritto d'uso del marchio



in conformità alle norme:

UNI 3952 - UNI 9158 - UNI EN 12207 - UNI EN 12208 - UNI EN 12210

CONCESSIONE n°: SM 004

Produttore: **STARPUR srl**
Z.I. Loc. Fosso Imperatore - 84014 Nocera Inferiore (SA)

Prodotto: Serramento esterno metallico (alluminio/legno)
Modello: STW/SK65-B2AR
tipo: porta finestra, luce fissa, finestra
numero massimo ante: 2
finitura superficiale: verniciatura o anodizzazione
dimensioni in mm (massime): 2300 x 1400
movimento apertura: battente, ribalta, luce fissa, vasistas
tipo di vetro (minimo mm): camera 4/15/4
classi di resistenza: permeabilità all'aria: classe 4
tenuta all'acqua: classe 9A
resistenza al vento: classe C4

Il presente certificato è soggetto al rispetto del regolamento di CSICERT per la certificazione dei prodotti, processi e servizi ed al rispetto delle regole particolari doc. CSICERT 006/01.

Data rilascio: 23/12/2005

Validità: 2 anni

CSICERT
Il Presidente
Ing. P. CAU

SINCERT

GRUPPO
IMQ



CSI

Viale Lombardia 20 - 20021 Bollate (MILANO) - ITALY
Tel. +39.02.383301 - Fax +39.02.3503940- www.csi-spa.com

CERTIFICATO DI ESAME DI TIPO

CERTIFICATE of TYPE EXAMINATION

Registrazione n.° CPD/1040/07

Registration number

l'Istituto di Certificazione CSI S.p.A.

The Certification Body CSI S.p.A.

dichiara che la Società/declare that the Company

STARPUR Srl

Zona Industriale Località Fosso Imperatore – 84014 NOCERA INFERIORE (SA)

Ha fatto eseguire sulla campionatura denominata/ *Has requested on the specimens named*

“FINESTRE A BATTENTE IN ALLUMINIO LEGNO”

Aluminium/wood window

Le prove di Tipo (ITT) secondo la norma EN 14351-1:2006, in conformità ai punti 4.2, 4.5, 4.6, 4.11, 4.12, 4.14, (ove applicabili) richiamati nell'allegato ZA della norma stessa, secondo la procedura del Sistema 3(tre) - Allegato III della Direttiva 89/106/CEE

For Initial Type-Examination according to the EN 14351-1:2006 and to test in compliance with the points 4.2, 4.5, 4.6, 4.11, 4.12, 4.14, (where applicable) in the annexe ZA of the standard, according to the procedure of System 3 (three) - Annex III of the 89/106/EEC Directive

I risultati delle prove eseguite sul campione più critico della famiglia e applicabili alle versioni di dimensioni inferiori sono riportati nell'Allegato A

The results of the tests done on the most critical specimen included in the range and applicable on the lower dimensions specimens are reported in Annex A

Data emissione/issue date 24/01/2007

Data scadenza/expiring date 23/01/2012

GRUPPO
IMQ

Pag. 1/2

Il Responsabile del Centro

Managing Director

Dott.-Ing. P. Cau



CSI

Viale Lombardia 20 - 20021 Bollate (MILANO) - ITALY
Tel. +39.02.383301 - Fax +39.02.3503940 - www.csi-spa.com

Certificato di Esame di Tipo - Allegato A

Certificate of Type Examination - Annex A

Registrazione n.° CPD/1040/07

Registration number

STARPUR Srl

Zona Industriale Località Fosso Imperatore – 84014 NOCERA INFERIORE (SA)

“FINESTRE A BATTENTE IN ALLUMINIO LEGNO”

Aluminium/wood window

Descrizione del prodotto/*Product description:*

Chiusura a battente.

Profili in alluminio/legno.

Vetrare isolanti : 4-15-4 clear

Modelli: STW/SK65-B2AR – STW/SW70TT-B2AR – STW/SK80TT-B2AR

in base alle prove di tipo eseguite ed ai documenti del Fascicolo Tecnico predisposto, i risultati applicabili a tutti i prodotti della famiglia sono:

Dimensioni massime /Max Size (mm) :	W 1400 x H 2300
4.14 Tenuta aria/air permeability	classe 4
4.5 Impermeabilità acqua/watertightness	classe 9A
4.2 Resistenza al vento e flessione/ Wind load	classe C4
4.6 Rilascio di sostanze pericolose :	nessuna
4.11 Isolamento acustico/acoustic insulation $R_w(C; C_{tr})$	
- con vetrata 4-15-4 mm : valore estrapolato	27 dB
In base ai profili e alle vetrate sopra indicati la trasmittanza calcolata risulta:	
4.12 Trasmittanza termica U_w	3,14 W/m²K

Data emissione/*issue date* 24/01/2007

Data scadenza/*expiring date* 23/01/2012

**GRUPPO
IMQ**

Pag. 2/2

Il Responsabile del Centro

Managing Director

Dott. Ing. P. Cau

7.2. Companies

Starting in 2000 Starpur, within a framework of a continual improvement of the process, followed the guidelines set out in UNI EN ISO 9001:2000 (quality) and UNI EN ISO 14001:2004 (environment).

- Quality

Quality Policy

The declaration of intent below, and in particular the concepts of "continual improvement" and "principles of quality" contained in it, sum up the policy regarding quality and the company objectives. This ensures that such a policy is understood, implemented and maintained at all levels of the organisation through consultation with the staff, the distribution of management and operational procedures.

Management has appointed the Quality Manager as its representative, and endows the position with the authority and the responsibility to ensure that the requisites of the Quality Management System are implemented and maintained.

GENERAL OBJECTIVES OF QUALITY

- Management has set itself the following objectives:
- to offer processes and services that conform to the specifications, in terms of safety, performance, suitability, reliability, times and costs;
- to respect the laws in force and Contractual Standards;
- to train and motivate all the employees, at all levels, in the principles of Quality;
- to encourage the integration of the various company sectors;
- to make the entire company more responsible in carrying out its work according to the company's standards of quality, making customer satisfaction an imperative;
- to obtain the level of quality that has been fixed, minimising the costs that the Organisation has to bear in order to prevent and correct non-conformity;
- to control respect for and the efficiency of the Quality System, recording and publishing the results;
- to make the company more competitive, reducing the costs of non-quality and adapting technical product solutions to the real requirements of the end user.
- to reduce the amount of, and the costs of, anomalies and the unforeseen;

- to maintain and enhance the company image as far as the provision of Quality is concerned;
 - to continually look for improvements in the Quality.
 - The management undertakes to provide suitable resources for this continual improvement and the efficiency of the quality management system
- Environment

ENVIRONMENTAL POLICY

Starpur S.r.l., a company that manufactures and designs aluminium and wood frames, promotes, in the ambit of its Environmental Management System UNI EN ISO 14001, respect for man and the environment in its work. In this context it has undertaken to:

- respect the applicable laws and regulations;
- take into consideration the direct and indirect environmental aspects of its products and processes;
- adopt the latest technologies in order to obtain the lowest possible environmental impact;
- keep down the consumption of natural resources and energy;
- reduce or eliminate emissions, sewage and refuse;
- encourage its employees at every level to become responsible in the protection of the environment by means of instructional and training programmes;
- promote the cooperation with suppliers and clients in order to harmonise conduct;
- guarantee transparency and cooperation with public authorities;
- oblige its suppliers and sub-contractors to respect, inside their companies, the same rules followed by Starpur;
- check out beforehand the environmental impact of new processes and modifications to be made to existing plant;
- respect the undertakings in the environmental sphere undersigned with other organisations;
- pursue continual improvement aimed at the reduction of environmental impact to a level corresponding to the economically viable application of the best technology available;
- periodically monitor environmental goals and aims;
- make this document available to company staff, to clients, to suppliers and the public.

The authority and the responsibility for ensuring that the requisites of the EMS are established, applied and maintained in conformity with the norm has been assigned to the Manager of the Quality System and Environment (MSE). Respect for these undertakings requires the full commitment and collaboration of all the company employees. Management will support the Environment Project with the necessary actions throughout the entire company structure.



DNV

DET NORSKE VERITAS

QUALITY MANAGEMENT SYSTEM CERTIFICATE

Certificato No. / Certificate No. **CERT-09689-2001-AQ-NPL-SINCERT**

Si attesta che / This certifies that

IL SISTEMA DI GESTIONE PER LA QUALITÀ DI / THE QUALITY MANAGEMENT SYSTEM OF

STARPUR S.r.l.

Zona Ind. Loc. Fosso Imperatore - 84014 Nocera Inferiore (SA) - Italy

È CONFORME AI REQUISITI DELLA NORMA PER I SISTEMI DI GESTIONE PER LA QUALITÀ
CONFORMS TO THE QUALITY MANAGEMENT SYSTEMS STANDARD

UNI EN ISO 9001:2000 (ISO 9001:2000)

Questa certificazione è valida per il seguente campo applicativo:

This certificate is valid for the following products or services:

*(Ulteriori chiarimenti riguardanti lo scopo e l'applicabilità dei requisiti della normativa si possono ottenere consultando l'organizzazione certificata)
(Further clarifications regarding the scope and the applicability of the requirements of the standard(s) may be obtained by consulting the certified organisation)*

Progettazione e produzione di infissi e porte, misto alluminio-legno

Design and manufacture of aluminium-wooden window frames and doors

Luogo e data
Place and date

Agrate Brianza, (MI) 2004-10-05

Lead Auditor: Giovanni Criseuolo

Settore EA: 17

Data Prima Emissione:

First Issue Date:

2001-12-11

SINCERT

ACREDITAMENTO ORGANISMI DI CERTIFICAZIONE E SPEDIZIONE

SGQ Registrazione N. 0034A
SCA Registrazione N. 0032D
PRD Registrazione N. 0038B
SCR Registrazione N. 0044F
SSI Registrazione N. 0022G

Memoria degli Accordi di Mutuo Riconoscimento EA e IAF
Registry of EA and IAF Mutual Recognition Agreements

per l'Organismo di Certificazione
for the Accredited Unit

Det Norske Veritas Italia S.r.l.

Leonardo Omodeo Zorini
Management Representative

La validità del presente certificato è subordinata a sorveglianza periodica (ogni 6, 9 o 12 mesi) e al riesame completo del sistema con periodicità triennale

The validity of this certificate is subject to periodical audits (every 6, 9 or 12 months) and the complete re-assessment of the system every three years

Le aziende in possesso di un certificato valide sono presentati nella banca dati sul sito www.dnv.it e sul sito Sincert (www.sincert.it) - All the companies with a valid certificate are online at the following addresses: www.dnv.it and www.sincert.it



DET NORSKE VERITAS

ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE

Certificato No. / Certificate No. **CERT-1556-2006-AE-NPL-SINCERT**

Si attesta che / This certifies that

IL SISTEMA GESTIONE AMBIENTALE DI / THE ENVIRONMENTAL MANAGEMENT SYSTEM OF

STARPUR S.r.l.

Zona Ind. Loc. Fosso Imperatore - 84014 Nocera Inferiore (SA) - Italy

È CONFORME AI REQUISITI DELLA NORMATIVA
CONFORMS TO THE ENVIRONMENTAL MANAGEMENT SYSTEM STANDARD

UNI EN ISO 14001:2004 (ISO 14001:2004)

Questa certificazione è valida per il seguente campo applicativo:
This certificate is valid for the following products or services:

**Progettazione e produzione di infissi e porte, misto alluminio-legno tramite
le fasi di taglio, assemblaggio, collaudo e imballaggio**

*Design and manufacture of mixed aluminium-wooden window frames and doors
through the phases of cutting, assembling, testing and packing*

Luogo e data
Place and date

Agrate Brianza, (MI) 2006-03-13

Lead Auditor: Mario Ragucci

Settore EA: 17

SINCERT
ACREDITAMENTO ORGANISMO CERTIFICAZIONE E SPEZIONE

SGS Registration N. 003A
SGA Registration N. 003D
PES Registration N. 003B

Membro degli Accordi di Mutuo Riconoscimento EA e IAF
Signatory of EA and IAF Mutual Recognition Agreements

per l'Organismo di Certificazione
for the Accredited Unit

Det Norske Veritas Italia S.r.l.

Vittore Marangon
Management Representative

La validità del presente certificato è subordinata a sorveglianza periodica (ogni 6, 9 o 12 mesi) e al riesame completo del sistema con periodicità triennale
The validity of this certificate is subject to periodical audits (every 6, 9 or 12 months) and the complete re-assessment of the system every three years
Le aziende in possesso di un certificato valido sono presenti nelle banche dati sul sito www.dnv.it e sul sito www.sincert.it - All the companies with a valid certificate are online at the following addresses: www.dnv.it and www.sincert.it

- **Product Guarantee**



To whom of competence

Your ref.
Our ref. Divisions Agents

CERTIFIED OF INSURANCE

Object: RC Products Policy 1003.1005000675 STARPUR SRL

With this it is certified the Messrs STARPUR SRL is insured for the Civil Responsibility Products with this Society with policy n. 1003.1005000675, expiring 25.09.2007 .

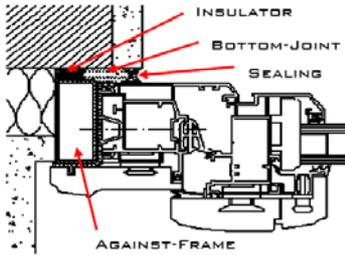
It is specified the guarantee is lent for the following maximal insured.

RC Products
€1.000.000,00 for accident
€1.000.000,00 for damages to people
€1.000.000,00 for damages to things

Best regards



8. INSTALLATION



It is a very important operation and should be carried out with great care so as not to demean the quality of the frame, indeed incorrect installation can compromise:

- Airtightness
- Waterproofing
- Resistance to wind loads
- Heat insulation
- Soundproofing
- Resistance to wear and tear

It is important:

- to use a counterframe so as to facilitate the installation of the frame, and delineate a room with a precise and exact conformation;
- insulate the frame from the outer wall (as shown in the diagram) so as to avoid thermal bridges between the frame and the exposed wall, thereby minimising the formation of condensation;
- a correct sealing between the wall and the frame, with the use of appropriate silicone, prevents infiltration of water and supports the heat insulation;
- avoid contact with alkaline mortars that could give rise to corrosion.

9. MAINTENANCE AND CLEANING

To make sure the systems lasts as long as possible, periodic cleaning should be carried out so that any dirt that is not removed does not corrode the surfaces and cause the opening mechanisms to malfunction. In the table below there is a list of the operations needed to protect the fixture and its components.

Element	Cleaning	Maintenance	To avoid
Aluminium	With a clean cloth, warm neutral soapy water with neutral detergent		The use of abrasive solvents or ones that contain ammonia, acids and alcohol since they could cause the surface to become opaque.
Wood	With soft cloth, dampened with water		
Glass	Use normal household products		
Hardware	With small brush.	Grease all the moving parts (with lubricants for the mechanisms) at least once a year	Coating/painting the mechanisms; direct contact of the mechanisms with dampness and detergents.
Gaskets	With small brush and after with a damp cloth		Direct contact with paints or detergents.
Hinge covers	With a damp cloth		
Edge sealing		Visual control every two years	

1. THE PRODUCT	1
1.1. Features	1
1.2. Technical characteristics	1
2. THE PROPERTIES OF THE COMPONENTS	2
2.1. Aluminium	2
2.2. Wood	6
2.3. Corner joints	6
2.4. Gaskets	8
2.5. Nylon spacers	10
2.6. Hardware	13
2.7. Glass	13
2.8. Measures for coastal areas	14
3. THE PRODUCTION PROCESS	17
3.1. Cutting the aluminium	18
3.2. Cutting the wood	18
3.3. Processing the aluminium	18
3.4. Wood assembly	18
3.5. Installation of the aluminium profiles	18
3.6. Hardware assembly	18
3.7. Application of the wood	18
3.8. Application of the glass	19
3.9. Registration	19
3.10. Testing	19
4. CONTROLS	19
4.1. On acceptance	19
4.2. In production	19
5. STARPUR PRODUCTS	20
6. PERFORMANCES	30
7. CERTIFICATION	72
7.1. For the product	72
7.2. Companies	76
8. INSTALLATION	82
9. MAINTENANCE AND CLEANING	83