

TECNO LAN[®]

Tekninen specifikaatio, Materiaali-/ Pinnoitus informaatio

**TECHNICAL INFORMATION
ABOUT GESAB PRODUCTS.
- TECHNICAL FURNITURE, LAN RACKING -**

Realized by: DPT. OF QUALITY AND ENVIRONMENT, DPT.
TECHNICAL AND DPT. RESEARCH AND DEVELOPMENT



TECNO LAN[®] TECNO WORK[®]

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TECNO LAN, TECNO WORK are patented
products property of GESAB.



This document provides all the information about laws, certifications, homologations, technical specifications, materials and national and international quality controls met by all GESAB products.

TECHNICAL FURNITURE

Gesab, S.A. designs, develops and manufactures the TECNO LAN – TECNO WORK range following the strictest specifications of the most demanding national and international laws, in quality, security and ergonomics.

The products of the “TECNO LAN – TECNO WORK” range, have the prestigious certification of product GS, following the demanding German law ZH 1/428 granted by the TÜV PRODUCT SERVICE entity.

TECNO LAN & WORK meet with all the ergonomic specifications indicated in the guide of the Ministry of Labor and Social Issues, recognised on an international level.

MATERIALS

GESAB uses materials of great quality for the manufacturing of its products, these materials are:

- Cold Laminated Steel Sheets following the standards EN10204, DIN 50049 and ISO404.
- Electro-Zinc Steel Sheets.
- Agglomerated Planks E-1 of low formal content based on the law EN 120.
- Planks of DM Class: A of low formaldehyde content, based on the law EN-622-1
- Plastic of the ABS and BARLO CAST class.
- Planks of COMPACT PHENOL Class M1.
- Post-formed ESD (Dissipaters of Electrostatic Electricity).

The different metallic components are tested through a variety of Saline Fog tests performed in laboratories accredited by the NEAC (National Entity of Accreditation and Certification) following the indications of the laws UNE-EN ISO 7253 and DIN 50021, which require that the painted pieces are exposed to 300 hours of saline environment. By means of these tests, periodically performed following the demanding quality controls performed on all the products, GESAB guarantees the endurance of the finish in the time and the quality of its products as well as the control of all the processes, in order to offer products of great quality to its clients.

The Agglomerated Wooden Planks as well as the DM are submitted to tests of mechanical resistance, water resistance and humidity resistance following the indications of the European laws EN 323, EN 319, EN 310, EN 317 and EN 322. In this same manner, the content of silica is also controlled following the indications of the law ISO 3340.

The BARLO CAST plastic pieces are submitted to mechanical tests according to the international laws ISO 178 and ISO 527, thermal tests according to the international laws ISO 306, ISO R 75 and electric tests according to the laws DIN 53483, DIN 53482 and DIN 53481.

The Planks of COMPACT M1 and POST-FORMED ESD, are submitted to climatic, mechanical and electrical type tests according to the law NF EN 438.

GESAB,S.A, in its constant compromise with the Environment and Society, utilize recyclable components for the manufacture of its products and reduce their Environmental Impacts in origin.

INTERNATIONAL EQUIVALENCE AMONG STANDARDS

GS MARKING in TECNO LAN –TECNO WORK

German: ZH 1/428 (German Ministry of Industry).

This standard has no equivalent, due to the fact that it is very specific and demanding at the same time. It is the standard that TÜV PRODUCT SERVICE utilizes to certify our TECNO LAN –TECNO WORK product.

DIN GOST CERTIFICATE

It is the homologation of the “GS” marking for the Russian market. It is an annual homologation, which is related to the annual audits realized for us by TÜV PRODUCT SERVICE.

STANDARD 19”

National: UNE 20539

European: EN 60297

German: DIN 41494

USA / UK: ANSI / EIA 310

International Electro technical Committee IEC or CEI: CEI 297 or IEC 297

SALINE FOG TRIALS (COATING PAINT METALLIC PIECES)

National: UNE EN ISO 7253

European: EN ISO 7253

German: DIN 50021

EN 60950 OF SECURITY OF THE EQUIPMENT OF TREATMENT OF THE INFORMATION, INCLUDING THE ELECTRIC OFFICE EQUIPMENT.

National: UNE in 60950

European: EN 60950

German: EN 60950

UK: BS EN 60950

French: IDT*NF C77-210

CEI or IEC: IEC 60950 or CEI 60950

MATERIALS INFORMATION

WOOD	RESISTANCE, MECHANICAL, WATER AND HUMIDITY TESTS ACCORDING TO: EN 317 EN 322 EN 310 EN 323	EN 317 EN 322 EN 310	EN 323 EN 319 EN 319
	SILICA CONTENT ACCORDING TO ISO 3340		
	AGGLOMERATED CLASS E1 ACCORDING TO EN 120		
	DM CLASS A ACCORDING TO EN 622-1		
STEEL	COLD LAMINATED STEEL AND ELECTRO-ZINC FINISHED STEEL ACCORDING TO:	EN 10204 DIN 50049 ISO 404	
PLASTIC	ABS AND BARLO CAST ACCORDING TO:	ISO 178 ISO 527 ISO 306	ISO R35 DIN 53483 DIN 53482 DIN 53481
	COMPACT PHENOL M1 ACCORDING TO NF EN 438		
ESD	DISSIPATER OF ELECTRO-STATIC CHARGES ACCORDING TO NF EN 438		

**Technical information
TECNO LAN and TECNO WORK**

Realized by: DPT. OF QUALITY AND ENVIRONMENT, DPT.
TECHNICAL AND DPT. INVESTIGATION AND DEVELOPMENT



TECNO LAN[®] **TECNO WORK**[®]

TECNO LAN®
TECNO WORK®

1. CERTIFICATE OF SECURE PRODUCT "GS"

Product certified according to the German standard ZH 1/428 of metallic industrial load bearing shelves, obtaining the certification of product "GS" granted by the organism TÜV PRODUCT SERVICE.

In the same manner, "DIN GOST TÜV" certifies this product for the exportation to Russia, equivalent to GS for the Russian market.

Gesab S.A., guarantees a load bearing resistance in the structures of this equipment of 13500 N, and a resistance of the trays, tables and laterals that make up the different configurations according to the indications of the user's guide.



To guarantee the compliance with the indications of the standard ZH 1/428 as is with the resistance indicated in the user's manual, Gesab performs a series of periodic controls in the manufacture process.

These controls consist of dimensional studies and mechanical load bearing trials.

2. LOAD BEARING TRIALS IN "TECNO-LAN®" PRODUCTS



Application of one 1st load of 13500N
and one 2nd load of 27000N
WITHOUT THE OCCURENCE OF
DEFORMATIONS.



3. DESIGN OF THE PRODUCT



In the same way, to guarantee the design of our product and at all times be able to give good service to our clients, the different configurations of Gesab present a label in which is indicated, as shown in the image below, the date of manufacture.

This joined by the design of each element which makes up the configuration, would permit us, in the case that an anomaly were produced, to act in a diligent and rapid manner.



4. MATERIALS

The materials employed for the manufacture the products are of great quality and as indicated in the table below, comply with different European, German and French standards.

Important Note: to know with more detail the Technical information of the materials, consult in the following Annexes.

WOOD	MECHANICAL RESISTANCE, WATER AND HUMIDITY TESTS ACCORDING TO:	EN 317 EN 322 EN 310	EN 323 EN 319
	SILICA CONTENT ACCORDING TO ISO 3340		
	AGGLOMERATED CLASS E1 ACCORDING TO EN 120		
	DM CLASS A ACCORDING TO EN 622-1		
STEEL	COLD LAMINATED STEEL ACCORDING TO:	EN 10204 DIN 50049 ISO 404	
PAINT	POWDERED EPOXI POLYESTER		
PLASTIC	ABS		
	COMPACT M1 ACCORDING TO NF EN 438		
ANTI-STATIC (ESD)	ACCORDING TO EN 438		

5. ESD (ANTI-STATIC MATERIAL)

With optional character, Gesab offers the possibility to obtain job posts free of electro-static charges offering ESD configurations.



By means of these types of configurations, it is guaranteed that the person/s working in this job post and the actual job post are free of electro-static charges, due to the high quality ESD materials used that ground the charges, avoiding damage to the equipment and the components that are placed on the work surfaces.

The material that inhibits the generation of static charges is classified as anti-static. An anti-static material may be a conductor, dissipater or even insulation. Only conducting or dissipating anti-static materials should be used in an area free of electro-static charges. Gesab S.A. utilizes both types of anti-static products: conductors and dissipaters or insulation.

5.1 WORK SURFACES

In the line of Techno Lan and Techno Work products Gesab offers work surfaces free of electro-static charges on which the apparatus and electronic components can be used with total ease and tranquility.

The work surfaces of our Techno Lan and Techno Work products are the following:

- Tables: Manufactured with agglomerated wood, laminated post-manufacture at high-pressure (HPL), dissipater of electro-static charges (ESD), of 0,8 mm of thickness. The electro-static characteristics of the laminated HPL are:
 - Surface resistance according to ASTM D 257 : $1 \times 10^5 - 1 \times 10^9 \Omega$.
 - Time of electro-static charge flow according to MILB-81705-B: = 0,5 seconds
- The high-pressure laminate (HPL) utilized in our tables complies with the requisites established in the law FD T 54-332 "Electrical properties of the decorative surfaces of high pressure. Electro-static and anti-static behaviour," of AFNOR.

- Trays: Manufactured of steel sheets polished and painted with powdered epoxy paint. The ESD protection of the surfaces of the trays is assured by the placement of static dissipating tray covers of two layers with a ground connection. The ground resistance offered is of $5 \times 10^5 \Omega$ (European Law EN100015).

To guarantee the perfect protection against the electro-static charges of the work surfaces, these are found connected to a central point of the metallic structure that should be connected to the ground.

In this manner, the entire structure and the work surfaces are connected to the ground and any electro-static discharge will not damage the equipment or the components placed in it.

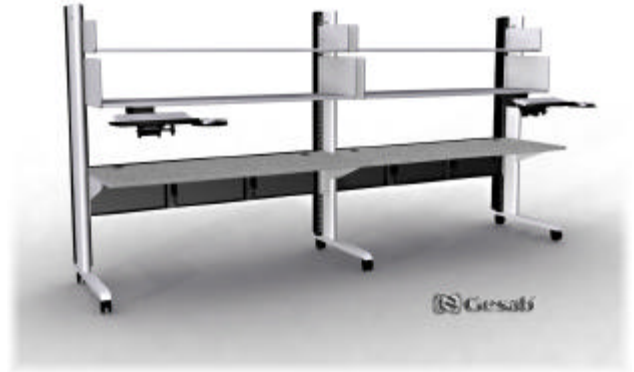


PRODUCT	STANDARD
WORK SURFACES	American Norm ASTM D 257 (Agglomerated)
	French Norm FD T 54-332 (Laminated HPC)
STATIC TRAY COVER	European Norm EN 100015

- **AGGLOMERATED**
- **DM**
- **HIGH PRESSURE HPL COMPACT LAMINATE**
- **STEEL SHEET**
- **PANDUIT ® PVC SLOTTED CANAL**
- **ESD "ELECTRO-STATIC CHARGE DISSIPATER"**
- **POWDERED EPOXI PAINT**
- **APPLICATION PROCESS OF PAINT**



TECNO LAN[®]



TECNO WORK[®]

AGGLOMERATED PLANKS E-1

THICKNESS

5, 6, 8, 10, 12, 13, 15, 16, 18, 19, 22, 25, 28, 30, 35 y 40mm

FORMATS

2.440/3.660/4880 x 2.050/1.830 mm	From 5 to 40
2.750/3.660/4.880 x 1.830/2.050 mm.	From 10 to 30
1.220/1.830/2.050/3.660/4.880 x 2.440/2.500/2.530mm	From 8 to 40

FIMAPAN TG

THICKNESS	FORMATS
16, 19 y 22 mm.	1.820 x 900 mm.
	2.040 x 900 mm.

TECHNICAL DATA – AVERAGE VALUES

Test of Reference	Properties	Units	Thickness (mm.)			
EN 323	Density*	Kg/m ³	>4-6	>6/13	>13/19	>19/30
			>30			
			720/700	690/650	640/615	615/600
			580			
EN 319	Traction resistance	N/mm ²	0,45 0,20	0,40	0,35	0,30
EN 310	Flexion resistance	N/mm ²	15 8,5	14	13	11,5
EN 310	Elasticity module	N/mm ²	1.950 1.200	1.800	1.600	1.500
EN 317	Swelling in water 2 hours	%	6 6	6	6	6
EN 322	Humidity	%	8+/-3 8+/-3	8+/-3	8+/-3	8+/-3
EN 324-1	Tolerance in nominal dimensions	MM	+/-0,3 0,3	+/-0,3	+/-0,3	+/-0,3
	Thicknes					
EN 324-1	Long/wide	MM	+/-5mm			
EN 324-2	Squared	MM	+/-2mm/m			
EN 324-2	Border rectitude	MM	+/-1,5mm/m			
EN 311	Superficial traction	N/mm ²	0,8 0,8	0,8	0,8	0,8

AGGLOMERATED PLANKS OF STANDARD PARTICLES

All planks of fibers of middle density, utilized by its manufacturers, come protected by the CERTIFICATE OF ORIGEN.

Fimapan is supplied by request in Class A in accordance with the law EN 120

The Fimapan is protected by the Stamps of Quality of AITIM 2-06 and 2-11

(*) This piece of information is for orientation purposes (tolerance +/- 10%)

The agglomerated E-1 planks are certified by the wooden financial. In accordance with the European law of low formol content, when the same is analyzed in accordance with the European law EN 120.

STANDARD THICKNESS

9, 10, 12, 15, 16, 18, 19, 21, 22, 25, 30, 35, 40 and 50mm.

STANDARD MEASUREMENTS

2.500 / 2.440 x 1.220 / 1.830 / 2.050 / 3.660 / 4.880 mm.

From 9 to 22 mm.

3.660 x 1.830 mm.

From 16 to 50 mm.

TECHNICAL INFORMATION- AVERAGE VALUES

Properties		Units	Thickness mm.			
			= 9 -12	>12 - 19	>19 - 30	
EN 323	Density (+/-5%) (*)	Kg/m ³	600	EN 323	Density (+/-5%) (*)	Kg/m ³
EN 319	Traction Resistance	N/mm ²	0,55	EN 319	Traction Resistance	N/mm ²
EN 310	Flexion Resistance	N/mm ²	20	EN 310	Flexion Resistance	N/mm ²
EN 310	Elasticity Module	N/mm ²	1700	EN 310	Elasticity Module	N/mm ²
EN 317	Swelling in water 24 Hrs	%	15	EN 317	Swelling in water 24 Hrs	%
EN 322	Humidity (+/-3)	%	7	EN 322	Humidity (+/-3)	%
ISO 3348	Silica Content	% Weight	Max. 0.05			
EN 324-1	Thickness tolerance (+/-)	Mm	0,20	EN 324-1	Thickness tolerance (+/-)	Mm

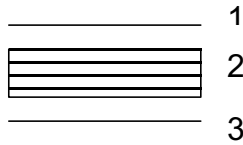
DM**(*) Orienting Values**

Available through request in CLASS A in accordance with the law EN 120
These values comply with the law EMB. MAY 1998

CERTIFIED FORMALDEHYDE CONTENT		
<u>Characteristics</u>		
Manufacture #	1991-1	1991-2
# Of Modules	24	1
Thickness (mm)	16	16
Density (Kg / m ³)	621	606
Humidity Content (%)	4.4	4.6
Perforator Value Method EN-120	7.3	7.1
CLASSIFICATION EN-622-1	CLASS: A	CLASS: A

In accordance with the formaldehyde content "Perforator Value" (Method EN-120) and humidity contents found in the planks shown. The laboratory INTAMASA certifies that the quality of this plank is CLASS A (EN: 622-1).

HIGH PRESSURE LAMINATE HPL COMPACT
SELF-CARRYING



1. - Sheet of paper dyed in dough, impregnated with melamine resin.
2. - Phenol Nucleus: piling of various sheets of kraft impregnated with phenol resins according to the thickness
3. - Sheet of paper dyed in dough, impregnated with melamine resin of the same color.

CHARACTERISTICS of HPL	COMPACT M1
Thickness	13 mm
Normalized type	CGF *
Tolerance of thickness – NF EN 438-2-4	± 5 %
Dimensional Stability- NF EN 438-2-9 ? longitudinal sense ? transversal sense	< 0,25 % < 0,55 %
Resistance to boiling water – NF EN 438-2-7 2 h to 100°C ? mass ? thickness	= 2 % = 2 %
Resistance to humidity– NF EN 438-2-27 24 h to 65 °C ? classification	= 3
Resistance to water vapor – NF EN 438-2-24	= 4
Surface Thermal Resistance – NF EN 438-2-8 ? 180°C cooled to 20 min.	Without deterioration
Resistance to stains – NF EN 438-2-15	No attacks
Solidity of the color under artificial light according to design – NF EN 438-2-6	= 6
Resistance to impact in test tube self-carrying NF EN 438-2-9 ? height of the fall of the diametric ball, mark of the ball = 10 mm	1,75m
Scratch resistance – NF EN 438-2-14	= 2,5 N
Resistance to abrasion – NF EN 438-2-6 Number of turns	= 350
Resistance to cigarette burns NF EN 438-2-18	Without burns
Resistance to fissures – NF EN 438-2-13	Class 4
Reaction to fire – PV of the C.S.T.B or LNE	M 1
Density Weight by m ²	1,41 Aprox. 18 Kg
Thermal conduction ?	0,1 to 0,5 kcal/m.h.°C
Elasticity Module – ISO 178	= 9000 MPa
Resistance to flexion – ISO 178	= 80 Mpa
Resistance to traction – ISO 178	= 60 Mpa
Chlorine content	0 %
Nitrogen content according to design	100 to 2000 g/m ²
Surface defects – NF EN 438-2-5	= 1 mm ² /m ²
Contact with food or drink * PV of the I.I.A.N.E.S.C.O	Authorized

HIGH PRESSURE LAMINATE

Classification M3 – Verbal Process of the CSTB or LNE (France)	Not contemplated: STANDARD contains less than 25% of synthetic material
CHARACTERISTICS of HPL	POST FORMABLE
Thickness	0,8 mm and 1mm
Normalized type - NF EN 438	HGP
Tolerance of thickness – NF EN 438-2-4 Dimensional Stability- NF EN 438-2-9 ? longitudinal sense ? transversal sense	± 0'1mm < 0,40% < 0,60%
Resistance to boiling water – NF EN 438-2-7 2 h to 100°C ? mass ? thickness	 = 17,5% = 19,5%
Resistance to water vapor – NF EN 438-2-24	= 3
-Surface thermal resistance – NF EN 438-2-8 ? 180°C cooled to 20 mm	Without deterioration
Resistance to stains – NF EN 438-2-15	No attack
Solidity of the color under artificial light according to design – NF EN 438-2-16	= 6
Resistance to impact – NF EN 438-2-11 ? strength of the coil	= 20 N
Scratch resistance – NF EN 438-2-14	= 2N v
Resistance to abrasion – NF EN 438-2-6 Number of turns	= 350
Resistance to cigarette burns NF EN 438-2-18	Without burns
Resistance to fissure – NF EN 438-2-13 Reaction to fire – PV of the C.S.T.B or LNE	Class 4 M 3
Density	1,43
Thermal Conduction ?	0,1 to 0,5 Kcal/m.h.°C
Aptitude to the curve ? radius of convex and concave curvature	7 & 10 cm
Post-formability in heat – NF EN 438-2-20 ? radius of curvature ? resistance to heating	8 and 10 mm 15 mm for POS 8 M1 = 15s
Surface defects – NF EN 438-2-5 ? exact ? linear	= 1 mm ² /m ² = 10 mm ² /m ²

The lamination of high pressure is obtained by piling up sheets of paper impregnated with thermal-hardening resins, polymerized at high pressure (8Mpa) and high temperature (140°C).

1. Protective surface impregnated with resin of melamine (Overlay) for decoratives.
2. Decorative sheet or smooth sheet impregnated with resin of melamine.
3. Support: Piling of sheets of kraft impregnated with phenol resins.

MAINTENANCE AND CLEANING (Guide AFNOR T 54325)

Common stains shall be cleaned with a damp soft cloth, hot water and soap or with everyday cleaning products that are neither abrasive nor alkaline. Tougher stains should be eliminated with appropriate organic solvents such as alcohol, acetone, tri-cloroetilene, or benzene. Never use waxes or beautifying products.

MAINTENANCE OF THE PLATES

The plates should be cleaned with water and soap. Abrasives and powdered detergents should not be used. The finish of the SM surface, although complying with the requisites of the standard, requires specific cleaning conditions. It is not recommended for use in a horizontal position in collectivities with intense use.

STEEL SHEET

BAMESA
barcelonesa de metales, s.a.
Ronda Piedad 10-12
08820 El Prat de Llobregat (Barcelona)
tel.93 479 29 90-fax.93 370 05 00
E-mail: calidad@bamesa.com

CERTIFICADO DE CALIDAD SEGUN NC
Destinatario: **HIERROS BACHS, S.A.**
Nº alburdo/fecha: **510024883 / 10**
Calidad: **DC 01AM**
Recubrimiento:

Nº lote	Identificación Producto	Nº bulto	Espesor(mm)
0000020988		020980E	1,50
0000030979		030979E	1,50
0000030978		030978E	1,50
0000030977		030977E	1,50
0000020976		020976E	1,50
0000020975		020975E	1,50

Nº Bobina: **0005028539** Nº Serie de proveedor: **214978**

Características Mecánicas(1)									
Re	Rm	A ₅ (A)	r	n	Ra	C	Min	P	S

Observaciones:

(1) Unidades:
Re: N/mm²
Rm: N/mm²
Lo: mm
Ra: micra
Unidades: Valores en %

Certificamos que el material ha sido fabricado de acuerdo a las especificaciones técnicas del contrato y que, una vez efectuados los ensayos, el material cumple con las especificaciones técnicas y responde bajo todos sus aspectos a las especificaciones técnicas en vigor antes referidas.

SLOTTED CANAL – PANDUIT®

Properties	Method of proof	PVC	Units
<u>General</u>			
Specific Weight	ASTM D 792	1,38	g/cc
Temperature of thermal deflection @ 264 Psi	ASTM D 648 (without making into a ring)	73	° C
Lineal thermal expansion coefficient	ASTM D 696	6,7e-5	mm/mm°C
Thermal conduction coefficient	ASTM C 177	187	W/mK
Resistance to compression	ASTM D 695	55,0	Mpa
<u>Flameproof Characteristics</u>			
Class of inflammability	UL 94	V-D	-
Density of the smoke	ASTM E 662	538	-
Index of oxygen, limited	ASTM D 2863	40-49	%
<u>Hardness</u>			
Hardness in durometer	ASTM D 2240	78	Shore "D"
Rockwell Hardness	ASTM D 785	111	"R" scale
<u>Stretch</u>			
Hardness yield	ASTM D 638	42,7	Mpa
Module	ASTM D 638	2689	Mpa
<u>Resistance</u>			
Flexibility yield	ASTM D 790	75,8	Mpa
Module	ASTM D 790	2413,2	Mpa
<u>Resistance to Impacts</u>			
Izod slotted to:			
23°C	ASTM D 256	907	J/m
0°C		85	J/m
-18°C		59	J/m
Izod without slotting to:			
23°C	ASTM D 256	3416	J/m
0°C		3416	J/m
-18°C		2242	J/m
<u>Electrical Properties</u>			
Energy factor			
60 Hz@ 30°C	ASTM D 150	2,90	-
1MHz@ 30°C		4,00	-
Dielectric constant			
60 Hz@ 30°C	ASTM D 150	3,90	-
1MHz@ 30°C		3,30	-
Dielectric resistance			

INFLAMMABILITY TRIAL

Test of inflammation vertical UL

Samples of a material with dimensions of 12,7 mm by 12,7 mm and the thickness of the final wear was found to be in an un-aged state, "exactly how it was manufactured" and in an aged state (7 days at 70°C). The test requires the placement of a flame with precise control under one of the samples held vertically for a period of ten seconds, the flame is removed and the duration of the inflammation is noted. If the flame is extinguished, it is immediately put through another ten seconds of ignition. The duration of the inflammation is noted again. If the drippings set fire to the cotton, this is also noted.

Materials Classified as 94V-0

The materials classified as 94V-0 should:

- Not have any sample that burns with a flame for more than ten seconds after the application of the test flame.
- Not have a total time of combustion superior to the 50 seconds for the applications of the flame of ten seconds for each group of five samples.
- Not have samples that burn with flames or that the combustion reaches the fastening brace.
- Not have samples that drip particles that may ignite the surgical cotton situated 305 mm underneath the test sample.
- Not have any sample continue to burn for more than 30 seconds after the second test flame is removed.

ESD "ELECTRO-STATIC CHARGE DISSIPATOR"

QUELLE EST LA RESISTANCE OPTIMALE D'UN POLYREY DCE ?

Elle se situe volontairement entre 10^5 et 10^7 ohms, c'est à dire, dans la zone la plus efficace de la plage admise par tous les spécialistes les plus éminents, définissant les matériaux ANTISTATIQUES.

Cette plage va de 10^5 ohms environ à 10^9 ohms environ.

Le Professeur TAYLOR de l'Institut de Bangor a donné le 03/12/86 à l'Institut de Physique de Londres (où nous étions), les plages de :

- 10^5 à 10^{10} ohms par maille pour un antistatique superficiel,
- et 10^6 à 10^8 ohms pour un antistatique transversal.

C'est une hérésie de croire que la course au plus petit indice est preuve de performance supplémentaire :

- un 10^4 ohms est MAUVAIS
- un 10^3 ohms est DANGEREUX
- un 10^2 ohms est UNE FOLIE etc

QUEL EST LE TEMPS DE DECHARGE OPTIMAL D'UN POLYREY DCE ?

Quelques dixièmes de seconde - ni plus ni moins !

Sur un conducteur, une décharge d'électricité statique se déroule entièrement en moins de 50 milliardièmes de seconde avec une intensité maximale de 30 ampères, dommageable pour la plupart des micro-composants électroniques.

Sur des éléments moins conducteurs, cette même quantité d'énergie, se dissipera plus longuement, et en première approximation, l'intensité maximale sera inversement proportionnelle à la durée de la dissipation.

Un matériau trop conducteur (inférieur à 10^4 ohms), permettra l'écoulement de la décharge en quelques centièmes ou quelques millièmes de seconde et cela avec une intensité encore trop élevée pour être inoffensive. Ce matériau "attirera" la décharge, provoquera la formation d'arcs (étincelles) etc...

Un matériau trop isolant (supérieur à 10^{11} ohm) n'évacuera l'énergie statique qu'après plusieurs secondes et outre le maintien prolongé d'un danger latent, il peut permettre le développement de dégats thermiques par effet Joule.

Ici encore, l'idéal est dans le compromis.

ESD" ELECTRO-STATIC CHARGE DISSIPATOR"

QUELLE EST LA DURABILITE DE L'EFFET ANTISTATIQUE DU POLYREY DCE ?

Celle de la durée de vie du POLYREY, c'est à dire qu'il faudra qu'il atteigne un état de dégradation, d'usure, de destruction tel que pour des raisons de vétusté et d'esthétique, il sera déclaré "hors d'usage" bien avant !

Les éléments semi-conducteurs sont intégrés dans la masse du stratifié, noyés dans les couches internes et surprotégés par les couches décoratives et résistantes de surface.

C'est notre point fort, par rapport aux divers traitements antistatiques de surface (pulvérisation, peintures etc...)

Des mesures faites après plusieurs années de vieillissement normal, montrent que les caractéristiques de résistance et de résistivité, sont restées constantes.

COMMENT EVOLUE L'EFFET ANTISTATIQUE DU DCE EN FONCTION DE L'HUMIDITE RELATIVE?

Comme tout matériau antistatique, l'efficacité dissipative décroît avec l'humidité relative, mais dans de faibles proportions car ici encore, les couches semi-conductrices, étant dans la masse du stratifié thermodurci sous haute pression, ne sont que très peu sensibles aux variations d'humidité ambiantes. Un POYREY DCE à 10^5 ohms par maille à 70 % H.R, est encore 10^7 ohms à moins de 30% H.R, c'est dire que dans le domaine des variations climatiques habituelles, il reste intégralement dans la plage idéale des antistatiques.

UN STRATIFIE POLYREY DCE EST-IL UN STRATIFIE DECORATIF HAUTE PRESSION ?

Oui, à part entière, il est totalement conforme à toutes les normes HPL en vigueur, ce qui revient à posséder les avantages suivants :

- haute résistance à la rayure, à l'abrasion, aux tâches, aux chocs,
- insensible aux solvants donc aisément nettoyable,
- haute résistance thermique, donc aux brûlures de gouttes de soudure...,
- mise en oeuvre, usinages et finitions classiques.

ESD "ELECTRO-STATIC CHARGE DISSIPATOR"

NF EN 438



Características	Oversil loseta para suelo técnico 1,2 mm		DCE	
	estándar	DCE M1	Posformable 0,8 mm	Compact M1 4, 6, 8, 10 et 13 mm
Tipo normalizado - NF EN 438	HDS	HDF	HGP	CGF
Tolerancia de grosor - NF EN 438-2-4	± 0,15 mm	± 0,15 mm	± 0,1 mm	cf. página 7
Estabilidad dimensional - NF EN 438-2-9				
● sentido longitudinal	< 0,30 %	< 0,25 %	< 0,30 %	< 0,20 %
● sentido transversal	< 0,60 %	< 0,50 %	< 0,65 %	< 0,50 %
Resistencia al agua hirviendo - NF EN 438-2-7 2 h a 100 °C				
● masa	≤ 8 %	≤ 8 %	≤ 17,5 %	≤ 2,5 %
● espesor	≤ 10 %	≤ 8,5 %	≤ 19,5 %	≤ 5,5 %
Resistencia al vapor de agua - NF EN 438-2-24	≥ 4 %	> 3 %	> 4 %	> 4 %
Resistencia térmica superficial - NF EN 438-2-8 ● 180 °C enfriado 20 mn	sin deterioro	sin deterioro	sin deterioro	sin deterioro
Resistencia a las manchas - NF EN 438-2-15	ningún ataque	ningún ataque	ningún ataque	ningún ataque
Solidez del color a la luz artificial según diseño - NF EN 438-2-16	≥ 6	≥ 6	≥ 6	≥ 6
Resistencia al choque - NF EN 438-2-11 ● fuerza del muelle	≥ 20 N	≥ 20 N	≥ 20 N	≥ 20 N
Resistencia al rayado - NF EN 438-2-14	≥ 3 N	≥ 3 N	≥ 2 N	≥ 2,5 N
Resistencia a la abrasión - NF EN 438-2-6				
Número de vueltas (Media)	3000 a 5000	3000 a 5000	≥ 500	≥ 600
Resistencia a las quemaduras de cigarrillo - NF EN 438-2-18	sin quemadura	sin quemadura	sin quemadura	sin quemadura
Resistencia a la fisura - NF EN 438-2-13	clase 4	clase 4	clase 4	clase 4
Reacción al fuego - PV del C.S.T.B. o LNE	M3	M1	M3	M1
Densidad	1,43	1,43	1,43	1,41
Conductibilidad térmica λ	0,1 a 0,5 kcal/m.h. °C	0,1 a 0,5 kcal/m.h. °C	0,1 a 0,5 kcal/m.h. °C	0,1 a 0,5 kcal/m.h. °C
Aptitud al curvado				
radio de curvatura convexo y cóncavo	30 cm	30 cm	8 cm	-
Poliformabilidad en caliente				
● radio de curvatura NF EN 438-2-20	-	-	10 mm	-
● resistencia al calentamiento NF EN 438-2-22	-	-	> 20 sec.	-
Defectos de superficie - NF EN 438-2-5				
● puntuales	≤ 1 mm ² /m ²	≤ 1 mm ² /m ²	≤ 1 mm ² /m ²	≤ 1 mm ² /m ²
● lineales	≤ 10 mm/m ²	≤ 10 mm/m ²	≤ 10 mm/m ²	≤ 10 mm/m ²
Resistencia superficial según NPFA 99 (50 % R.V. - 23 °C - 100 volts)	-	1 x 10 ⁷ - 1 x 10 ⁹ Ω	1 x 10 ⁷ - 1 x 10 ⁹ Ω	1 x 10 ⁷ - 1 x 10 ⁹ Ω
Resistencia superficial según ASTM D 257 (50 % R.V. - 23 °C - 100 volts)	-	1 x 10 ⁵ - 1 x 10 ⁹ Ω	1 x 10 ⁵ - 1 x 10 ⁹ Ω	1 x 10 ⁵ - 1 x 10 ⁹ Ω
Resistencia transversal según NPFA 99 (50 % R.V. - 23 °C - 500 volts)	-	1 x 10 ⁵ - 1 x 10 ⁹ Ω	1 x 10 ⁵ - 1 x 10 ⁹ Ω	1 x 10 ⁵ - 1 x 10 ⁹ Ω
Tiempo de flujo de cargas electroestáticas según MILB - 81705 - B (12 % HR - 23 °C - 5000 volts) E.T.S. (Glenside - U.S.A.)	-	≤ 0,5 segundos	≤ 0,5 segundos	≤ 0,5 segundos
Campo de aplicación	losetas para suelos técnicos flotantes	losetas para suelos técnicos flotantes salas blancas	mesa de ensamble de componentes y revestimiento de muebles de oficinas	mamparas y revestimientos de paredes de salas asépticas y salas blancas

HGP: Laminado de alta presión de tipo posformable para utilización horizontal.

HDF: Laminado de alta presión con reacción al fuego mejorada para uso intenso.

HDS: Laminado de alta presión de tipo estándar para uso intenso.

CGF: Laminado de alta presión de gran espesor o compacto con reacción al fuego mejorada.

THERMAL-HARDENING POWDERED PAINT

COLOR

RAL 7035 (GREY)

CHARACTERISTICS OF THE POWDER:

Density (UNE 48 – 098 – 92)	1, 60 g / cc.
Time of Gel (150° C)	100 / 150 c.
Non volatile Matter (180° C)	99,9 %
Physical Stability	Good

APPLICATION

Tension	50 – 70 KV
Cure	10 a 100°C (Temp.Piece)

CHARACTERISTICS OF THE COVER APPLIED (*)

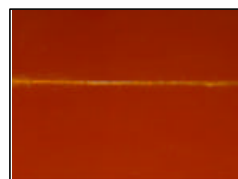
Thickness (UNE 48 – 031 – 80)	60 – 80
Shine 60° (UNE 48 – 026 – 80)	90%
Resistance to over-heating in oven	E < 2,0
Persoz Hardness (UNE 48 – 024 – 80)	250"
Adherence (UNE 49 – 032 – 80)	100 %
Erichsen Squeeze (UNE 48 – 183 – 84)	7 mm.
Folded 5 mm (UNE 48 – 169 – 92)	OK
Percussion: Direct and Inverse	
(Inta 160266)	70 cm (1 Kg)

TEST OF ACCELERATED AGING (*)

Chamber of saline fog (INTA 160604)	500 hrs. Minimum
Saturated humidity (DIN 50 017)	500 hrs. Minimum
Inclement weather Q. U. V.	-----



SALINE FOG CHAMBER



TRIAL TEST TUBE

COLOR	RAL 9011 (BLACK MATTE)
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PROPERTIES OF THE PRODUCT

Type of resin	Polyester
Particle size	Adequate for electro-static application
Specific weight	1.2-1.8 g/cm ³ according to the color
Storage	In a fresh and dry environment. Temperature inferior to 25°C
Time of half-life	12 months
Conditions of Cure (a)	15 minutes at 190°C
(metal temperature)	10 minutes at 200°C
	8 minutes at 210°C

TEST CONDITIONS

Substrate	Mechanical tests	Polished steel Gold Seal
	Chemical and resistance tests:	Smooth steel Gold Seal
Pretreatment	Zinc phosphate	
Thickness of cover	50 µm	
Cure	10 minutes at 200°C (metal temperature)	

MECHANICAL TESTS

Flexibility	BS3900-E11 (Conic mandrel)	= 3mm
<u>Adherence</u>	BS3900-E6 (2mm of separation)	0
Erichsen Squeeze	BS3900-E4	= 7 mm
	BS3900-E2 (2000 grs)	<u>Complies. Without penetration in the substrate</u>
<u>Impact</u>	BS3900-E3	<u>Complies 2,5mm direct and reverse</u>

TESTS OF CHEMICAL RESISTANCE AND DURABILITY

Saline fog	ASTM B117 (250 hours)	Complies. Corrosion after the cross inferior to 2 mm.
Humidity Chamber	BS3900-F2 (1000 hours)	Complies. Without swelling or loss of shine.
Immersion in distilled water	BS3900-F7 (240 hours)	Complies. Without swelling or loss of shine.
Exposition to the exterior		Excellent: without lime, slight loss of shine after 12 months of continuous exposition, but without cracking or reduction of the protective properties of the cover.
	Stability of the color at elevated temperatures	Excellent in continuous exposition until 150°C.

SALINE FOG CHAMBER



COLOR

RAL 3005 (BORDEAUX)

PROPERTIES OF THE PRODUCT

Type of resin	Polyester
Particle size	Adequate for electro-static application (crown and rub)
Specific weight	1.5 ±0,2 g/cm ³ according to the color
Storage	In a fresh and dry environment. Temperature inferior to 25°C
Time of half-life	6 months
Conditions of Cure (ª)	20 minutes at 180°C
(Metal temperature)	15 minutes at 190°C
	10 minutes at 200°C

TEST CONDITIONS

Substrate	Mechanical tests	Polished steel Gold Seal
	Chemical and resistance tests:	Smooth steel Gold Seal
Pretreatment	Zinc phosphate	
Thickness of cover	60 µm	
Cure	15 minutes at 190°C (metal temperature)	

TECHNICAL INFORMATION
MATERIALS
TECNO LAN-TECNO WORK

TEST CONDITIONS			
Substrate	Mechanical tests	Polished steel Gold Seal	
	Chemical and resistance tests:	Smooth steel Gold Seal	
Pretreatment	Zinc phosphate		
Thickness of cover	60 um		
Cure	15 minutes at 190°C (metal temperature)		
MECHANICAL TESTS			
Flexibility	ISO 1519 (Conic mandrel)	= 3mm	
Adherence	ISO 2409 (2mm of separation)	0	
Erichsen Squeeze	ISO 1520	= 7 mm	

Hardness	ISO 2815 (Buchholz)	= 80
<u>Impact</u>	ECCA T5	Complies 2,5 Jules direct and reverse
TESTS OF CHEMICAL RESISTANCE AND DURABILITY		
Saline fog	ISO 7253 (250 hours)	Complies. Corrosion after the cross inferior to 2 mm.
Chamber of humidity	DIN 50017 (1000 hours)	Complies. Without swelling or loss of Shine
Chemical resistance		Generally good resistance to the acids, alkalis and oils at room temperature
Test of accelerated aging (QUV)	ASTM G53-93 (Lamp 313 nm 4 hours UV at 55°C / 4 hours cycle of condensation)	Retention of shine: 50% after 200 hours of testing.

RADIATION TEST (UNE 23.727-90)

Test tubes	I	II	III	IV	AVERAGE
Index i	0	0	0	0	0
Index s	0	0	0	0	0
Index h	0	0	0	0	0
index c	< 1	< 1	< 1	< 1	< 1

i (flammability index)

s (index of development of the flames)

h (index of maximum longitude of the flame)

c (index of combustibility)

Determination of the reaction to fire of powdered thermo-hardening paint, of epoxi-polyester, reference H99-5532 applied onto stainless steel pan with electro-static equipment, and in aprox. quantity of 70 g/m², thickness 40-50 micras. and layer density 1,64 g/cm³, dry extract 100”.

The company that performed this test: Ferro Enamel Española, S.A certifies that the coats in thermal-hardening powder: H3-9134/V and those utilized by us: H99-5532 have similar chemical composition except for a few variations that should not affect their compliance to the technical specifications of reaction to fire.

The coats in powder, based in polyester resins offer a good stability of the color under the light and to the disagreeable conditions above a great variety of substrates applied with only one coat. Its resistance to heat makes it that the powdered coats be suitable when a decent retention of color is required in surfaces exposed to heat in a continuous manner.

