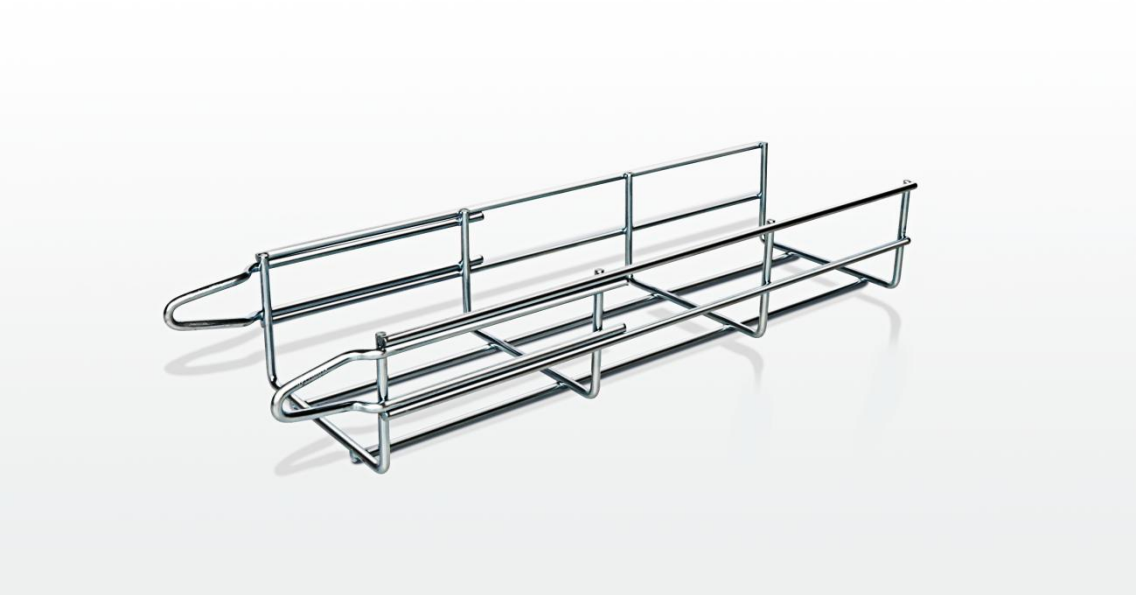
Valdinox

THE CABLE TRAY COMPANY

Technical Dossier



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INTRO: VALDINOX S.L.

VALDINOX offers the best electro-welded wire mesh cable trays in the market with fastest delivery times and high flexibility in production.

In order to comply with its mission, VALDINOX has the extensive experience of its managers, the exhaustive technical knowledge of its team, including some excellent facilities and work equipment.

From the very beginning, VALDINOX shares some values that we consider essential for complying with our mission: Honesty, transparency and professional ethics that reinforce our spirit of entrepreneurship and influence positively the relationships with each of our customers, suppliers, work teams, personnel, management and products.

VALDINOX products are present in small and large engineering projects, including infrastructures, shipbuilding, as well as in all kinds of industries and facilities pertaining to any type of renewable energy, such as photovoltaic plants, wind farms and aerogenerators.

HISTORY

Mr. Justo Valdés owner and founder of Valdinox started to produce wire mesh cable trays in 1982, being the first company to produce wire mesh cable trays in Spain. From the beginning VALDINOX is committed to the development and improvement of LV & MV cable channelling and management, in order to offer the best solution, the fastest response and the best customer service.

In 2011 VALDINOX patented EASYCONNECT SYSTEM, which started selling in Spain, Portugal, Italy and France. At present, 46,3 % of our turnover comes from export sales.

FACILITIES, EQUIPMENT AND MACHINERY

- Total premises: 10.000 square metres.
- Current Production Capacity: 11.000 metres/day. 2.500.000 metres/year
- Equipment & machinery:
  - 1 SCHLATTER SYSTEM MG automatic welding machine.
  - 1 SCHLATTER SYSTEM PG semi-automatic welding machine.
  - 4 production lines for wire straightening and cutting.
  - 2 production lines for wire mesh folding.
- Indoor stocking capacity: We can stock up to 150 pallets including special measures and fast movers references.

LRQA
Business Assurance

CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

VALDINOX, S.L.
Villanueva, 12
39192 San Mamés de Meruelo, Cantabria
Spain

has been approved by Lloyd's Register Quality Assurance
to the following Quality Management System Standard:

ISO 9001:2008

The Quality Management System is applicable to:

Manufacturing of wire-mesh organizer cable cradles.

Approval
Certificate No: SGI 1200439/11

Original Approval: 18 May 2001

Current Certificate: 12 December 2012

Certificate Expiry: 11 December 2015

Issued by: LRE, S.A.
On behalf of Lloyd's Register Quality Assurance Limited

UKAS
MANAGEMENT
SYSTEMS
001

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cofrac
CERTIFICATION D'ENTREPRISES & DE PERSONNELS
ACCREDITATION N°4-0003
PORTÉE DISPONIBLE SUR WWW.COFRAC.FR

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Declaration of conformity

The company: *VALDINOX*
C/Villanueva, 12- 39192
SAN MAMÉS DE MERUELO-CANTABRIA-ESPAÑA

Declare that the products:
CABLE TRAYS
EASY CONNECT SYSTEM CABLE TRAYS
FITTINGS
SUPPORTS
CABLE TRAY ACCESSORIES

Installed in accordance to the installation standards , manufacturer's instructions and profesional rules, duly maintained and used for the applications as intended, comply with the essential requirements of the CE Council Directives 2006/95/CE (Low Voltage Directive), Incorporated in the Spanish Legislation in RD 7/1988 and its modification RD 154/1995

And it is suitable and safe for the intended use and it is in conformity with the following standard: ***UNE EN 61537***

Additional information: This product is intended to be installed and maintained by skilled workers, it may be used by not skilled workers and individuals only as a replacement part, to substitute for an identical device.

Marked in: 2010

Place and Date: San Mamés de Meruelo, Cantabria, Spain. November 2010

Signature,
Carmen Valdés Ruiz, General Manager

ONLINE CERTIFICATIONS DIRECTORY

CYNW.E350492
Cable Trays

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Cable Trays

See General Information for Cable Trays

VALDINOX S L E350492
BARRIO VILLANUEVA 12
39192 SAN MAMES DE MERUELO, SPAIN
Last Updated on 2012-06-18

Questions? Print this page Terms of Use Page Top

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Declaration of conformity

The company: *VALDINOX*
C/Villanueva, 12- 39192
SAN MAMÉS DE MERUELO-CANTABRIA-Spain

This is to declare that

EASY CONNECT SYSTEM CABLE TRAYS, Zinc plated steel, Hot Dip galvanized and Stainless steel trays, have been investigated by UL in accordance with the Standard(s) for Safety: Article 392 of NFPA 70, "National Electrical Code" -2011, ***NEMA VE 1-2009. CSA C22.2 No. 126.1-09, Cable Tray Systems****. The results of this investigation indicate that the products evaluated comply with the applicable requirements and, therefore, such products are judged eligible to bear UL's Mark.*

METAL CABLE TRAY IN ACCORDANCE WITH THE STANDARD FOR CABLE TRAY SYSTEMS
CAN/CSA-C22.2 NO. 126
<4UE7>

Certificate Number: 20120618-E350492
Report Reference: E350492-20120614
File No: E350492
Issue Date: 2012-JUNE-18

Signed,
Carmen Valdés Ruiz, General Manager

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TECHNICAL INFORMATION

GENERAL REQUIREMENTS OF THE REGULATION

Tray systems must be designed and manufactured in such a way that, once installed in accordance with the instructions of the manufacturer or the responsible seller, they provide a safe support for the cables they contain. Under no circumstances should they present an unwarranted risk to humans or to the cables.

System components must be designed to withstand the expected strains of transportation and storage. Tray systems manufactured in accordance with Standard UNE EN 61537 are not intended to be used for supporting people.

CLASSIFICATION ACCORDING TO UNE EN 61537 STANDARD

CLASSIFICATION WIRE MESH TRAY ST AND WIRE MESH TRAY EASYCONNECT ACCORDING TO UNE EN 61537	
RESISTANCE TO FLAME SPREAD	FLAME RETARDANT
ELECTRIC CONTINUITY	YES
ELECTRIC CONTINUITY FEATURES	CONDUCTOR
COATING MATERIAL	METAL
TEMPERATURE FOR TRANSPORTATION, STORAGE, INSTALLATION AND USE	MINIMUM: - 40º MAXIMUM: + 150º
CLASSIFICATION ACCORDING TO THE PERFORATION OF THE BASE AREA	CLASSIFICATION D
IMPACT RESISTANCE	UP TO 20J

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CLASSIFICATION FOR RESISTANCE AGAINST CORROSION

The classification for resistance against corrosion is shown in the table below. This table shows the most widely used materials and coatings. These must be taken as a reference to measure the other materials and coatings in order to classify them:

CLASSIFICATION FOR RESISTANCE AGAINST CORROSION	
CLASS	**REFERENCE/MATERIAL AND COATING**
0 (a)	None
1	Electroplated to a minimum thickness of 5µ
2	Electroplated to a minimum thickness of 12 µ
3	Pre-galvanized to grade 275 according to EN 10327 and EN10326
4	Pre-galvanized to grade 350 according to EN 10327 and EN10326
5	Hot-galvanized to a zinc mean coating thickness of 45µ (minimum) according to ISO1461 for zinc thickness only
6	Hot-galvanized to a zinc mean coating thickness of 55µ (minimum) according to ISO1461 for zinc thickness only
7	Hot-galvanized to a zinc mean coating thickness of 70µ (minimum) according to ISO1461 for zinc thickness only
8	Hot-galvanized to a zinc mean coating thickness of 85µ (minimum) according to ISO1461 for zinc thickness only (usually high silicon steel)
9A	Stainless steel manufactured to ASTM: A 240/A 240M- 95a designation S30400 or EN 10088 GRADE 1-4301 without post-treatment (b)
9B	Stainless steel manufactured to ASTM: A 240/A 240M- 95a designation S31603 or EN 10088 GRADE 1-4404 without post-treatment (b)
9C	Stainless steel manufactured to ASTM: A 240/A 240M- 95a designation S30400 or EN 10088 GRADE 1-4301 without post-treatment (b)
9D	Stainless steel manufactured to ASTM: A 240/A 240M- 95a designation S31603 or EN 10088 GRADE 1-4404 without post-treatment (b)

(a) For material which have not declared corrosion resistance classification

(b) The post--treatment process is used to improve the protection against crevice crack corrosion and the contamination by other steels.

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CLASS OF THE ST SYSTEMS AND EASYCONNECT SYSTEMS

It should be noted that the standard UNE EN 61537 gives us the possibility to establish equivalence between the corrosion resistance class and the duration of the neutral salt spray test (ISO 9227)

The following table is based on this equivalence:

CLASSES / DURATION	
CLASS (ACCORDING TO UNE 61537)	DURATION (HOURS)
0	0
1	24
2	96
3	155
4	195
5	450
6	550
7	700
8	850

TYPES OF FINISH

STEEL + ZINC PLATED

Electroplated steel base. Depending on the thickness of the Zinc layer, it will offer protection to a greater or lesser extent. Our Systems ST and EASYCONNECT have a minimum thickness of 12µ, which corresponds to class 2 in the classification set forth in UNE 61537

The Zinc used is free from Hexavalent Chromium, in compliance with the requirements of directive 2002/95 EC RoHS.

STEEL + ZINC PLATED – DICHROMIUM PLATED

Electroplated steel base, subsequently applying a passivation with chromium salts which gives it its characteristic golden--iridescent colour.

Our Systems ST and EASYCONNECT have a minimum thickness of 12µ, which corresponds to class 2 in the classification set forth in UNE 61537tion set forth in UNE 61537.

The Zinc used is free from Hexavalent Chromium, in compliance with the requirements of directive 2002/95 EC RoHS.

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STEEL + HOT-DIP GALVANIZING

Molten zinc coating according to UNE EN ISO 1461.

The protection of the coating depends on the steel base used and the dipping time in the molten zinc vessel.

At VALDINOX we believe in using high--quality steel (high silicon), for this reason, our hot--galvanized systems correspond to classification 8 according to UNE 61537.

STAINLESS STEEL (AISI 304L AND AISI 316L)

Stainless steels are carbon steels with a chromium, nickel and manganese alloy.

Following the forming of the piece, we carry out a cleaning process known as PASSIVATION that gives a higher of protection against corrosion, because it provides protection in crevice cracks and it helps to eliminate the contamination it might have suffered when contacting other steels.

Our Systems ST and EASYCONNECT AISI 304L and 316L correspond to class 9D according to standard UNE 61537.

EPOXY POLYESTER:

- In any colour.
- Minimum coating of 60 microns. Maximum 80 microns
- Minimum duration at salt spray chamber 300hours

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STEEL & PLATING CHARACTERISTICS OF VALDINOX CABLE TRAYS

ZINC PLATED STEEL			
Material	**Tensile strenght**	**Yield strenght**	**Electrical Continuity**
Steel C9D (EN 10016-2/94)	70 Kg/mm²	67 Kg/mm²	According to requisites EN 61537:2007
Zinc trivalent bichromium plating according to ISO 2081:1986 with trivalent chromium passivation (Cr3+) according to UNE 112050:1994 and ISO 4520:1981. Minimmum Thickness 8µ			
ENVIRONMENTALLY FRIENDLY: According to EU Directive 2002/95/CE RoHS and later modifications. Free of Hexavalent chromium Cr6			
Clasificación 2 according to EN 61537 :2007			

HOT DIP GALVANIZED STEEL			
Material	**Tensile strength**	**Yield strength**	**Electrical Continuity**
Steel C9D (EN 10016-2/94)	70 Kg/mm²	67 Kg/mm²	According to requisites EN 61537:2007
Hot Dip Galvanized process according to UNE EN ISO 1461. Galvanized plating Thickness: Min. 85µ - Av. 100µ			
Zinc according to standard UNE EN 1179			
Classified 8 according EN 61537: 2007			

STAINLESS STEEL		
Material	**Tensile strength RT N/mm²**	**Electrical Continuity**
Stainless Steel AISI 304 L	765 N/mm²	According to requisites EN 61537:2007
Passivated Steel (Chemical removal of all particules and contaminants that may have been stuck in the manufacturing process). WITHOUT RIDGES OR SCRATCHES.		
Clasification 9D according to EN 61537:2007 (Stainless Steel with aftertreatment)		

STAINLESS STEEL		
Material	**Tensile Strength RT N/mm²**	**Electrical Continuity**
Stainless Steel AISI 316 L	765 N/mm²	According to requisites EN 61537:2007
Passivated Steel (Chemical removal of all particules and contaminants that may have been stuck in the manufacturing process). WITHOUT RIDGES OR SCRATCHES.		
Clasification 9D according to EN 61537:2007 (Stainless Steel with aftertreatment)		

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CHOOSING OF FINISH ACCORDING TO ENVIRONMENTAL CONDITIONS

In order to be able to offer the highest possible quality and extend the useful life of our products, we have developed a table that shows the optimal relationship between the work environment and the finish of components:

SELECTION TABLE DEPENDING ON THE WORK ENVIRONMENT	
ENVIRONMENT	**RECOMENDED FINISH**
Indoors installation-Normal environment	Zinc plated / Galvanized / EPOXY
Outdoors installation-Normal environment	Galvanized / EPOXY
Indoors installation	Stainless Steel
Food industry	Stainless Steel / EPOXY
Chemical industry	Stainless Steel
Ship building insdustry	Stainless Steel
Indoors/outdoors installation	Galvanized / Stainless Steel
Acid or alkaline environment	Galvanized / Stainless Steel
Halogen environment	Galvanized

Table 1. Selecting the surface treatment

Performance:

	E = Excellent	*G= Good*	*P= Possible*	*Su= Superfluous*	*Na= not Advised*	
Applications	**Zinc electroplating**	**Sendzimir**	**Hot dip galvanized**	**Stainless steel**	**Epoxy***	**Polyester***
Indoors installation. Normal environment	**E**	**E**	Su	Su	**E**	Su
Indoors installation with high humidity	NA	NA	**G**	Su	NA	**E**
Outdoors installation Normal environment	NA	P	**E**	Su	NA	**E**
Marine environment (saline)	NA	NA	P	**G**	NA	**E**
Industrial environment (SO2)	NA	NA	NA	P	NA	P
Alimentary sector	NA	NA	P	**E**	**E**	**E**
Acid environment	NA	NA	NA	P	**G**	**G**
Alcaline environment	NA	NA	P	P	**G**	NA
Environment with presence of halogens	NA	NA	NA	P	**E**	**E**

* Values obtained without cuts on the tray

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LOAD CAPACITY

Load capacity diagrams

The permissible load diagrams have been obtained experimentally in our laboratory according to CEI 61537:2001 standard and load limitations determined by:

1. Maximum longitudinal deflection = 1/100 of the span between supports
2. Maximum transversal deflection = 1/20 of cable tray width
3. With the joint of two cable trays placed approximately at 1/5 of the span between supports (null flector moment). We discard, therefore, joints of two cable trays in the middle of the span between supports or on the support.
4. The values established are for uniformly distributed loads and excluding any type of isolated loads (as the weight of a worker).
5. Safety coefficient = 1,7

Diagrams indicate the permissible loads in N/m (1N ~ 0,1Kg) for a certain type of cable tray depending on the span between supports and are formed by a horizontal section that represents the load of the different cable trays at their limit of full load capacity with cables. The load has been calculated having in consideration the useful cross section of the cable tray (width x interior height) and an average density of 0,025 N/mm2 per metre of the copper power cable set (copper + insulating material + air interstices).

A second section formed by a descending curve (only on those affected diagrams) represents the maximum load that can withstand the cable tray with the limitations mentioned above.

Number of Cables and section

It's the first factor that determines the dimensions of the cable trays to be installed. With this data it is possible to calculate the useful cross section that the cables would occupy in the tray as indicated as follows

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Calculating useful cross section

Useful cross section of cable trays is obtained using the following formula:

Su (mm2) = C x R x S (mm2)

where:

Su = Minimum useful section needed

C = Filling coefficient. This coefficient takes into account both the incapacity to fill completely the section of the cable tray and the need to leave enough space for cable ventilation.

C = 1, 25 for control cables

C = 1, 45 for power cables

R = Space reserve coefficient. This coefficient takes into account the possible future installation of more cables in the cable tray. Recommended values are:

R = 1, 20 to 1, 30

S = Added section, (conductor + insulator) of all cables being installed.

The appropriate size of the cable tray can be ascertained by comparing the value of Su with values of useful cross sections of cable trays.

We should verify that the chosen size is adequate to support the weight of cables given the existing or planned span between supports.

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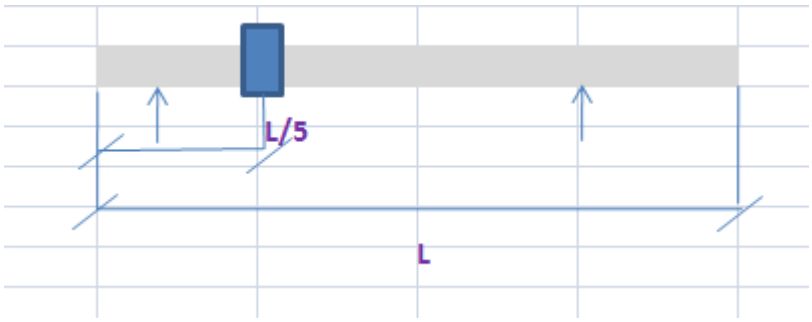
Number of cables and weight

It's the second factor that determines the dimensions of the trays to be installed and defines the distance between supports (L). (See CTA Certificate graphics)



Couplers

For a correct installation, it is important to correctly place the couplers according to the supports' position. The optimal location is found at 1/5th of the span between supports. In any case, it is never advised to place the couplers right over the supports or right in between two supports

Calculating cable tray permissible load

Permissible load of cable trays is obtained using the following formula:

L. perm (N/m) = 10 x R x W (Kg/m

where:

L. perm = Permissible Load

R = Space reserve coefficient. It will be the same value used for the calculations of Su. (R = 1,20 to 1,30)

W = Added weights per lineal metre of all cables being installed.

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Looking at the load capacity diagram of the chosen cable tray, we will make sure that the value of the permissible load calculated (L. perm) is below the horizontal line of maximum filling capacity of this cable tray and, if no maximum load capacity curve exist that limits the span between supports, this span will be 2 metres maximum.

In accordance to the permissible load capacity diagrams, the longest span between supports would be 2 metres. With the first mm cable tray, ventilation is highly efficient, though it takes up too much space; with the second cable tray space and ventilation are balanced and with the third ventilation is not optimal.

Calculation example

We are looking for a perforated sheet steel cable tray to house the cables in these quantities and with these manufacturer specifications:

Quantity of cables	Nominal section (mm2)	External diameter (mm)	External section (mm2)	Total section (mm2)	Weight (Kg/m)	Total Weight (Kg/m)
4	1x4	7,200	41,000	164,000	0,087	0,348
3	4x6	17,200	232,000	696,000	0,516	1,548
8	4x70	35,500	990,000	7,920	3,574	28,592
6	3x150	44,900	1583,000	9498,000	5,550	33,300
				S = 18.278 mm2	W = 63,788 Kg/m	

Assuming that we want to reserve 20% of the space (R=1,20), and appreciating that most of the cables are power cables (C=1,40), the minimum useful cross section needed will be:

Su = 1, 40 x 1, 20 x 18.278 mm2 = 30.707 mm2

ELECTRICAL CONTINUITY

According to UNE 61537, cable management systems regarding their ability to conduct current in:

a) Tray systems with electric continuity

b) Tray systems without electric continuity.

Our Systems ST and EASYCONNECT are classified as tray systems with electrical continuity. Relevant tests were conducted in accordance with UNE 61537.

(See our certificates duly issued by Spanish government authorities)

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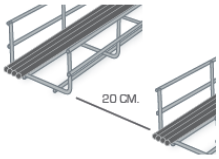
ELECTROMAGNETIC COMPATIBILITY

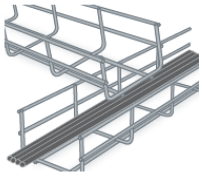
Electromagnetic disturbances are emitted by a source that contaminates a victim. The means of transmission of the electromagnetic disturbances is the so called coupling.

An ECM problem only occurs when the three factors - source, coupling and victim - occur at the same time. In order to achieve a good ECM you just have to eliminate or reduce the influence of one of these three factors.

If a cable tray has an excellent electric continuity and is integrated in the equipotential earthing system of the installation, it reduces the impact of coupling and contributes to a good ECM of the electric installation.

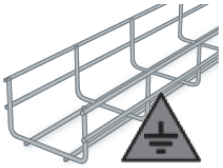


Separate power and data cables (20cm apart)



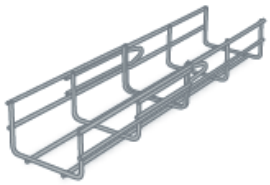
Cross cable groups and circuits at right angles

Ensure electric continuity: metallic cable trays and joints



Always connect cable trays to the earthing system (every 15-20m)

ECM classification of steel cable trays:

EXCELLENT	REGULAR	POOR
Optimal ECM execution. Allows complete visualization and inspection of cables	Normal ECM execution but limited visualization of cables	Poor ECM. Data and electrical Cables must not be together
		

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ASSEMBLIES AND FINISHINGS

The wire mesh cable tray has many advantages over other trunking systems. One of these advantages, perhaps the most significant is that, thanks to its shape, wire mesh cable tray adapt perfectly to spatial requirements of each installation.

The wire mesh cable tray is easily moldable by making a few cuts on its structure. This flexibility will enable us to overcome any unforeseen problem during installation.

It has to be said that our fast and easy attachment accessories, fittings and supports allow us to avoid the using of fixing tools like wrenches or screwdrivers.

GLOSSARY OF TERMS

The following definitions are used within the scope of this international standard:

Tray system (cable trays)

A set of cable tray support devices made up by cable tray sections and other components of the system.

System components

A part used in the system. The system components are the following:

a) Tray sections

b) Tray channelling elements

c) Support elements

d) Mounting devices

e) System accessories.

[Note: It is not strictly necessary that all components are included in the system]

Tray section

A component of the system for supporting cables and made up by a base and integrated sides or, a base fixed to the sides.

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Tray conduction accessory

A component of the system used for joining, changing direction, changing the dimension or ending tray sections. [Note: typical examples are joints, elbows, bends, shunts...).

Cable management

A set made up only by the tray sections and their conduction accessories.

Support element

A component of the system designed to provide a mechanical support that can limit the movement of a cable management system.

Mounting device

A component of the system used for joining or securing other cable management devices.

Adapter of mechanisms

A component of the system used for placing electrical mechanisms such as switches, sockets, phone sockets, etc. that can be part of the electrical mechanism but are not part of the tray system.

System accessory

A component of the system that has a complementary function such as securing cables, covers, etc.

Metallic Component of the system

A component of the system made out exclusively of metal. Connection bolts and other fastening devices are not taken into account.

Non--metallic component of the system

A component of the system made out exclusively of non--metallic material. Connection bolts and other fastening devices are not taken into account.

Composite component of the system

A component of the system made out of both metallic and non--metallic material. Connection bolts and other fastening devices are not taken into account.

Flame--retardant component of the system

A component of the system that can catch fire when applying a flame, fire does not spread along it, it goes out by itself in a limited time period after the flame application ends.

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External influence

The presence of water, oils, building materials, corrosive substances and contaminants, external forces such as snow, wind and other weather conditions.

Working load limit [WLL]

Maximum load that can be applied in normal operation safely.

Uniformly distributed load [UDL]

A load that is uniformly distributed over a specific area.

Span

Distance between the central points of two adjacent supports.

Internal fastening device

A device for joining or fastening system components to other system components. This device is a part of the system but not a component of the system. (Note: typical examples are nuts and bolts).

External fastening device

A device used for fastening a device to a wall, ceiling or any other structural element. This device is not part of the system. (Note: Typical examples are anchor bolts).

Base area of a tray section

Useful area of the base for housing the cables.

Free base area

The part of the base area open to allow air circulation.

Load distribution plate

The means used to apply a punctual load to the sample with a view to performing a new test.

Type of product

Group of system components that vary,

- In the case of cable management, only the width.
- In the case of horizontal supports, only the length.
- In the case of vertical elements, only the length.

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Topology form

The set of product types that only varies in thickness and height.

Transversal arrow

A vertical arrow along the width of the base area, regardless of the longitudinal arrow, in horizontal installations.

INFORME DE ENSAYO

Ensayo Nº 201204100147

1.- OBJETO

El objeto del presente informe es presentar los resultados obtenidos de la medida de continuidad eléctrica sobre un prototipo de bandeja de canalización de cable solicitadas por el solicitante.

2.- SOLICITANTE

Nombre : **VALDINOX, S. L.**
Domicilio: **Barrio Villanueva, 12**
39192 San Mamés de Meruelo
Cantabria – España

3.- MUESTRA ENSAYADA

La muestra ensayada ha consistido en dos bandejas de 500 mm de longitud junto con la unión fija mediante tres puntos de anclaje entre las dos bandejas suministradas, tal como lo ha suministrado el solicitante.

Se adjunta en el anexo-I fotografías de la muestra ensayada.

La muestra se ha entregado para los ensayos el día 25-04-2012.
Los ensayos se realizaron el día 03-05-2012.

NOTA: Este Informe de Ensayos consta de cuatro páginas mecanografiadas y un Anexo-I de tres páginas

4.- REFERENCIAS NORMATIVAS

Para los ensayos cubiertos en el presente informe, se han seguido las pautas definidas en los siguientes documentos normativos:

EN 61537:2007 – "Conducción de cables. Sistemas de bandejas y de bandejas de escalera".

Apdo. 11.1 Continuidad eléctrica

5.- ENSAYOS REALIZADOS

A continuación, se listan los ensayos realizados sobre la muestra analizada.

Las condiciones ambientales durante la realización de los ensayos han sido:
Temperatura ambiente: 23ºC ± 5 ºC
Humedad relativa: 20 ÷ 60 %

5.1.- Ensayo de continuidad eléctrica (Apdo. 11.1 EN 61537:2007)

Previamente al ensayo se ha realizado un preacondiconamiento para evitar la posible grasa que pudiera presentar la muestra ensayada.

Durante el ensayo se ha pasado a lo largo de la muestra ensayada una corriente de 25 A ± 1 A con una frecuencia de 50 Hz, suministrada por una fuente de tensión que en vacío no supera 12 V. Se ha medido la caída de tensión en las siguientes zonas de la muestra:

a) Entre dos puntos situados a cada uno de los lados de la unión integrada de la muestra suministrada, distantes 50 mm de cada lado de la unión.

b) Entre dos puntos distante 500 mm entre sí y situados al mismo lado de la unión.

La impedancia total se calcula a partir de la corriente aplicada y de la caída de tensión medida.

Resultados obtenidos:

Para cada uno de los casos anteriores se han obtenido los siguientes resultados:

a) Medida entre dos puntos situados a cada uno de los lados de la unión integrada:

- Corriente aplicada de ensayo = 25,2 A (50,0 Hz)
- Caída de tensión medida = 123,84 mV
- Cálculos de la impedancia obtenida = 4.91 mΩ
- Límite permitido: < 50 mΩ

Conclusión: Conforme con los requisitos determinados por la norma de referencia.

b) Medida ente puntos distantes en una lado de la unión:

- Corriente aplicada de ensayo = 25,0 A (50,0 Hz)
- Caída de tensión medida = 56,1 mV
- Cálculos de la impedancia obtenida = 2,24 mΩ (500mm distancia)
- Cálculo impedancia por metro= 4.49 mΩ/m
- Límite permitido = < 5 mΩ/m

Conclusión: Conforme con los requisitos determinados por la norma de referencia.

Y, para que conste, a petición de la empresa C.A.T., S. L.; se expide el presente en Madrid, a tres de Mayo del año dos mil doce.

EL DIRECTOR DE DEPARTAMENTO,

ANTONIO VALLADOLID ALONSO

Ensayado por,

JESUS SANCHEZ PANDO

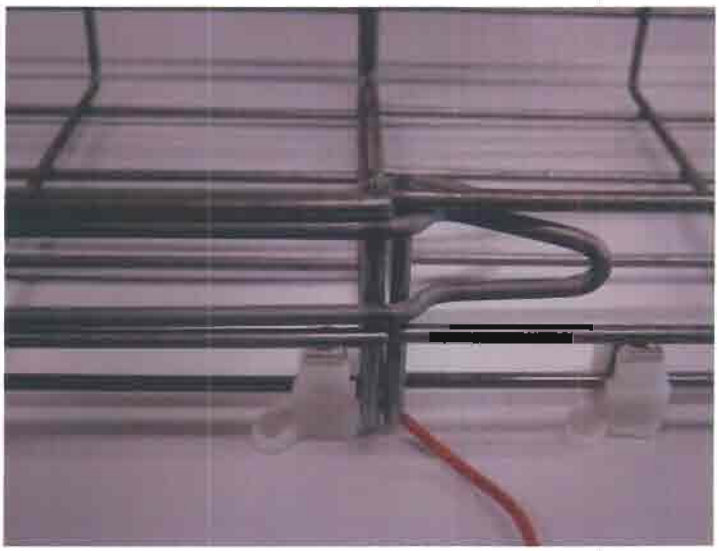
LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA, E.T.S.I.I.

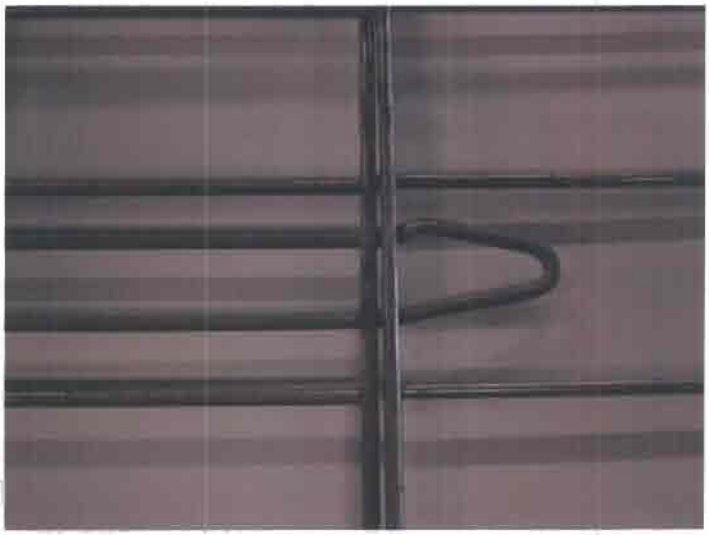
ANEXO-I

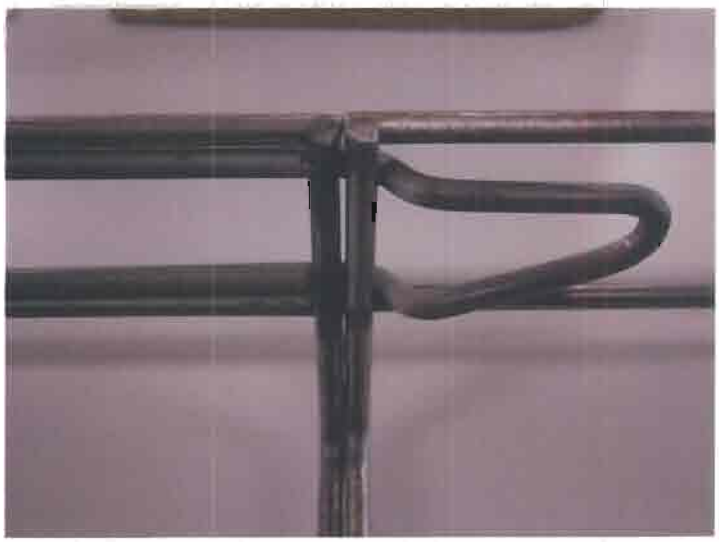
FOTOGRAFIAS DEL PRODUCTO

(3 Pág.)

Bandeja bajo ensayo







Fijación

INFORME DE ENSAYO

Ensayo Nº 201112100511

1.- OBJETO

El objeto del presente informe es presentar los resultados obtenidos de la medida de continuidad eléctrica sobre un prototipo de bandeja de canalización de cable solicitadas por el solicitante.

2.- SOLICITANTE

Nombre : **VALDINOX, S. L.**
Domicilio: **Barrio Villanueva, 12**
39192 San Mamés de Meruelo
Cantabria – España

3.- MUESTRA ENSAYADA

La muestra ensayada ha consistido en dos bandejas de 500 mm de longitud junto con la unión elástica mediante cuatro elementos de fijación entre bandejas integrada en la misma, tal como lo ha suministrado el solicitante.

Dicha unión se ha evaluado para los dos sistema de fijación aportados por el solicitante, designando de tipo elástico negro y de tipo elástico plateado.

Se adjunta en el anexo-I fotografías de la muestra ensayada.

La muestra se ha entregado para los ensayos el dia 2911-2011.
Los ensayos se realizaron el día 13-12-2011.

LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA, E.T.S.I.I.

NOTA: Este Informe de Ensayos consta de cuatro páginas mecanografiadas y un Anexo-I de tres páginas

4.- REFERENCIAS NORMATIVAS

Para los ensayos cubiertos en el presente informe, se han seguido las pautas definidas en los siguientes documentos normativos:

EN 61537:2007 – "Conducción de cables. Sistemas de bandejas y de bandejas de escalera".

Apdo. 11.1 Continuidad eléctrica

5.- ENSAYOS REALIZADOS

A continuación, se listan los ensayos realizados sobre la muestra analizada.

Las condiciones ambientales durante la realización de los ensayos han sido:
Temperatura ambiente: 23ºC ± 5 ºC
Humedad relativa: 20 ÷ 60 %

5.1.- Ensayo de continuidad eléctrica (Apdo. 11.1 EN 61537:2007)

Previamente al ensayo se ha realizado un preacondiconamiento para evitar la posible grasa que pudiera presentar la muestra ensayada.

Durante el ensayo se ha pasado a lo largo de la muestra ensayada una corriente de 25 A ± 1 A con una frecuencia de 50 Hz, suministrada por una fuente de tensión que en vacío no supera 12 V. Se ha medido la caída de tensión en las siguientes zonas de la muestra:

a) Entre dos puntos situados a cada uno de los lados de la unión integrada de la muestra suministrada, distantes 50 mm de cada lado de la unión.

b) Entre dos puntos distante 500 mm entre sí y situados al mismo lado de la unión.

La impedancia total se calcula a partir de la corriente aplicada y de la caída de tensión medida.

Resultados obtenidos:

Para cada uno de los casos anteriores se han obtenido los siguientes resultados:

a) Medida entre dos puntos situados a cada uno de los lados de la unión integrada:

a.1. Fijación tipo elástico negro

- Corriente aplicada de ensayo = 25,6 A (50,0 Hz)
- Caída de tensión medida = 383,4 mV
- Cálculos de la impedancia obtenida =14.9 mΩ
- Límite permitido: < 50 mΩ

Conclusión: Conforme con los requisitos determinados por la norma de referencia.

a.2. Fijación tipo elástico plateado

- Corriente aplicada de ensayo = 25,6 A (50,0 Hz)
- Caída de tensión medida = 48,7 mV
- Cálculos de la impedancia obtenida =1,902 mΩ
- Límite permitido: < 50 mΩ

Conclusión: Conforme con los requisitos determinados por la norma de referencia.

b) Medida ente puntos distantes en una lado de la unión:

- Corriente aplicada de ensayo = 24,8 A (50,0 Hz)
- Caída de tensión medida = 61,6 mV
- Cálculos de la impedancia obtenida = 2,48 mΩ (500mm distancia)
- Cálculo impedancia por metro= 4.96 mΩ/m
- Límite permitido = < 5 mΩ/m

Conclusión: Conforme con los requisitos determinados por la norma de referencia.

LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA E.T.S.I.I.

Y, para que conste, a petición de la empresa C.A.T., S. L.; se expide el presente en Madrid, a dieciséis de Diciembre del año dos mil once.

EL DIRECTOR DE DEPARTAMENTO,

ANTONIO VALLADOLID ALONSO

Ensayado por,

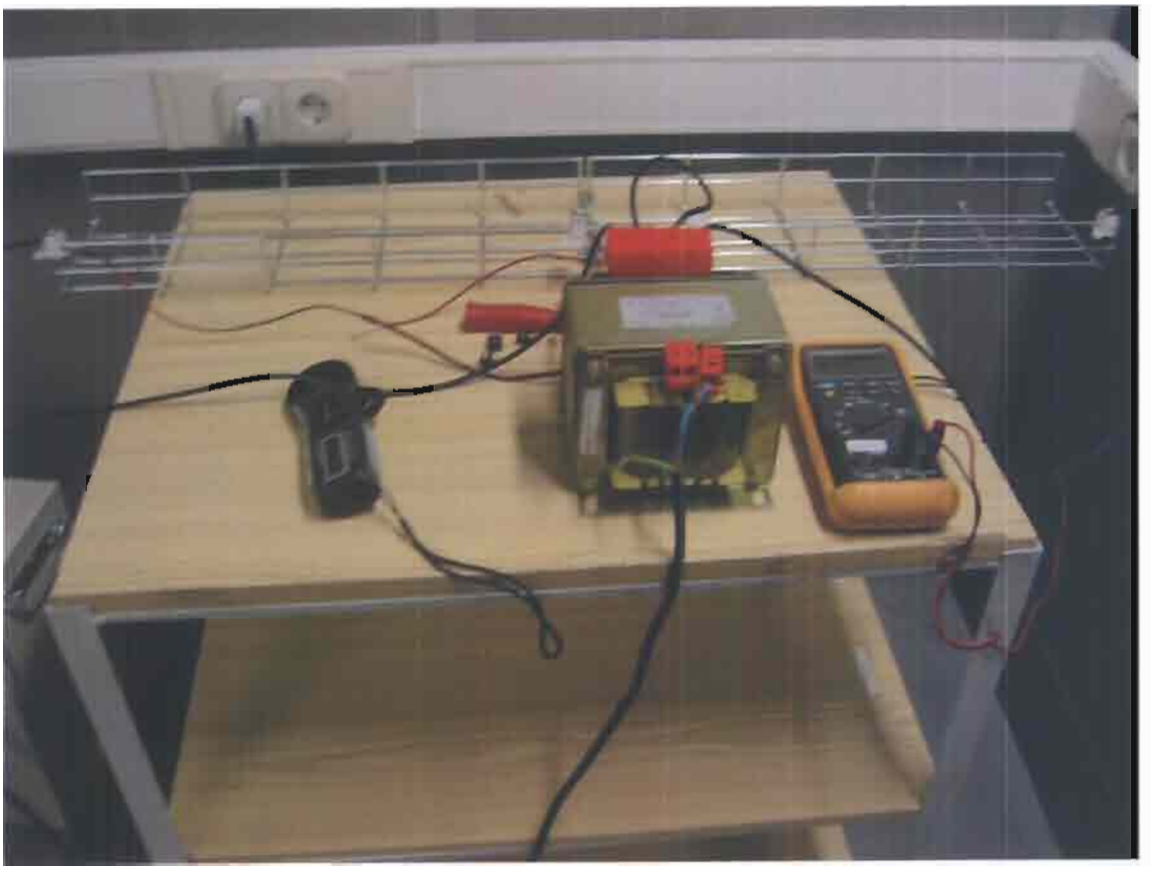
JESUS SANCHEZ PANDO

LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA E.T.S.I.I.

ANEXO-I

FOTOGRAFIAS DEL PRODUCTO

(3 Pág.)



Bandeja bajo ensayo

LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA E.T.S.I.I.

Fijación tipo elástico plateada

Fijación tipo elástico negro

INFORME DE ENSAYO

Ensayo Nº 201111100490

1.- OBJETO

El objeto del presente informe es presentar los resultados obtenidos de la medida de continuidad eléctrica sobre un prototipo de bandeja de canalización de cable solicitadas por el solicitante.

2.- SOLICITANTE

Nombre : **VALDINOX, S. L.**
Domicilio: **Barrio Villanueva, 12**
39192 San Mamés de Meruelo
Cantabria – España

3.- MUESTRA ENSAYADA

La muestra ensayada ha consistido en dos bandejas de 500 mm de longitud junto con la unión atornillada integrada en la misma, tal como lo ha suministrado el solicitante.

Se adjunta en el anexo 1 fotografías de la muestra ensayada.

La muestra se ha entregado para los ensayos el día 18-11-2011.
Los ensayos se realizaron el día 24-11-2011.

LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA · E.T.S.I.I.

NOTA: Este Informe de Ensayos consta de cuatro páginas mecanografiadas y un Anexo 1 de dos páginas

4.- REFERENCIAS NORMATIVAS

Para los ensayos cubiertos en el presente informe, se han seguido las pautas definidas en los siguientes documentos normativos:

EN 61537:2007 – "Conducción de cables. Sistemas de bandejas y de bandejas de escalera".

Apdo. 11.1 Continuidad eléctrica

5.- ENSAYOS REALIZADOS

A continuación, se listan los ensayos realizados sobre la muestra analizada.

Las condiciones ambientales durante la realización de los ensayos han sido:
Temperatura ambiente: 23ºC ± 5 ºC
Humedad relativa: 20 ÷ 60 %

5.1.- Ensayo de continuidad eléctrica (Apdo. 11.1 EN 61537:2007)

Previamente al ensayo se ha realizado un preacondiconamiento para evitar la posible grasa que pudiera presentar la muestra ensayada.

Durante el ensayo se ha pasado a lo largo de la muestra ensayada una corriente de 25 A ± 1 A con una frecuencia de 50 Hz, suministrada por una fuente de tensión que en vacío no supera 12 V. Se ha medido la caída de tensión en las siguientes zonas de la muestra:

a) Entre dos puntos situados a cada uno de los lados de la unión integrada de la muestra suministrada, distantes 50 mm de cada lado de la unión.

b) Entre dos puntos distante 500 mm entre sí y situados al mismo lado de la unión.

La impedancia total se calcula a partir de la corriente aplicada y de la caída de tensión medida.

Resultados obtenidos:

Para cada uno de los casos anteriores se han obtenido los siguientes resultados:

LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA, E.T.S.I.I.

a) Medida entre dos puntos situados a cada uno de los lados de la unión integrada:

- Corriente aplicada de ensayo = 25,0 A (50,0 Hz)
- Caída de tensión medida = 8.3 mV
- Cálculos de la impedancia obtenida = 0,332 mΩ
- Límite permitido: < 50 mΩ

Conclusión: Conforme con los requisitos determinados por la norma de referencia.

b) Medida ente puntos distantes en una lado de la unión:

- Corriente aplicada de ensayo = 25,1 A (50,0 Hz)
- Caída de tensión medida = 53,6 mV
- Cálculos de la impedancia obtenida = 2,13 mΩ (5mm distancia)
- Cálculo impedancia por metro= 4.26 mΩ/m
- Límite permitido = < 5 mΩ/m

500 mm

Conclusión: Conforme con los requisitos determinados por la norma de referencia.

LABORATORIO CENTRAL OFICIAL DE ELECTROTECNIA, E.T.S.I.I.

Y, para que conste, a petición de la empresa C.A.T., S. L.; se expide el presente en Madrid, a Veintiocho de Noviembre del año dos mil once.

EL DIRECTOR DE DEPARTAMENTO,

ANTONIO VALLADOLID ALONSO

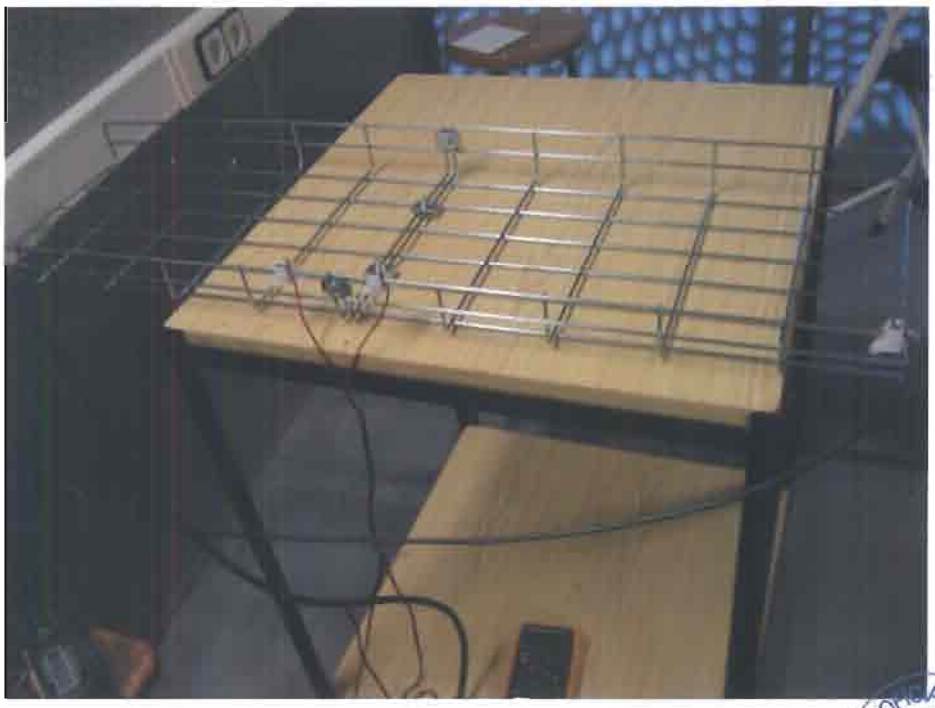
Ensayado por,

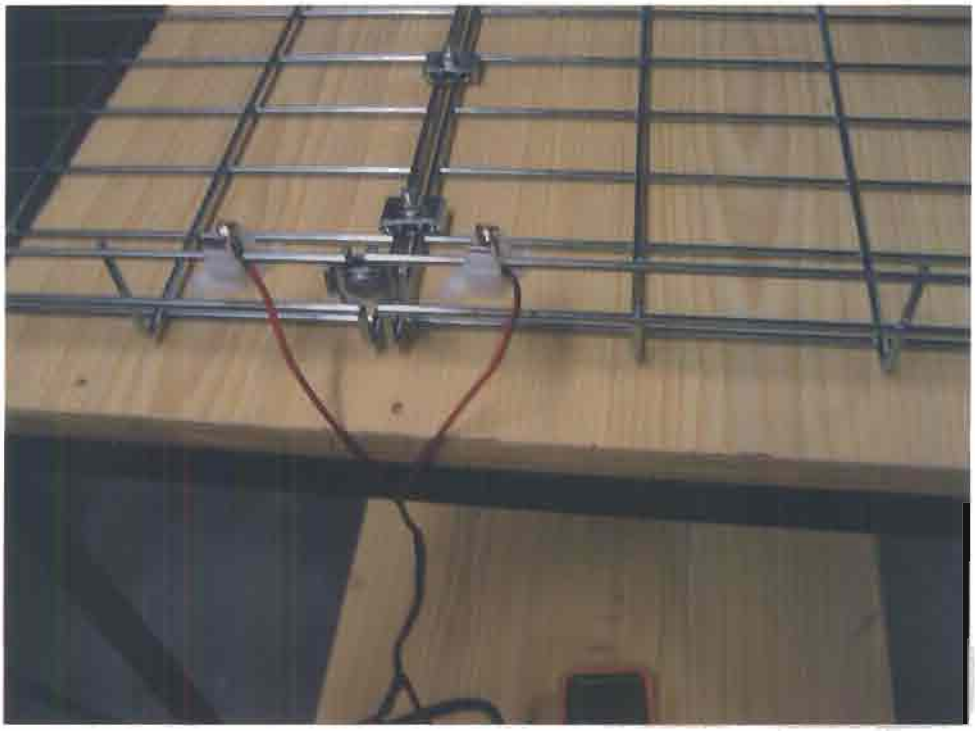
JESUS SANCHEZ PANDO

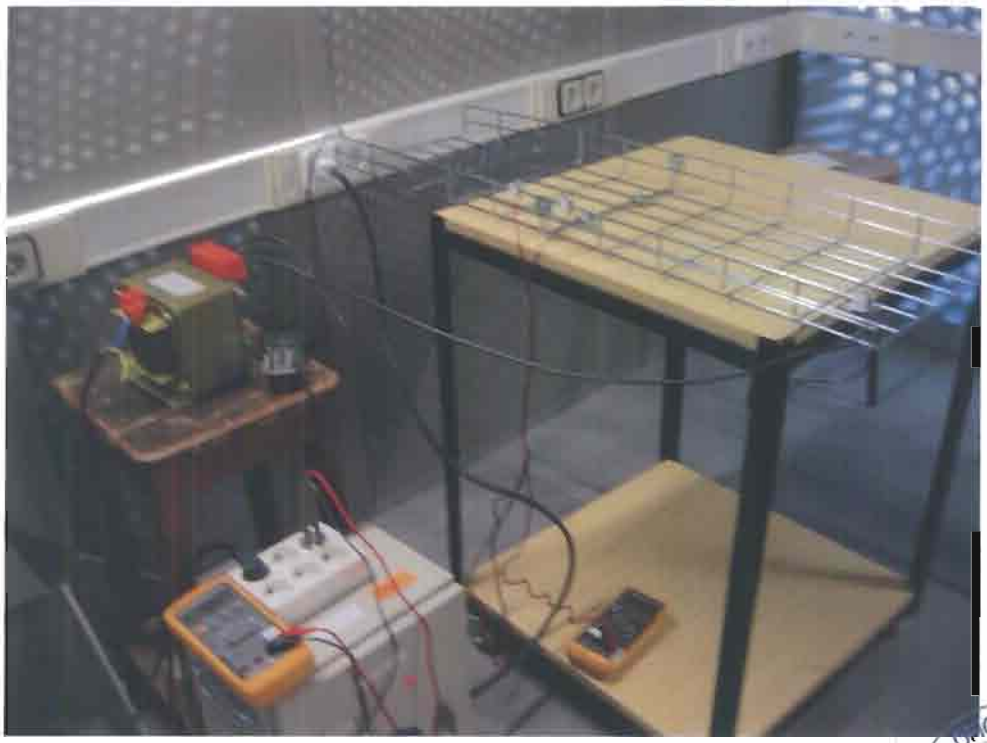
ANEXO-I

FOTOGRAFIAS DEL PRODUCTO

(2 Pág.)







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ENGLISH TRANSLATION OF ELECTRICAL CONTINUITY TESTS OF EASYCONNECT CABLE TRAYS

MINISTRY OF INDUSTRY, TOURISM AND COMMERCE

L.C.O.E. OFFICIAL CENTRAL ELECTRICAL TECHNOLOGY LABORATORY

FOUNDATION FOR THE PROMOTION OF INDUSTRIAL INNOVATION

TEST REPORT

Test Nº 201204100147

1.- PURPOSE

The purpose of this report is to present the results obtained from the measurement of electrical continuity in a cable tray prototype requested by the applicant.

2.- APPLICANT

Name: **VALDINOX, S.L.**
Address: **Barrio Villanueva, 12**
39192 San Mamés de Meruelo
Cantabria – Spain

3.- SAMPLE TESTED

The sample tested consisted of two 500 mm long trays together with the joint attached by three anchorage point between the two trays supplied, as supplied by the applicant.

Photos of the sample tested are attached in Annex I.

The sample was submitted for testing on 25-04-2012.
Testing took place on 03-05-2012.

NOTE: This test report consists of for typewritten pages and one three-page Annex-I.

4.- REGULATORY REFERENCES

For the testing covered by this report, the standards defined in the following regulatory documents have been followed:

EN 61537:2007 – "Conduction of cables. Cable tray and ladder systems".

Section 11.1 Electrical continuity

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5.- TESTS PERFORMED

The tests performed on the sample analysed are listed below.

The environmental conditions during the testing were:
Ambient temperature: 23ºC +/- 5ºC
Relative humidity: 20 ÷ 60 %

5.1.- Electrical continuity test (Section 11.1 EN 61537:2007)

Before testing, preconditioning was performed to avoid the possible grease contained in the sample tested.

During the test a current of 25 A +/- 1 A was passed along the sample tested at a frequency of 50 Hz, supplied by a voltage source not exceeding 12 V in vacuum. The fall in voltage was measured in the following areas of the sample:

a) Between two points located on each side of the integrated joint of the sample supplied, 50 mm from each side of the joint.

b) Between two points 500 mm apart and located on the same side of the joint.

Total impedance is calculated from the current applied and the fall in voltage measured.

Results obtained:
For each of the above cases the following results were obtained:

a) **<u>Measurement between two points located on either side of the integrated joint:</u>**

- Test current applied = 25.2 A (50.0 Hz)
- Fall in voltage measured = 123.84 mV
- Impedance calculations obtained = 4.91 mΩ
- Admissible limit: < 50 mΩ

Conclusion: Meets the requirements established by the reference standard.

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b) Measurement between two separate points on one side of the joint:

- Test current applied = 25.0 A (50.0 Hz)
- Fall in voltage measured = 56.1 mV
- Impedance calculations obtained = 2.24 mΩ (distance 500 mm)
- Calculation of impedance per metre = 4.49 mΩ/m
- Admissible limit: < 5 mΩ/m

Conclusion: Meets the requirements established by the reference standard.

In witness whereof, at the request of the company C.A.T., S.L., this document is issued in Madrid on May 3, 2012.

DEPARTMENT DIRECTOR

ANTONIO VALLADOLID ALONSO
Signature

Tested by,

JESUS SANCHEZ PANDO
Signature

- The tests refer exclusively to the sample tested; this sample is the one described in the report and corresponds to the sample originally received, with the modifications that in the course of testing may have occurred in order to perform the tests. These modifications are documented in the files of the L.C.O.E. and are available to the applicant or body authorized by the latter.
- Partial reproduction of this document is prohibited.
- This report may not contain amendments or scratches, otherwise it shall be considered void.
- The uncertainty of the measurements included in this report is available, under express request, in the internal procedure PS 1/5 INCERT of the L.C.O.E..

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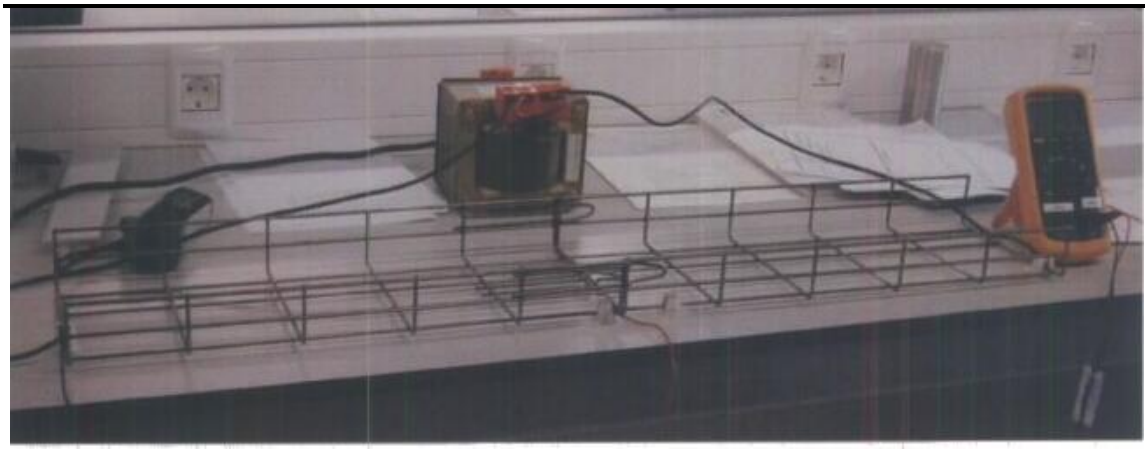
ANNEX-I
PHOTOGRAPHS OF THE PRODUCT

(2 PAGES)



Tray being tested

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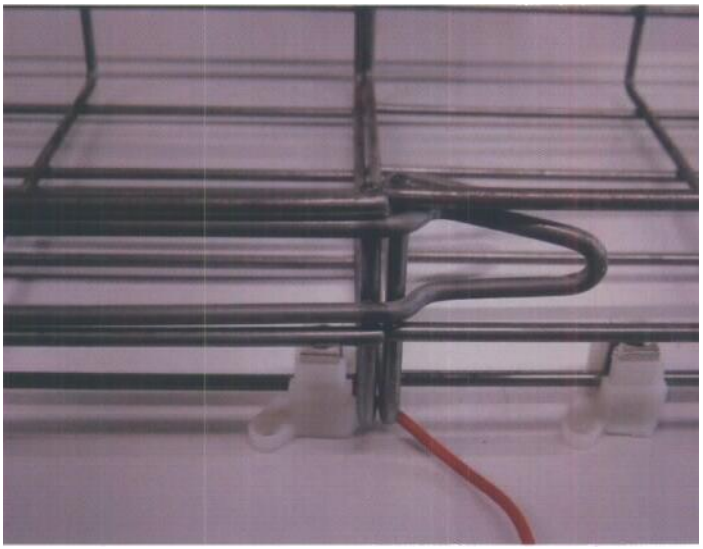

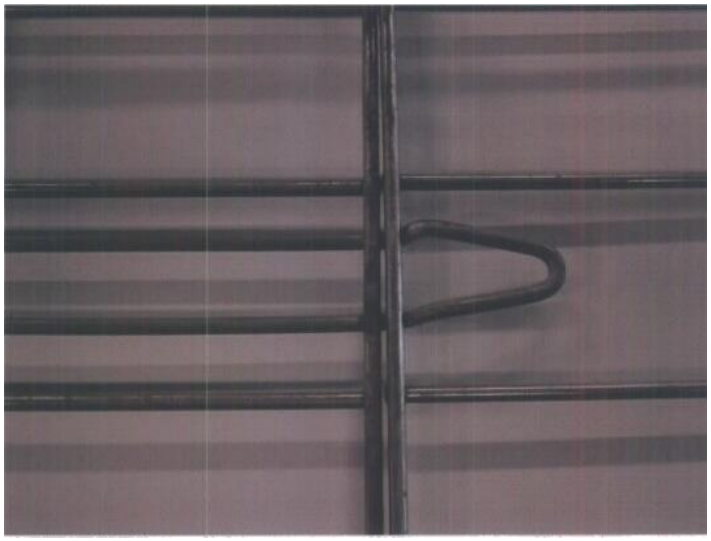

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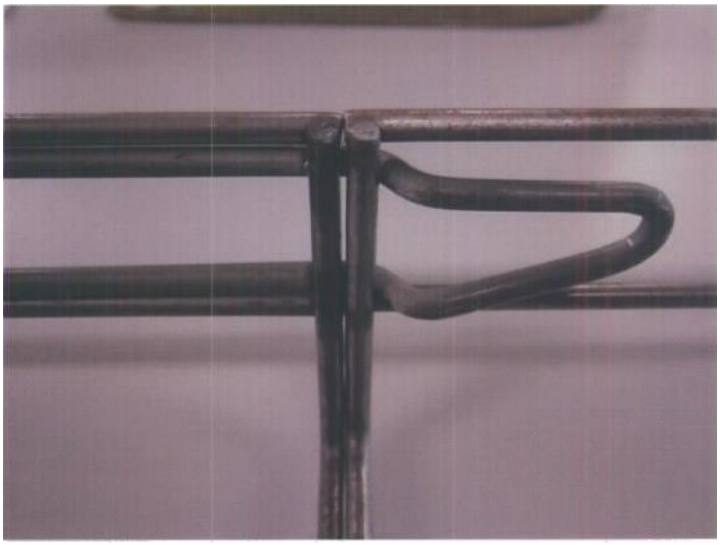
e: valdinox@valdinox.com
w: www.valdinox.com



Attachment

C/Eric Kandel, 1 – TECNOGETAFE – 28906 Getafe-Madrid Tel.: 91 491 81 68 www.ffii.es

Seal: OFFICIAL CENTRAL ELECTRICAL TECHNOLOGY LABORATORY E.T.S.I.I.

WORKLOAD TEST CERTIFICATE: CTA-CERTIFIED BASKET CABLE TRAYS UNE-EN 61537 - APRIL 2012

Company: VALDINOX S.L.

According to tests on the products and accessories manufactured by Valdinox, SL according to EN 61537/2007 (IEC 61537 and NEMA UE-1/CSA 22.2), the results are certified as follows:

Products tested:

Trays EASYCONNECT model

Test performed (according to section 10 of the standard indicated):

CTA test on trays mounted on the horizontal plane and installed horizontally with several openings.
CTA test on trays mounted on the horizontal plane and mounted horizontally on an installation of a single segment.
Tests have been conducted without fixing bracket

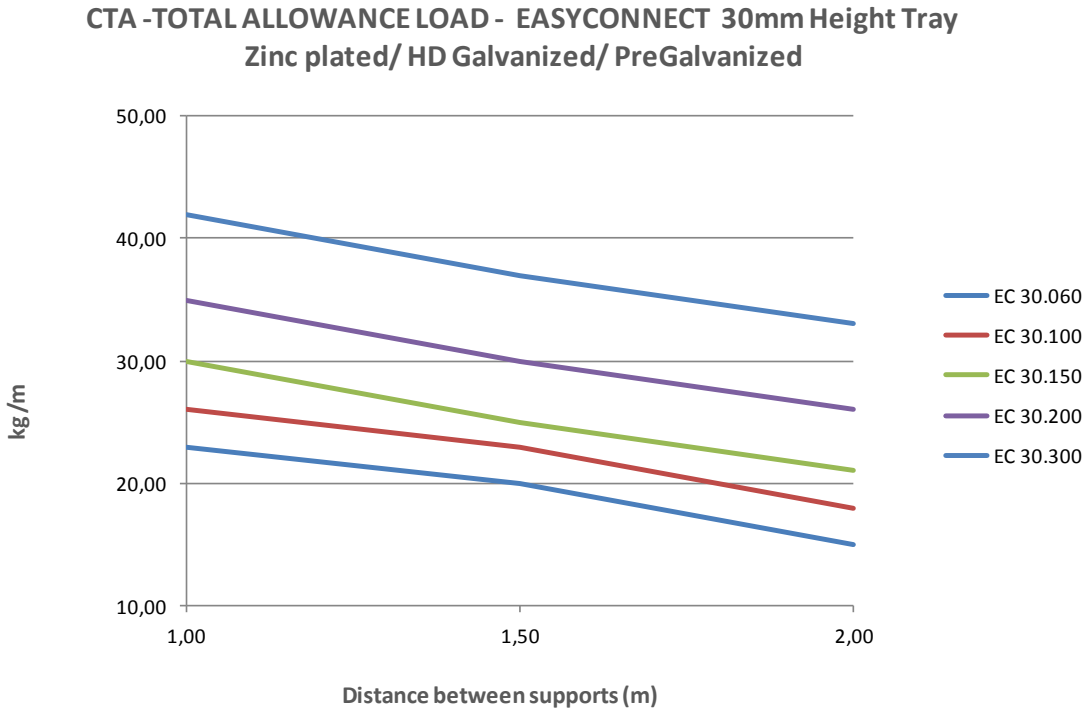
Criteria:
The tray passes the test if permissible load:

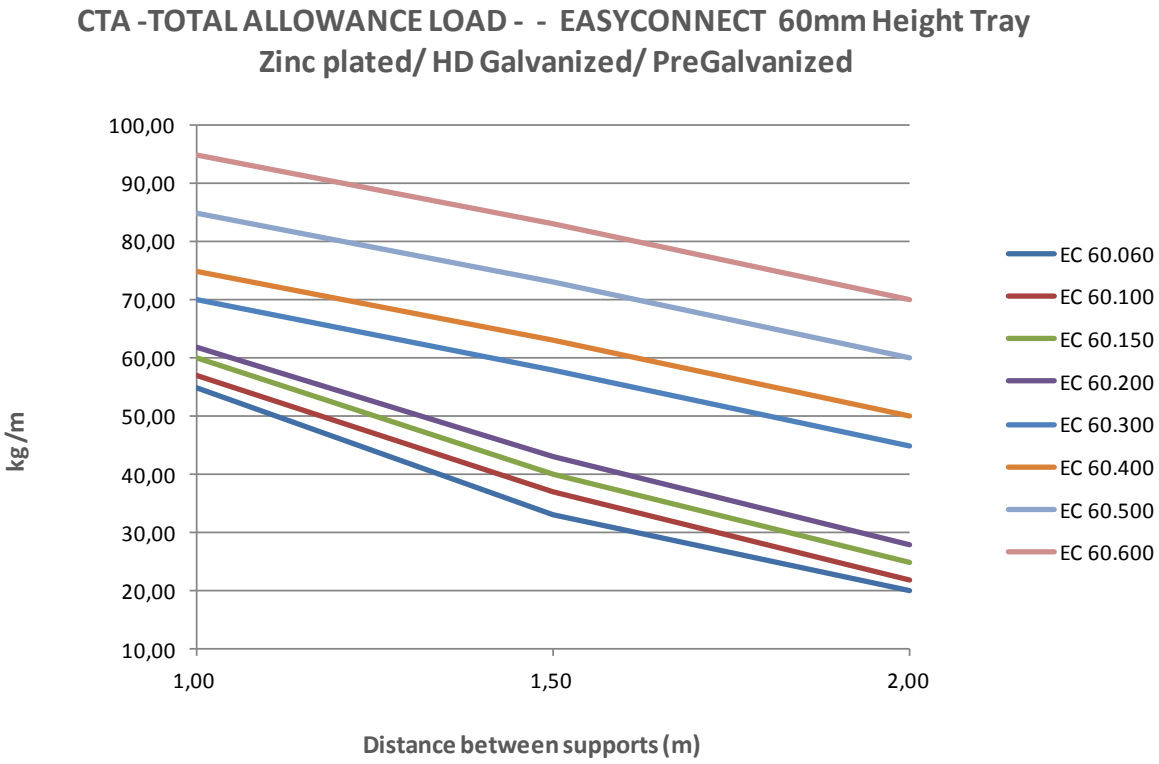
1. *Arrow MD <1% (distance between supports)*
2. *Arrow Cross <5% Base Tray*
3. *At 1.7 times the working load, the tray must bear the burden without collapse*

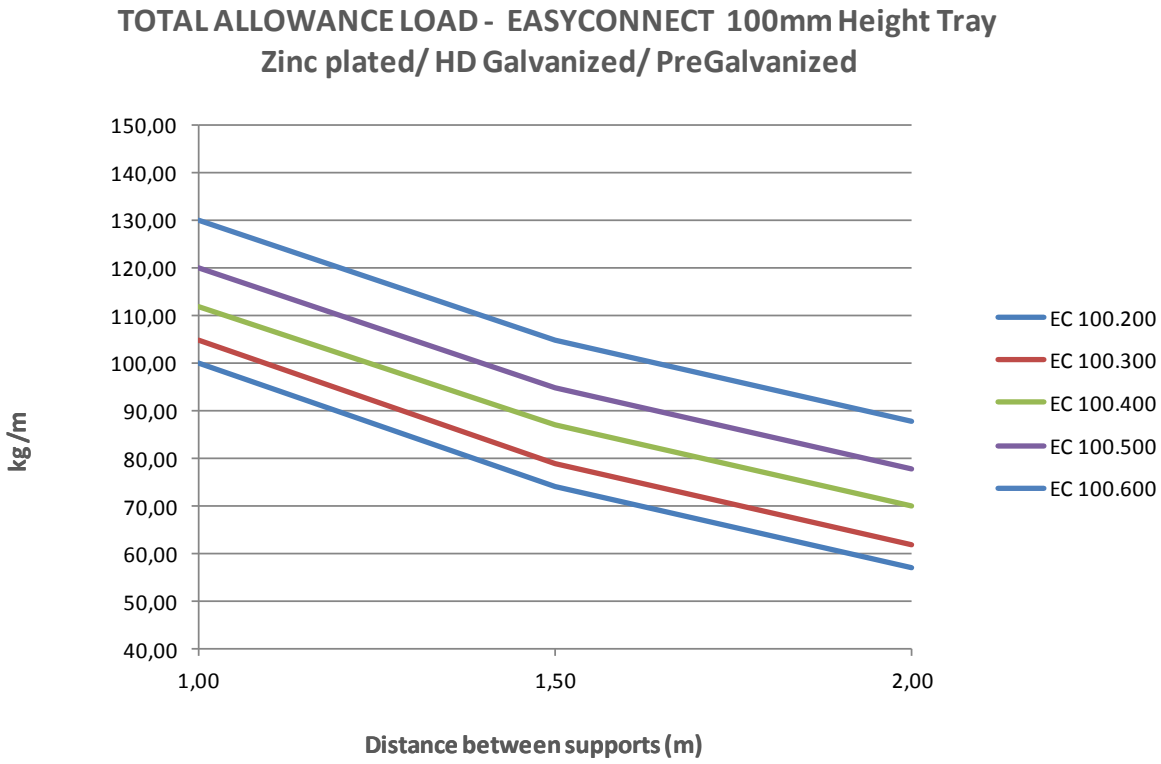
ALLOWABLE LOAD.

The values of Safety Workload for each tray models have been determined by tests conducted according to international standard UNE-EN 61537.

The dimensions, the values of useful section and the maximum loads supported are:




CTA -TOTAL ALLOWANCE LOAD - - EASYCONNECT 60mm Height Tray
Zinc plated/ HD Galvanized/ PreGalvanized
100,00
90,00
80,00
70,00
60,00
50,00
40,00
30,00
20,00
10,00
kg/m
1,00
1,50
2,00
Distance between supports (m)
EC 60.060
EC 60.100
EC 60.150
EC 60.200
EC 60.300
EC 60.400
EC 60.500
EC 60.600


TOTAL ALLOWANCE LOAD - EASYCONNECT 100mm Height Tray
Zinc plated/ HD Galvanized/ PreGalvanized
150,00
140,00
130,00
120,00
110,00
100,00
90,00
80,00
70,00
60,00
50,00
40,00
kg/m
1,00
1,50
2,00
Distance between supports (m)
EC 100.200
EC 100.300
EC 100.400
EC 100.500
EC 100.600

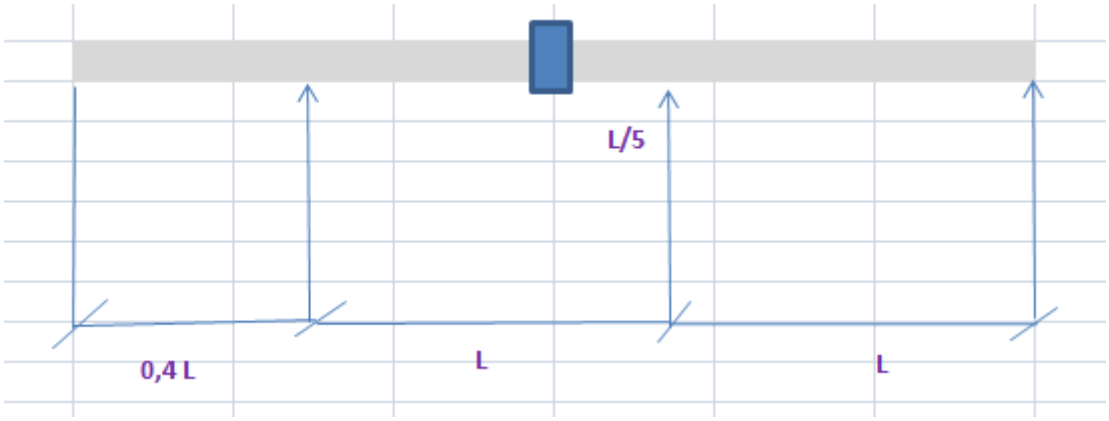
LOAD TEST.

Load test was carried out according to the reference standard.

The arrow is the far half of the support with a binding located with respect to one of the brackets to 1/5 times the separation of them.

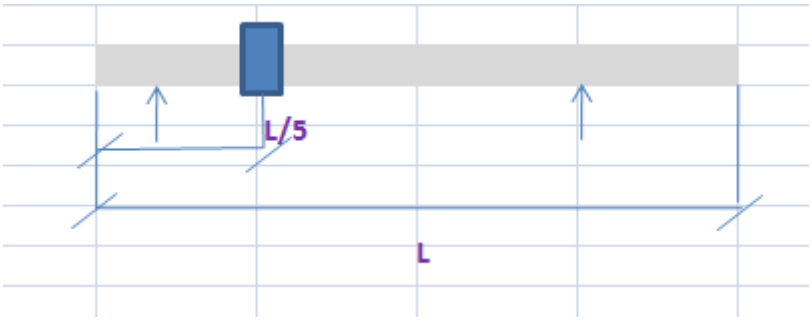
The safety margin is the worst value for:

1. The load creating a deflection equal to 1/100.
2. The breaking load divided by 1.7 if the arrow of 1/100 does not cause damage.

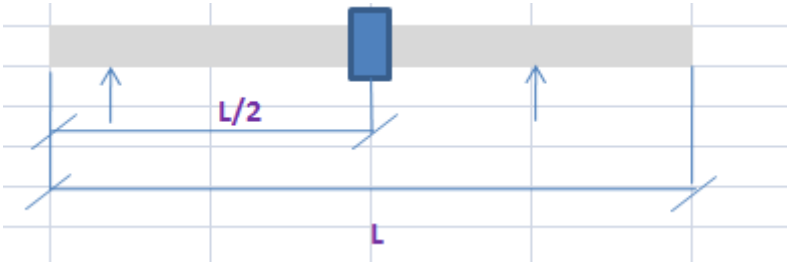


INDICATIONS FOR TYPE AND UNION POINT

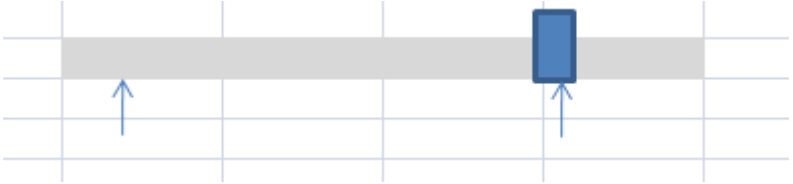
The unions have undergone a test to overcome the most demanding mechanical tests for this type of work. Users are advised to follow the instructions below to optimize the strength of the trays when placed on the supports.



Union to L/50: BETTER



Applying the coefficient 0.7 to the allowable load. 70% of the RESULT

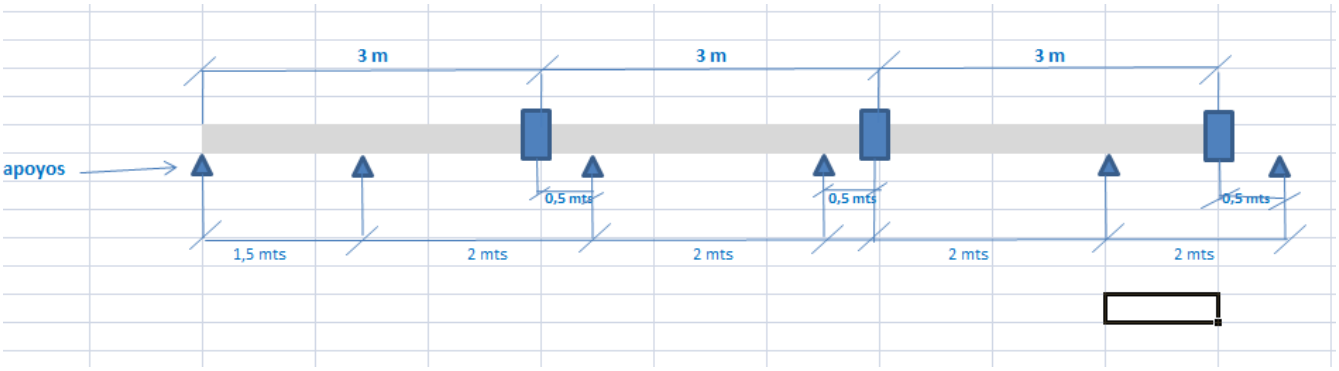


NO.- Do not put the union on the support

.

TRAY CASE: 3 METERS

Is recommended to place the supports according to the following configuration, to achieve optimum installation of the trays

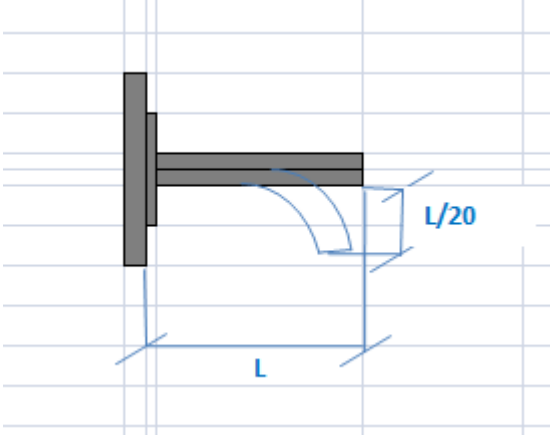


- The first light is 1, 5 m.
- The supports are placed every 2 m
- The joints are 0, 5 m from support.

SUPPORTS

According to IEC 61537, the minimum value of the safe load is:

- The load creating a deflection of L/20 at the end.
- The breaking load divided by 1.7, when it reaches the bend in L/20



The support is recommended to be placed at 1/5 of the light of the junctions of the trays

MEASURING EQUIPMENT USED

- Digital dial 25 mm. Code N-067-1. IC/N-067-1/6 calibration certificate. Mitutoyo 07710.
- Micrometer head Russell Gauges ID N-009-1 0100-3635 0100-3897. Inspection Certificate No. 107350.
- Measurement range of 0 +25 mm. 0.5 µ scale division.
- Mass working • 5 kg. ID DE-E-115-0-(01) to E-115-0. (04). Calibration certificate I05/12.
- Mass working • 2 kg. DE-E-identification 116-0, (01) to E-116-0. (10). Calibration certificate I06/12.
- Mass working • 1 kg. DE-E-identification 117-0, (01) to E-117-0. (04). Calibration certificate I07/12.
- Working masses of 10 kg. ID DE-E-107-0-(01) to E-107-0. (04). Calibration certificate I04/12

For more details see Technical File for the determination of the CTA system cable management trays as EN 61.537 delivered to Valdinox, S.L . as of April 30, 2012

San Mamés de Meruelo (Cantabria) , April 30, 2012

.

Inés Serna Alonso

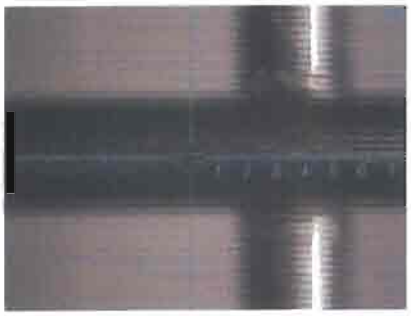
Chemical Engineer - nº 13.336

Cat Ingenieros, S.L

RECUBRIMIENTOS ELECTROLITICOS
B-28392744
POLÍGONO INDUSTRIAL VALDONAIRE
C/ANDRÉS ALVAREZ CABALLERO, 18
28970 HUMANES DE MADRID
TELF. 916909733 FAX: 916098882
e-mail: ismael@cincadosroma.com

HELMUT FISCHER GmbH + Co
Industriestrasse 21
71069 Sindelfingen

Fischerscope® **XRAY XDL**
Product: 1 / Zn/Fe **Dir.:** Group1 **Block:** 28
Application: 1 / Zn/Fe



n = 1 Zn = 9.66 µm
n = 2 Zn = 9.56 µm
n = 3 Zn = 9.60 µm
n = 4 Zn = 9.76 µm
n = 5 Zn = 9.51 µm

Mean	9.62 µm
Standard deviation	0.096 µm
C.O.V.	1.00 %
Range	0.25 µm
Number of readings	5
Min. reading	9.51 µm
Max. reading	9.76 µm
Measuring time	10 sec

Operator: Ismael
Date: 20/05/2010
Time: 9:51:56

Empresa: Valdinox S.L.
Material: Muestra Bandeja
Proceso: Trivalente Exento de Cr VI
Rango Minimo/Maximo: Entre 8 / 12 µm

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39192 San Mamés de Meruelo
Cantabria | España
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F: +34 942 637 901 | +34 942 677 020
e: valdinox@valdinox.com
w: www.valdinox.com

Statement of Compliance

The company: *VALDINOX*
C/Villanueva, 12- 39192
SAN MAMÉS DE MERUELO-CANTABRIA-ESPAÑA

Statement of Compliance:

Zinc trivalent bichromium plating of wire mesh cable trays comply with Rohs European directive and it is classified 2 according to EN 61537:2007

Tests:

Roma, recubrimiento Electrolíticos. B29391744. POl. Industrial Valdonaire. C/ Andrés Álvarez Caballero, 18 28970 Humanes de Madrid.

HELMUT FISCHER GmbH + Co Industriestrasse 21. 71069 Sindelfingen
Fischerscope® XRAY XDL
Product: 1 / Zn/Fe
Process: Trivalent exempt of Hexavalent Cr VI

Thickness range: 8 µm. - 12 µm. Average: 9,62 µm. Mean: 11,7 µm

Approved by Valdinox Quality dept: Mr. Pedro Valdés

Signed,

Carmen Valdés Ruiz, General Manager

GALVANIZADOS AVILÉS	**Certificado de Galvanizado.** **Galvanizinc Certificate.**	Edición: 1 Fecha: 04/01/12 Página 1 / 1

Nº de Documento ***(Document Nº):*** **1083**

Fabrica ***(Manufacturer's Works)***: Galvanizados Avilés, S.A.; Avda. De La Siderurgia, 21, Avilés; Asturias

Comprador ***(Purchaser): Valdinox, S.L.***

Nº de pedido del Comprador ***(Purchaser order nº): 12/5 / PV540***

Nº Albarán *(Delivery Note)*: AV004259

Declaración de Conformidad ***(Statement of compliance):***

Galvanizados Avilés, empresa dedicada al recubrimiento galvanizado en caliente de aceros en general, **DECLARA** QUE:

Galvanizados Avilés, hot dip galvanizer company, DECLARES:

- El lote de productos suministrados aquí referido son conformes con los requisitos de la norma UNE- EN ISO 1461./*The described batch fulfills the standard UNE-EN ISO 1461*

Tamaño Lote **Batch quantity**	**Descripción / Description**	**Espesor medio Recubrimiento(µm) / Coating Mean Thickness**
5840 Kgs	Bandeja Eléctrica	94

- La Calidad del zinc usado es conforme con los requisitos de la norma UNE-EN 1179./ *The Quality of Zinc is according to standard UNE-EN 1179.*

Sello del Inspector

(Stamp of the inspection representative)

GALVANIZADOS AVILES
ACEPTADO

Alberto Costales
Jefe Taller

Fecha de Emisión y Validación: 12/01/12

Date of issue and validation

Ignacio Iñarrea,
Responsable de Calidad
Quality Responsible

3096

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e: valdinox@valdinox.com
w: www.valdinox.com

Statement of Compliance

The company: *VALDINOX*
C/Villanueva, 12- 39192
SAN MAMÉS DE MERUELO-CANTABRIA-ESPAÑA

Statement of Compliance:

Standard: UNE EN ISO 1461
Product: WIRE MESH CABLE TRAYS
Finishing/Plating: HOT DIP GALVANIZED
Average thickness: 94 µ
The quality of Zinc is according to standard UNE EN 1179

Tests:

Galvanizados Avilés, S.A.; Avda. De la siderurgia, 21 Avilés. Asturias.
Document nr: 1083

Date of issue and validation: January,2012

Approved by Valdinox Quality dept.: Mr. Pedro Valdés

Signed,

Carmen Valdés Ruiz, General Manager

CERTIFICATION OF CONFORMITY WITH FIRE SECURITY STANDARDS

Company: VALDINOX S.L.

Fire resistance essays (Tested DIN4102 -12) of cable trays manufactured by VALDINOX

Essays were made according to standards:

- **DIN 4102-2:1977-09**: Fire behavior of Building Materials and Building Components; Building Components; Definitions, Requirements and Tests.

- **DIN4102-12:1998-11**: Fire behavior of building materials and building components - Part 12: Circuit integrity maintenance of electric cable systems; requirements and testing

Laboratory:

- **AFITI- LICOF** Asociación para el Fomento de la investigación y tecnología de la Seguridad contra incendios. This agency appertains to the Ministry of Industry, energy and Tourism of Spain.
- Essay number 8649/12
- Date of Essays: 21.12.2012

Date: 21.12.2012

Signature:

Inés Serna Alonso.Chemical Engineer.

Chemical Engineer - nº 13.336

Cat Ingenieros, S.L

cat@catingenieros.es.
www.catingenieros.es

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F: +34 942 637 901 | +34 942 677 020
e: valdinox@valdinox.com
w: www.valdinox.com

Statement of Compliance with Fire Security Standards

The company: *VALDINOX*
C/Villanueva, 12- 39192
SAN MAMÉS DE MERUELO-CANTABRIA-ESPAÑA

Declares that:

Fire resistance essays (Tested DIN4102 -12) of cable trays manufactured by VALDINOX were made according to standards:

- **DIN 4102-2:1977-09**: Fire behavior of Building Materials and Building Components; Building Components; Definitions, Requirements and Tests.

- **DIN4102-12:1998-11**: Fire behavior of building materials and building components - Part 12: Circuit integrity maintenance of electric cable systems; requirements and testing.

Laboratory:

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- **Essay number 8649/12**
- **Date of Essays: 21.12.2012**

Signature,
Carmen Valdés Ruiz, General Manager

INOXFIL,S.A.

FABRICA:
PAISES BAJOS, 11-15
POL. IND. LAS COMAS
08700 IGUALADA (BARCELONA)
FAX: (93) 801 82 25
EMAIL: INX_fabrica@acerinox.com

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28035 MADRID (ESPAÑA)
TLF.: (91) 398 52 57
FAX: (91) 398 51 93
EMAIL: roldan@acerinox.com

CERTIFICADO DE INSPECCION
INSPECTION CERTIFICATE
ABNAHMEPRÜFZEUGNIS
CERTIFICAT DE PRODUIT

EN 10204.3.1

2012	6	FECHA / DATE:	18/12/2012
Nº ALBARAN:	2012 3074	Hoja num.	1
MATERIAL	ACX125		
GRADE / WERKSTOFF / NOUANCE	304		

TÜVRheinland CERT ISO 9001 ISO 14001

CLIENTE / CUSTOMER / BESTELLER / CLIENT	TOLERANCIA / TOLERANCE / TOLERANZ / TOLERANCE	PRODUCTO / PRODUCT / PRÜFGEGENSTAND / PRODUIT
VALDINOX, S. L.	ISO h11	

LOTE / BURBOT # / WERKS NR / Nº DE LOT	REQUERIMIENTOS / REQUERIMENTS / ANFORDERUNGEN / EXIGENCES	DIMENSIONES / DIMENSIONS / ABMENSSUNGEN / DIMENSIONS	LONGITUD / LENGHT / LÄNGE / LONGUEUR
089655	AISI	4,400mm.	

Nº CONTRATO / ORDER Nº / BESTELL Nº / Nº CONTRAT	MARCA / PAQUETE / MARKS / BUNDLE / MARKE / PAKET / MARQUE / COLIS	PESO / WEIGHT / GEWICHT / POIDS Kg
IN 52998 2	10/007	1019

CARACTERISTICAS MECANICAS / MECHANICAL PROPERTIES / MECHANISHE EIGENSCHAFTEN / CARACTERISTIQUES MECANIQUES

ENSAYO / TEST / WERKSSTOFFPRÜFUNG / ESSAI	A(100)% (%) MAX.	A(100)% (%) MIN.	Rp 0,2% (Kg/mm2) MAX.	Rp 0,2% (Kg/mm2) MIN.	Rm (Kg/mm2) MAX.	Rm (Kg/mm2) MIN.	D (mm.) MAX.	D (mm.) MIN.	MAX.	MIN.
	32	32	58,000	58,000	77,000	77,000	4,387	4,387		
REQUERIMIENTOS / REQUIRED VALUES / SOLLWERTE / EXIGENCES					80,000	70,000	4,400	4,325		
ENSAYO / TEST / WERKSSTOFFPRÜFUNG / ESSAI	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
REQUERIMIENTOS / REQUIRED VALUES / SOLLWERTE / EXIGENCES										

INSPECCION DIMENSIONAL Y VISUAL
SURFACE AND DIMENSIONS CONTROL
BESICHTIGUNG UND MASSKONTROLLE WURDER DURCHGEFÜHRT
INSPECION DIMENSIONELLE VISUELLE

OK

CORROSION INTERGRANULAR
INTERGRANULAR CORROSION
INTERKRISTALINE KORROSION
CORROSION INTERGRANULAIRE

ASTM-A-262 PRACTICE "E"

OTROS ENSAYOS
OTHER TEST RESULTS
SONSTIGE PRÜFUNGEN
AUTRES ESSAIS

COMPOSICION QUIMICA % / CHEMICAL COMPOSITION % / CHEMISCHE ZUSAMMENSETZUNG % / COMPOSITION CHIMIQUE %

Nº COLADA / CAST # / SCHMELZE NR. / Nº COULEE	C	P	S	Si	Mn	Cr	Ni	N2								
B5WR	0,058	0,023	0,004	0,320	1,553	18,040	8,165	0,058								
REQUERIMIENTOS / REQUIRED VALUES / SOLLWERTE / EXIGENCES	0,080	0,045	0,030	0,750	2,000	20,000 18,000	10,500 8,000	0,100								

CONTRASEÑA DEL SUMINISTRADOR
TRADE MARK
HERSTELLERZEICHEN
SIGLE DU PRODUCTEUR

INOXFIL

OBSERVACIONES / OBSERVATIONS / BEMERKUNGEN / OBSERVATIONS

PEDIDO CLIENTE/CUSTOMER ORDER/KUNDENAUFTRAG/COMMANDE DU CLIENT

12/265

El nivel de radiación detectado, en el material, no es en ningún caso superior a los niveles normales.
The radiation level exhibited by this material is not greater than the normal background level.
Die radioaktive Strahlung von diesem Material übersteigt nicht dem naturgegebenem Wert.
Le niveau de radiation relevé sur ce matériel n'est pas supérieur à un niveau normal.

POR CONTROL DE CALIDAD
QUALITY INSPECTOR
WERKSSACHVERSTÄNDIGER
L'AGENT RECEPTIONAIRE

JOAN SANCHEZ RUBIO

No necesaria firma según
Signature not needed EN 10.204
Ohne Unterschrift gültig nach
Signature pas Nécessaire selon

INOXFIL,S.A.

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CERTIFICADO DE INSPECCION
INSPECTION CERTIFICATE
ABNAHMEPRÜFZEUGNIS
CERTIFICAT DE PRODUIT

EN 10204.3.1

2013 961		FECHA / DATE:	14/02/2013
Nº ALBARAN:	2013 407	Hoja num.	1
MATERIAL	ACX125		
GRADE WERKSTOFF NOUANCE	304		

CERT ISO 9001 ISO 14001

CLIENTE / CUSTOMER / BESTELLER / CLIENT
VALDINOX, S. L.

TOLERANCIA / TOLERANCE
TOLERANZ / TOLERANCE
ISO h11

PRODUCTO / PRODUCT / PRÜFGEGENSTAND / PRODUIT

LOTE /
BURBIOT # /
WERKS NR /
Nº DE LOT
091014

REQUERIMIENTOS / REQUERIMENTS
ANFORDERUNGEN / EXIGENCES
AISI

DIMENSIONES /
DIMENSIONS /
ABMENSSUNGEN /
DIMENSIONS
4,000mm.

LONGITUD /
LENGHT /
LÄNGE /
LONGUEUR

INSPECCION DIMENSIONAL Y VISUAL
SURFACE AND DIMENSIONS CONTROL
BESICHTIGUNG UND MASSKONTROLLE WURDER DURCHGEFÜHRT
INSPECION DIMENSIONELLE VISUELLE

OK

Nº CONTRATO ORDER Nº BESTELL Nº Nº CONTRAT	MARCA / PAQUETE MARKS / BUNDLE MARKE / PAKET MARQUE / COLIS	PESO WEIGHT GEWICHT POIDS Kg
IN 53286 1	1/003	1034
IN 53286 1	2/004	1047

CARACTERISTICAS MECANICAS / MECHANICAL PROPERTIES / MECHANISHE EIGENSCHAFTEN / CARACTERISTIQUES MECANIQUES

ENSAYO TEST WERKSSTOFFPRÜFUNG ESSAI	A(100)% (%)		Rp 0,2% (Kg/mm2)		Rm (Kg/mm2)		D (mm.)			
	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
	15	15	65,000	65,000	74,000	74,000	3,941	3,941		
REQUERIMIENTOS REQUIRED VALUES SOLLWERTE EXIGENCES					80,000	70,000	4,000	3,925		
ENSAYO TEST WERKSSTOFFPRÜFUNG ESSAI	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
REQUERIMIENTOS REQUIRED VALUES SOLLWERTE EXIGENCES										

CORROSION INTERGRANULAR
INTERGRANULAR CORROSION
INTERKRISTALINE KORROSION
CORROSION INTERGRANULAIRE
ASTM-A-262 PRACTICE "E"

OTROS ENSAYOS
OTHER TEST RESULTS
SONSTIGE PRÜFUNGEN
AUTRES ESSAIS

COMPOSICION QUIMICA % / CHEMICAL COMPOSITION % / CHEMISCHE ZUSAMMENSETZUNG % / COMPOSITION CHIMIQUE %

Nº COLADA CAST # SCHMELZE NR Nº COULEE	C	P	S	Si	Mn	Cr	Ni	N2								
NB6Y2	0,018	0,029	0,002	0,307	0,708	18,050	9,554	0,030								
REQUERIMIENTOS REQUIRED VALUES SOLLWERTE EXIGENCES	0,080	0,045	0,030	0,750	2,000	20,000 18,000	10,500 8,000	0,100								

CONTRASEÑA DEL SUMINISTRADOR
TRADE MARK
HERSTELLERZEICHEN
SIGLE DU PRODUCTEUR

OBSERVACIONES / OBSERVATIONS / BEMERKUNGEN / OBSERVATIONS

PEDIDO CLIENTE/CUSTOMER ORDER/KUNDENAUFTRAG/COMMANDE DU CLIENT
13/1020

El nivel de radiación detectado, en el material, no es en ningún caso superior a los niveles normales.
The radiation level exhibited by this material is not greater than the normal background level.
Die radioaktive Strahlung von diesem Material übersteigt nicht dem naturgegebenem Wert.
Le niveau de radiation relevé sur ce matériel n'est pas supérieur à un niveau normal.

POR CONTROL DE CALIDAD
QUALITY INSPECTOR
WERKSSACHVERSTÄNDIGER
L'AGENT RECEPTIONAIRE

JOAN SANCHEZ RUBIO

No necesaria firma según
Signature not needed EN 10.204
Ohne Unterschrift gültig nach
Signature pas Nécessaire selon

INOXFIL,S.A.

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FAX: (91) 398 51 93
EMAIL: roldan@acerinox.com

CERTIFICADO DE INSPECCION
INSPECTION CERTIFICATE
ABNAHMEPRÜFZEUGNIS
CERTIFICAT DE PRODUIT

EN 10204.3.1

2013 [illegible]		FECHA / DATE:	28/01/2013
Nº ALBARAN:	2013 232	Hoja num.	1
MATERIAL	ACX332		
GRADE WERKSTOFF NOUANCE	316L		

TÜVRheinland® CERT ISO 9001 ISO 14001

CLIENTE / CUSTOMER / BESTELLER / CLIENT	TOLERANCIA / TOLERANCE TOLERANZ / TOLERANCE	PRODUCTO / PRODUCT / PRUFGEGENSTAND / PRODUIT
VALDINOX, S. L.	ISO h11	

LOTE / BURBOT # / WERKS NR / Nº DE LOT	REQUERIMIENTOS / REQUERIMENTS ANFORDERUNGEN / EXIGENCES	DIMENSIONES / DIMENSIONS / ABMENSSUNGEN / DIMENSIONS	LONGITUD / LENGHT / LÄNGE / LONGUEUR
090487	AISI	4,000mm.	

INSPECCION DIMENSIONAL Y VISUAL
SURFACE AND DIMENSIONS CONTROL
BESICHTIGUNG UND MASSKONTROLLE WURDER DURCHGEFÜHRT
INSPECION DIMENSIONELLE VISUELLE

OK

Nº CONTRATO ORDER N# BESTELL Nº Nº CONTRAT	MARCA / PAQUETE MARKS / BUNDLE MARKE / PAKET MARQUE / COLIS	PESO WEIGHT GEWICHT POIDS Kg
IN 53168 1	1/003	568

CARACTERISTICAS MECANICAS / MECHANICAL PROPERTIES / MECHANISHE EIGENSCHAFTEN / CARACTERISTIQUES MECANIQUES

ENSAYO TEST WERKSSTOFFPRÜFUNG ESSAI	A(100)% (%)		Rp 0,2% (Kg/mm2)		Rm (Kg/mm2)		D (mm.)			
	MAX.	MIN.	MAX.	MIN.	MAX.	MIN	MAX.	MIN.	MAX.	MIN.
	24	24	64,000	64,000	73,000	73,000	3,981	3,981		
REQUERIMIENTOS REQUIRED VALUES SOLLWERTE EXIGENCES					75,000	65,000	4,000	3,925		
ENSAYO TEST WERKSSTOFFPRÜFUNG ESSAI	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX	MIN.	MAX.	MIN.
REQUERIMIENTOS REQUIRED VALUES SOLLWERTE EXIGENCES										

CORROSION INTERGRANULAR
INTERGRANULAR CORROSION
INTERKRISTALINE KORROSION
CORROSION INTERGRANULAIRE

ASTM-A-262 PRACTICE "E"

OTROS ENSAYOS
OTHER TEST RESULTS
SONSTIGE PRÜFUNGEN
AUTRES ESSAIS

COMPOSICION QUIMICA % / CHEMICAL COMPOSITION % / CHEMISCHE ZUSAMMENSETZUNG % / COMPOSITION CHIMIQUE %

Nº COLADA CAST # SCHMELZE NR. Nº COULEE	C	P	S	Si	Mn	Cr	Ni	Mo	N2							
Z9N7	0,026	0,024	0,001	0,388	1,626	16,921	10,381	2,043	0,040							
REQUERIMIENTOS REQUIRED VALUES SOLLWERTE EXIGENCES	0,030	0,045	0,030	1,000	2,000	18,000 16,000	14,000 10,000	3,000 2,000	0,100							

CONTRASEÑA DEL SUMINISTRADOR
TRADE MARK
HERSTELLERZEICHEN
SIGLE DU PRODUCTEUR

INOXFIL

OBSERVACIONES / OBSERVATIONS / BEMERKUNGEN / OBSERVATIONS

PEDIDO CLIENTE/CUSTOMER ORDER/KUNDENAUFTRAG/COMMANDE DU CLIENT

El nivel de radiación detectado, en el material, no es en ningún caso superior a los niveles normales.
The radiation level exhibited by this material is not greater than the normal background level.
Die radioaktive Strahlung von diesem Material übersteigt nicht dem naturgegebenem Wert.
Le niveau de radiation relevé sur ce matériel n'est pas supérieur à un niveau normal.

POR CONTROL DE CALIDAD
QUALITY INSPECTOR
WERKSSACHVERSTÄNDIGER
L'AGENT RECEPTIONAIRE

JOAN SANCHEZ RUBIO

No necesaria firma según
Signature not needed EN 10.204
Ohne Unterschrift gültig nach
Signature pas Nécessaire selon

Certificado de Calidad

EXELFIL

Dpto. Calidad
Valdinox, s.l.
Bº Villanueva, 12

39292 San Mames de Meruelo (Cantabria)

Fecha : 21-ener-13

orden fab. : 83.717

producto : ABC0390C5CA Alambre acero brillante ø 3,9 mm. carrete 1000 kgs.

Norma :

Alambre de acero tipo C9D, según norma ISO 16120-2

Dimensiones : (en mm.)

Ø nominal :	3,9 mm.		Ø máximo :	3,87 mm.	Lectura Ø :
Tolerancia Ø :	-0,03/-0,07 mm.		Ø mínimo :	3,83 mm.	3,85 mm.

Composición química :

Colada nº :		
	C	0,060%
	Mn	0,480%
83.717	Si	0,170%
	S	0,033%
	P	0,021%

Características mecánicas :

Resistencia a la tracción (tensile strength) : 76,5 kg/mm² / 750 N/mm²

Límite elástico : 68,8 kg/mm² / 675 N/mm²

Calidad Exel Fil

DNV

DCA-0267-AQ-99

EXELFIL

Certificado de Calidad

EXELFIL

Dpto. Calidad
Valdinox, s.l.
Bº Villanueva, 12

39292 San Mames de Meruelo (Cantabria)

Fecha : 21-ener-13

orden fab. : 83.707

producto : ABC0430C5CA Alambre acero brillante ø 4,3 mm. carrete 1000 kgs.

Norma :

Alambre de acero tipo C9D, según norma ISO 16120-2

Dimensiones : (en mm.)

Ø nominal :	4,3 mm.		Ø máximo :	4,27 mm.	Lectura Ø :
Tolerancia Ø :	-0,03/-0,07 mm.		Ø mínimo :	4,23 mm.	4,26 mm.

Composición química :

Colada nº :		
	C	0,060%
	Mn	0,480%
83.707	Si	0,170%
	S	0,033%
	P	0,021%

Características mecánicas :

Resistencia a la tracción (tensile strength) :	79,3	kg/mm²
	778	N/mm²
Límite elástico :	71,3	kg/mm²
	700	N/mm²

Calidad Exel Fil

DNV

DCA-0267-AQ-99

EXELFIL

Certificado de Calidad

EXELFIL

Dpto. Calidad
Valdinox, s.l.
Bº Villanueva, 12

39292 San Mames de Meruelo (Cantabria)

Fecha : 21-ener-13

orden fab. : 83.718

producto : ABC0460C6CA Alambre acero brillante ø 4,6 mm. carrete 1000 kgs.

Norma :

Alambre de acero tipo C9D, según norma ISO 16120-2

Dimensiones : (en mm.)

Ø nominal :	4,6 mm.	Ø máximo :	4,6 mm.	Lectura Ø :
Tolerancia Ø :	0/-0,05 mm.	Ø mínimo :	4,55 mm.	4,57 / 4,58 mm.

Composición química :

Colada nº :		
	C	0,060%
	Mn	0,410%
83.718	Si	0,172%
	S	0,035%
	P	0,023%

Características mecánicas :

Resistencia a la tracción (tensile strength) : 71,4 kg/mm² / 700 N/mm²

Límite elástico : 64,3 kg/mm² / 630 N/mm²

Calidad Exel Fil

DNV

DCA-0267-AQ-99

EXELFIL

Certificado de Calidad

Dpto. Calidad
Valdinox, s.l.
Bº Villanueva, 12

39292 San Mames de Meruelo (Cantabria)

Fecha : 05-octu-12

orden fab. : 81.429

producto : ABC0480C6CA Alambre acero brillante ø 4,8 mm. carrete 1000 kgs.

Norma :

Alambre de acero tipo C9D, según norma : UNE EN 10016-2

Dimensiones : (en mm.)

Ø nominal :	4,8 mm.	Ø máximo :	4,77 mm.	Lectura Ø :	
Tolerancia Ø :	-0,03/-0,07 mm.	Ø mínimo :	4,73 mm.	4,76 mm.	

Composición química :

Colada nº :		
	C	0,060%
	Mn	0,420%
81.429	Si	0,170%
	S	0,015%
	P	0,022%

Características mecánicas :

esistencia a la tracción (tensile strength) :	71,0 kg/mm²
	696 N/mm²
Límite elástico :	63,9 kg/mm²
	627 N/mm²

Calidad Exel Fil

DNV

DCA-0267-AQ-99

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39192 Cantabria – Spain

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