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LONGSPAN SHELVING

TECHNICAL CATALOGUE

INDICE

1 REACH

1.1 History of Revisions

Revisión	Date	Superseded/Replaced Document		
04	04/08/2009	Longspan Shelving. Technical Catalogue	Revisión 03	16/09/2008
03	16/09/2008	Longspan Shelving. Technical Catalogue	Revisión 02	16/06/2008
02	16/06/2008	Longspan Shelving. Technical Catalogue	Revisión 01	14/05/2008
01	14/05/2008	Longspan Shelving. Technical Catalogue	Revisión 00	29/04/2008
00	29/04/2008	CREATED		

2 GENERAL

2.1 Quality Control

The quality of the product Arestant offers its customers is based on the various controls carried out in the Quality Management System in the different phases of the production and commercialisation process.

2.2 The Raw Material

Our knowledge of steel, obtained as a result of extensive experience, provides us with the necessary basis to use the most adequate quality for each product

In order to manufacture the elements of the racking system and according to the requirements of every component, different qualities of steel are used with guaranteed minimum elastic limits that vary from 235 N/mm2 (S235JR according to EN 10025) to 420 N/mm2 (S420MC according to EN 10149), and 355 N/mm2 (S355MC according to EN 10149).

Each manufactured product is associated to a minimum raw material specification and it is received together with its quality certificate which is verified in each receipt.

2.3 The Manufacturing Process

ARESTANT, S.A. has the latest technology to manufacture storage systems for heavy and medium loads. The automation level reached in the production process is the basic guarantee for the quality and reliability of our product.

The production process automation is also a guarantee for repetitive and unified manufactured parts. This requirement, inherent to the line, is reinforced with controls set for each operation.

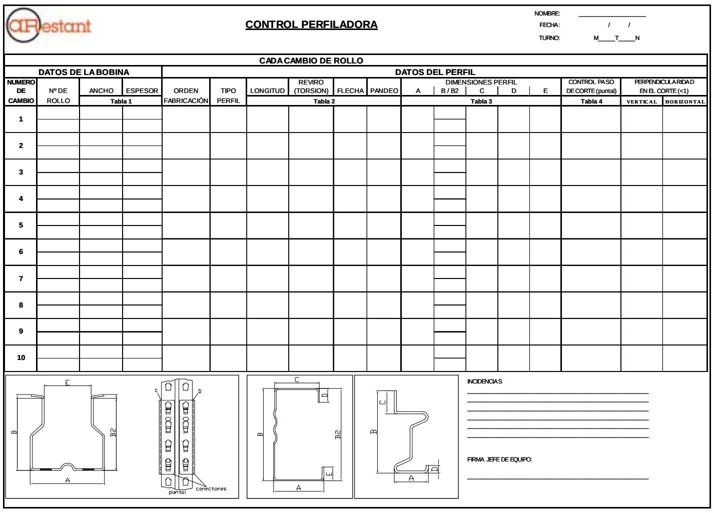
From profiling to painting, each operation which changes any product properties is routinely checked, either manually or automatically, in order to ensure a strict quality standard.

2.3.1 Profiling

A profiler that is technologically up-to-date, robust, versatile and allows for a strict control of the dimensions of the profile, ensures that the product is always within the parameters of established quality

The numerous controls defined in our Quality Control system for this phase of the process allow us to obtain a profile within very reduced tolerances.

For each manufactured article we have defined a complete set of dimensions that are continually checked during each production order. Each critical measurement is controlled to ensure that the product is reacting correctly for both the assembling of the installation and under the application of the load.


CONTROL PERFILADORA

NOMBRE: ____________
FECHA: / /
TURNO: M____T____N

CADA CAMBIO DE ROLLO

DATOS DE LA BOBINA				DATOS DEL PERFIL													
NUMERO DE CAMBIO	Nº DE ROLLO	ANCHO	ESPESOR	ORDEN FABRICACIÓN	TIPO PERFIL	LONGITUD	REVIRO (TORSION)	FLECHA	PANDEO	DIMENSIONES PERFIL A	B / B2	C	D	E	CONTROL PASO DE CORTE (puntal)	PERPENDICULARIDAD EN EL CORTE (<1)	
		Tabla 1				Tabla 2				Tabla 3					Tabla 4	VERTICAL	HORIZONTAL
1																	
2																	
3																	
4																	
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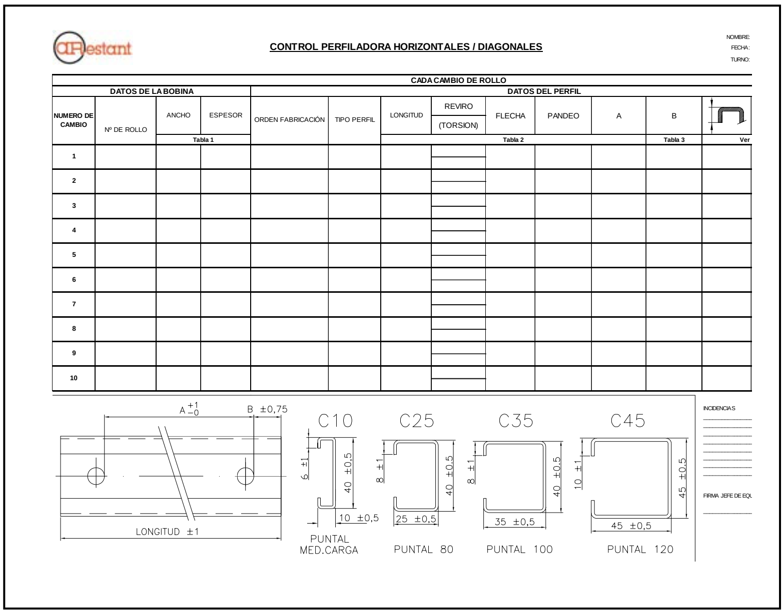
9																	
10																	

INCIDENCIAS

FIRMA JEFE DE EQUIPO:

Quality control of profilings. Beams and Frames



NOMBRE:
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TURNO:

CONTROL PERFILADORA HORIZONTALES / DIAGONALES

CADA CAMBIO DE ROLLO												
DATOS DE LA BOBINA				DATOS DEL PERFIL								
NUMERO DE CAMBIO	Nº DE ROLLO	ANCHO	ESPESOR	ORDEN FABRICACIÓN	TIPO PERFIL	LONGITUD	REVIRO (TORSION)	FLECHA	PANDEO	A	B	
		Tabla 1				Tabla 2					Tabla 3	Ver
1												
2												
3												
4												
5												
6												
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9												
10												

Quality control of profilings. Bracings

2.3.2 Welding

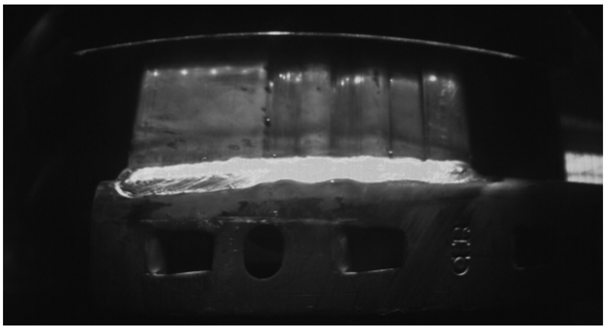
The process of automated welding guarantees the repetitiveness of the processed parts with controls within the cell itself thereby guaranteeing the quality of the product. In the same way, the automated system gives a uniform welding with an excellent artificial finish.

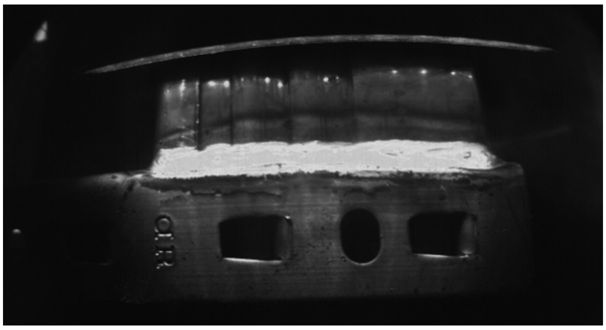
The final unit control of 100% of the welded parts using state of the art techniques, discards any possible defect in this operation; these aspects being of vital importance in the comportment of the Beam when supporting loads.

The Welding procedure has been approved in accordance with the regulations UNE EN 288-8 2000 and EN ISO 15614-1.

The welding between the profile of the beam and the connector is one of the critical components of Longspan Shelving.

Arestant does the quality control of this operation automatically using high technology: The position and the continuity of the welding cords is verified by unit 100% of the parts produced, ensuring the absence of cracks and defects during the welding phase.





Quality control of the Welding

2.3.3 *Painting*

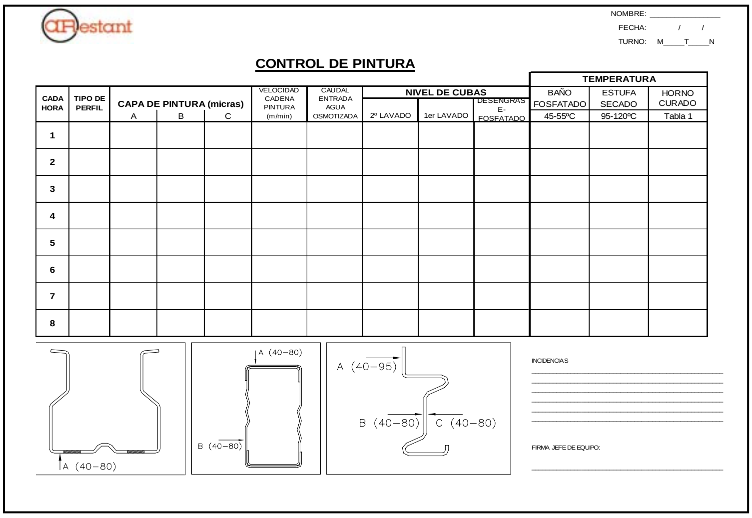
The Frames and Beams are painted via automatic processes where they undergo previous phases of degreasing, phosphated and washed with 100% osmotised water. This eliminates the possibility of the appearance of impurities which could lead to corrosion.

The deposition of paint is carried out via an electrostatic application in an automated cabin. For that reason, paint in the form of powder made of epoxy-polyester is used followed by grounting in an oven.

The Frames are painted as standard in BLUE ARESTANT and the Beams in ORANGE ARESTANT, with the possibility of using other colours. Frame Protectors and other preventive elements are painted in YELLOW ARESTANT.

All our paintings are 100% lead-free and have been approved as MI in terms of comportment in the case of FIRE according to the regulation UNE-23727

The state of the treatment baths (temperature and concentration) and the cleaning, the temperature of the oven and the analysis of the layer of paint in different walls of each part, controlled hourly ensure a uniform finish of our products.



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CONTROL DE PINTURA

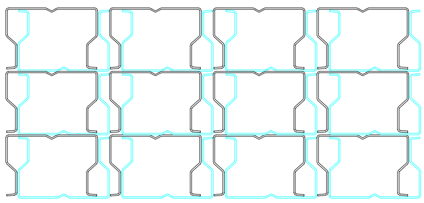
CADA HORA	TIPO DE PERFIL	CAPA DE PINTURA (micras) A	B	C	VELOCIDAD CADENA PINTURA (m/min)	CAUDAL ENTRADA AGUA OSMOTIZADA	NIVEL DE CUBAS 2º LAVADO	1er LAVADO	DESENGRASE-FOSFATADO	TEMPERATURA BAÑO FOSFATADO 45-55ºC	ESTUFA SECADO 95-120ºC	HORNO CURADO Tabla 1
1												
2												
3												
4												
5												
6												
7												
8												

Quality Control of Painting

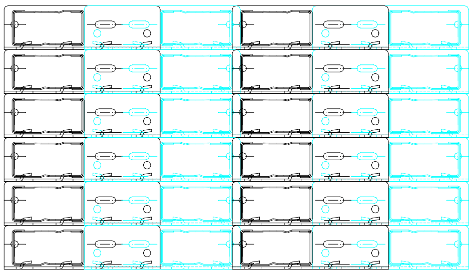
2.3.4 Packaging

The final phase of the process, automatised like the previous ones, guarantees a final uniform packet with excellent protection against accidental impacts during the handling and transportation phases:

- Frames and Beams are assorted in minimum groups of four units per container.
- Each container is covered with plastic lengthway, making sure that the ends of the products are protected to avoid deterioration of the goods when being handled and transported.
- The containers are assorted in large units for storage and delivery, using narrow strips of polyester, avoiding other materials that could damage the product



Section view of attached uprights



Section view of attached beams

2.4 Comercialised Products

All the commercialised products that are part of our range are controlled on reception, verifying those characteristics that affect the functionality of the element.

For each component a specific format has been defined in which the properties to be controlled and the required finish in our standards appear.

3 OVERVIEW OF THE STORAGE SYSTEM

The purpose of this document is to define the features of the Longspan Shelving system supplied by ARESTANT, S.A. as well as the guidelines to ensure the correct assembly. The information herein contained does not apply to other storage systems, which could be partially covered.

The information in this catalogue is intended for installers, designers and users familiar with the use of Longspan Shelving, who may benefit from knowing the characteristics of the product manufactured by ARESTANT, S.A..

3.1 Overview of the Longspan Shelving system

The Longspan Shelving system is designed to manually store small to medium sized products for picking operations, being the ideal solution for storing diverse material.

Storage is carried out on foot from floor or from elevated walkways supported by the shelving system.

Longspan shelving increases the space available by allowing several handling levels. It is a simple structure consisting of frames, which set the height of the system; beams, which set the length of the bay; and other elements intended to protect the structure.

This system includes a wide variety of accessories, such as support bars, garment rails, chipboard panels, galvanized supports, access stairways, railings, etc., for storing any kind of products making it a highly versatile shelving system.

This storage system provides the following advantages:

- Capacity to adapt to changing needs.
- The variety of available accessories and configurations allow you to adjust the shelving to any type of load, according both to weight and volume.
- Maximization of space is allowed by easily and quickly adjusting load levels to meet required volumes.
- Maximum cost-effective space and optimal stock management.
- Easily assembled modular structure. The assembly design of the different structural elements makes disassembly and transport easy, as well as reconfiguration or enlargement according to new storage needs.
- Increased safety based on its accessories.

Easily and quickly assembled, strength and versatility make it particularly suitable for storage needs of workshops, industrial stores, ancillary warehouses, archives, spare parts warehouses,…

The longspan shelving system can be used to make different kinds of raised tiers and elevated walkways.

Shelving for picking is designed for those systems in which the goods are manually placed and withdrawn. The full height of the facility can be leveraged, since the highest levels can be accessed both using mechanical means that take the operator to the desired level (S/R cranes or order-picking trucks) and by means of walkways located within the shelving system.

Also frequently used are combined installations of picking shelving and pallet racking, where the higher area is for pallets and the lower area is for picking.

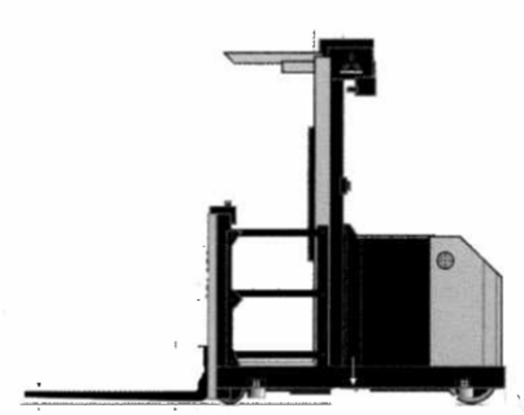
3.2 Types of Forklift Trucks

3.2.1 Pallet Trucks

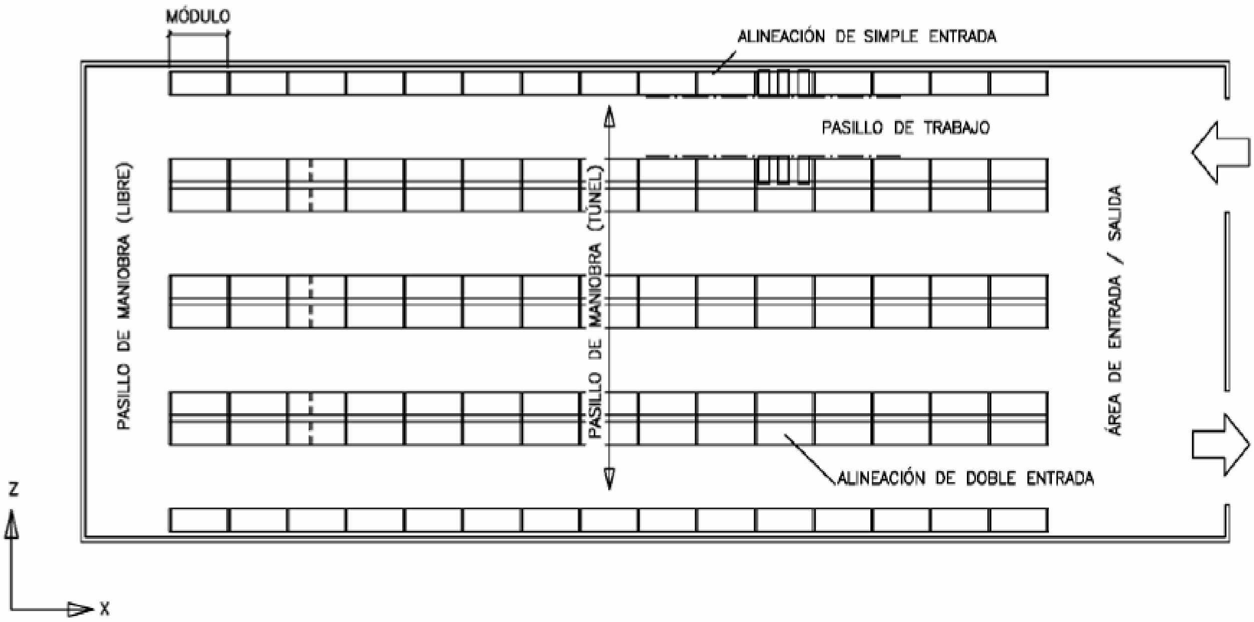
Both hand- and electrically-operated pallet trucks provide an easy way to transport materials located in different working areas.

3.2.2 Order Picking Reach Truck. Class 400.

An electrically-powered machine, manually operated on-board, specifically designed for picking loose items from shelves. It is used for indoor work and with narrow-aisle systems.

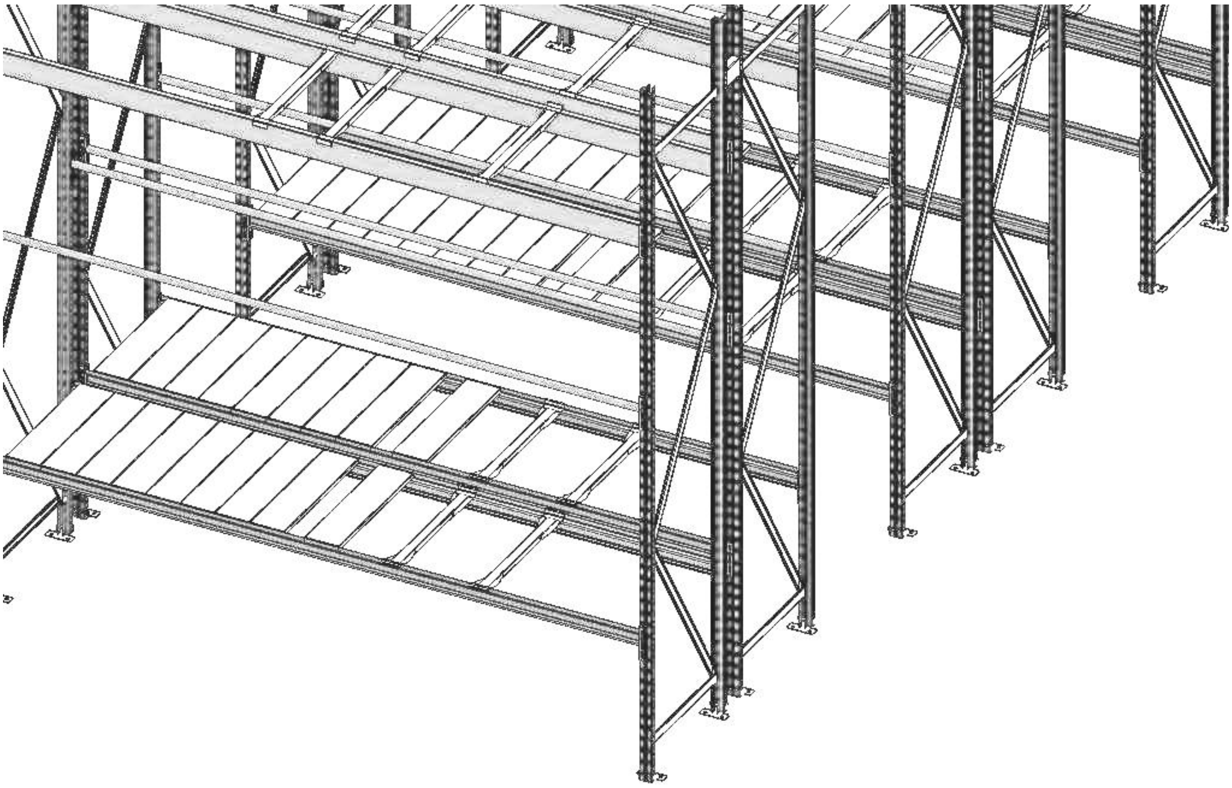


3.3 General Definitions



- Run: The adjacent bays in the longitudinal direction.
- Warehouse: The area for storing and handling unit loads.
- Storage Cell: The space between two frames and any two load levels.
- Staging Area: The area adjacent to loading bays or gates intended to receive or ship the unit loads.
- Double Entry: A shelving run accessible from two operating aisles.
- Double Deep: A shelving run for storing two unit loads deep.
  - X. Longitudinal Axis. Down-aisle direction.
  - Z. Cross Axis. Cross-aisle direction.
  - Y. Vertical Axis. Load-level direction.
- General Layout: Plan view of the facility inside the warehouse (see Figure).
- Bay: Space between two frames, spanning as many load levels as allowed by their height.
- Load Level: The area or set of components intended to support the stored unit loads.
- Operating Aisle: The longitudinal space between two shelving runs allowing direct access to load levels.
- Safe Aisle: Cross space perpendicular to the operating aisles intended only to allow people to move between aisles.
- Single Entry: A shelving run accessible from one operating aisle.
- Single Deep: A shelving run for storing one unit load deep.
- Unit Load: A unit item consisting of cartons or platforms which hold the goods for handling, storage and transport.

3.4 Basic Components



- Frame

A vertical structure consisting of two or more perforated uprights, joined to one another by means of a lattice, intended to support a bay's load levels.

  - Upright: A vertical element to which beams, arms, supports, etc. are attached, also supporting their loads
  - Bracing: A horizontal or vertical structure keeping cross or down-aisle alignment, providing stability to the whole structure.

- Base Plate

A structural component joined to uprights, allowing the loads to rest and be distributed on the slab or ground.

- Leveling Shim

A steel component located under the base plate, ensuring the leveling of the system.

- Anchor Bolt

A single device allowing the base to be joined to the slab or ground.

- Beam

A horizontal component supporting the unit loads at each level. It is equipped with a connector at each end for fixing to the upright.

- Shelf

A surface that is the load level and can be composed by steel panels, chipboard panels, grid panels, etc.

- Shelf Panel

A component, in a single or multiple arrangement, making up the shelf.

- Top Panel

A surface which does not support unit loads, closing the facility from the top.

- Side Panel

Lateral covering of the facility to close and stabilize it across.

- Shelf Reinforcement

A component fixed to the shelf, increasing its load bearing capacity.

- Panel Support

A component connecting the shelf panel and the upright to each other.

- Retainer

A part located on the beams, preventing the shelf to be displaced horizontally.

- Shelf Divider

A vertical component which divides the shelf horizontally.

- Sign

Informational item used to make personnel tasks and warehouse operation easier.

- Back

Rear covering that encloses the facility and provides it with longitudinal stability.

- Front Piece

A component located in the front or rear of the facility, preventing objects from falling out.

- Name Plate

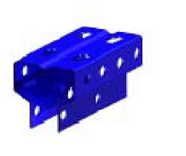
Marking conspicuously and permanently attached to the facility which specifies its features.

- Support Bar

A structural component, crossly joined to beams, increasing the load bearing capacity of the shelf or the pallets. It can also prevent the longitudinal displacement of beams.

4 COMPONENTS

FRAME



UPRIGHT

HORIZONTAL AND DIAGONAL

UPRIGHT BASE

BEAMS

BEAMS Z

BEAM 103

GARMENT RAIL BEAM

ACCESSORIES

RETAINER SUPPORT BAR

WALKWAY/INSIDE FRAME SUPPORT

CHIPBOARD SUPPORT

LEVELING SHIM

ROW SPACER

UPRIGHT SPLICER

SAFETY LOCKING PIN

METAL SHELF PANEL

4.1 FRAME MC

A vertical structure consisting of two or more perforated uprights, joined to one another by means of a lattice, intended to support a bay's load levels.

4.1.1 Dimensions and Components

A frame consists of two uprights and the corresponding bracing, upright bases and fixing elements (bolts, nuts and fixing plates). Floor anchor bolts are not included.

Bracing is formed by horizontal and diagonal profiles whose length, depending on the frame width, is shown in the following table:

FRAME WIDTH (mm)	LENGTH OF HORIZONTAL (mm)	LENGTH OF DIAGONAL (mm)
400	362	949
500	462	989
600	562	1037
800	762	1155
900	862	1222
1.000	962	1294
1.200	1162	1448

For the frames' horizontal and diagonals length calculation the following equations can be used:

- Horizontal length:

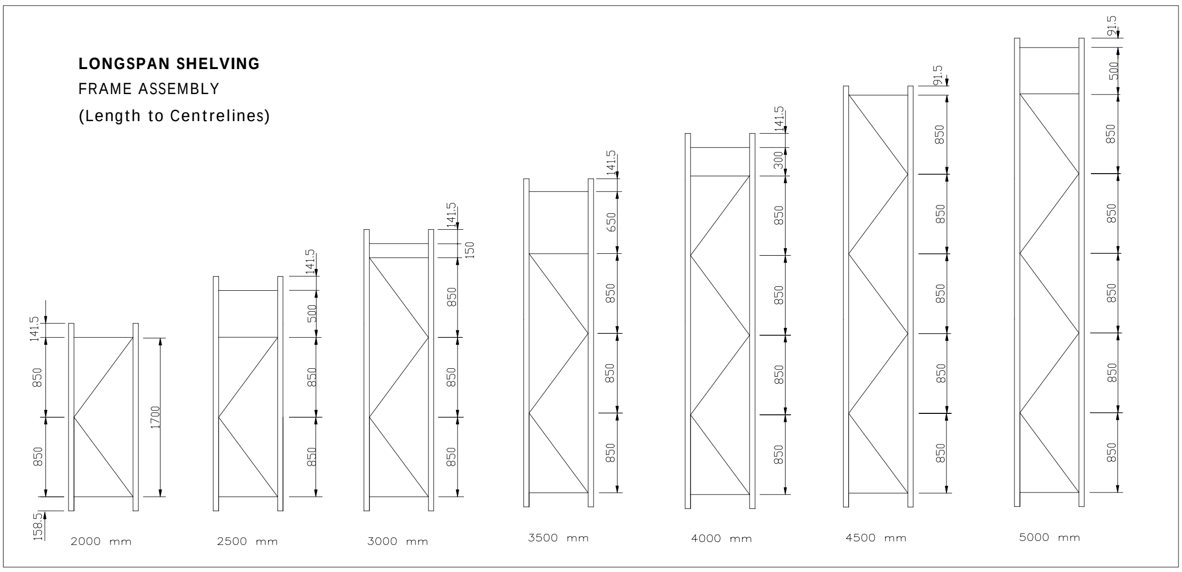
$$L_{horizontal} = B_t - 38$$

- Diagonal length:

$$L_{diagonal} = \sqrt{(L_{horizontal} - 40)^2 + (850)^2} + 40$$

Being B_t the frame depth.

The first horizontal member is placed 158.5 mm from floor and then diagonal members are placed every 850 mm, with a final horizontal member. If the distance of the last horizontal member at the end of the upright is equal to or greater than 291.5, another horizontal member will be placed at a minimum distance of 150 mm. The following figures show the different configurations depending on the frame height:



The number of each of these components necessary to make up a frame is based on height according to the following table:

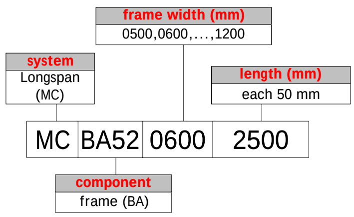
FRAME HEIGHT (mm)	UPRIGHT	HORIZONTAL	DIAGONAL	UPRIGHT BASE	BRACING FIXING BOLT	UPRIGHT BASE FIXING BOLT	WASHER	NUT	SPACER FIXING PLATE
2.000	2	2	2	2	5	2	7	7	2
2.500	2	3	2	2	7	2	9	9	4
3.000	2	3	3	2	8	2	10	10	4
3.500	2	3	3	2	8	2	10	10	4
4.000	2	3	4	2	9	2	11	11	4
4.500	2	2	5	2	8	2	10	10	2
5.000	2	3	5	2	10	2	12	12	4

Frame Composition

4.1.2 Designation and Codification

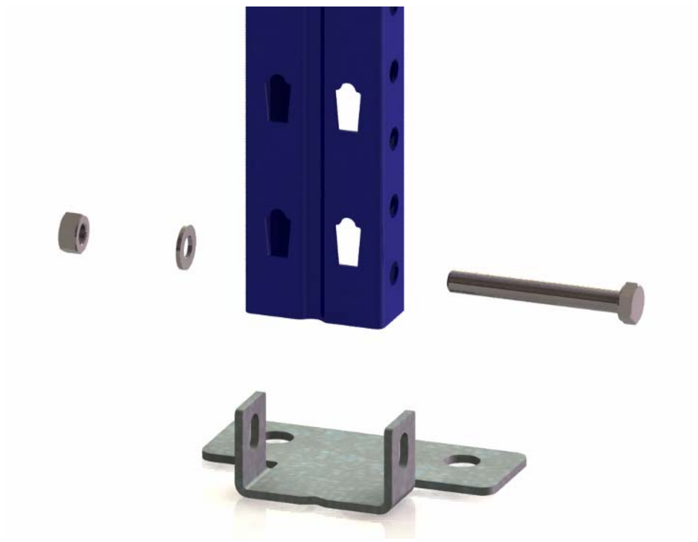
FRAME MC / [WIDTH] / [LENGTH]

Example: FRAME MC / 0600 / 2500



4.1.3 Fasteners

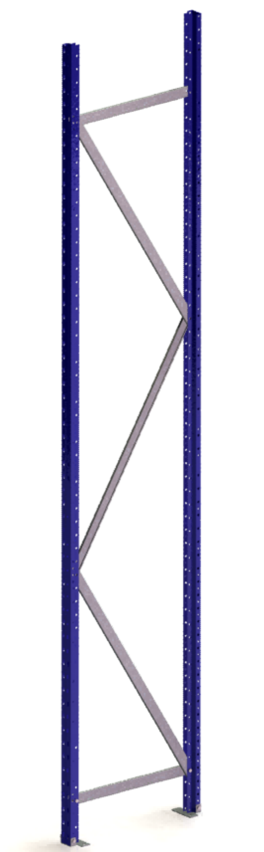
- Upright – base connection: 1 Bolt DIN 931 M8X65 6.8 Zinc Coated
  1 Nut DIN 934 M8 6.8
  1 Washer DIN 125 M8



- Upright – bracing connection: Bolts DIN 931 M8X35 6.8 Zinc Coated
  Nuts DIN 934 M8 6.8
  Washers DIN 125 M8
  Spacer Fixing Plate MC


A Spacer Fixing Plate MC is not required at anchor points where 2 bracings are joined.

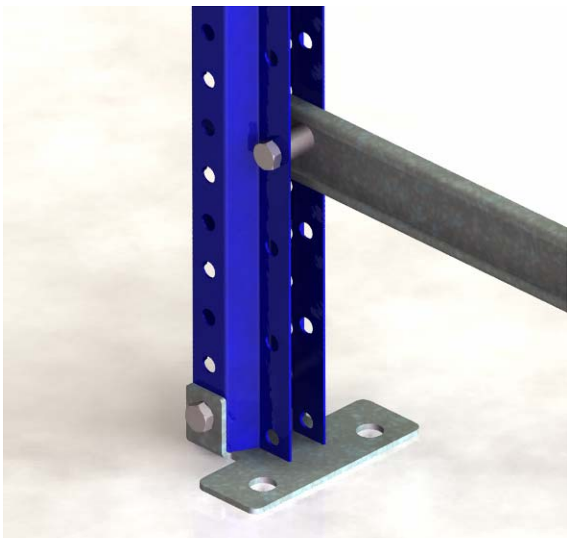
4.1.4 Frame Assembly



Fasten the upright base to the upright using bolt M8x65 6.8 DIN931

Install bracing (horizontals and diagonals) bottom up.

The first horizontal (closest to the floor) must be placed 158.5 mm from floor, at hole 4 from the bottom of the upright.



Then, place the remaining diagonals, bearing in mind that vertical distance between ends is 850 mm measured vertically.

Spacer fixing plates must be installed at ends of horizontals not matching a diagonal.

Once frame assembly is completed, beams must be positioned according to the desired height for storing the load. To do this, the beam end connector's flanges must be fitted to the upright front holes. A safety locking pin must be used for each connector to prevent the beam from disassembling by accidental impact during loading/unloading operations.

The frame's load bearing capacity must be considered when defining the distance between beam levels so that admissible load is not exceeded.

We recommend fastening the upright bases to the floor in order to prevent the effects from accidental impact on the frame. According to EN 15635 in single tier hand loaded systems without drawers and with a height of less than 2,5m or single tier double runs less than 4,0m in height, nedd not comply with the requirement regarding floor fixings if the ratio between height to topmost loaded shelf and overall depth is less than 4:1.

Frames must be completely vertical after assembly. When the system is assembled and still unloaded, the deviation from the upright vertical shall not exceed d=H/350, where H is the frame height.

The whole surface of the upright bases must be in contact with the floor. The difference in height between 2 bases of the same frame must not exceed 1/500 of the frame width. To achieve this, use as many leveling shims as needed. Leveling shims will be located under the upright bases and must be firmly fastened to these using anchor bolts.

For double-entry systems, we recommend using at least 2 frame splicers at each pair of frames.

- The lower frame splicer must be installed next to the diagonals connection that is closest to the floor.
- The higher frame splicer must be installed next to the horizontal that is joined to the last diagonal.

4.1.5 UPRIGHT

4.1.5.1 TECHNICAL CHARACTERISTICS

Type	Width A (mm)	Depth B (mm)	Weight (Kg./ml)	Finishing
MC	52	50	1,626	BLUE ARESTANT

4.1.5.2 MATERIAL

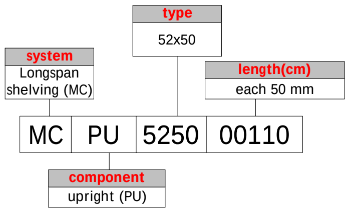
S355JR or S355MC according to EN 10025 or EN10149

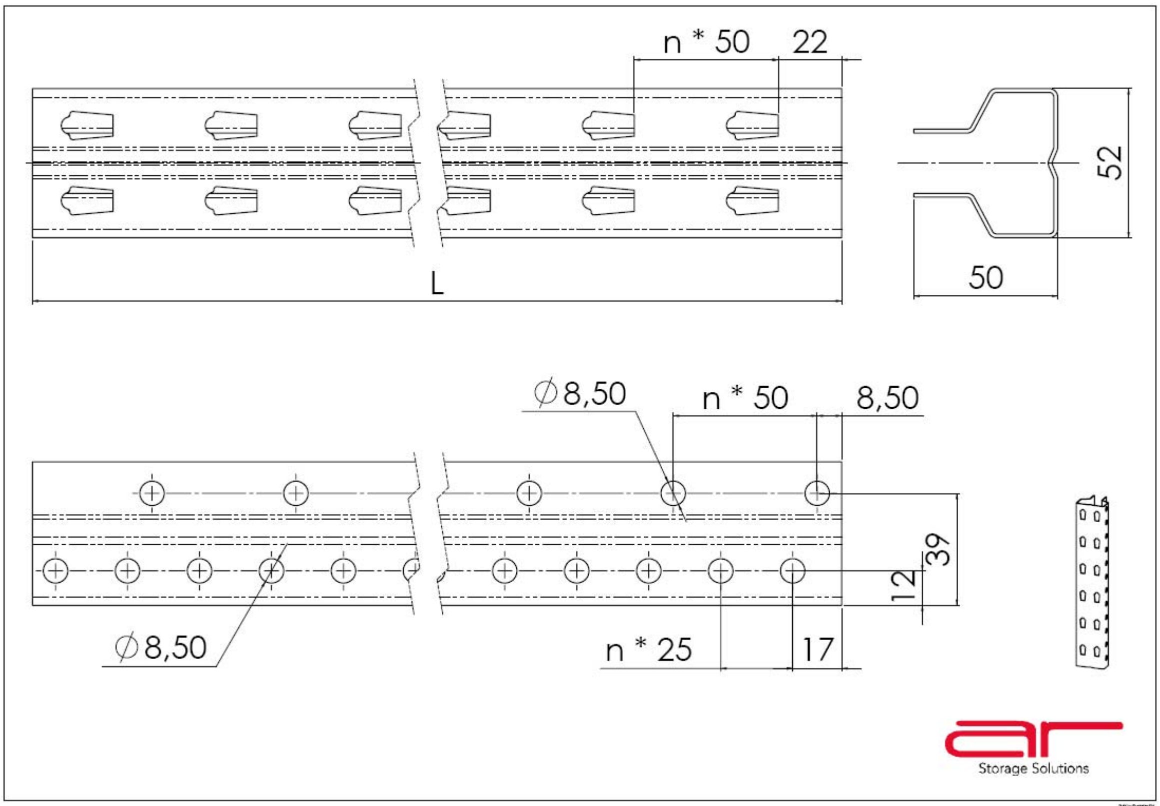
BAND EN 10139 – DC01+C440 – MA según EN 10139

4.1.5.3 DESIGNATION AND CODIFICATION

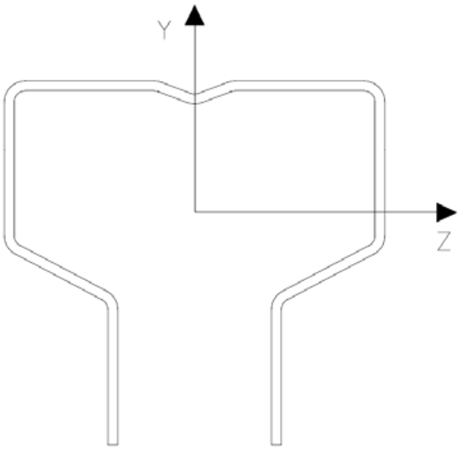
UPRIGHT MC/ [LENGTH in mm]

Example: UPRIGTH MC / 1100





4.1.5.4 MECHANICAL PROPERTIES OF THE UPRIGHTS

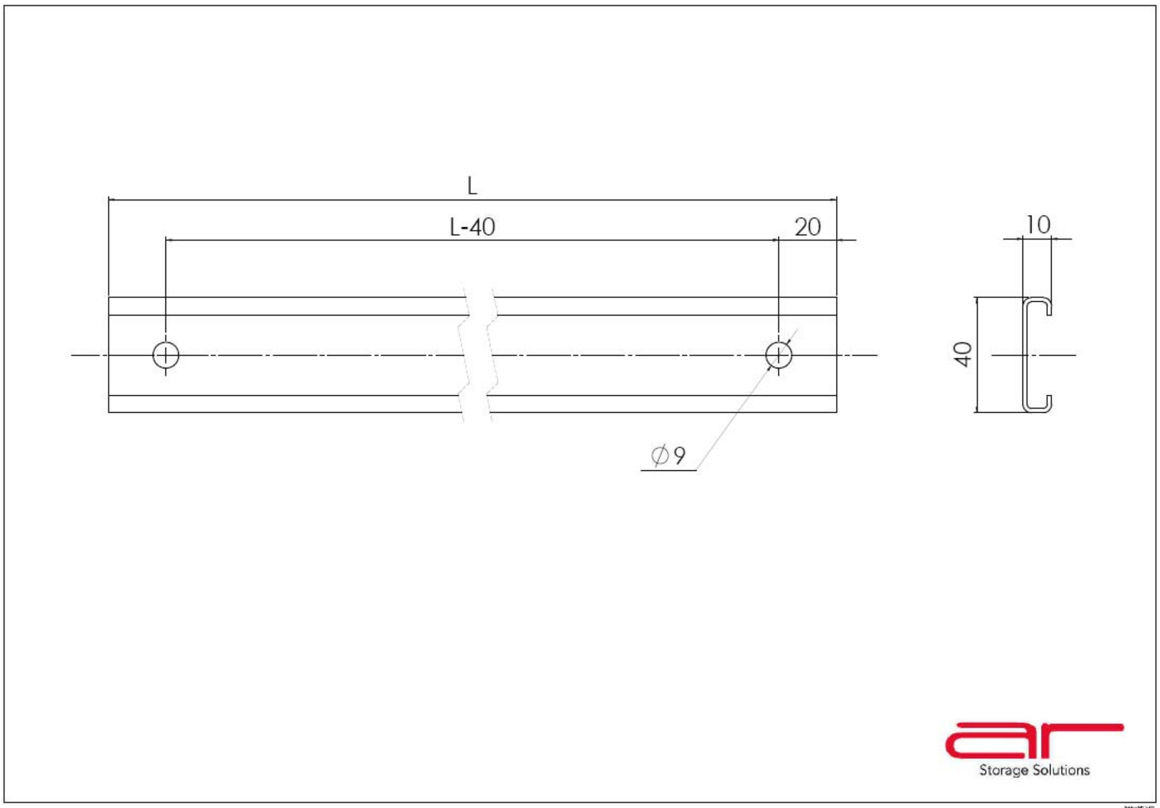


Type	Width A (mm)	Depth B (mm)	Weigth (Kg./ml)	Área (cm^2)	Second Moment of Inertia (cm^4)		Section Modulus (cm3)			Radious of Giration (cm)	
					I_{YY}	I_{ZZ}	W_Y	$W_{Z,1}$	$W_{Z,2}$	i_Y	i_Z
MC	52	50	1,626	2,225	7,23	5,53	2,78	3,06	1,73	1.8	1,58

4.1.6 FRAME BRACING

4.1.6.1 TECHNICAL CHARACTERISTICS

Type	Heigth A (mm)	Width B (mm)	Flange C (mm)	Weigth (Kg./ml)	Finishing
C4010	40	10	6	0,73	GALVANIZED



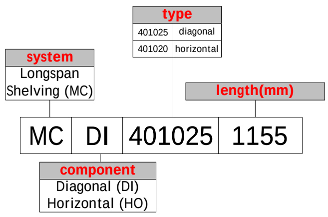
4.1.6.2 MATERIAL

S280GD+200 M-C-C s/EN 10326

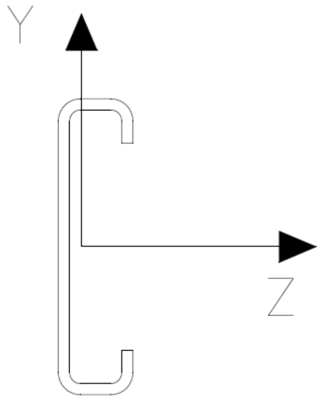
4.1.6.3 DESIGNATION Y CODIFICATION

PROFILE [TYPE] / [LENGTH in mm]

Example: PROFILE C4010 / 1012



4.1.6.4 MECHANICAL PROPERTIES OF THE FRAME BRACING

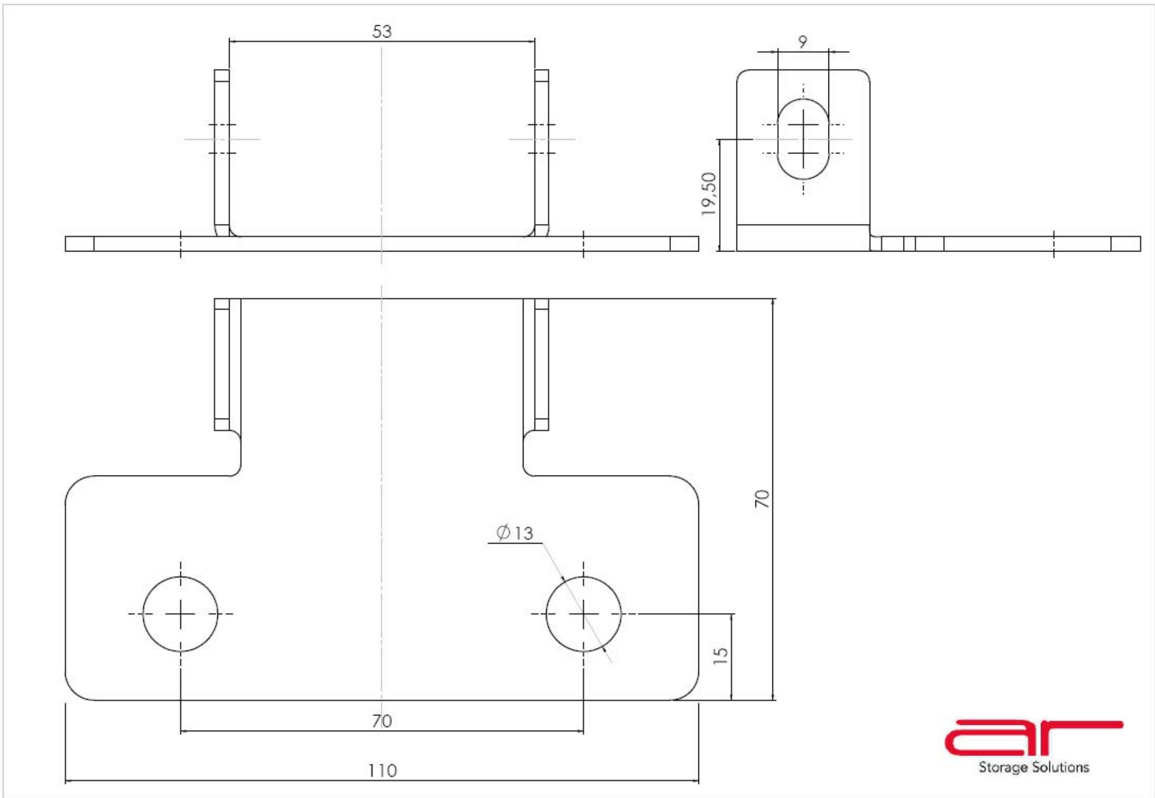


Type	Heigth A (mm)	depth B (mm)	Flange C (mm)	Weigth (Kg./ml)	Área (cm^2)	Second Momebt of Inertia (cm^4)		Section Modulus (cm^3)		Radious of Giration (cm)	
						I_{ZZ}	I_{YY}	W_Z	W_Y	i_Z	i_Y
C4010	40	10	6	0,73	0,93	1,88	0,104	0,94	0,336	1,42	0,334

4.1.7 UPRIGHT BASE

4.1.7.1 TECHNICAL CHARACTERISTICS

Type	Width A (mm)	Length (mm)	weigth (Kg/Ud)	Finishing
MC	110	70	0,133	GALVANIZED



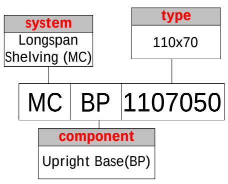
4.1.7.2 MATERIAL

S280GD according to EN 10326

4.1.7.3 DESIGNATION AND CODIFICATION

UPRIGHT BASE [TYPE]

Example: UPRIGHT BASE MC



4.1.8 FLOOR ANCHOR

4.1.8.1 TECHNICAL CHARACTERISTICS

2 floor anchor bolts per base plate

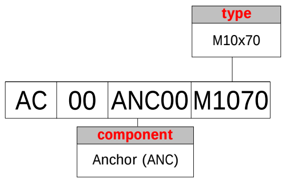
Anchor bolts used are HSA M10x70

Characteristics:

- High load capacity
- Controlled expansion
- Long thread length
- Fire resistant
- Fitted with nut and washer
- Cold formed

4.1.8.2 DESIGNATION AND CODIFICATION

ANCLAJE M10x70



4.2 BEAM Z

4.2.1 TECHNICAL CHARACTERISTICS

Type	Heigth A (mm)	Width B (mm)	Weigth (Kg/ml)	Connector Weigth (Kg)	Finishing
61	61	30	2,079	0,152	ORANGE ARESTANT
64	64		2,126		
74	74		2,283		
99	99		2,665		

4.2.2 MATERIAL

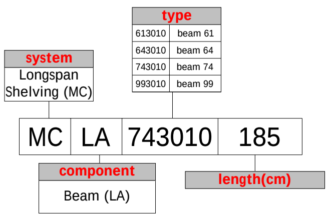
Beam: S235JR according to EN 10025-
S355JR according to EN 10025 or S355MC according to 10149
BAND EN 10139 – DC01 + C340 – MA according to EN 10139
BAND EN 10139 - DC01 + C440 - MA according to EN 10139

Connector: S235JR according to EN 10025-2

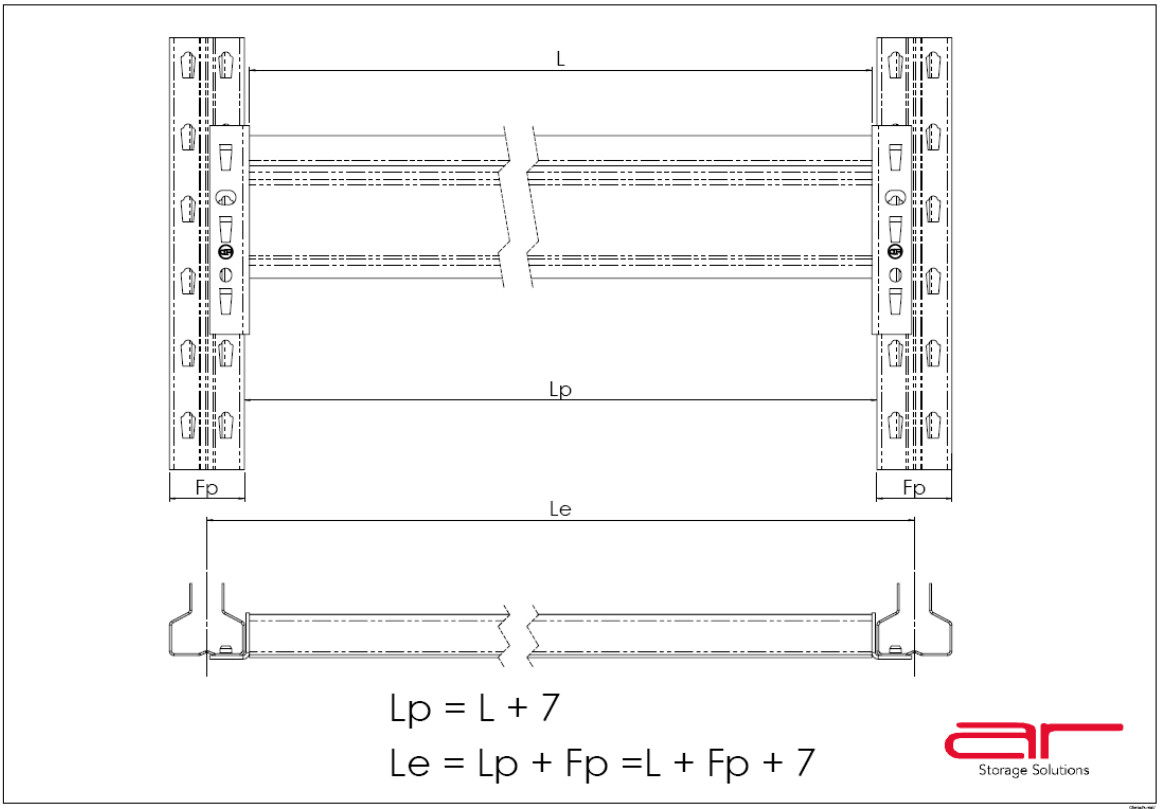
4.2.3 DESIGNATION AND CODIFICATION

BEAM [TYPE] / [LENGTH in mm]

Example: BEAM 74 / 1850

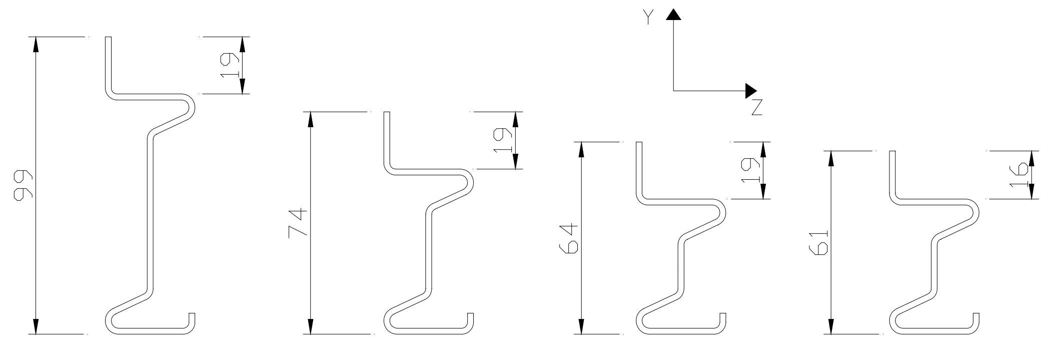


4.2.4 LENGTH CRITERIA

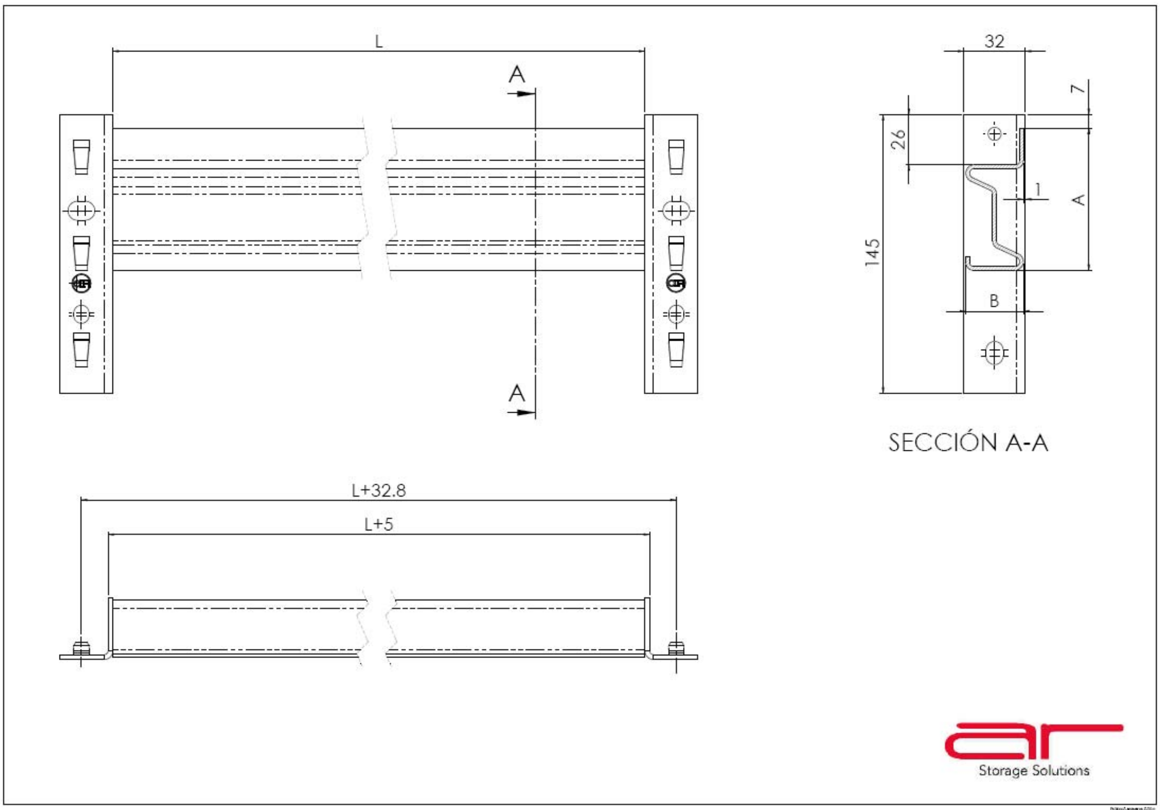


L	Inside Length of Connectors	
Fp	Upright Face Width	
Lp	Length Between Uprights	(Lp = L + 7)
Le	Length to Centrelines of Uprights	(Le= Lp + Fp = L+ Fp + 7)

4.2.5 MECHANICAL PROPERTIES OF BEAMS Z



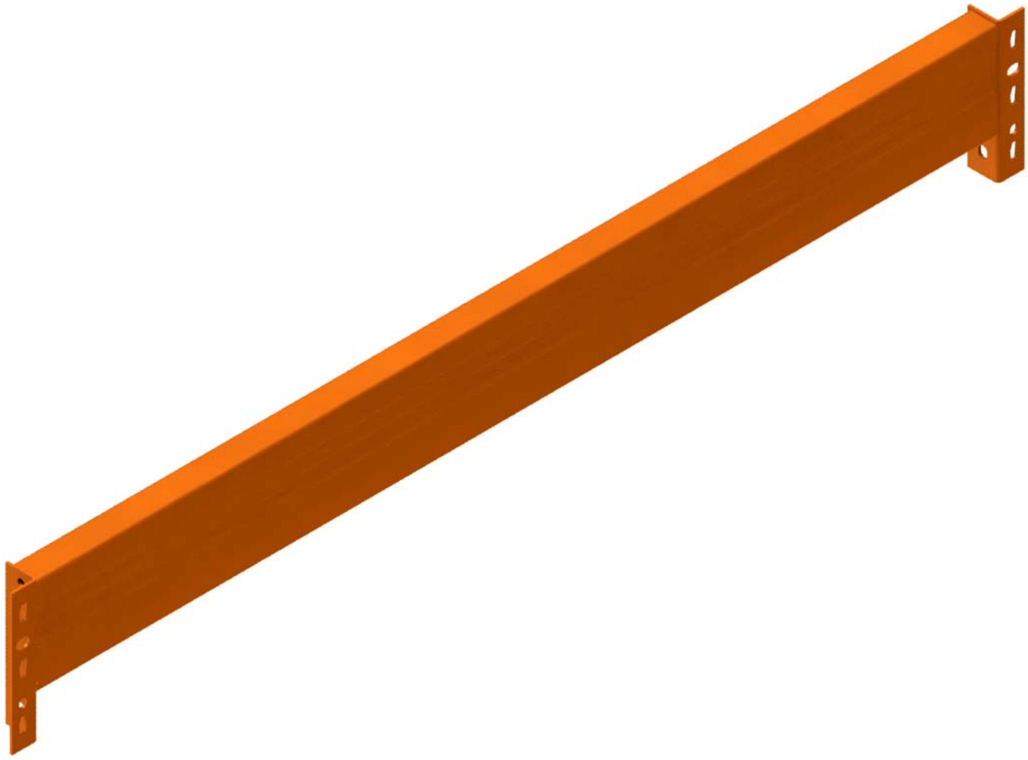
Type	Heigth A (mm)	Width B (mm)	Weigth (Kg/ml)	Área (cm^2)	Second Moment of Inertia (cm^4)		Resistant Module (cm^3)		Radious Gyration (cm)	
					I_{ZZ}	I_{YY}	W_{Zmax}	W_{Ymax}	i_Z	i_Y
54	54	30	1,969	2,51	6,374	2,277	1,936	1,694	1,56	9,527
61	61		2,079	2,65	9,807	2,185	2,763	1,579	1,924	9,083
64	64		2,126	2,71	10,61	2,285	2,817	1,684	1,98	9,18
74	74		2,283	2,91	16,19	2,287	3,816	1,675	2,36	8,866



4.3 BEAM 103

4.3.1 DIMENSIONS TECHNICAL CHARACTERISTICS

Type	Heigth A (mm)	Width B (mm)	Weigth (Kg/ml)	Connector Weigth (Kg)	Finishing
103	100	30	4,16	0,152	ORANGE ARESTANT



4.3.2 MATERIAL

Beam: S275JR according to EN 10025

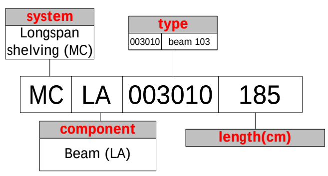
BAND EN 10139 – DC01 + C390 – MA según EN 10139

Connector: S235JR according to EN 10025

4.3.3 DESIGNATION AND CODIFICATION

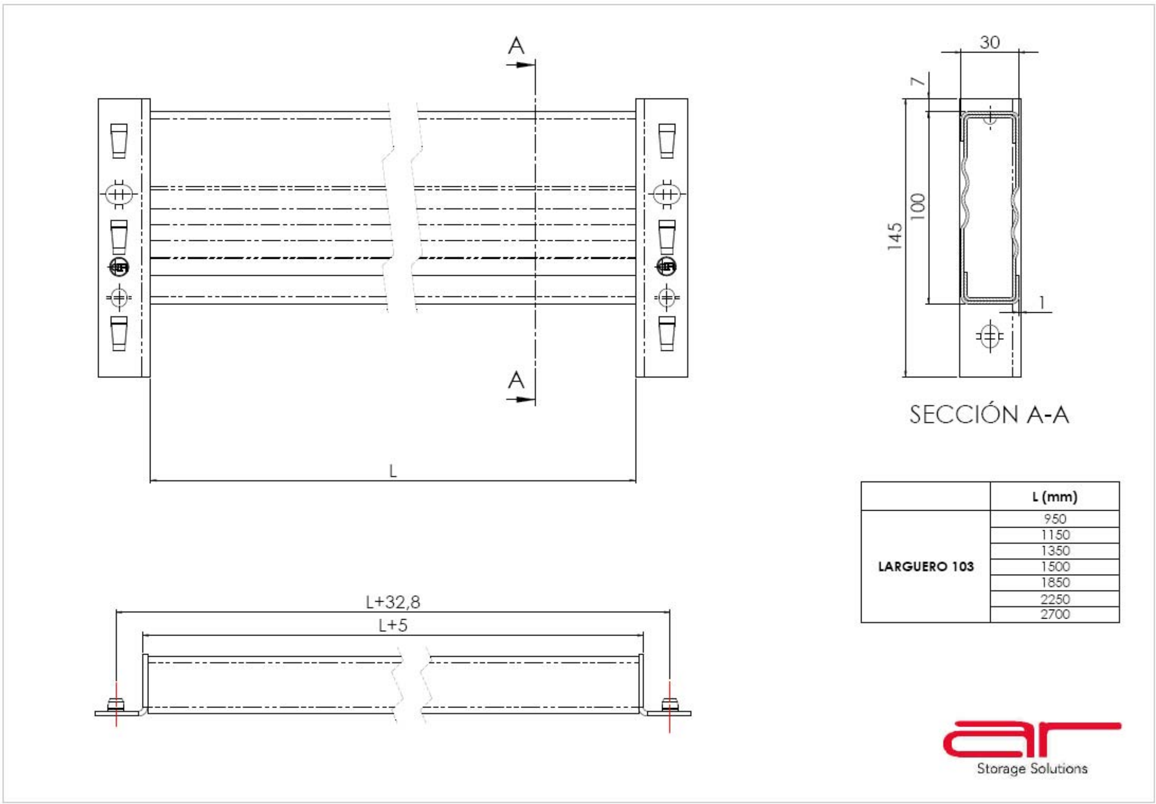
BEAM [TYPE] / [LENGTH in mm]

Example: BEAM 103 / 2700

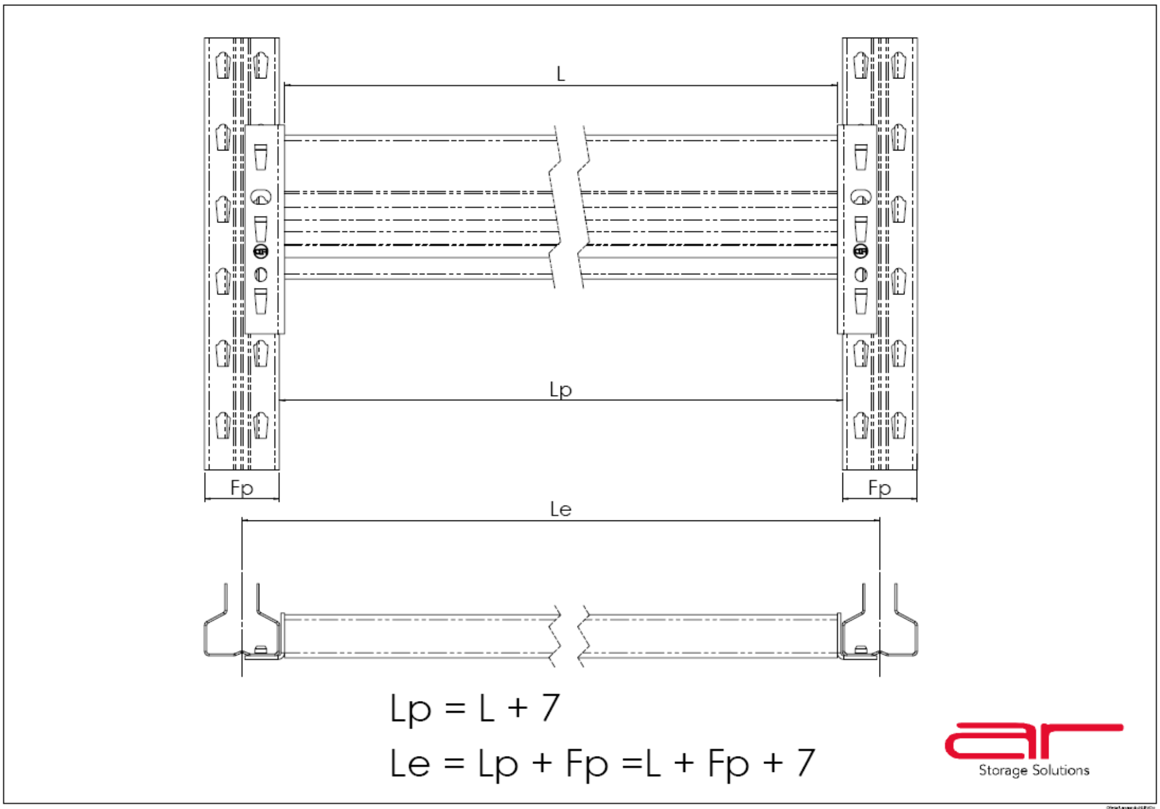


4.3.4 MECHANICAL PROPERTIES OF BEAMS 103

Type	Heigth A (mm)	Width B (mm)	Weigth (Kg/ml)	Área (cm^2)	Second Moment of Inertia (cm^4)		Section Modulus (cm^3)		Radious of Giration (cm)	
					I_{ZZ}	I_{YY}	W_Z	W_Y	i_Z	i_Y
103	100	30	4,16	5,304	72,53	7,646	14,51	5,097	3,698	1,2



4.3.5 LENGTH CRITERIA

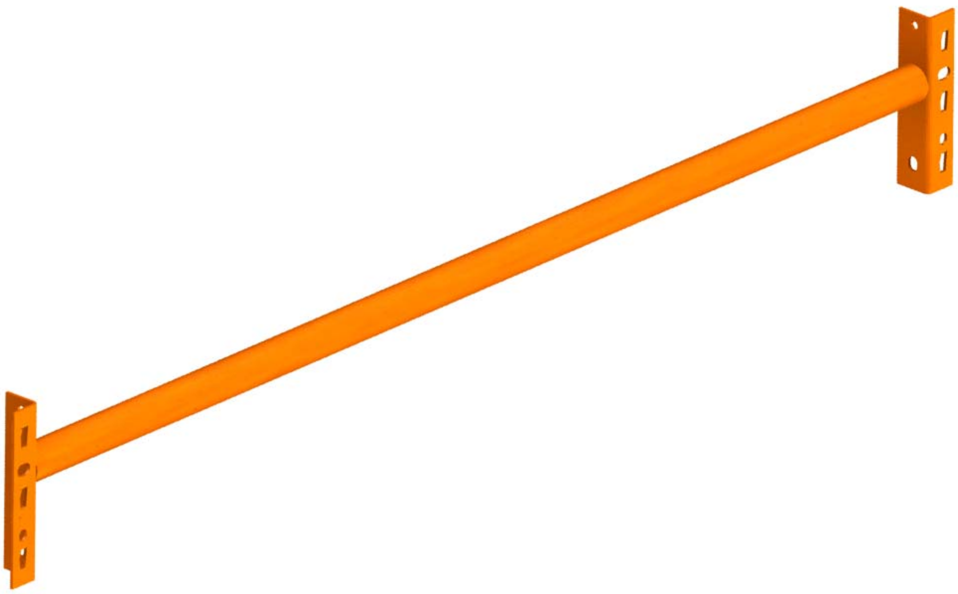


L	Inside Length of Connectors	
Fp	Upright Face Width	
Lp	Length Between Uprights	(Lp = L + 7)
Le	Length to Centrelines of Uprights	(Le= Lp + Fp = L+ Fp + 7)

4.4 GARMENT RAIL BEAM

4.4.1 DIMENSION TECHNICAL CHARACTERISTICS

Type	Diameter (mm)	Weigth (Kg/ml)	Connector Weigth (Kg)	Finishing
C3015	30	1,054	0,152	ORANGE ARESTANT



4.4.2 MATERIAL

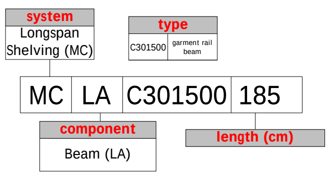
Beam: S235JR according to EN 10025

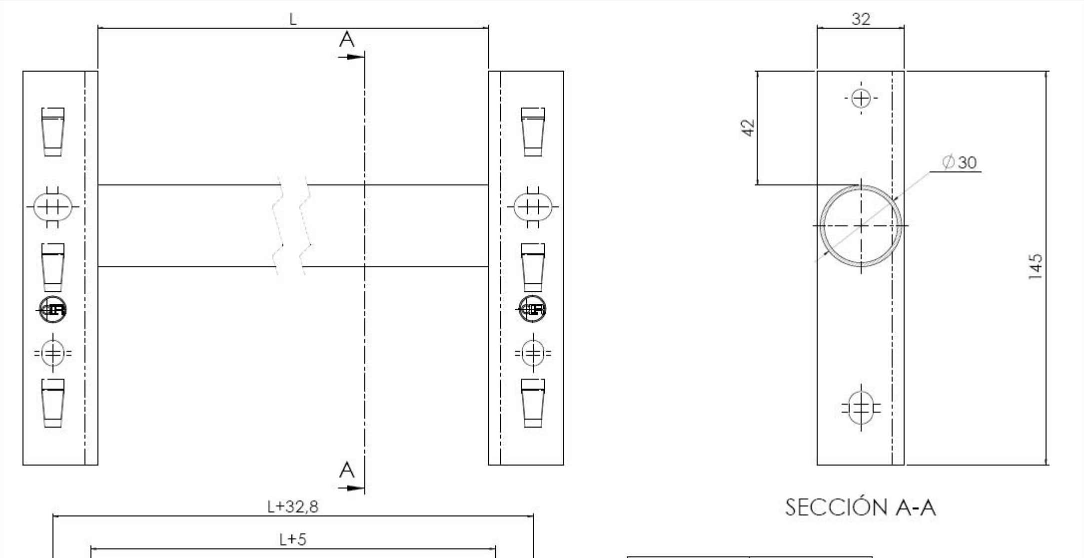
Connector: S235JR according to EN 10025

4.4.3 DESIGNATION AND CODIFICATION

BEAM [TYPE] / [LENGTH in mm]]

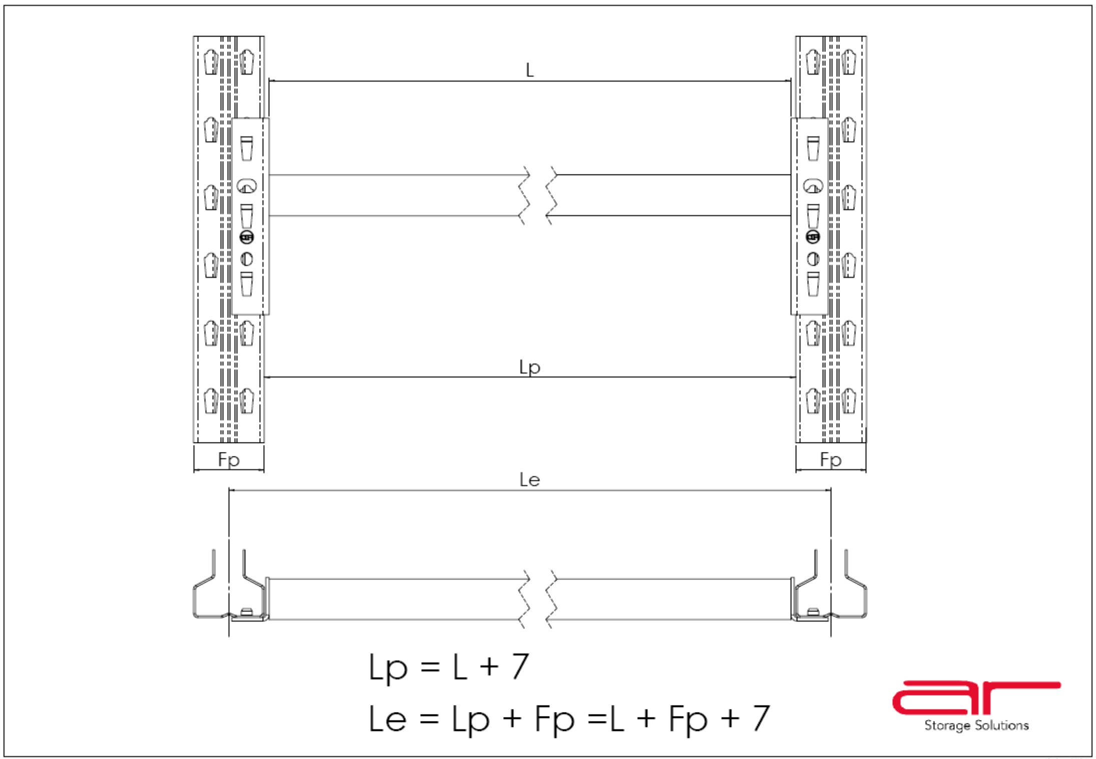
Example: BEAM C3015 / 1850





	L (mm)
LARGUERO TUBO COLGADOR	950
	1150
	1350
	1500
	1850

4.4.4 LENGTH CRITERIA



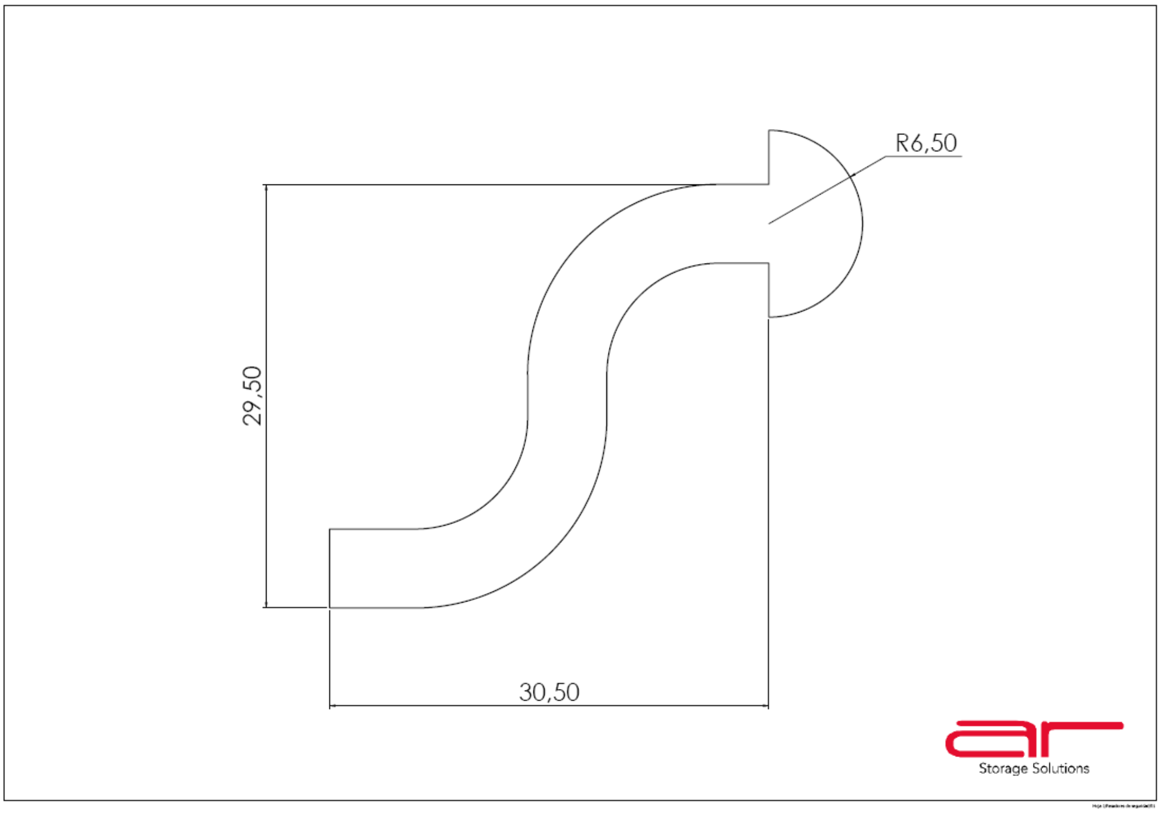
L	Inside Length of Connectors	
Fp	Upright Face Width	
Lp	Length Between Uprights	(Lp = L + 7)
Le	Length to Centrelines of Uprights	(Le= Lp + Fp = L+ Fp + 7)

4.5 SAFETY LOCKING PIN MC

4.5.1 TECHNICAL CHARACTERISTICS

Weigth (Kg)	Finishing
0.017	ZINC COATED

Two units per beam are supplied

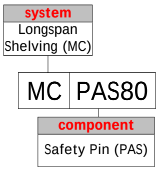


4.5.2 MATERIAL

S235JR according to EN 10025-2

4.5.3 DESIGNATION AND CODIFICATION

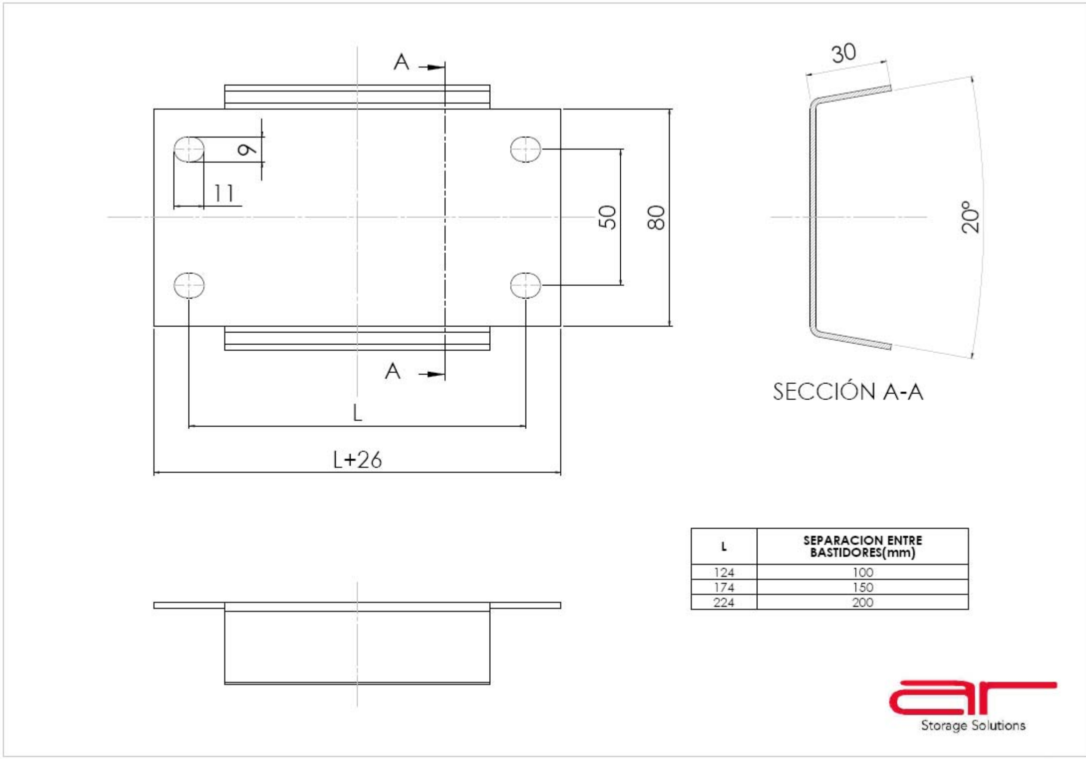
SAFETY LOCKING PIN MC



4.6 FRAME SPACER DBC

4.6.1 TECHNICAL CHARACTERISTICS

Type	Length L (mm)	Weigth (Kg)	Finishing
100	124	0,267	GALVANIZED
150	174	0,372	
200	224	0,478	



4.6.2 MATERIAL

S220 GD according to EN 10326

4.6.3 FASTENERS

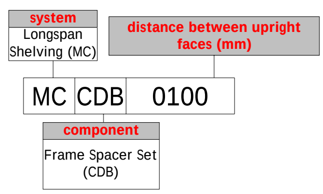
- Frame – upright connection: 4 Bolts DIN 933 M 8 x 65 6.8
  4 Nuts DIN 934 M8 6.8
  4 Washers DIN 125 M8

4.6.4 ESIGNATION AND CODIFICATION

FRAME SPACER SET [TYPE] / [LENGTH in mm]) Bolts included

Example:

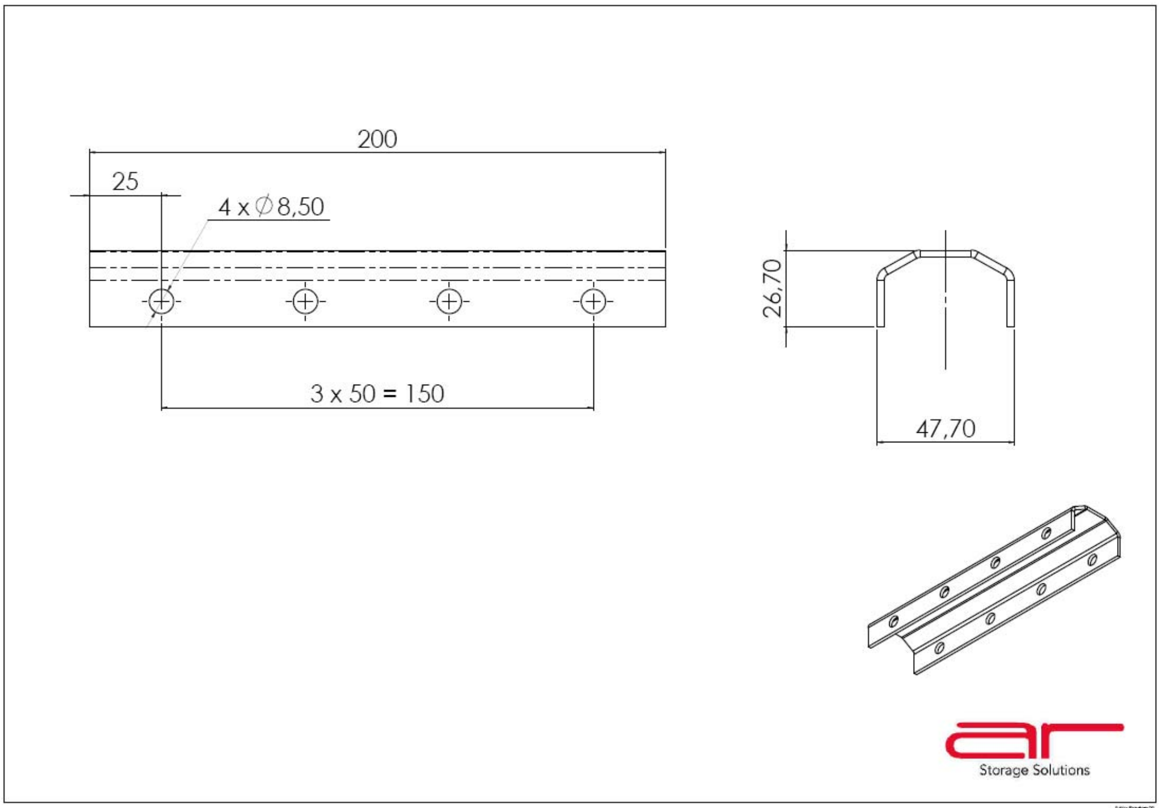
FRAME SPACER SET DBC / 100



4.7 UPRIGHT SPLICER MC

4.7.1 TECHNICAL CHARACTERISTICS

Type	Length (mm)	Weigth (Kg)	Finishing
MC	200	0,323	GALVANIZED



4.7.2 MATERIAL

S280GD according to EN 10326

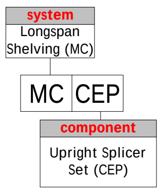
4.7.3 FASTENERS

- Upright Splicer MC- Upright connection: 4 Bolts DIN 933 M 8 x 65 6.8
  4 Nuts DIN 934 M 8 6.8
  4 Washers M8 DIN 125

4.7.4 DESIGNATION AND CODIFICATION

UPRIGHT SPLICER SET [TYPE]

Bolts incuded



Example: UPRIGHT SPLICER SET MC

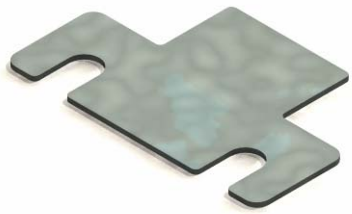
4.8 ACCESORIES

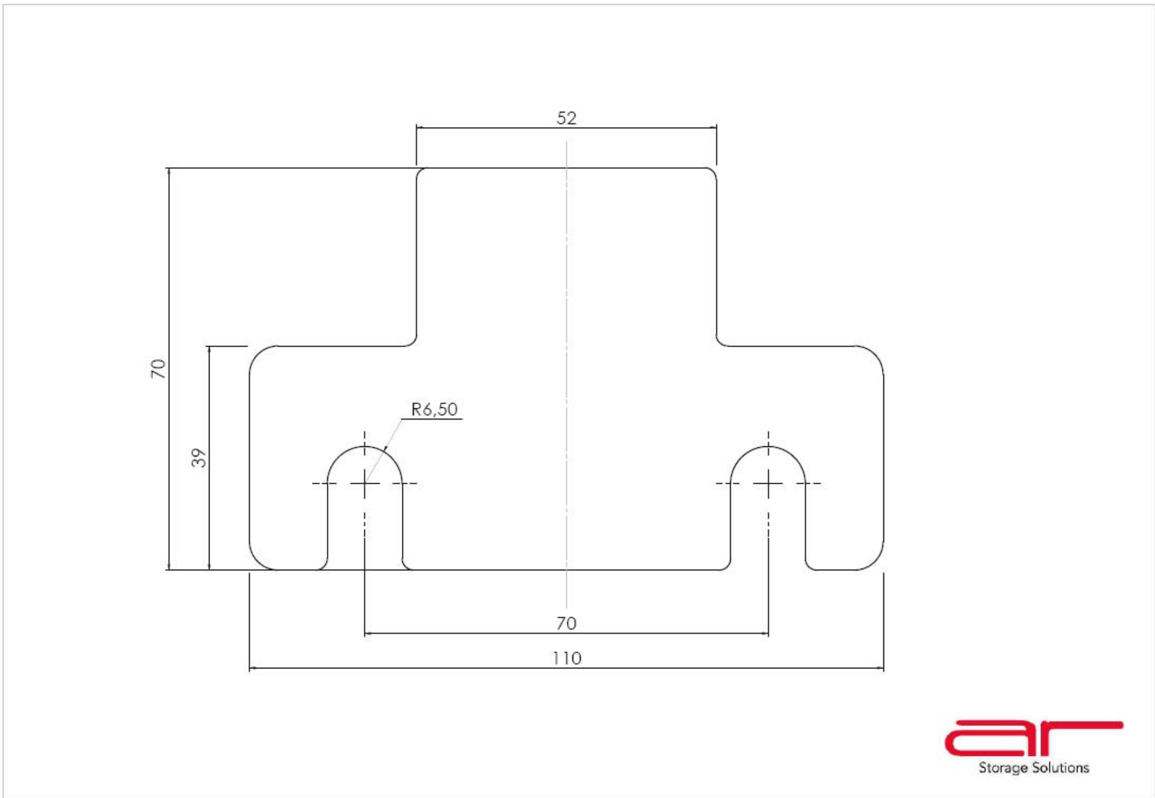
4.8.1 LEVELING SHIM MC

A steel component located under the base plate, ensuring the leveling of the system

4.8.1.1 TECHNICAL CHARACTERISTICS

Type	Weigth (Kg)	Finishing
MC	0,084	GALVANIZED





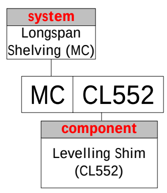
4.8.1.2 MATERIAL

S280GD according to EN 10326

4.8.1.3 DESIGNATION AND CODIFICATION

LEVELING SHIM [TYPE]

Example: LEVELING SHIM MC

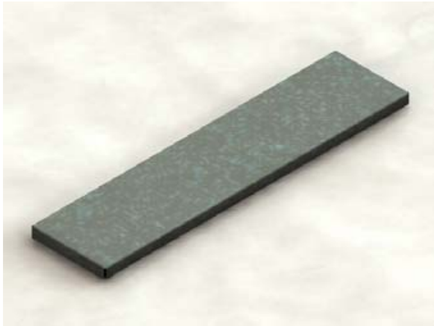


4.8.2 GALVANIZED SHELF PANEL

A structural component crossly arranged on beams Z and used as a load level in picking operations.

4.8.2.1 TECHNICAL CHARACTERISTICS

Type	Shelf Panel Width (mm)	Length (mm)	Finishing
BAG	150 ó 200	500	GALVANIZED
		600	
		700	
		800	
		900	
		1000	
		1100	
		1200	



Quantity of Shelf Panels per Beam		
Beam Length (mm)	150	200
950	1	4
1150	1	5
1350	1	6
1500	2	6
1850	3	7
2250	3	9
2400	4	9
2700	2	12

4.8.2.2 MATERIAL

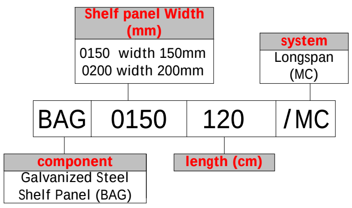
S280GD according to EN 10326

4.8.2.3 DESIGNATION AND CODIFICATION

GALVANIZED STEEL SHELF PANEL [LENGTH] / [SHELF PANEL WIDTH]

Example:

GALVANIZED STEEL SHELF PANEL 1200 / 150

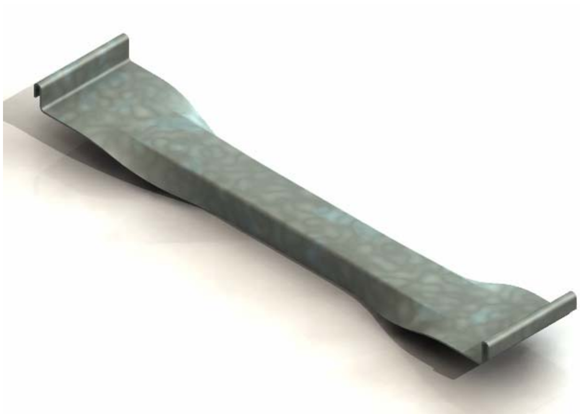


4.8.3 CHIPBOARD RETAINER SUPPORT BAR

A structural component crossly arranged on beams Z and used to support chipboard panels when used as load levels, preventing the horizontal movement of beams.

4.8.3.1 TECHNICAL CHARACTERISTICS

Type	Frame Width (mm)	Weigth (kg)	Finishing
TR402331	400	0,436	GALVANIZED
	500	0,536	
	600	0,631	
	700	0,726	
	800	0,822	
	900	0,917	
	1000	1,013	
	1100	1,108	
	1200	1,204	



4.8.3.2 MATERIAL

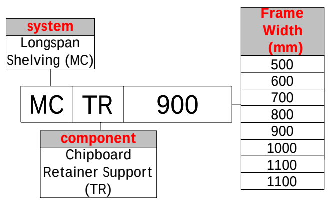
S280GD according to EN 10326

4.8.3.3 DESIGNATION AND CODIFICATION

CHIPBOARD RETAINER SUPPORT BAR [FRAME WIDTH]

Example:

CHIPBOARD RETAINER SUPPORT BAR TR 900



4.8.4 CHIPBOARD WALKBAY SUPPORT BAR AND INSIDE FRAME SUPPORT BAR

A structural component crossly arranged on beams 103 and used to support chipboard panels when used as load levels, preventing the horizontal movement of beams. The inside frame support bar allows beams 103 to be connected inside the frame, and the walkway support bar connects beams 103 in the walkway.

4.8.4.1 TECHNICAL CHARACTERISTICS

Type	Frame Width (mm)	Length (mm)	Finishing
TP402540	400	406	GALVANIZED
	500	506	
	600	606	
	700	706	
	800	806	
	900	906	
	1000	1006	
	1100	1106	
	1200	1206	

Type	Frame Width (mm)	Length (mm)	Finishing
TP402540	400	464	GALVANIZED
	500	564	
	600	664	
	700	764	
	800	864	
	900	964	
	1000	1064	
	1100	1164	
	1200	1264	

4.8.4.2 MATERIAL

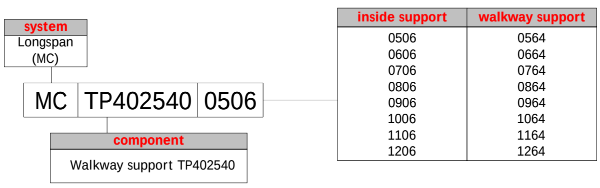
S280GD according to EN 10326

4.8.4.3 DENOMINACIÓN Y CODIFICACIÓN

CHIPBOARD WALKWAY SUPPORT BAR / [LENGTH]

Example:

CHIPBOARD WALKWAY SUPPORT BAR
[TP402540] / 0506

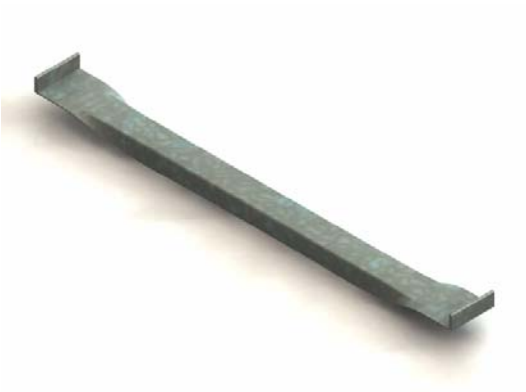


4.8.5 CHIPBOARD SUPPORT

A structural component crossly arranged on beams 103 and used to support chipboard panels when used as load levels, preventing the horizontal movement of beams.

4.8.5.1 TECHNICAL CHARACTERISTICS

Type	Frame Width (mm)	Length (mm)	Finishing
TM402545	400	406	GALVANIZED
	500	506	
	600	606	
	700	706	
	800	806	
	900	906	
	1000	1006	
	1100	1106	
	1200	1206	



4.8.5.2 MATERIAL

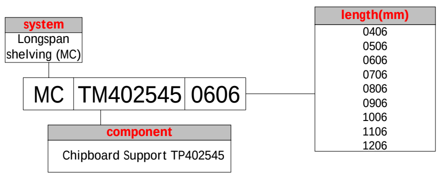
S280GD according to EN 10326

4.8.5.3 DENOMINACIÓN

CHIPBOARD SUPPORT FOR BOX BEAM [TYPE] / [LENGTH]

Example:

CHIPBOARD SUPPORT FOR BOX BEAM TM402545 / 606

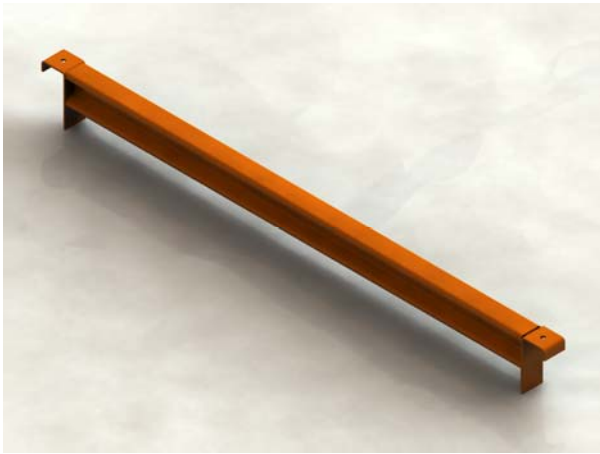


4.8.6 WALKWAY SUPPORT BAR Z

A structural component crossly arranged on beams 103 and used to support chipboard panels when used for walkways, preventing the horizontal movement of beams.

4.8.6.1 TECHNICAL CHARACTERISTICS

Type	Walkway Width (mm)	Length (mm)	Weigth (Kg/m.l.)	Hook Weigth (Kg)	ACABADO
TP643034	600	595	2,079	0,071	ORANGE ARESTANT
	700	695			
	800	795			
	900	895			
	1000	995			
	1100	1095			
	1200	1195			



4.8.6.2 MATERIAL

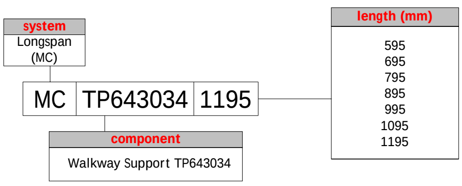
Support Bar Z64: S235JR according to EN 10025

Hook: S235JR according to EN 10025

4.8.6.3 DESIGNATION AND CODIFICATION

WALKWAY SUPPORT BAR [TYPE] / [LENGTH in nmm]

Example: WALKWAY SUPPORT BAR TP643034 / 1195

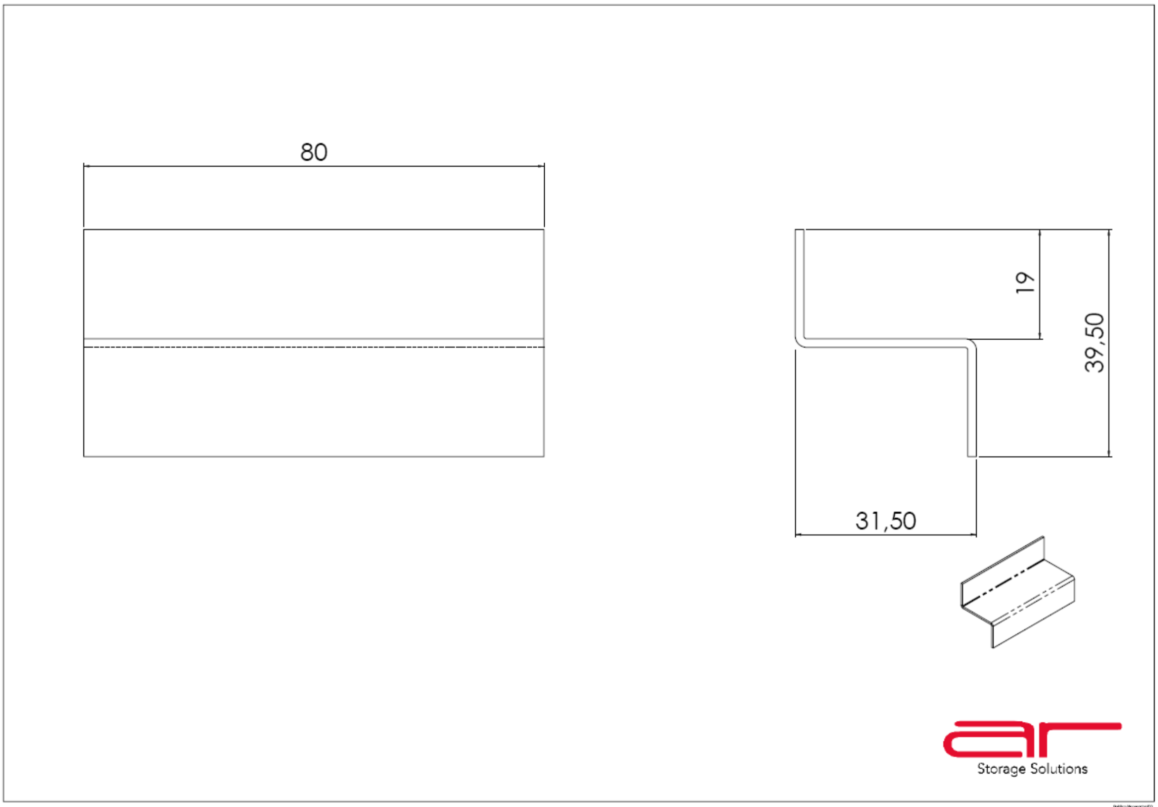


4.8.7 RETENEDOR MADERA

Steel element located on the beam 103 to avoid the chipboard .

4.8.7.1 TECHNICAL CHARACTERISTICS

Type	Weigth (Kg)	Finishing
MC	0,064	GALVANIZED



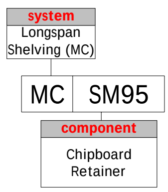
4.8.7.2 MATERIAL

S220GD according to EN 10326

4.8.7.3 DENOMINATION & CODIFICATION

CHIPBOARD RETAINER [TYPE]

Ejemplo: CHIPBOARD RETAINER MC



4.8.8 CHIPBOARD PANELS

A longspan shelving system requires a load level to allow boxes to be located in picking operations. Chipboard panels allow this functionality.

Below is the criteria to dimension chipboard panels located on the different beams supplied by ARESTANT S.A.:

	PANEL DIMENSIONS (mm)	
ITEMS	**LENGTH**	**WIDTH**
BEAMSS Z WITH RETAINER	L-10	Bt-5
BEAMSS Z WITHOUT RETAINER	L-10	Bt-5
BEAMS 103 WITH SUPPORT BARS	L-10	Bt

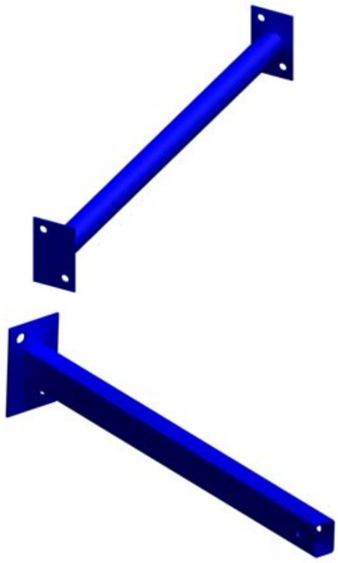
Where Bt is the frame depth and L is the length of the beam between connectors.

4.8.9 FRAME SPACER MCTR Y MCTREC

4.8.9.1 TECHNICAL CHARACTERISTICS

Type	Distance between upright faces (mm)	Weight (Kg)
MCTR	1000	1,52
	1100	1,66
	1200	1,8
	1300	1,94
	1400	2,08
	1500	2,22

Type	Distance between upright faces (mm)	Weight (Kg)	Finishing
MCTREC	200,...800	(consult)	BLUE ARESTANT
	900	1,02	
	1000	1,125	
	1100	1,23	
	1200	1,34	
	1300	1,45	
	1400	1,55	
	1500	1,66	



4.8.9.2 MATERIAL

S235JR according to EN 10025

4.8.9.3 FASTERNERS

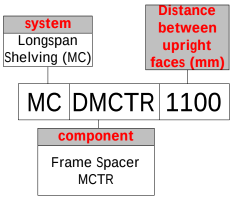
- Frame Spacer MCTR- Upright: 4 Bolts DIN 933 M 8 x 14 6.8
  4 Nuts DIN 934 M 8 6.8
  4 Washess M8 DIN 125
- Distanciador MCTREC- puntal: 2 Bolts DIN 933 M 8 x 14 6.8
  1 Bolt DIN 931 M8x35 6.8
  3 Nuts DIN 934 M 8 6.8
  3 Washes M8 DIN 125

4.8.9.4 DENOMINATION & CODIFICATION

Bolts notr included

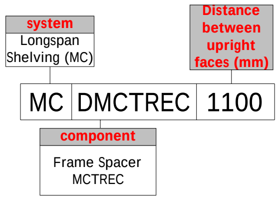
FRAME SPACER MCTR / [WIDTH]

Example: Frame Spacer MCTR/1100



FRAME SPACER MCTREC / [WIDTH]

Example: Frame Spacer MCTREC/0900



5 LOAD CAPACITIES

5.1 FRAMES

The load capacity per frame is defined as the maximum load supported by the frame, taken as the sum of the loads of all levels supported by the frame.

The frame's load capacity depends on its dimensions and the steel used for manufacture. The load capacity decreases when the distance between levels is increased and, especially, when increasing the height of the lowest level.

The safety factor used for the load levels shown is 1.4

Heigth of Lowest Levek or Between Levels (mm)	MAXIMUM LOAD (Kg.) PER FRAME
Up to 500	7.500
500-1.000	6.000
1.000 - 1.500	4.000
1.500 - 2.000	2.250

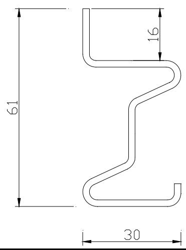
5.2 BEAMS

For beams, the load capacity is defined as the maximum load that can be arranged at each level (i.e. per pair of beams), considering:

- the load is uniformly distributed on both beams
- maximum deformation of beam is L/200, where L is the length of the beam
- beam failure with a safety factor of 1.5

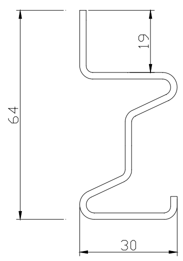
The load capacity per level depends on the type of beam used (model and length).

5.2.1 Beam Z61



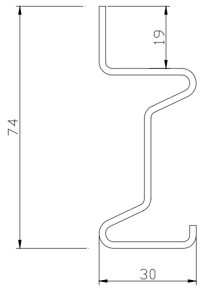
Z61	LENGTH (mm)	LOAD CAPACITY (Kg)
	950	1075
	1150	900
	1350	775
	1500	650

5.2.2 Beam Z64

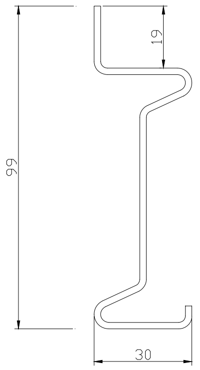


Z64	LENGTH (mm)	LOAD CAPACITY (Kg)
	950	1125
	1150	945
	1350	800
	1500	700
	1850	470
	2250	320
	2400	285
	2700	225

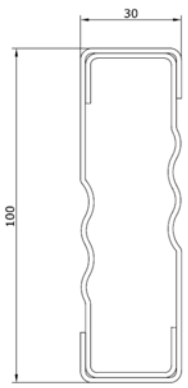
5.2.3 Larguero Z74

Z74	LENGTH (mm)	LOAD CAPACITY (Kg)
	**950**	1525
	1150	1275
	1350	1050
	1500	975
	1850	790
	2250	660
	2400	505
	2700	430

5.2.4 Larguero Z99

Z99	LENGTH (mm))	LOAD CAPACITY (Kg)
	**1850**	1300
	2250	950
	2400	875
	2700	700

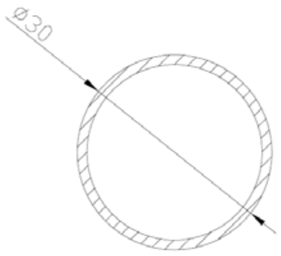
5.2.5 Larguero 103

103	LENGTH (mm)	LOAD CAPACITY (Kg)
	**950**	2.400
	1150	1.950
	1350	1.800
	1500	1.500
	1850	1.300
	2250	1.100
	2700	1.000

5.3 GARMENT RAIL BEAM

For garment rail beams, the load capacity is defined as the maximum load that can be arranged per beam, considering:

- the load is uniformly distributed on the beam length
- maximum deformation of beam is L/200, where L is the length of the beam
- beam failure with a safety factor of 1.5

GARMENT RAIL	LENGTH (mm)	LOAD CAPACITY (Kg)
	**950**	110,5
	1150	56,3
	1350	46
	1500	30,6
	1850	20,9

5.4 SUPPORT BARS

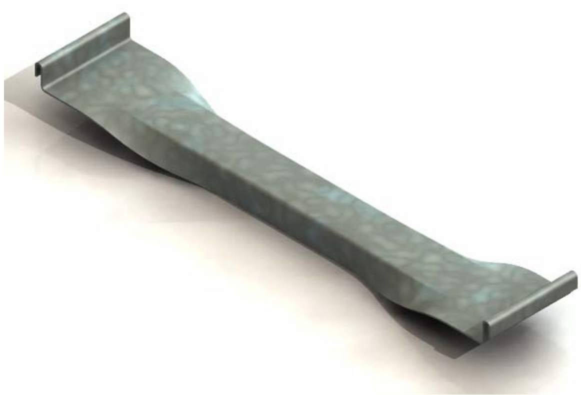
For support bars, the load capacity is defined as the maximum load that can be arranged per item, considering:

- the load is uniformly distributed on the support bar
- maximum deformation of support bar is L/200, where L is the length of the beam
- beam failure with a safety factor of 1.5

5.4.1 CHIPBOARD WALKWAY SUPPORT AND CHIPBOARD SUPPORT FOR BOX BEAM

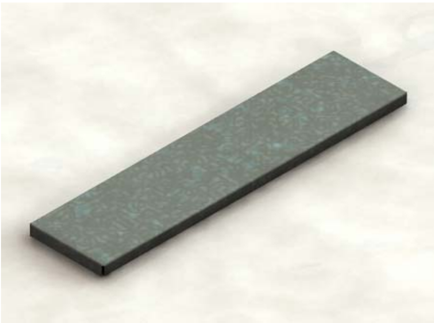
LENGTH (mm)	LOAD CAPACITIES(Kg)
400	279,5
500	223,6
600	186,3
700	159,7
800	139,7
900	124,2
1000	111,8
1100	101,6
1200	93,2

5.4.2 CHIPBOARD RETAINER SUPPORT BAR



LENGTH (mm)	LOAD CAPACITIES(Kg)
400	155,6
500	124,5
600	103,8
700	88,9
800	77,8
900	69,2
1000	62,3
1100	56,6
1200	93,2

5.5 GALVANIZED SHELF PANEL



LENGTH (mm)	LOAD CAPACITIES (Kg)	
	SHELF PANEL WIDTH 150	SHELF PANEL WIDTH 200
400	115,4	116,8
500	92,3	93,4
600	76,9	77,9
800	57,7	58,4
900	51,3	51,9
1000	46,2	46,7
1200	38,5	38,9