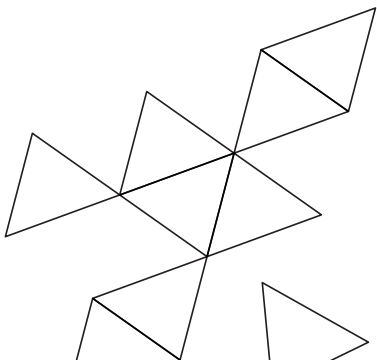


METALSISTEM[®]



Patented modular structures

SUPERCANT



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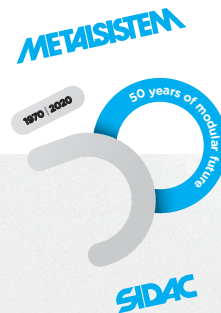
METALSISTEM: yesterday, today, tomorrow

Founded in **1970**, METALSISTEM commenced its activities specialising in the design and production of metal roll-forming machinery and the manufacture of galvanised steel profiles created for the material handling sector. This first step established METALSISTEM as the pivot around which an articulated network of companies flourished. METALSISTEM, with **headquarters in Rovereto** – Italy, is a world leader not only in the **material handling sector**, but also in **industrial automation systems, shopfitting solutions and in photovoltaic panel support systems**.

Thanks to its exceptional production capacity and sales network, METALSISTEM creates **unique leading-edge products**. Continuous research in new production

technologies creates products that are ideally suited for safe exhibition and storage spaces. The great versatility of METALSISTEM components, combined with their nimble application, facilitates the erection of modular systems which are able to both fully satisfy the customer's need and follow the evolutionary developments of the sector.

A system which is **modular, functional and simple in application**: these are the core ideals of the original concept that gave birth to an articulated range of storage and archiving systems. Every product is defined by **superior structural performance** while ensuring **high standards of quality** that are recognised by the most important European controlling bodies.



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Quality, Excellence, Service

our strength points in the challenge of competitiveness

Safety Standards and Design Assumptions

A product's correct technical application and its visual appearance distinguishes both the customer and the manufacturer. METALSISTEM recommends that customers make use of this product professionally and in strict conformity with the applicable Standards and the technical characteristics described in this manual.

The design and assembly of projects must be conducted by expert and qualified personnel. METALSISTEM declines any responsibility for improper or inappropriate use of its products or noncompliant uses without prior written approval.

a) Tolerances, deformations and clearances

This document applies to class 400 (wide and narrow aisle without automation) installations as defined by the UNI EN 15620 standards, installed according to the tolerances listed in Annex E of UNI 11598 or FEM 10.2.09.

Installations in a class other than this need more stringent structural and deformation characteristics which require the intervention of the METALSISTEM Technical Office.

a1) Suitability of the floor

Before commencing a project the suitability, or adequacy of the pavement, or floor slab to support the installation loads must be confirmed. The client must supply the necessary technical data for this evaluation. Unless otherwise expressly mentioned, the floor tolerances shall be in accordance with the UNI EN 15620 Standard.

a2) Clearances

The minimum installation operating tolerances and clearance of the installation from the building and its fixtures must be agreed with the client, using Annex C of UNI 11598 or FEM 10.2.09 as reference.

b) Assembly

The rack assembly must be carried out by specialized personnel in conformity with national occupational health and safety regulations and the information contained in this document. Particular attention must be taken to ensure that all frame bracing components are tightly bolted and that all safety apparel has been properly assembled (Refer also to the "METALSISTEM Heavy Duty Operating and Maintenance Manual code MUM01").

c) Rack alignment

The vertical plumb of the pallet racking frames must be checked along both the depth (Z) and length (X) directions. UNI 11598 prescribes for both quantities a

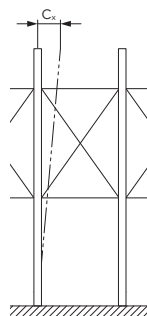


Fig. 1

maximum value of $H/350$, where H is the height of the column; this value shall be adopted unless more restrictive prescriptions apply (eg FEM 10.2.09 prescriptions requiring a maximum installation out of plumb equal to $H/500$).

d) Safety signage and load bearing capacity plaques

Refer to National legislation for guide lines regarding the application of safety signage to installations. In Europe, the 92/58/EEC directive and its amendments provide the minimum acceptable level of safety signage regarding occupational health and safety in the work place.

The minimum level of safety signage that must be placed on every installation include:

- Generic warning plaque (consisting in an exclamation mark) (Italian legislative decree 81/08, attachment XXV);
- Load bearing capacity plaque formatted as an information sign. These

must be placed in clearly visible locations showing year of assembly as well as the cantilever series, the number of levels, the type of column

METALSISTEM			
RACKING TO TECHNICAL MANUALS FOR CHARACTERISTICS AND STANDARDS			
REF. n° ECEB9999999	SYSTEM: SUPERCANT T58R	DATE	03/2020
NUMBER OF LEVELS: 3HG		COLUMN HEIGHT (m): 4.1	
LEVEL	ARMS	MAX LOAD (kg/m²)	AVERAGE LOAD (kg/m²)
From ground	Type and length		
H=1.5m	NORM L=0.8m	600	600
H=2.5m	NORM L=0.8m	600	600
H=3.5m	NORM L=0.8m	600	600
PORTATA PIANO CALPESTIO (kg/m²)			
DATE		DATE	
METALSISTEM			

Fig. 2

and arm, the column height, the arm length, the load bearing capacity per level or per arm (Fig. 2).

It is also advisable to provide:

- emergency exit signs erected in conformity with the instructions of local authorities or fire consultant;
- specific prohibitions and danger signs, if required.

e) Racking safety standards

Each single side base must be fixed using four (4) anchor bolts, while each double side base must be fixed using six (6) anchor bolts,

Wall ties are not allowed in cantilevers, since, with the exception of specifically designed extremely low duty configurations, walls and fixtures cannot be designed to withstand the resulting loads.

Upright protection must be provided to all columns subjected to the risk of collision by material handling equipment (refer to "Pallet Racking Accessories Manual", code MT07).

f) Reference standards

The structural calculation reference standard are:

- UNI 11598:2015 "Steel static storage systems - Cantilever racks. Principles for structural design.";

- FEM 10.2.09:2015 recommendations "Cantilever design code";
- UNI EN 15620:2009 "Steel static storage systems. Adjustable pallet racking. Tolerances, deformations and clearance.";
- UNI EN 1993-1-1:2014 "Eurocode 3 - Design of steel structures - Part 1-3: General rules and rules for buildings";
- UNI EN 1993-1-3:2007 "Eurocode 3 - Design of steel structures - Part 1-3: General rules - Supplementary rules for cold-formed members and sheeting";
- UNI EN 1993-1-8:2005 "Eurocode 3 - Design of steel structures - Part 1-8: Design of joints".

Materials reference standards:

- UNI EN 10346:2015 "Continuously hot-dip coated steel flat products - Technical delivery conditions";
- UNI EN 10149-1:2013 "Hot-rolled flat products made of high yield strength steels for cold forming. General delivery conditions.";
- UNI EN 10149-2:2013 "Hot-rolled flat products made of high yield strength steels for cold forming. Delivery conditions for thermomechanically rolled steels";
- UNI EN 10204:2005 "Metallic products - Types of inspection documents" (3.1 certificate).

Other reference standards:

- UNI EN 15635:2009 "Steel static storage systems - Application and maintenance of storage equipment";
- UNI EN 1090-1:2018 "Execution of steel and aluminium structures - Part 1: Requirements for conformity assessment of structural components.";
- UNI EN 1090-2:2018 "of steel and aluminium structures - Part 2: Technical requirements for steel structures";
- ACAI-CISI testo unico del 26/02/2004: "Self certification regulations"..

g) Structural component testing

The structural design is based on results derived from laboratory testing conducted by the Engineering Faculty of the University of Trento, Italy, and by the laboratories of the METALSISTEM Research Centre.

h) Structural calculations

The structural design has been conducted using the finite element method with ANSYS and STRAUS7 codes following UNI 11598 / FEM 10.2.09 prescriptions.

i) Cantilever arm load bearing capacities

The arm load bearing capacities have been calculated using the following assumptions:

- uniformly distributed load;
- maximum deflection of 1/200 of the arm length (UNI 11598 / FEM 10.2.09 limit) or of 1/100 of the arm length (extended limit);

- resistance and stability checks according to UNI 11598 / FEM 10.2.09, with material factors $\gamma_{M,0} = \gamma_{M,1} = 1,1$, $\gamma_{M,2} = 1,25$;
- arm safety coefficient of at least 2 respect to collapse;
- mandatory lock of safety flange preventing arm dislodgement;
- specific conditions listed under the load bearing capacity tables.

The extended deformation limit allows to optimize the load bearing capacities for a wide range of usage conditions while retaining full compliance with UNI 11598 / FEM 10.2.09 safety standards. The designer of the installation is in charge of determining if usage conditions allow the adoption of the extended deformation limit instead of the more restrictive UNI 11598 / FEM 10.2.09 deformation limit.

j) Column load bearing capacities

The tables contained in this document are used to find the column and arm type that match the load demands of a Supercant installation as a function of the number of loading levels and of the arm length.

These tables are applicable to cantilever rackings with:

- a distance between levels equal to or less than the height of the first beam from ground;
- an equal load acting on all levels;
- maximum sway according to UNI 11598 / FEM 10.2.09 (variable with the column height and approximately equal to H/100) or extended limit (not exceeding H/60);
- resistance and stability checks according to UNI 11598 / FEM 10.2.09, with material factors $\gamma_{M,0} = \gamma_{M,1} = 1,1$, $\gamma_{M,2} = 1,25$;
- anchoring to the floor slab with four (4) anchor bolts for each single side base and with six (6) anchor bolts for each double side base;
- compliance with the specific conditions listed under the load bearing capacity tables.

The extended sway limit allows to optimise the load bearing capacities for a wide range of usage conditions while retaining full compliance with UNI 11598 / FEM 10.2.09 safety standards. The designer of the installation is in charge of determining if usage conditions allow the adoption of the extended deformation limit instead of the more restrictive UNI 11598 / FEM 10.2.09 deformation limit.

Given that the load bearing capacity of the column is also dependent from other factors (height of beam from ground equal to or more than the centre distance between the bay beams, frame base to height ratio, seismicity of the area, environmental factors such as vibrations, atmospheric conditions, etc.) contact the

METALSISTEM Technical Offices regarding doubts concerning non-standard applications, large or complex installations requiring optimization, or structural controls for specific solutions.

The column load bearing capacities have been determined considering horizontal forces induced by imperfections as defined by UNI 11598 / FEM 10.2.09. Horizontal forces due to wind, vibrations, impact, seismic activity or other loads have not been considered. If these conditions apply, contact the METALSISTEM Technical Department.

k) Installation environment, use and maintenance of the product

The load bearing capacities and the material finish assume that the product is assembled in dry internal environments. Applications in external or highly aggressive environments forfeit the guarantee of the surface treatment. Contact the METALSISTEM Technical Department for structural verification of outdoor applications.

For guidelines regarding use of the installation and programmed component inspection, required by the UNI EN 15635 standards, refer to the "Heavy Duty Operating and Maintenance Manual", code MUM01.

l) Bracing

The bracing system is a structural element which limits the movement of the racking and guarantees its global stability.

This system is designed to absorb the horizontal forces caused by out of plumb imperfections and by storage and retrieval of goods as defined by UNI 11598 / FEM 10.2.09 prescriptions.

m) Raw material

The 3.1 certificate (UNI EN 10204 standard) guarantees the mechanical properties of the high tensile strength structural steels used by METALSISTEM production.

The mechanical properties of the structural steel may vary from between S315 to S355 for pickled steels and between S350 and S400 for galvanized steels (according to UNI EN 10346 and UNI EN 10149 norms) depending on the components structural application.

The surface treatment of the structural steels may either be hot dip galvanized using the SENDZIMIR process or powder coated pickled/galvanized steel.

n) Bolted assemblies

Local standards and norms could mandate, for specific installations, to equip the racking system with CE-marked bolts.

The CE marking according to EN 15048-1 regards the assembly (bolt + nut), and requires to provide sealed pack-

ages containing both the components. METALSISTEM provides a selected choice of CE marked assemblies which can be used alternatively to standard bolts and nuts. The full list of order codes for CE marked bolted assemblies can be found in the "Pallet Racking Accessories Technical Manual", code MT07.

o) Anchoring

The standard anchoring method which METALSISTEM provides for static conditions, in absence of seismic actions, considers expansion anchor bolts which are CE marked according to ETAG 001 Annex C – Option 7.

Alternative anchor bolts, which may be used for specific load or assembly conditions, are available for order.

Independent of the adopted anchor bolt, METALSISTEM recommends to strictly comply to all the instructions of use provided by the anchor bolts manufacturer, to ensure the safety of the anchoring.

Please contact METALSISTEM Technical Office for any additional information.

p) Fire protection

Refer to the "Heavy Duty Operating and Maintenance Manual", code MUM01, document for information regarding standard applications, reaction and resistance to fire. It is the duty of the racking installation designer to check if the client requires the installation to have allowances for the integration of fire protection measures.

q) Controls

The raw material entering production sustains ongoing testing by METALSISTEM internal Quality Control Department. The tests confirm the mechanical properties (elongation, yield, rupture), dimensional characteristics (gauge and width) surface finish (absence of defects, uniformity, resistance of coating).

METALSISTEM has its own internal testing facilities able to conduct SIT (Servizio di Taratura in Italia) certified tensile tests (approx. 1000 per year), dimensional tests and performance tests (stub column, beam end connector stiffness, shear and deflection) on finished product. Saline mist, scratch resistance and other tests are conducted by external facilities.

Testing of finished products are conducted by the internal METALSISTEM Quality Control Office. The system certifying agency RINA guarantees consistent product quality.

r) Certifications

METALSISTEM production has been certified by the following international standards:

- Centro di Trasformazione – Italian metal fabricator certificate No. 753/10;

- Environmental Management System – ISO 14001;
- Quality Management Standard – ISO 9001;
- TÜV test compliance certificate;
- CISI – Quality and safety;
- AEO FULL – Authorised Economic Operator;
- UNI EN ISO 3834 – Qualified welding processes;
- EN 1090-1 – Certificate of conformity of the factory production control.

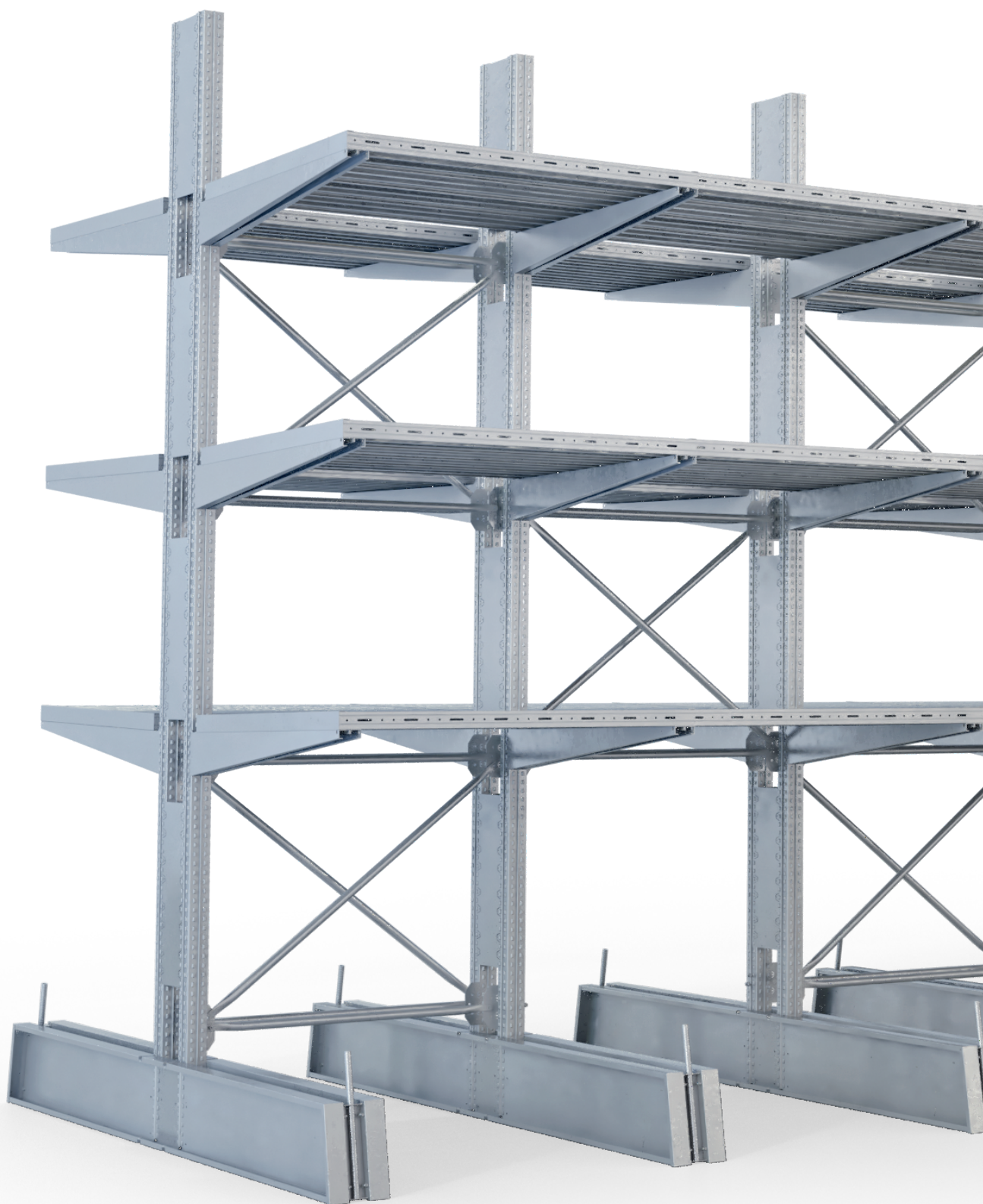
s) Safety apparel

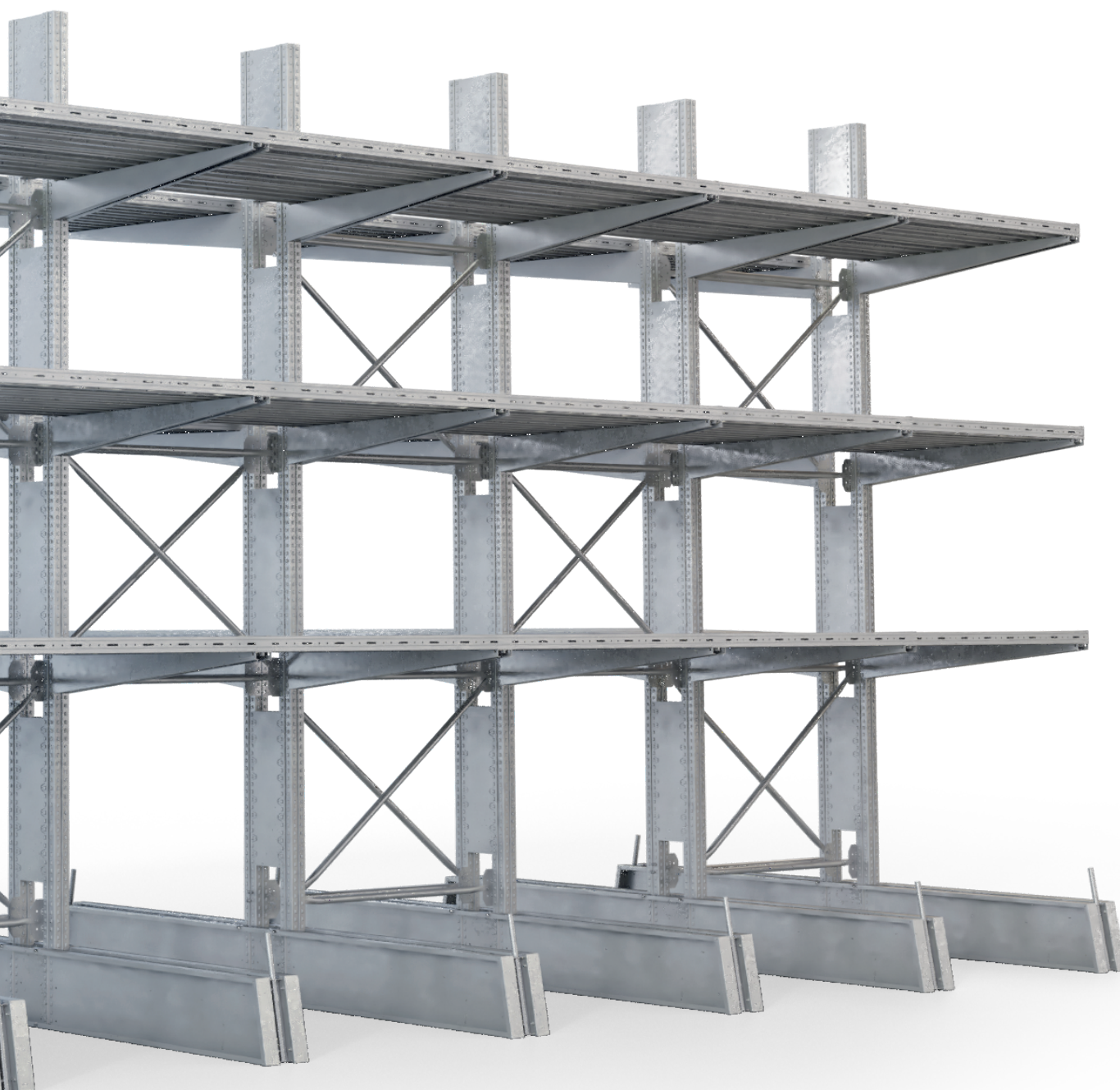
The purchaser is responsible to determine the type, locations, and needs of the safety apparel to be fitted to the installation (e.g.: upright and frame protection, floor guide rails, protections against the falling of stored goods, pallet support beams, walkway protection and covers, seismic design) to mitigate the risks connected to the usage conditions of each specific installation. The installer shall inform the purchaser of the available solutions and products, in order to correctly and knowingly choose the right safety apparels based on his needs.

t) Customized applications

Contact METALSISTEM Technical Office for solutions and / or calculations of non-standard applications.

METALSISTEM reserves the right to modify the technical characteristics of its products at any time it sees fit





Supercant system

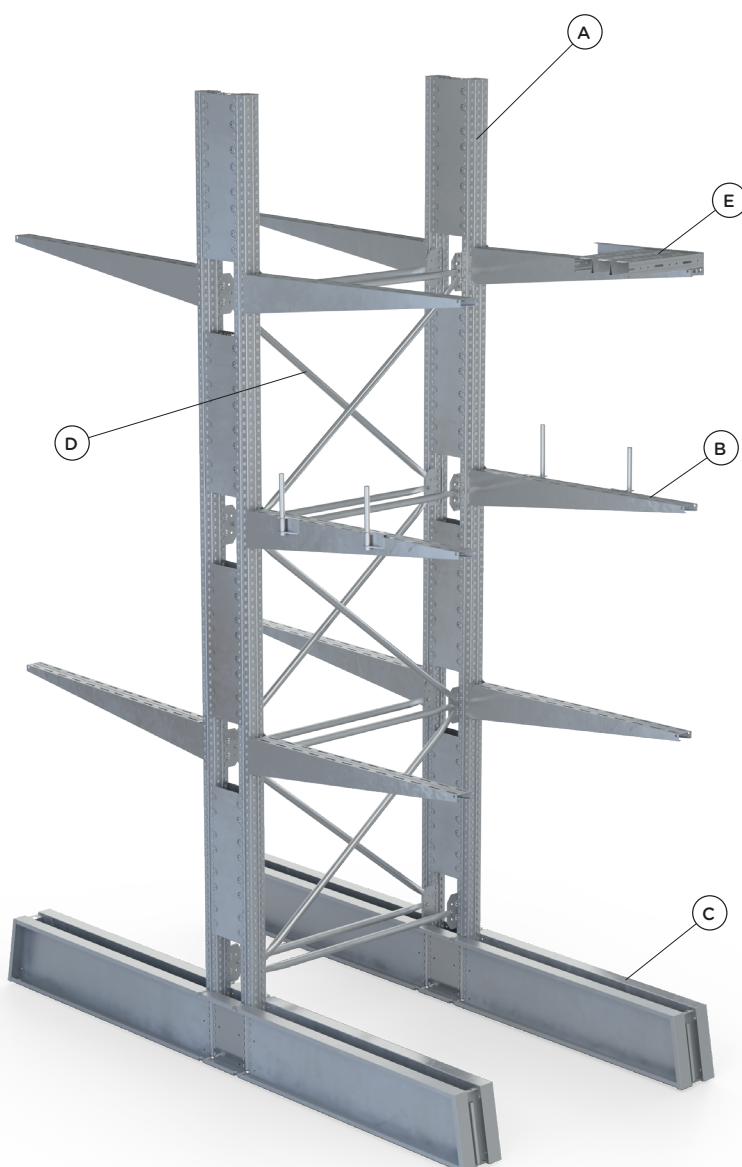
Supercant system allows the assembly of single and double side rows, with column heights up to 4094mm and arm lengths from 400mm and 1200mm.

Supercant system, based on METALSISTEM Super 4-5-6 series, is modular by nature, and is well suited to the realization of versatile geometries and structural schemes (height and width of the columns, longitudinal bracing geometry, portal frames in transverse direction, etc.); the feasibility of custom solutions is subject to the evaluation by METALSISTEM Technical Office.

Supercant system components

Pos.	Component	Page
A	Column	9
B	Arm and accessories	10
C	Base and accessories	11
D	Longitudinal bracing	12
E	Continuous shelves	13

Tab. 1



Supercant columns

Supercant columns, in both Super6 and reinforced Super6 variants, are supplied preassembled in the various heights listed in Tab. 2.

The assembled column is made up of a pair of uprights united by H=190mm connection plates and completed by vertical bracing connection plates.

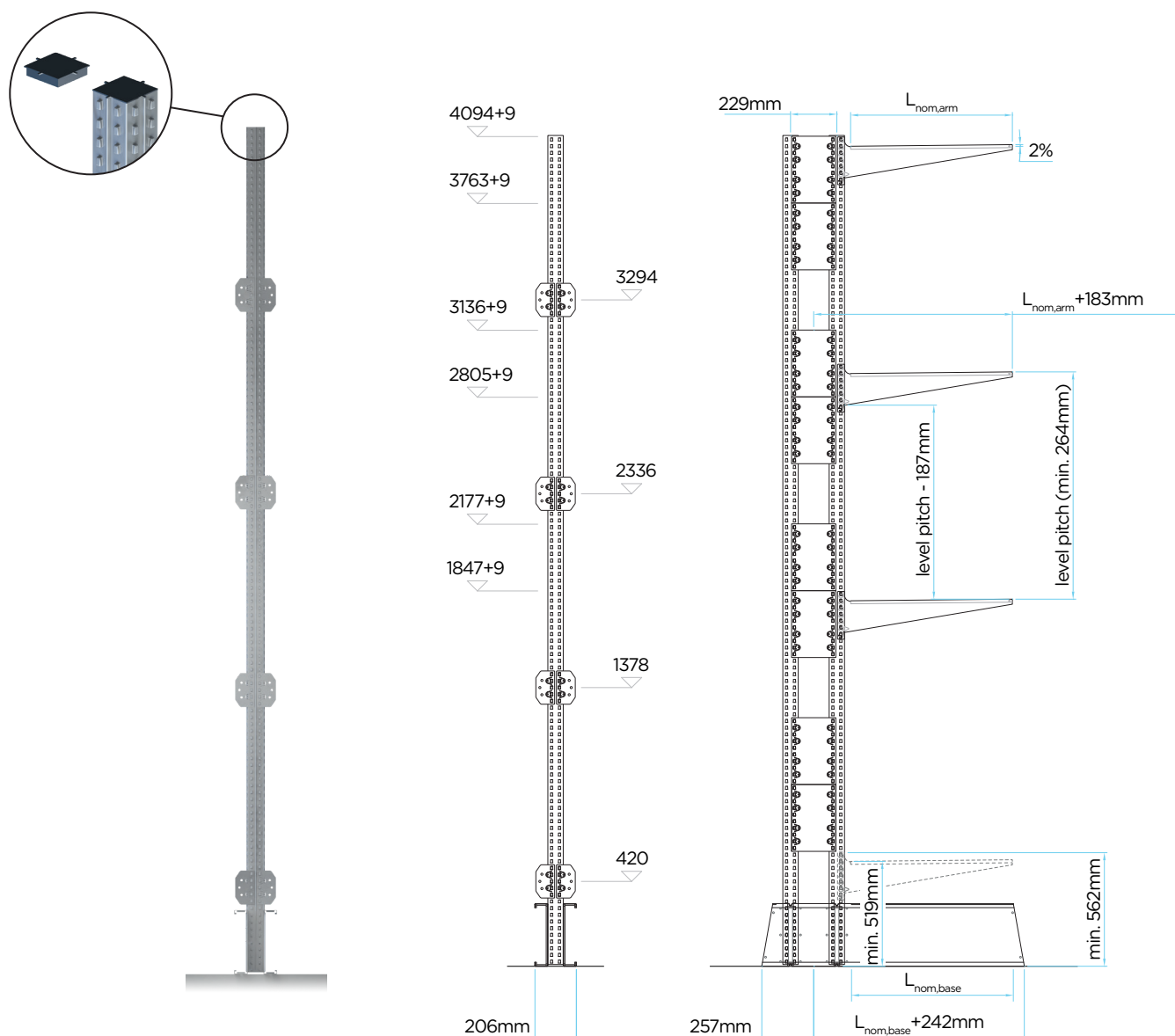
The main dimensions of the system - column heights, position of bracing connection plates, transverse dimensions - are described in the diagram below.

Uprights are capped with plastic top cap cod. 08021.98.

Supercant column order codes

Column height [mm]	Super6 column	Super6R column
1847	09610.95	09610/R.95
2177	09611.95	09611/R.95
2805	09612.95	09612/R.95
3136	09613.95	09613/R.95
3763	09614.95	09614/R.95
4094	09615.95	09615/R.95

Tab. 2



Supercant arms

Supercant arms are available in standard and reinforced versions, with nominal lengths ranging in increments of 100mm from 400mm to 1200mm. One arm is made up of the assembly of a left and right side, bolted together at their extremities with a M6x16 CHS bolt with M6 nyloc nut. Both half arms must be secured to the column by hammering the locking flange in order to prevent accidental dislodgement. The arm can be completed with an optional metallic cap, which can be installed if arms are not equipped with continuous shelves.

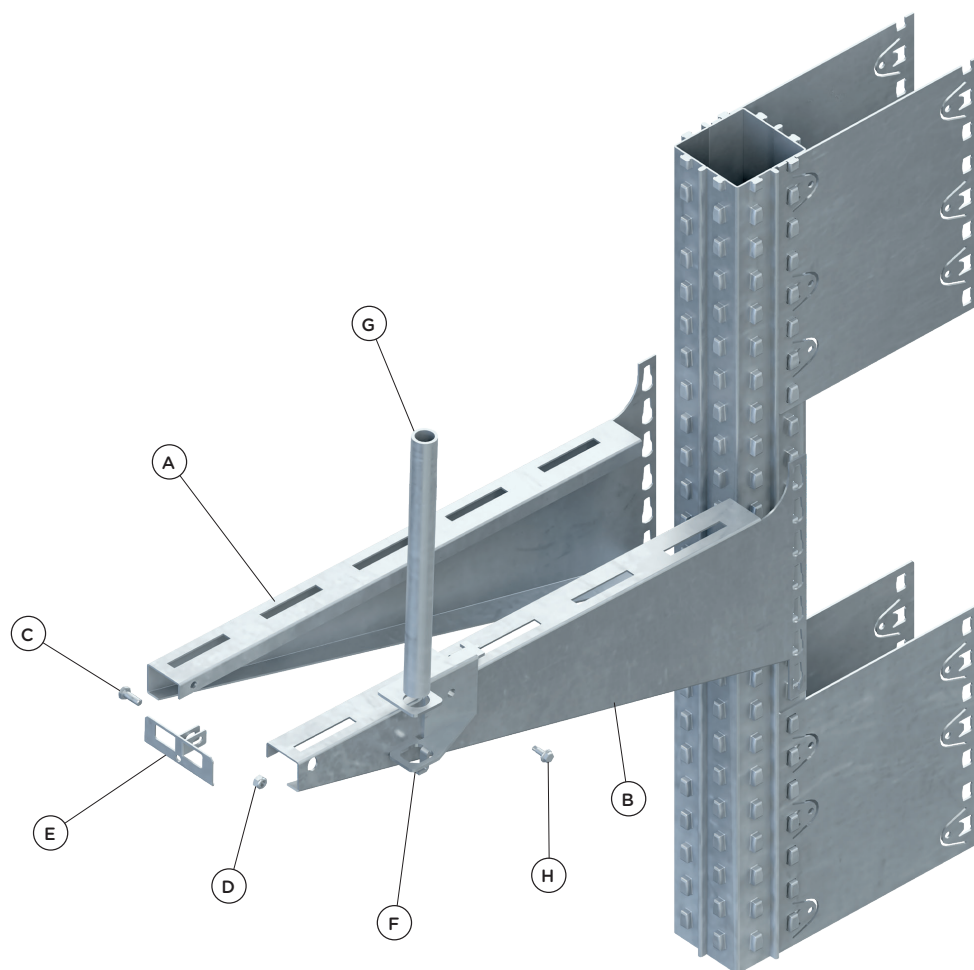
The end stop bracket for Supercant arms equipped with H=250mm tube can be installed in the dedicated slots on the upper wing of the arm to form an end stop suited for tubular stored goods.

Once installed in the slot, the bracket can be secured to the arm with a self tapping screw.

Supercant arms - codes and lengths

Pos.	Code	Description	L ord. [mm]
A	09620.95	Supercant arm normal left	L _{nom}
B	09621.95	Supercant arm normal right	
A	09623.95	Supercant arm reinforced left	
B	09624.95	Supercant arm reinforced right	
C	00035.20	M6x16 CHS bolt UNI 5931 ZP	-
D	00029.20	M6 nyloc nut DIN 982 ZP	-
E	09638.95	Top cap for Supercant arm	-
F	09644.95	Endstop bracket for Supercant arms	-
G	09646.95	Endstop rod for Supercant arm	-
H	00058.20	5,5x19 HEX self tapping screw UNI 8117 ZP	-

Tab. 3



Supercant bases

Supercant bases are supplied in single side version with nominal depths ranging from 400mm to 1500mm and in double side version with nominal depths ranging from 400mm+400mm to 1200mm+1200mm.

A complete base is assembled from two C-shaped profiles connected at both extremities by end plates which increase the resistance to small impacts.

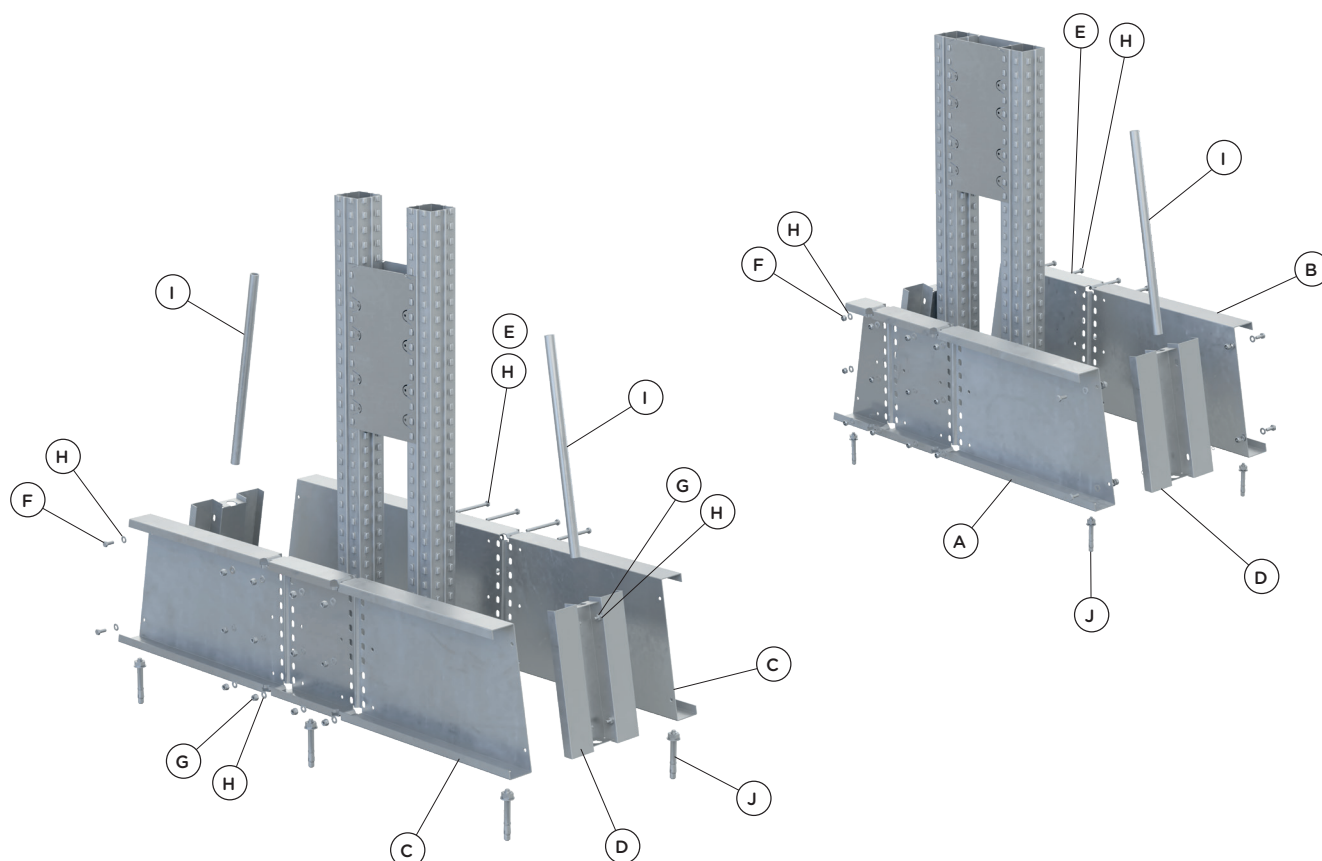
The order length of a base shall be at least equal to the longest arm connected to the corresponding column. The end plates shall be always installed on both ends of the base profiles. The end plates can host an endstop tube suited for tubular stored goods.

Every single side base must be fixed to the floor slab using 4 anchor bolts, while every double side base must be fixed to the floor slab using 6 anchor bolts.

Supercant bases - codes and lengths

Pos.	Code	Description	Q.ty SS	Q.ty DS	L. ord. [mm]
A	09601.95	Single side base Supercant left	1	-	L _{nom}
B	09602.95	Single side base Supercant right	1	-	
C	09603.95	Double side Supercant base 1/2	-	2	2 x L _{nom}
D	09604.95	Supercant base end plate	2	2	-
E	00010.20	M8x100 HEX bolt DIN 931 8.8 ZP	12	12	-
F	00004.20	M8x20 HEX bolt UNI 5739 8.8 ZP	8	8	-
G	00022.20	M8 nylon nut DIN 982 ZP	20	20	-
H	00030.20	M8 washer UNI 6592 ZP	40	40	-
I	09647.95	Endstop rod for Supercant base	1	2	-
J	00041.20	M10 expansion anchor bolt	4	6	-

Tab. 4



Longitudinal bracing

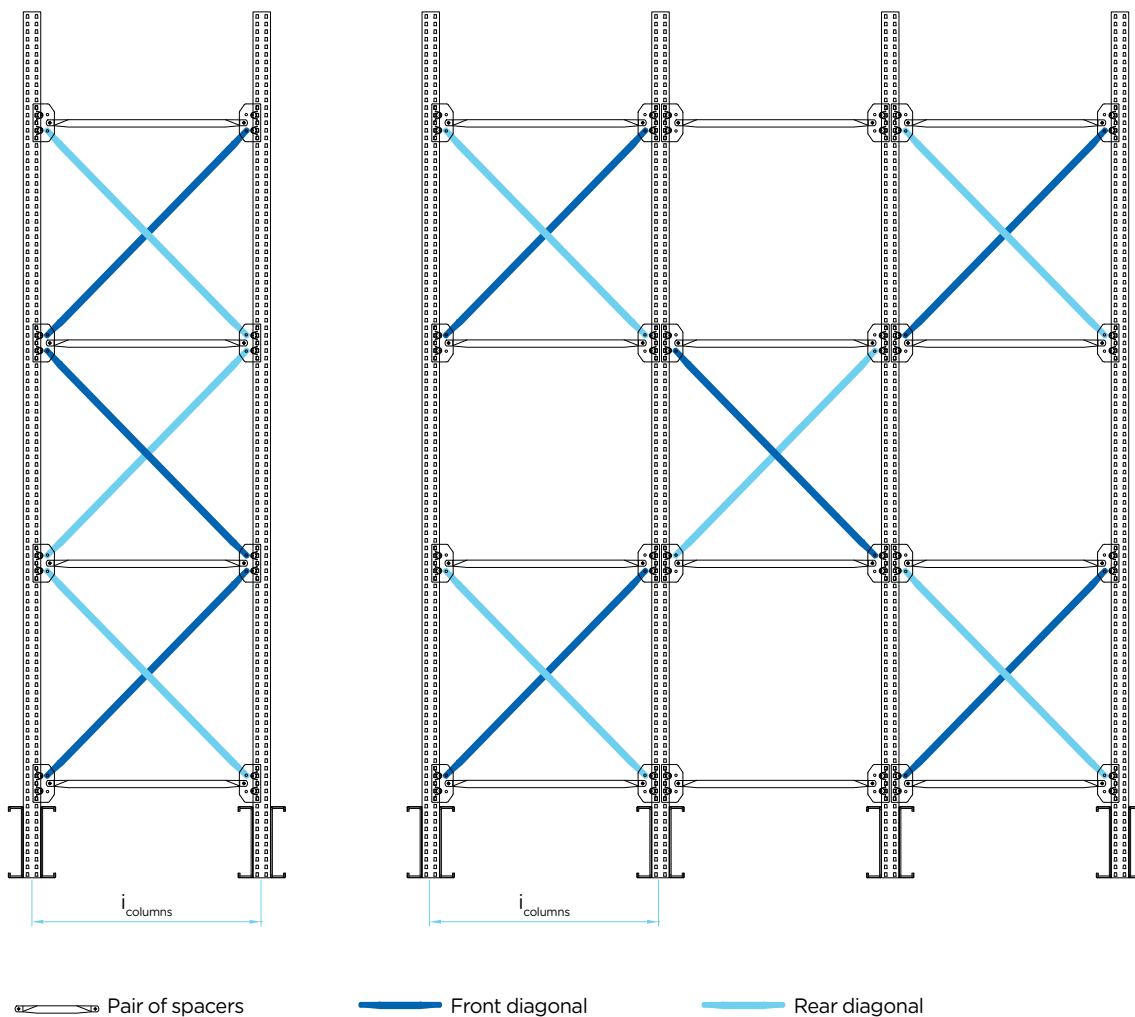
The longitudinal bracing system is created by connecting tubular profiles to the vertical bracing connection plates of the columns.

The bracing system of single bay rows is composed by one to three continuous braces, depending on the column height.

The bracing system of multiple bay rows follows a checked pattern.

The bracing elements lengths depend on the centre distance between adjacent columns. Supercant bracing ranges between 500mm and 2000mm column centre distances.

Tubular profiles with diameter Ø 32mm can be used for column centre distances up to 1500mm; for centre distances up to 2000mm, Ø 40mm diameter profiles are mandatory.



Longitudinal bracing - codes and lengths

Pos.	Code	Description	Order length [mm]
A	09635.95	Ø 32 spacer - Supercant cross bracing	$L_{\text{spacer}} = i_{\text{column}} - 124$
	09645.95	Ø 40 spacer - Supercant cross bracing	
B	09635.95	Ø 32 diagonal - Supercant cross bracing	$L_{\text{diag}} = \sqrt{(L_{\text{spacer}} - 11)^2 + 887^2} + 31$
	09645.95	Ø 40 diagonal - Supercant cross bracing	
C	00004.20	M8x20 HEX bolt UNI 5739 8.8 ZP	
D	00022.20	M8 nyloc nut DIN 982 ZP	

Note: each profile requires two bolted assemblies (bolt+nut)

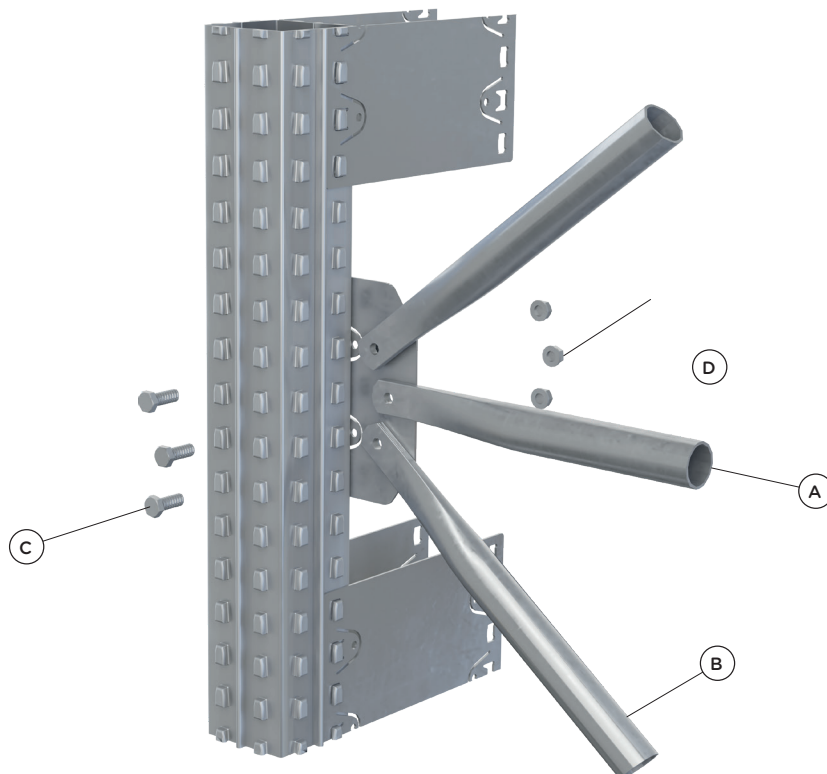
Tab. 5

Bracing elements count

Column height [mm]	Number of spacers	Single bay	Number of diagonals Even bays	Odd bays (>2)
1847	$4 \times n_{\text{bays}}$	2	$1 \times n_{\text{bays}}$	$1 \times n_{\text{bays}} + 1$
2177	$4 \times n_{\text{bays}}$	2	$1 \times n_{\text{bays}}$	$1 \times n_{\text{bays}} + 1$
2805	$6 \times n_{\text{bays}}$	4	$2 \times n_{\text{bays}}$	$2 \times n_{\text{bays}}$
3136	$6 \times n_{\text{bays}}$	4	$2 \times n_{\text{bays}}$	$2 \times n_{\text{bays}}$
3763	$8 \times n_{\text{bays}}$	6	$3 \times n_{\text{bays}}$	$3 \times n_{\text{bays}} + 1$
4094	$8 \times n_{\text{bays}}$	6	$3 \times n_{\text{bays}}$	$3 \times n_{\text{bays}} + 1$

Note: number of bolt assemblies (bolt+nuts) = number of profiles x 2

Tab. 6



Continuous shelves

Continuous shelves can be realized using H29 or H58 steel planks running over the arms. Please refer to "Pallet racking accessories technical manual", code MT07, for order procedures and codes and for load bearing capacity tables.

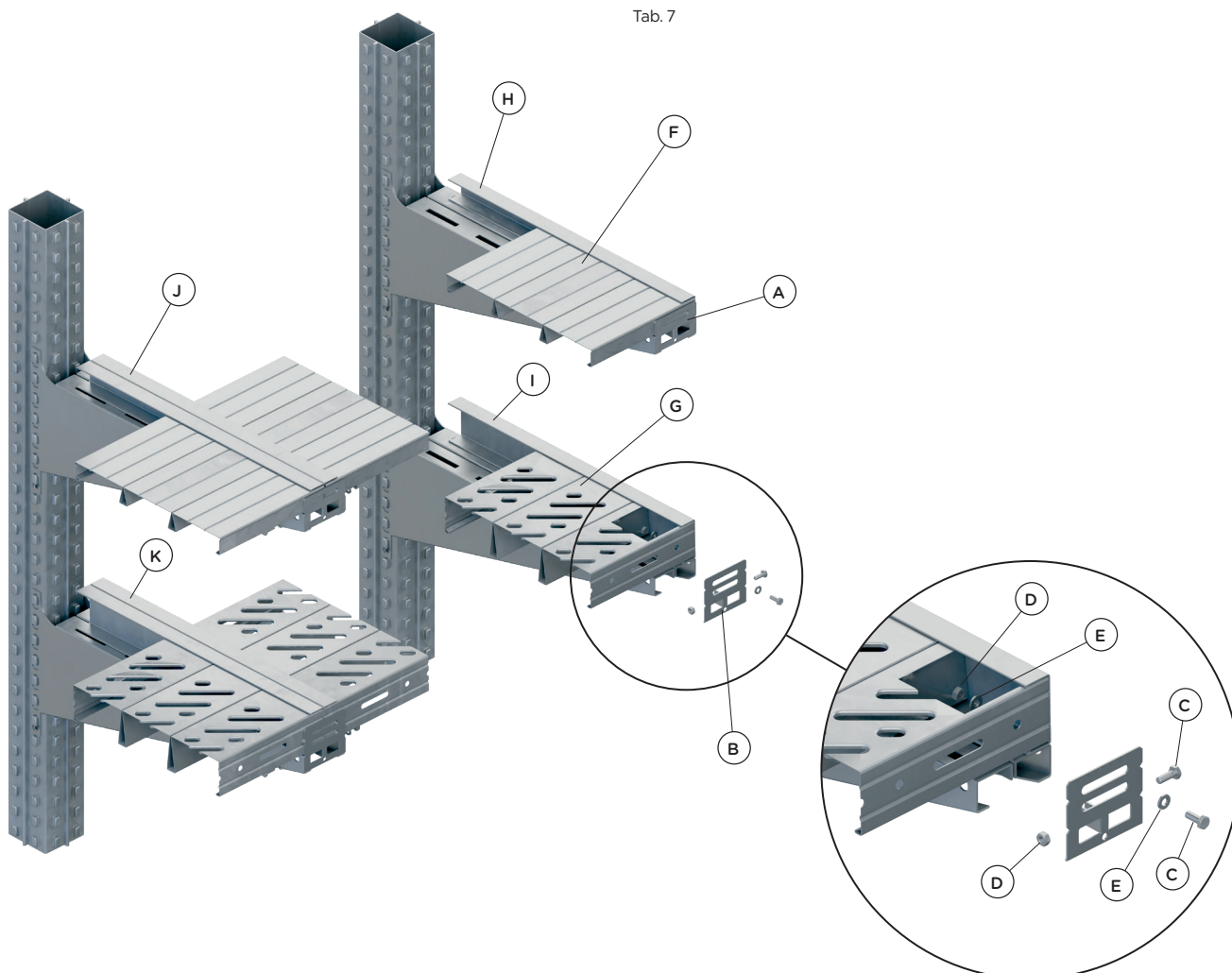
Steel planks are connected to the arms using the appropriate end stop fixing brackets. The brackets are connected to the tip of the arm in the place of the standard end cap, using the bolt already connecting the two half arms (page 12).

The external steel plank is connected to the bracket with a M6x20 hex bolt with nylon nut and washers.

Codes - continuous shelves

Pos.	Code	Description
A	09636.95	End stop for H29 steel planks
B	09637.95	End stop for H58 steel planks
C	00005.20	M6x20 CHS bolt UNI 5739 8.8 ZP
D	00029.20	M6 nyloc nut DIN 982 ZP
E	00005865.20	M6 washer UNI 6592 ZP
F	Ref. MT07	H29 steel plank
G	Ref. MT07	H58 steel plank
H	69801.95	"U" channel profile for H29 steel planks L=4000
I	69807.95	"U" channel profile for H58 steel planks L=4000
J	69804.95	"H" channel profile for H29 steel planks L=4000
K	69810.95	"H" channel profile for H58 steel planks L=4000

Tab. 7



Admissible loads

The load bearing capacity of a Supercant configuration depends on the arms length, on the number of loading levels and on the column and arm types.

Two load bearing capacity tables are available:

- Table A (cyan): load bearing capacity satisfying UNI 11598 / FEM 10.2.09 deformation limits;
- Table B (blue): load bearing capacity satisfying extended deformation limits, which can be adopted only in case the stability of stored goods and the operational methods are not affected by the deformation of the structure.

In both cases the load bearing capacity satisfies the safety levels mandated by UNI 11598 and FEM 10.2.09 (ref. paragraph Safety standards and design assumptions”).

Cantilever rackings are usually adopted to store long unit loads spanning several bays.

The required load bearing capacity per arm in a cantilever configuration depends on both the unit load flexibility and the distribution in plan of the supporting arms.

Refer to the informative Annex D of FEM 10.2.09 to correctly evaluate the required load bearing capacity.

TABLE A - Admissible load [daN] per Supercant arm - UNI 11598 - FEM 10.2.09 deformation limits

Arm length		400		500		600		700		800		900		1000		1100		1200	
N° of levels	Column Arm	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R
	Arm	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R
1	Normal	660		540		455		390		340		300		265		240		220	
	Reinf.	825		685		580		500		435		385		345		310		285	
2	Normal	660		540		455		390		340		300		265		240		220	
	Reinf.	825		685		580		500		435		385		345		310		285	
3	Normal	605	660	535	540	455		390		340		300		265		240		220	
	Reinf.					475	580	430	500	390	435	360	385	335	345	310		285	
4	Normal	465	575	410	505	365	450	330	390	300	340	275	300	255	265	240		220	
	Reinf.																		
5	Normal	380	470	335	410	300	365	270	330	245	300	225	275	210	255	195	240	180	220
	Reinf.																		
6	Normal	320	395	280	345	250	310	225	280	205	255	190	235	175	215	165	200	150	185
	Reinf.																		
7	Normal	275	340	245	300	215	265	195	240	180	220	165	200	150	185	140	170	130	160
	Reinf.																		
8	Normal	245	300	215	260	190	235	170	210	155	190	145	175	135	165	125	150	115	140
	Reinf.																		

This table applies to TS6 column heights up to 4094mm; TS6R columns with height higher than 4094mm and up to 5000mm can be adopted with a load bearing capacity reduced by 15%.

Tab. 8

TABLE B - Admissible load [daN] per Supercant arm - extended deformation limits

Arm length		400		500		600		700		800		900		1000		1100		1200	
N° of levels	Column Arm	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R
	Arm	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R	TS6	TS6R
1	Norm	1000		955		815		700		615		545		485		445		405	
	Reinf.			1000		985		855		750		665		600		545		495	
2	Norm	1000		955		815		700		615		545		485		445		405	
	Reinf.			995	1000	890	985	805	855	730	750	665		600		545		495	
3	Norm	790	1000	695	955	620	815	560	700	510	615	470	545	435	485	405	445	375	405
	Reinf.																		
4	Norm	605	1000	535	910	475	810	430	700	390	615	360	545	335	485	310	445	290	405
	Reinf.																		
5	Norm	495	845	435	740	385	660	350	600	320	545	295	500	270	465	250	430	235	400
	Reinf.																		
6	Norm	415	710	365	625	325	555	295	505	270	460	245	420	230	390	210	360	200	340
	Reinf.																		
7	Norm	360	615	315	540	280	480	255	435	230	395	215	365	195	335	185	310	170	290
	Reinf.																		
8	Norm	315	540	280	475	250	425	225	380	205	345	185	320	175	295	160	275	150	255
	Reinf.																		

This table applies to column height up to 4094mm.

Tab. 9

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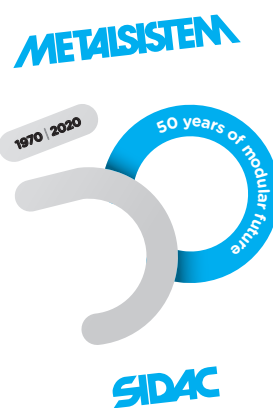


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