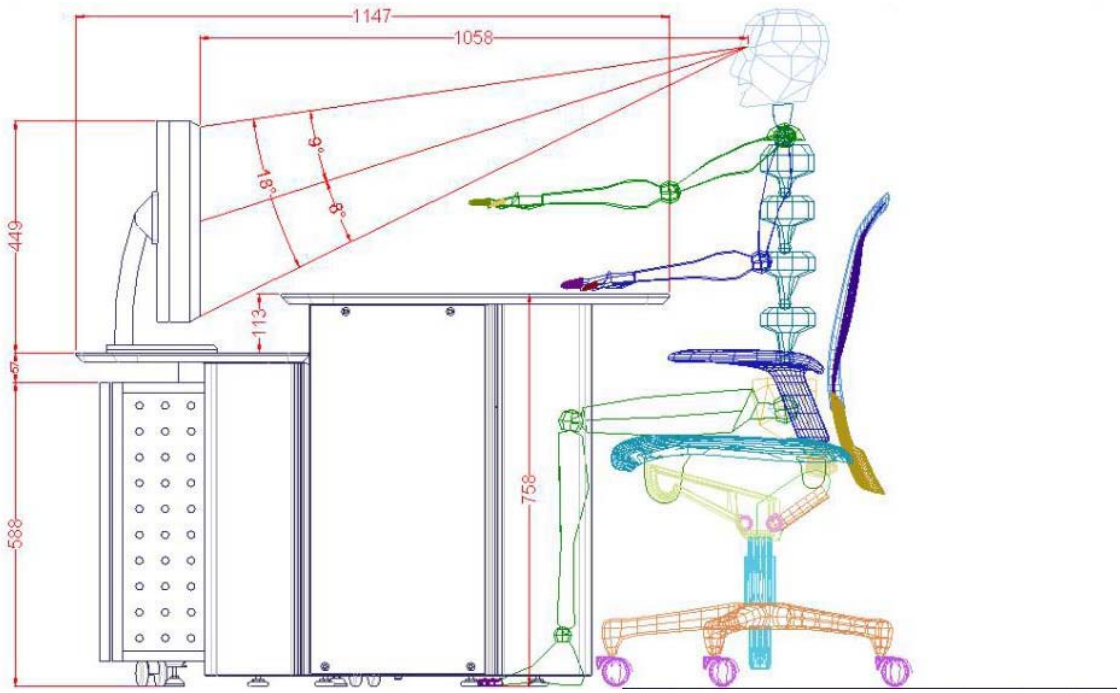
ADVANTIS Console
(Advanced Console Solutions)
TECHNICAL INFORMATION

advantis
console

1. ERGONOMICS

Advantis has been designed to meet the specifications laid down by the *Ministerio de Trabajo y Asuntos Sociales* (the Spanish Ministry of Work and Public Interests), which are in line with international requirements. Advantis offers flexibility and adaptability to each and every modular console, so that its workstations satisfy all of the customer's aesthetic or functional requirements, no matter how exacting they may be.



In the **Advantis** range, the following points have been considered when designing the work surfaces:

- The measurements and layout of the desktops are designed with the posture and positioning of the employee at work as a high priority.
- The height of the work surfaces is appropriate for the correct positioning of the employees when doing the specified job, as well as to the level of effort required and the visual attention span as required by work stations that are operated "24/7".
- In the following table are the recommended distances in line with the nature of the task. The point of reference is taken from the height of the elbow from the floor, with the arm bent and held tight to the body, forming a 90º angle. This has been the focal point in the ergonomic studies used to develop the **Advantis** range:

TYPE OF TASK/WORK	HEIGHT (Re: Elbow Position)
Difficult	10-15 cm. Below elbow height
Moderate or light	5-10 cm. Below elbow height
Precision or delicate	5-10 cm. Above elbow height

- In the same way, in order to avoid forced or stressed work positions, different configurations of the **Advantis** range, allow objects appliances or devices needed or operated by the user to be positioned within their reach, to ensure they are easily accessible. The area of normal or optimal reach is the term used for the zone which can be reached comfortably with the arm bent and forming a 90º angle; whereas the area of maximum or sub optimal reach would be the area that one can reach with the arm fully extended.

Reach Zones and Recommendations:

As a continuation, here are the areas/zones on a work surface in its various configurations, which can be reached by a person with their hand, both horizontally and vertically.

- **Horizontal Reach:** The following diagram show the areas of normal and maximum reach.

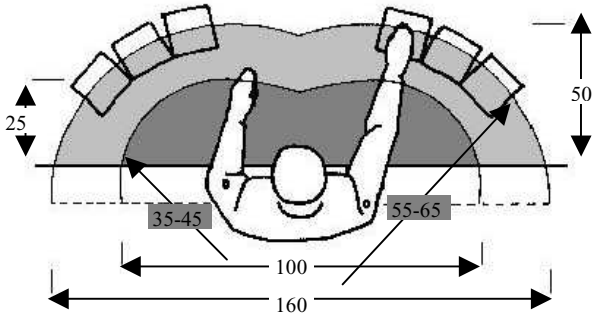


Figure 1 *Horizontal Reach.*

- **Vertical Reach:** A person's hand should work between the shoulder and waist height, for the majority of the time, spent working. The recommended working zones are shown in the following diagram. The reference point taken is the height of the standard working position (100 cm. from the floor when standing and 65 cm. from the floor when seated)

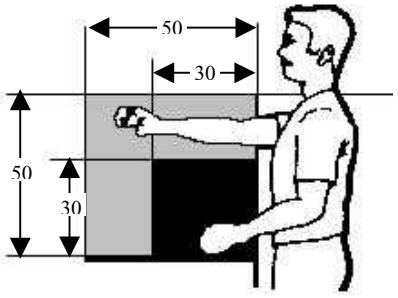


Figure 2 *Vertical Reach.*

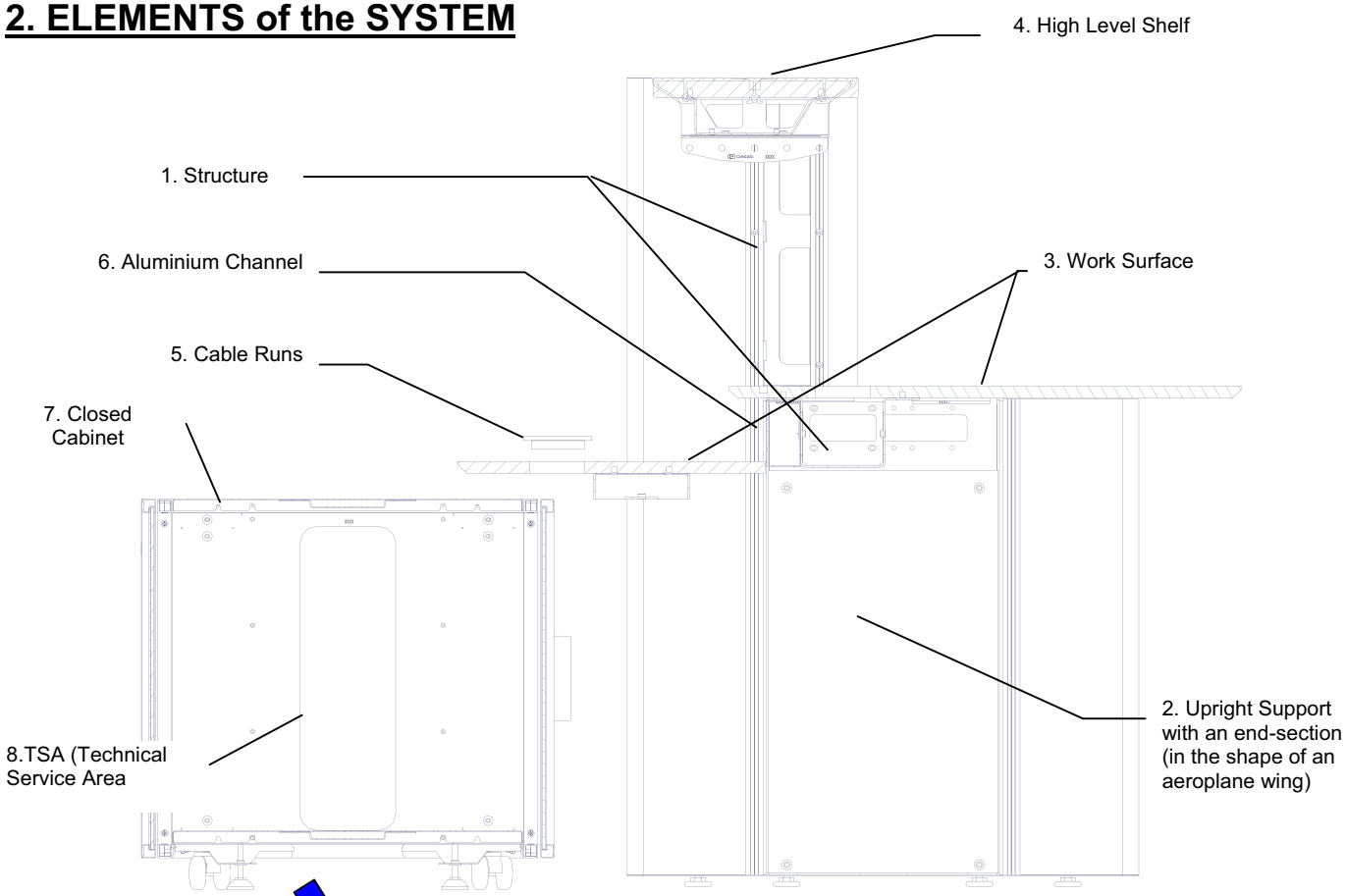
- The tools that the operator uses most frequently, such as the keyboard and the mouse, should be located in the optimal reach zone. Other objects such as screens etc should be situated in the sub optimal zone. It is also recommended that large or heavy objects be situated as close as possible to the operator.
- The length and width of the desktop or work surface will depend principally on the number and size of the appliances used to do the work. I.e. the work surface should be of sufficient dimensions to easily accommodate all of the necessary tools within reach of the operator.
- The **Advantis** range has a large number of solutions, depending on the requirements of the organisation, the workstation and adapting to the width and length of the work surface.

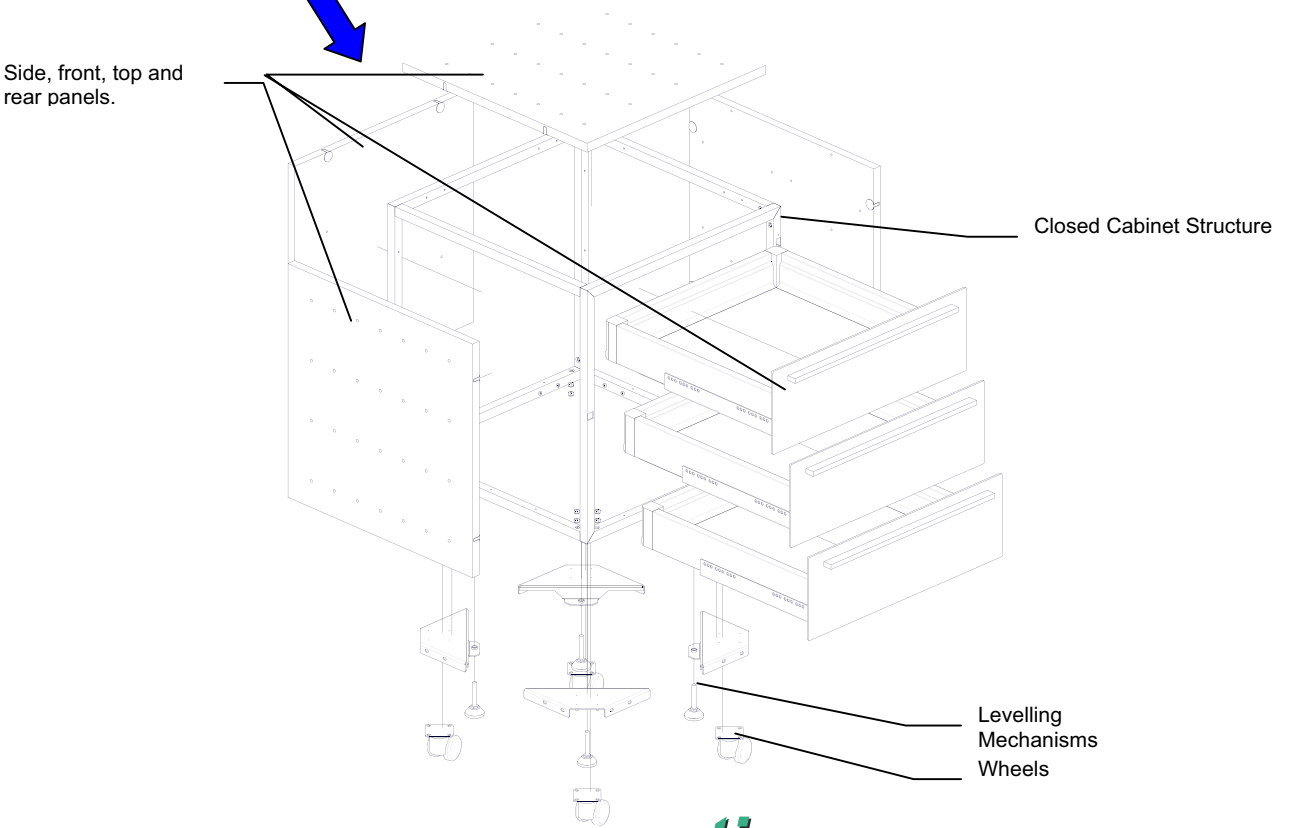
- The work surfaces in the **Advantis** range are supplied with a matte finish in order to avoid the reflections, which are inevitable with shiny surfaces in well lit areas.

Single Level
ADVANTIS Console

Multi Level
ADVANTIS Console

2. ELEMENTS of the SYSTEM





3. Technical features of the system's elements.

1. Structure

Central "U" shaped channel and auxiliary elements in **Steel,** which are cold laminated according to Standard UNE EN 10130:1999, **painted** with a high quality micro textured epoxy resin in powdered form as per standards UNE 48-098-90; UNE 48-031-80; UNE 48-026-80; UNE 48-024-80; UNE 48-032-80; UNE 48-183-84 48-024-80; UNE 48-032-80; UNE 48-183-84 y UNE 48-169-92 and has undergone stringent testing for long lasting aesthetic finishes according to standards ISO 7253 and DIN 50021, carried out in laboratories with ENAC approval.

2. Upright Supports

? **Support Structure**

The structure of the uprights is **Steel** and has the same features as the horizontal channel. The Aluminium end sections are designed in the shape of an aeroplane wing, and are made from an aesthetic **Aluminium** alloy 6106 (a variant but more resistant version of the 6063) in T5 form for light architecture. It is **lacquered** and has undergone stringent testing as per standards DIN 50939, ISO 2813, ISO 2360, ISO 2409, ISO 2815, ISO 1520 and ASTM D 2794 which guarantee its quality and durability, having reached the standards of the quality mark **QUALICOAT.**

? **Side Panels**

Side Panels are made from high quality E1 Class **MDF** meeting standards EN, ISO 3340, and has undergone stringent testing as per standards: EN 323; EN 319; EN 310, EN 317, EN 322 and EN 311. Finished with a high-density laminate layer ***HPL POSFORMABLE***, which has been stringently tested to meet standard EN 438.

The manufacture of our laminate passed the standards of *AENOR de Cadena de Custodia (CdC)* with flying colours.

3. Work Surfaces

The work surfaces are of a high quality and made from **Compact Laminate-** class M2 (or class M1 on request) meeting standard EN 438 and has been stringently tested to meet standard: DIN 53799; DIN 53455; DIN 53479; DIN 4102; DIN 53389 as well as being certificated by the prestigious organisations governing materials: antibacterial material and highly inflammable "PA III 2. 2100 type CF, as per DIN 16926, class B1, as per DIN 4102) or "floating" **Glass** with opaque "frosting" as per standard 572-1-2 and thermo tempered as per standard EN 12150-1 and with an anti smear coating (the glass can also be laminated for safety, on request.)

4. High Level Shelves

High resistance shelves made from **Sheet Steel** and cold coated (as per standard UNE EN 10130:1999 and **painted** with a high quality micro textured epoxy resin in powder form as per standards UNE 48-098-90; UNE 48-031-80; UNE 48-026-80; UNE 48-024-80; UNE 48-032-80; UNE 48-183-84 48-024-80; UNE 48-032-80; UNE 48-183-84 y UNE 48-169-92) an aesthetic **Aluminium** alloy 6106 (a variant but more resistant version of the 6063) at level T5 as per DIN 4113 and stringently weight tested to meet DIN 1055 part 3, with a high quality **natural** finish which meets the requirements of EWAA/EURAS (QUALANOD). The high level shelves can also be supplied in **Compact Laminate**, with features as per the work surfaces in point 3.

5. Cable Channels or Runs

Aluminium cable channels made from 6060 alloy to meet standard UNE 38-337-82 or from rigid M1 class **PVC** to meet standard UNE 23.737, which stands up well in tests with incandescent materials at 960º for 5 seconds and holds the CE mark of approval.

6. Aluminium Channels

The **Aluminium** channel, for installing 45x45 universal connectors, is 6060 alloy as per UNE 38-337-82. It has a **natural** finish and complies with Quality Mark EWAA/EURAS (QUALANOD), and has undergone tests for durability and quality to meet ASTM B-136 and holds the CE mark of approval.

7. Closed Compartments

? **Structure**

The cabinets have an **Aluminium** 20x20 6063/6060 alloy structure with a moment of inertia with respect to the x axis Mix=0.787 cm³ and bending Wx=0.787 cm³. They are **lacquered** in black and have undergone stringent tests to meets standards DIN 50939, ISO 2813, ISO 2360, ISO 2409, ISO 2815, ISO 1520 and ASTM D 2794, which guarantee its quality and durability having reached the standards of the quality mark **QUALICOAT.**

? **Components**

- **Doors**

The frame is made from **Aluminium** 20x20 alloy 6063 with a natural finish. They have a **Glass panel** with opaque "frosting" as per standard 572-1-2 and thermo tempered as per standard EN 12150-1 or perforated **Sheet Aluminium alloy** 6063/6060 which is **lacquered** with a high quality micro textured epoxy resin in powder form.

Side Panels

The **MDF** is E1 class meeting standards EN, ISO 3340, and has undergone stringent testing as per standards: EN 323; EN 319; EN 310, EN 317, EN 322 y EN 311. Finished with a high-density laminate layer "**HPL POSFORMABLE"**, which has been stringently tested to meet standard EN 438. The manufacture of our laminate passed the standards of *AENOR de Cadena de Custodia (CdC)* with flying colours.

- **Drawers**

These are made from **Compact Laminate-** class M2 (or class M1 on request meeting standard EN 438 and has been stringently tested to meet standard: DIN 53799; DIN 53455; DIN 53479; DIN 4102; DIN 53389 as well as being certificated by the prestigious organisations governing materials: antibacterial material and highly inflammable "PA III 2. 2100 type CF, as per DIN 16926, class B1, as per DIN 4102). The runners for the drawers are highly resistant and designed for continual use.

? **Wheels and Levelling Mechanisms**

The wheels and levelling mechanisms for the closed cabinets are made from polyamide (PA 6) and have a weight resistance of 50kg per unit. Each cabinet has 4 wheels and 4 levelling mechanisms.

? **TSA (Technical Service Area)**

A TSA can be located between closed cabinets, thus creating an area specifically for fast, easy and safe access to all cabling and equipment installed. In addition surface connections can be installed within the TSA itself, to supply electricity, telephone and data to the unit.

The TSA also assists in allowing ventilation to cool the equipment installed in the cabinets, via its aluminium grill, which also folds down to give immediate access to all connections and equipment.

? **Ventilation**

The sides and the perforated door give adequate ventilation for the equipment installed within the cabinets. In rare cases where there is not sufficient ventilation, a 925m³/h (220V, 50Hz) fan can be fitted to assist the process.

- **19" Area**

  The ADVANTIS cabinets have been designed to comply with the standards listed below, which related to the storage of 19" format ICT equipment. This guarantees that the cabinets can store racked 19" equipment regardless of the make or origin.

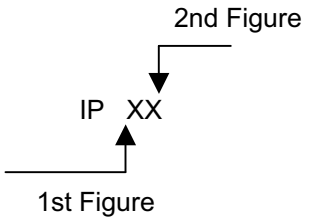
Spanish Standard UNE 20 539 /1 /2 /3	European Standard UNE EN 60297	International Standard CEI 297/1/2/3	German Standard DIN 41 494	American Standard ANSI/EIA 310-D-1992

- **IP Protection**

  The closed cabinets have been designed according to standard UNE 20324, which deals with the amount of protection offered from the surroundings (IPCode). This standard is the Spanish version of the European Standard EN 60529 and the International Standard CEI 60529.

  The IP Code, relates to a coding system indicating to the grades/standards of protections offered by surroundings against dangerous foreign bodies, penetration by solid objects, and penetration by water or liquids , providing additional information on the protection given by a given unit..

  Example:



  The 1st figure relates to the protection against entry by solid objects. This goes from 0 (unprotected) up to 6 (totally protected against solids as fine as dust)

  The 2nd figure relates to the protection against the entry of water, which would have a damaging effect. This goes from 0 (unprotected) to 8 (protected when totally immersed)
  The ADVANTIS cabinets have a grade of IP 20.

8. Tracability

In order to guarantee the tracability of our product and to enable us to offer a high quality service to our customers at all times, all Advantis models are inscribed with the date that there were manufactured.

In so doing, we can act quickly and effectively if a product suffers from any anomaly after it has been supplied.

4. Material Features and Specifications

1. Sheet steel, cold laminated as per standards EN10204, DIN 50049 and ISO404.

2. E-1 MDF Boards to meet standard EN120.

3. MDF surface coating “HPL POSFORMABLE”.

4. M1Class Compact Laminate as per European standard EN 438.

5. Compact Laminate coating “PAPEL DECORATIVO”

6. Aluminium 6106 T5 and High Resistance Aluminium 6060/6063.

7. Opaque Glass as per standard EN 572-2.

8. Surface Treatment of Metal Components:

8.1. Steel Components

8.1.1. Painting Process.

8.1.2. Paint- Technical features.

8.1.3. Tests.

8.2. Aluminium Components

8.2.1. Natural Finishing Process.

8.2.2. Lacquering Process.

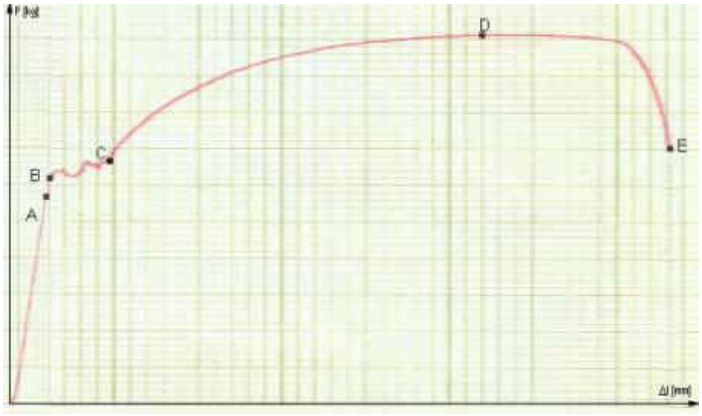
8.2.3. Tests.

8.3. Maintenance and Cleaning

The sheet steel used in the manufacture of Advantis, is cold laminated and low in carbon to allow it to be worked and formed at low temperatures as per standards UNE EN 10130:1999

The mechanical properties of the steel used in Advantis construction has been rigorously studied using the following tests:

- **Static Traction Tests.**

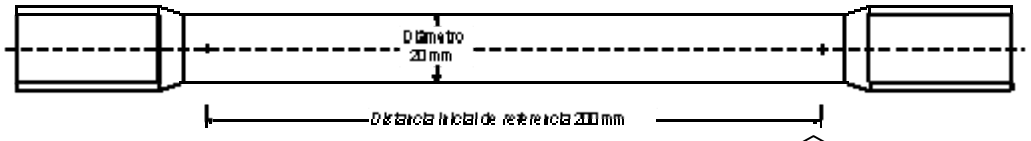


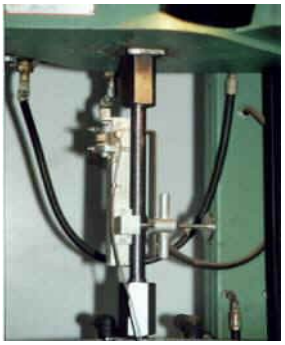
The previous graph shows, the x-axis corresponds with the weight and the y-axis, with metal deformation, length or widthways in millimetres.

From point O to point A, which is represented by a straight line, proves that there is a link between the changes in the metal and the weight that causes them (Hooks Law). Within this period and proportionally up to point A, the steels tested reacted by returning to their initial length upon stopping the effect of the weight. This is known as the ***period of proportionality or "elasticity".***

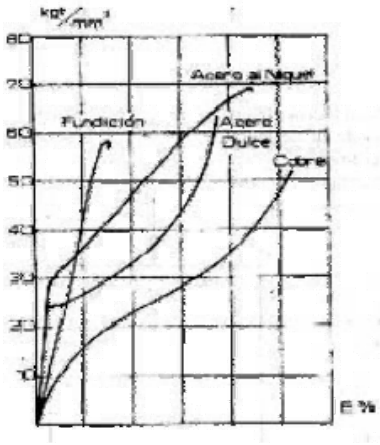
The graduated cylinders used for the traction tests are calibrated and are cylindrical or prismatic in form, with widened ends, to help to keep them under control in the testing machine, and to make the rupture of the steel safe in the lower section. Here the results are measured via "Fixed reference points" to an initial pre-established reference point. This also permits joining the 2 ends, after rupture. Thus determining the final distance between the 2 points.

The diagram of the graduated cylinder used as per standard IRAM



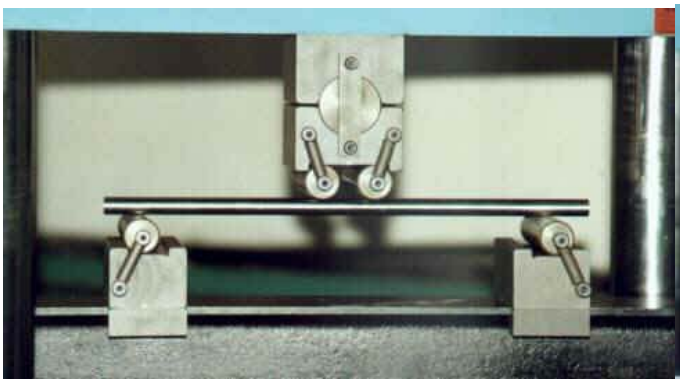


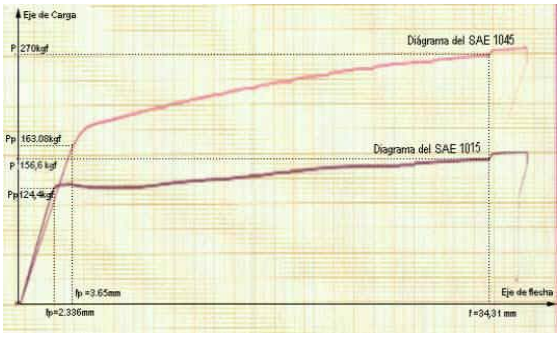
- **Compression Test**



- **Flex Test**

Using this type of test we study the limit of elastic deformation under weight.





- **Brinell and Rockwell Hardness Test**

In addition, here are the mechanical properties and the chemical compositions.

Designación		Clasificación según EN 10020	Estado de deoxidación	Validez de las propiedades mecánicas	Aspecto superficial	Ausencia de líneas de cedencia	R_e N/mm² 2)	R_m N/mm² 2)	A_{80} % mín.3)	r_{90} mín. 4);5)	n_{90} mín. 4)	Composición química % máx. en colada				
Simbólica según EN10027-1 y CR10260	Numérica según EN10027-2											C	P	S	Mn	Ti
DC01[6]	1.0330	Acero de calidad no aleado[7]	A elección del fabricante	----	A	----	[8] -/280 [10]	270/410	28	----	----	0.12	0.045	0.045	0.60	----
				----	B	3 meses										

The MDF sheets used are E-1 class and are certified as being low in formol in accordance with European standard EN 120.

Our provider therefore passed the standards of *AENOR de Cadena de Custodia (CdC)* with flying colours.

The sheets are periodically subject to the following tests:

- Density as per EN 323.
- Traction resistance as per EN 319.
- Flex resistance as per EN 310.
- Elasticity as per EN 310.
- Expansion in water or 2 hours as per EN 317.
- Humidity as per EN 322
- Surface treatment as per EN 311.

The average values as well as the technical information and dimensions are set out in the table:

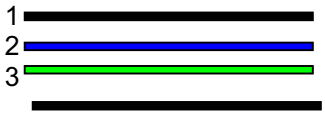
Standard Reference	Properties	Units	Average Values
EN 323	Density*	Kg/m³	>4 -6 >6/13 >13/19 >19/30 >30
			720/700 690/650 640/615 615/600 580
EN 319	Traction Resistance	N/mm²	0.45 0.40 0.35 0.30 0,20
EN 310	Flex Resistance	N/mm²	15 14 13 11.5 8,5
EN 310	Elasticity	N/mm²	1,950 1,800 1,600 1,500 1.200
EN 317	Expansion in Water 2 Hours	%	6 6 6 6 6
EN 322	Humidity	%	8+/ -3 8+/ -3 8+/ -3 8+/ -3 8+/ -3
EN 324 -1	Small Dimension Tolerance Thickness	MM	+/ -0.3 +/ -0.3 +/ -0.3 +/ -0.3 +/ -0.3
EN 324 -1	Length/width	MM	+/ -5mm
EN 324 -2	Square	MM	+/ -2mm/m
EN 324 -2	Edging	MM	+/ -1.5mm/m
EN 311	Surface Traction	N/mm²	0.8 0.8 0.8 0.8 0.8

- The content of silica is also controlled and meets standard ISO 3340.

The MDF used by Advantis has a high quality laminate (HPL POSFORMABLE) as its outer layer.

This HPL layer gives it a high level of surface resistance and durability as well as being aesthetically pleasing.

The laminate is the result of 3 different layers, which are all resins. When heated and combined at high pressure they form a single high performance layer.



Surface Layer.

As it is in immediate contact with the atmosphere, this layer forms a barrier to resist abrasions. It is formed by one or more layers, whose composition is rather like paper, which is then impregnated with melamine resins and strengthened with an aluminium oxide powder.

Decorative Layer.

This is the intermediate layer, which contains the colour or other image seen on the surface. Its composition is similar to the surface layer and its is also impregnated with melamine resins.

Base Layer.

This is formed by combining several layers of *Kraft* paper, impregnated with fenolic resins, which gives a cohesive nature to the end product that dissipates heat and impact.

MDF.

This is the high quality base on which the finished laminate layer is laid.

The HPL used by Advantis, is subjected to the most rigorous tests in order to guarantee the durability of the product. They are listed below:

- Resistance to boiling water 2 hours at 100ºC as per NF EN 438-2-7
- Resistance to steam as per NF- EN- 438-2-24
- Resistance to surface heat of 180ºC cooling at 20mm as per NF EN 438-2-8
- Resistance to staining as per NF EN 438-2-15
- Solidity of colour exposed to artificial light as per NF EN 438-2-16
- Resistance to impact as per NF EN 438-2-11
- Resistance to scratching as per NF EN 438-2-14
- Resistance to abrasions as per NF EN 438-2-6
- Resistance to cigarette burns as per NF EN 438-2-18
- Resistance to cracks as per NF EN 438-2-13
- Reaction to fire- PV of the C.S.T.B
- Density
- Thermal Conductibility
- Aptitude of curve
- Deformation by heat as per NF EN 438-2-20
- Surface Defects as per NF EN 438-2-5

The table provides information on the tests conducted:

Thickness	0.8 mm and 1mm
Normal Type - NF EN 438	HGP
Thickness Tolerance – NF EN 438-2-4 Dimensional Stability - NF EN 438-2-9 ● lengthways ● horizontally	± 0.1mm < 0.40% < 0.60%
Resistance to boiling water – NF EN 438-2-7 2 hours at 100ºC ● Volume ● Thickness	 ≤ 17.5% ≤ 19.5%
Resistance to steam – NF EN 438-2-24	≥ 3
Resistance to surface heat – NF EN438-2-8 ● 180ºC and cooling to 20 mm	Without deterioration
Resistance to staining – NF EN 438-2-15	No Staining
Solidity of colour exposed to artificial light as per design– NF EN 438-2-16	≥ 6
Resistance to impact– NF EN 438-2-11 ● force of a dropped object	 ≥ 20 N
Resistance to scratching – NF EN 438-2-14	≥ 2N υ
Resistance abrasion – NF EN 438-2-6 Number of turns	 ≥ 350
Resistance to cigarette burns NF EN 438-2-18	No Burning
Resistance to cracks– NF EN 438-2-13 Reaction to fire – PV del C.S.T.B o LNE	Class 4 M 3
Density	1.43
Thermal Conductibility λ	0.1 a 0.5 kcal/m.h.ºC
Aptitude of curve ● radius of curvature convex and concave	 7 & 10 cm
Deformation by heat – NF EN 438-2-20 ● radius of curvature ● resistance to heat	8 & 10 mm 15 mm for POS 8 M1 ≥ 15s
Surface Defects – NF EN 438-2-5 ● points ● lines	 ≤ 1 mm² /m² ≤ 10 mm² /m²

The Compact Laminate used in producing Advantis are boards based on thermo stable resins reinforced with cellulose fibres and produced according to the directives and requirements set out by European Standard EN 438 (53-173-92)

The production of the main material is carried out in high-pressure presses (100 bar) at temperatures in the region of 150 ºC.

The inner section is made up of sheets impregnated with fenolic resins with the outer section comprising of layers impregnated with melamine resins.

During the process of polymerisation of the resins form chemical bonds (between the synthetic resins and the natural fibres of the base product), which ensures excellent technical qualities, emphasising its properties of scratch and impact resistance.

The general features of this material are:

- High stability
- High durability
- High mechanical resistance
- High resistance to abrasion
- High resistance to scratching
- High resistance to impact
- High resistance to boiling water
- High resistance to chemicals (acids, base chemicals, solvents, salts....)
- High resistance to solvents
- High resistance to moderate heat
- High resistance to humidity
- High resistance to absorbing liquids
- High resistance to steam
- Easy to clean, due to a hygienic pore less surface.
- A non toxic, chemically inert, physically innocuous and safe surface
- Contains no asbestos, halogen compounds or sulphur
- Low level of fume emissions in the case of fire
- Special anti static properties
- Good dimensional stability

Also as per Gesab S.A.'s basic promise to the Environment, the materials used consist of natural fibres to at least 60% of the total weight of the material, and synthetic resins. The boards do not contain organic halogens (chlorine, fluoride, bromide, etc.), or elements found in aerosols or PVC. Nor do they contain asbestos or wood preservatives, such as fungicides or pesticides. They are free of sulphur, mercury and cadmium.

At the end of their lifespan they can be burned safely in modern incinerators without emitting hydrochloric acids, or organic chorine compounds including dioxides, which damage the environment.

When incinerated at high temperatures, with the aid of gas, and an adequate supply of oxygen, the materials are broken down to carbon dioxide, nitrogen, water and ash. The result being that the energy generated can be used again the resulting deposits can be used to fill areas and prevent global warming.

For correct waste management, please, please adhere to the national rules and regulations on the depositing of such waste: Normal waste container (030104 CER)

The laminate used by Advantis is subjected to the most vigorous tests to ensure a high quality product. These are:

- Resistance to abrasion as per DIN 53799.
- Resistance to impact as per DIN 53799.
- Flex resistance as per DIN 53455.
- Density as per DIN 53479.
- Module E as per DIN 53457.
- Reaction to fire- “F” Quality as per DIN 4102
- Resistance to tension
- Resistance to heat as per DIN 53389.
- Dimensional stability at 20ºC as per DIN 53799
- Coef. Thermal conductivity
- Resistance to steam.
- Surface resistance.
- Resistance to cigarette burns.

In the following table are the test results:

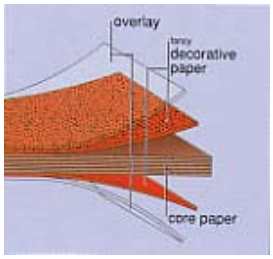
Ficha técnica

Propiedades	Norma	Unidad de medida	Valor según DIN 16926	Valor Obtenido
Clasificación	EN 438	-	C;(CF)*	C;(CF)*
Densidad	DIN 53479	g/cm^3	-	1,45
Tolerancia espesor	DIN 53799	mm	-	± 0,5mm
Resistencia - Abrasión	DIN 53799	C	> 350	450
Resistencia - Impacto	DIN 53799	(ø)mm	≤10	8
Resistencia - Flexión	DIN 53455	N/mm^2	> 100	110
Modulo E	DIN 53457	N/mm^2	> 10.000	11.000
Resistencia - Tensión		N/mm^2	> 70	80
Reacción al Fuego "F" Quality	DIN 4102	-	-	B1
Reacción al Fuego "F" Quality	NFP92/501	-	-	M1
Cambios Dimensionales		mm/m	L(≤2)	T(≤4)
Resistencia - Color	DIN 53389		≥6	≥6
Estabilidad dimensional a 20ºC	DIN 53799	l% t%	- -	0,05 (C) / 0,05 (CF)* 0,05 (C) / 0,1 (CF)*
Estabilidad dimensión a elevada temperatura	DIN 53799	l% t%	≤ 0,3 ≤ 0,6	0,05 (C) / 0,1 (CF)* 0,15 (C) / 0,25 (CF)*
Coef. de exp. térmica		1/K	-	$18x10^{-6}$
Coef. de conductividad térmica		W/mK	-	0,3
Permeabilidad a los vapores		μ	-	17200
Resistencia Superficial		Ohm		10^9-10^{11}
Resistencia a la quemadura cigarro		-	-	Sin cambios

As a result the laminate has been certified by official organisations in the following tests:

- The antibacterial material on the surface of the boards (Institute of Hygiene of the University of Vienna, Prof. Flam, nº F/39/79)

- Surface resistance to disinfectants (Austrian Institute of Plastics, nº 12298, 1978)
- Board tests as per DIN 53799 as classified according to the requirements of DIN 16928 (Austrian Institute of Plastics)
- Certificate of Quality from the Institute of Chemical Investigation for the Austrian Economy, nº 16507
- Type CF as per DIN 16926, fulfils the requirements of DIN 4102, Class B1, high inflammability. Mark of Approval PA III 2.2100 for 6-10 mm thick boards.
- Officially approved by the RFA Construction Inspection nº Z-33.2-16
- Medical qualification for fumes, as per DIN 4102, for board types N y F as per DIN 16926 (Department for Hygiene and Medicine in the Workplace from the Technical School in Aachen, Prof. Dr. Einbrodt)
- Report on the performance and lifespan of the boards for construction (Austrian Institute of Plastics, nº 20786/85 10 22)
- Report on the performance of the laminate, (Laboratory of Thermodynamics and physical Chemistry from the Terrassa School of Technical Engineering)
- Report on the possibility of disinfecting the laminate boards, (Prof. Dr. Med. Heinz Flamm)
- Testing for reaction to fire by national and international laboratories.



The decorative layer "FH" has a low porous level and is hygienic. It is formed by a combination of several layers as illustrated on the left.

The combination of the high quality laminate used and the protected decorative layer means that our furniture does not suffer from the normal signs of aging, retaining its properties and appearance from day one.
In the flowing table we can see the technical properties of the material as well as, tests conducted and the certificates gained.

Solidez a la luz y resistencia a la intemperie

Método de ensayo	Valoración	Valor normalizado	Valor real
EN 438-2 Solidez a la luz bajo lámpara de arco de xenón	escala de azul	≥ 6	≥ 7
DIN 53387 exposición a la intemperie artificial 3.000 horas de marcha de inversión (ensayo de xenón)	DIN 54001 escala de grises		≥ 3
DIN 50018 "lluvia ácida" atmósfera húmeda saturada alternante con atmósfera de $S0_2$ 50 ciclos KFV/0,25	DIN 54001 escala de grises		4-5

Propiedades mecánicas

Propiedades	Método de ensayo	Unidad de medida	Valor normalizado	Valor real
Densidad aparente	DIN52350	g/cm²		1,40
Resistencia a la flexión	EN 438	N/mm²	> 80	> 80
Módulo E	EN 438	N/mm²	> 9.000	> 9.000
Resistencia a la tracción	EN 438	N/mm²	> 60	> 60
Resistencia al choque	DIN 53453	mJ/mm²		> 6,5
Coeficiente de dilatación térmica	DIN 52328	1/k		18 x 10^{-6}
Variación dimensional en clima alternante a temperatura elevada	EN 438 para 6 mm grosor	longitudinal % transversal %	< 0,3 < 0,6	0,05 0,15
Conductibilidad térmica		W/mk		0,3
Resistencia a la difusión del vapor de agua		μ		aprox. 17.200

Clase de material de construcción, Austria B3800/parte 1	ÖNORM	Instituto austriaco de plásticos	B1, Q1, TR1 = 2 mm
Clase de material de construcción, Alemania	DIN 4102	Instituto para técnica de la construcción, Berlín	B1 para 6 – 10 mm, Nº Z Z-33.2-16 (marca de verificación PA III.2.2100)
Clase de material de construcción, Suiza		EMPA Dübendorf	índice de incendio 5.3 para 6 – 10 mm
Clase de material de construcción, Francia	NFP 92051	LNE	Calidad M1 para 2 – 10 mm
Clase de material para la construcción, España	UNE 23-727-90	LICOF	Calidad M1 para 2 – 10 mm

Certificaciones

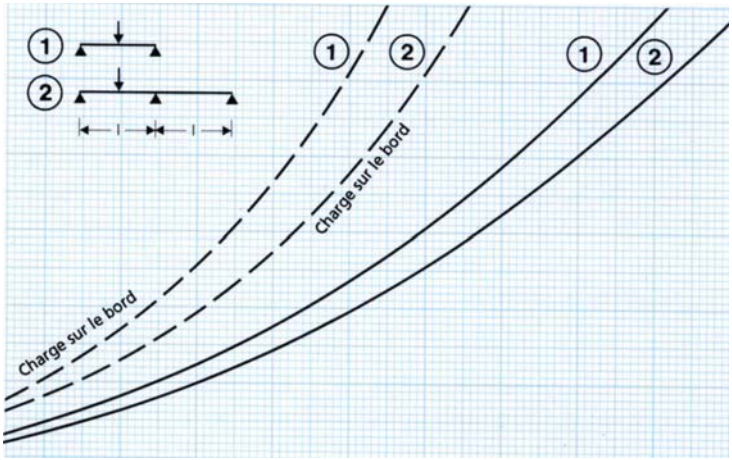
Autorización de fachada Alemania		Instituto para la técnica de la construcción, Berlín	6, 8, 10 mm Nº de autorización Z-33.2-16
Directiva ETB para elementos de construcción que proporcionan seguridad frente a caídas, del 6/1985 Petos de balcones		TU Hannover	se cumple (según la prescripción constructiva y construcción de barandas 6, 8, 10 ó 13 mm de grosor de placa)
Instituto Eduardo Torroja DOCUMENTO DE IDONEIDAD TECNICA	D.I.T. Nº 339	Instituto Eduardo Torroja - España	Sistema de cerramiento de fachadas con placas MAX EXTERIOR "F"

Advantis is basically constructed from two types of Aluminium.

The first type is aesthetically finished for light architectural use combing the highest performance qualities with painstaking design.

The second is high resistance, used in structural elements, which have to support heavy loads.

To achieve the high specifications needed for Advantis, studies on forces and inertia were conducted on various sections as well as on the mechanical properties of different materials such as the “Elastic Module” in order to achieve a product that is highly resistant to external forces.



All of the cross sections used are extruded from the alloy 6106 in T5 form.

This type of alloy is a variation of the 6063 but with more resistance and consists of a soft alloy with a small number of additional elements. It basically consists of Aluminium, Magnesium and silicone.

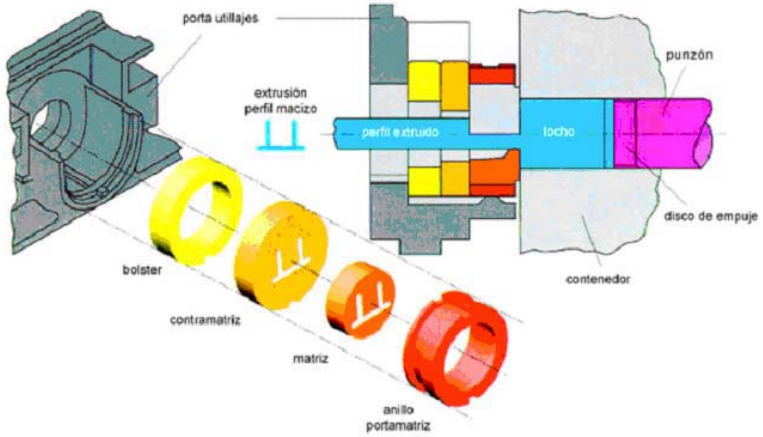
Its mechanical properties are:

- Rotation load Rm N/mm² = 220.
- Elastic limit Rp 0.2 N/mm² = 195.
- Extension A 5.65% = 15%.
- Brinell Hardness= HB 70.
- Diameter Pressure = 120-145 N/mm²

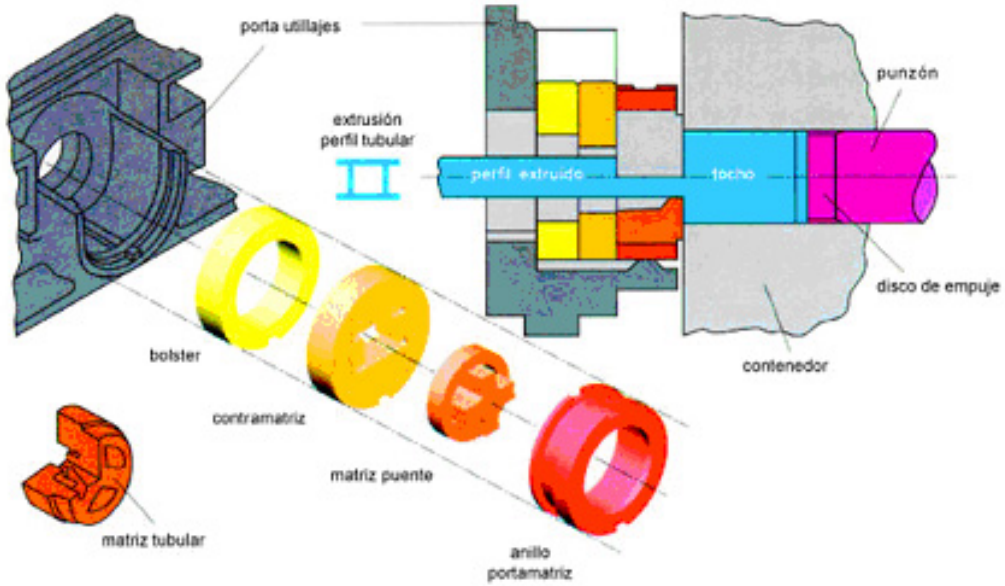
The T5 form consists of a thermal tempering treatment from the extrusion temperature and artificial maturity. By applying an adequate supply of compressed air to cool the other elements from the extrusion temperature, their mechanical properties are thus heightened by the fact that they are artificially matured.

The extrusion of our cross sections is done in a press. This is a process of obtaining a structure via plastic deformation, which involves moulding a metal, hot or cold, by compressing it in a container, blocked at one end with a mould, which is shaped to the approximate dimensions required. At the other end there is a solid disc known as the pressure disc.

EXTRUSION E HILERA DE UN PERFIL MACIZO

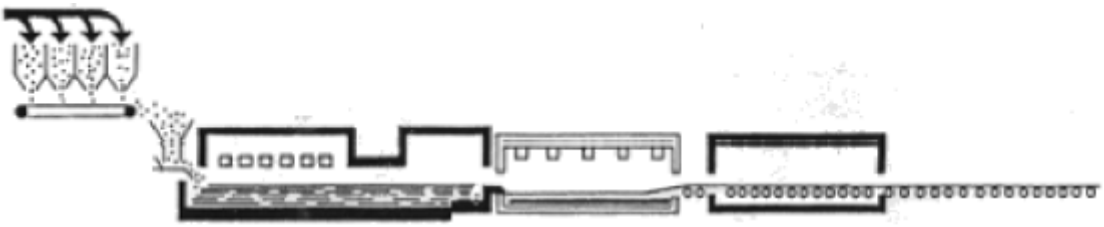


EXTRUSION E HILERA DE UN PERFIL HUECO



The glass used in Advantis is a “floating” type of opaque glass, which undergoes a tempering treatment.

The term floating comes from the manufacturing process, which consists of blowing the glass in a furnace from which it passes into a chamber housing a vat of liquid tin, on which the glass floats. The class expands and continues horizontally. On leaving the chamber it passes through a tunnel where it is reheated and finally cut.



Introducción de materias primas | Fusión de materias primas (entre 1500 y 2000 ºC) | Formación de la hoja de vidrio por flotación sobre baño de estaño (a 1000 ºC) | Recocido | Control, corte, almacenamiento ...

All elements of this process meet the requirements of standard EN 572-2.

During the tempering process we subject the glass to a thermal process, where the glass is uniformly heated to above its normal melting point, to about 700ºC. It is then quickly cooled on the surface. This starts the formation of a surface layer, formed under low-pressure forces with equalised polarisation. This layer gives the glass new properties, which makes it a totally different product to the original glass panel.

An important property of tempered glass is that, on breaking it shatters into very small pieces, which are unlikely to cut.

The properties gained in the tempering process are:

- Greater heat resistance.
- Greater flex resistance.
- Greater mechanical tolerance.
- Greater torsion resistance.
- Greater impact resistance.

8. Surface Treatment for Metal Components

8.1. Steel Components

During the surface treatment the steel is protected from the action of atmospheric agents, thus guaranteeing a longer life of the components.

8.1.1. The Painting process

Installations
The painting machinery comprises of a pre-treatment tunnel, a drying oven, a painting module with dry air intake, a polymerising oven and a general control area. All of the components are transported through each zone of the installation using an aerial system.

Drying heaters
Length: 14 metres
Temperature: 120º

Painting Modules
These installations comprise of two modules, the first for white and light colours and the second for black and dark colours. The recirculation of the powder (paint) is fully automatic using a closed circuit. Robots are available to function in this area as it is also used to complete any “touch ups” as necessary.

Polymerisation Chambers
The two polymerisation ovens are 40 meters long and are heated by “Vena de Aire” natural gas burners.

Stages of the Painting Process:

Stage 1: Alkaline degreasing

Purpose: Eliminate all oils, small imperfections and any particles from the surface of the component.

Stage 2: Constant washing cycle

Purpose: To eliminate the residues left by the previous stage. The water in the section is renewed constantly.

Stage 3: Tri-metal Amorfa Phosphorisation

Purpose: To chemically transform the surface of the component by adding a phosphorous layer: 0.4-0.6 gr/m². Surfaces of iron, aluminium and zinc components can be treated in this way.

The type of phosphate used is “AMORFO”.

Stage 4: Constant washing cycle

Purpose: Same as Stage 2.

Stage 5: Chroming

Purpose: Eliminate the dirt from the surface and neutralise the component. Product based on Cr6 + and Cr3+

Stage 6: Constant washing cycle with deionised water

Purpose: To wash the component with water of a higher quality than mains water to completely clean the component.

Stage 7: Ionised water directly applied via jets

Purpose: To totally eliminate any dirt or residues on the surface of the component.

8.1.2. Technical Features of the Paint

FEATURES OF THE POWDER:	
Density (UNE 48 – 098 – 92)	1. 60 g / cc.
Gel Cycle (150° C)	100 / 150 c.
Non Volatile Material (180° C)	99.9 %
Physical Stability	Good

APPLICATION	
Tension	50 – 70 KV
Cured/Hardened	10 to 100ºC (Temp of Component)

FEATURES OF THE APPLIED FILM (*)	
Thickness (UNE 48 – 031 – 80)	60 – 80
Shine 60º (UNE 48 – 026 – 80)	90%
Resistance to overheating	E < 2.0
Hardness (UNE 48 – 024 – 80)	250”
Adhesion (UNE 49 – 032 – 80)	100 %
Erichsen Inlay (UNE 48 – 183 – 84)	7 mm.
Folding 5 mm (UNE 48 – 169 – 92)	OK
Percussion: Direct and Inverse	
(Inta 160266)	70 cm (1 Kg)

ACCELERATED AGING TEST (*)	
Saline Fog chamber (INTA 160604)	500 hrs. Minimum
Saturated humidity (DIN 50 017)	500 hrs. Minimum
Exposure to bad weather Q. U. V.	----------

REACTION TO FIRE EXCEDE THE BASE OF STANDARD UNE 23.727-90
RADIATION TEST (UNE 23.727-90)

Tests	I	II	III	IV	AVERAGE
Index i	0	0	0	0	0
Index s	0	0	0	0	0
Index h	0	0	0	0	0
Index c	< 1	< 1	< 1	< 1	< 1

i (In flammability Index)
s (Development of flames Index)
h (Maximum Height of the flame Index)
c (Combustibility Index)
The reaction to FIRE of the thermo durable epoxy-polyester paint in powder form, reference H99-5532 applied to a stainless steel sheet with electrostatic equipment, and in a quantity of approx. 70 g/m², 40-50 microns thick. The coating density is 164 g/cm³, dry extract 100”.

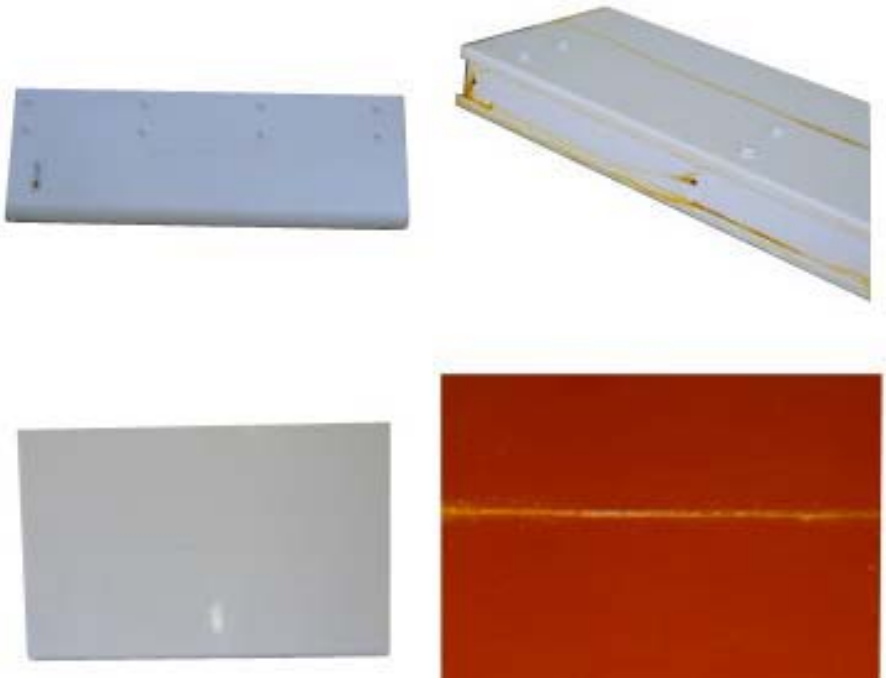
8.1.3. Tests

Verification and control

Once painted the components are checked and packaged.

The different metal components, are subjected to Saline Fog Tests in laboratories approved by the ENAC following specifications set out in standard UNE-EN ISO 7253 and DIN 50021. In these laboratories the painted components are subjected to 300 hours of exposure to a saline environment. As a result of these tests that are conducted periodically together with the quality control applied to all of its products, GESAB, S.A. guarantees the finish of its products both in terms of durability and quality. Furthermore GESAB's constant checking of its processes and practices enables the company to always offer its customers high quality products.

These tests, as can be seen in the images below, are conducted on actual lines as well as test components.



8.2. Aluminium Components

During the surface treatment we protect the aluminium from the atmospheric agents, by covering it with a thin film of oxide. This layer of Al2O3 has a more or less regular thickness of 0.01 microns on metal that has been recently sanded and can be as thick as 0.2 or 0.4 microns on metal that has been treated in an annealing oven. To guarantee greater durability the upright supports of the Advantis range are available in two finishes: Lacquered or Natural.

8.2.1. The Natural Finishing Process

During the natural finishing process much heavier films of oxide can be obtained artificially which also have different properties to the oxide layer that occurs naturally. They are more protective, as they can be up to 25 to 30 microns thick in protection or decoration treatment processes, reaching 100 microns and more for surface hardening processes. This is known as hard oxidisation.

Gesab S.A.'s process of oxidisation meets the quality requirements for oxidised aluminium for defined architectural purposes, as set by national and international standards such as the Quality Mark EWAA/EURAS (QUALANOD)

Stages of the Process:

Preparation of the base material by:

Cleaning with a cotton brush

Sanding with emery paper

Scrubbing with a metal brush

Other types of cleaning

Degreasing:

Acid surface cleaning etc.

Alkali cleaning

Washing in a continually renewed water cycle.

Deep surface removing cleaning (with 5% caustic soda in water at 45-50°C)

Cleaning to achieve an immediate matte finish

Chemical cleaning

Electronic cleaning.

Washing in a continually renewed water cycle.

Neutralising (50% Nitric acid at 60°Be in water at ambient temperature)

Washing in a continually renewed water cycle.

Anode oxidation (20% sulphuric acid in water at 19-20°C and a continual current of 1.5 A/dm2²)

Washing in a continually renewed water cycle.

Colouring.

The outer layer of oxide formed by sulphur is porous in structure and similar to textile fibres. It can therefore be coloured using special colours derived from dyes used in textile industry.

As the outer layer is transparent, the shine from the base metal shows through and can give an effect that no other surface treatment like paint or varnish is able to equal.
The colourings used to colour aluminium can be organic or mineral.

a) Organic Colouring, a large number of different colourings can be used for this type of treatment. They are different especially in their method of absorption. The majority are absorbed by capillarity. It is these in particular, groups of acid colours and so called substantive colours such as alizarin and indigo dyes.

Others function through a chemical reaction with the aluminium, like the colours from metallic compounds, diazole and basic colours. The latter need to be treated with collagen substances and are rarely used due to their poor resistance to light.

b) Electrolyte Colouring, metal oxides are used for this treatment. These work on the porous nature of the oxide layer and are highly resistant to light and heat.

Coating or Fixing.

Experience shows that a 20-micron oxide layer formed on aluminium that isn't sealed, disappears in a few hours in a decinornmal solution of nitric acid. The same layer when perfectly sealed shows practically no loss after 1,200 hours of emersion. In reality it is one of the principle features of the aluminium sealed in the outer layer or seal that gives resistance to the acid.

It is vital to seal in pure water, preferably demineralised, or better still with deionised water.

The most used process for demineralising water is the exchange of an ions and cat ions by using special resins that exchange ions. The aim is to achieve a double exchange of ions (by installing two bodies) and not to soften the water, by transforming the non-soluble elements into soluble dirt, and thus run the risk of producing bodies that may be detrimental to the sealing layer.

The temperature of the in coming water is given as boiling point (in practice 97-100°C) with the result that it produces hydration very slowly when coming into contact with water of a lower temperature.

It is advisable to keep the pH of the bath between 5.5 and 6.5.

8.2.2. Lacquering Process

Gesab S.A. guarantees that its products have been lacquered according to the quality and standards of **QUALICOAT**. These standards are based on minimum technical requirements so that the lacquering process for the aluminium is fully guaranteed.

These standards are continually applied and met.

PRETREATMENT.

The preparation of the surface for painting is carried out in a sprinkling using nozzles designed to this effect or by emersion in baths.

The treatment cycle consists of the following phases:

- **Degreasing Phase.**

This is the first stage of cleaning and absorption of oils from the surface.

- **Rinsing Phase.**

Rinsing with water at ambient temperature; this is carried out in two stages, the second of these acting as a final rinse with water directed straight at the material.

- **Descaling or Stripping Phase.**

The objective in this phase is to attack the crossection's surface, leaving it totally clean and ready for the next phase.

- **Rinsing Phase.**

Rinsing with water at ambient temperature under the same conditions as phase 2.

- **Chroming Phase.**

A solution chromic acid with stabilisers is used, which transform the surface into zinc chrome, which ensures that the final product has excellent adherence and resistance to corrosion.

- **Washing with Deionised Water.**

To clean the surface of the lime deposits left by the other cleaning processes.

APPLICATION OF THE TREATMENT.

The treatment is applied in a specially equipped module, using electrostatic pistols operated by robots. Using a combination of the speed of the transporter, the volume of powder, the electrostatic charge and the speed of the robot, a completely even finish is achieved. The paint that doesn't end up on the component itself is then recycled via a cyclone redirected to the pistol nozzles.

POLYMERISATION.

This is carried out in a fan assisted oven, to permanently provide the correct time and temperature for the cross sections as stipulated by the paint manufacturer. In this way we achieve a layer of organic polymer at least 60 microns thick on the surface of the component.

8.2.3. Tests

Tests are regularly carried out on the painting process to ensure the durability and quality of the finish.

Tests are carried out on lacquered test pieces at the same time as on the material and the frames themselves.

The following tests are carried out:

- Shine
- Thickness of the coating
- Adhesion
- Buchholz hardness
- Perforation
- Resistance to bending
- Impact
- Melting Test

8.3. Maintenance and Cleaning

The Natural Finish 

Clean by dusting periodically with a clean cloth. If dirt builds up over time, clean with soapy water and rinse well with plenty of clean cold water and dry with a soft cloth.

NEUTRAL synthetic cleaning products may be used, applied with a soft brush, chamois or sponge, rinsing with clean cold water.

When the surfaces have been this cleaned, they can be polished using a thin layer of Vaseline or Lanoline. This must be web diluted to avoid the build up of excessive dust.

COMPLETELY avoid the use of STANDARD or ACIDIC cleaning products, heavy abrasives, such as sand, wire wool, metallic sponges, etc.

Painted or Lacquered 

Lacquered aluminium should be cleaned periodically. The required frequency will depend on the environment in which the unit is based, however it should be cleaned at least once a year.

Cleaning should take place with a solution of 5% soap or neutral detergent in water using a sponge, a chamois or a damp cloth. Care should be taken to ensure that these are free from anything that may scratch the surface (sand in the water, dust, etc.)

Ensure that the surface area is totally cold (maximum 20 degrees centigrade) and do not expose to direct sunlight. Similarly the detergent should be kept cold (maximum 20 degrees centigrade)