



As part of the development of our industrial activity for the manufacture of technical cabinets for the Telecommunications, Information Systems and Energy sectors, Olivetel S.A performs tests and verification of its processes and products in accordance with the following standards:

- **EN ISO 60529** Degrees of protection provided by enclosures against solid objects and liquid (IP Code)
- **EN ISO 62262** Degrees of protection provided by enclosures against external mechanical impacts (IK code)
- **EN ISO 12944** Paints & Varnishes - Corrosion protection of steel structures by protective paint systems

EN ISO 60529 - Degrees of protection provided by enclosures against solid objects and liquid (IP Code)

Within the scope of the standard EN ISO 60529, Olivetel S.A. groups its standard portfolio products into two categories: Cabinets for indoor installation and Cabinets for outdoor installation, each group with different levels of protection and aimed at various environments and installation requirements.

		Water protection level / Test Parameters								
		Not Protected	Protected against vertical drop of water droplets	Protected against vertical drop of water droplets at maximum slope of 15°	Protected against water sprayed from an angle of ± 69°	Protected against splashing water	Protected against water jets	Protected against powerful water jets	Protected against temporary immersion	Protected against submersion
		0	1	2	3	4	5	6	7	8
Level of protection against solid objects / Test Parameters	Not Protected	0								
	Protected against solid objects with ø greater than 50mm	1								
	Protected against solid objects with ø greater than 12mm	2	IP20 Indoor Cabinets							
	Protected against solid objects with ø greater than 2.5mm	3		IP31 Indoor Cabinets						
	Protected against solid objects with ø greater than 1mm	4				IP43 Indoor Cabinets				
	Protected against pressure dust 200mm of water column. Maximum air suction: 80 x casing volume	5					IP54 Indoor Cabinets	IP55 Outdoor Cabinets		
	Fully protected from dust. Same test procedure	6						IP65 Outdoor Cabinets		

For development and manufacture of customized products, and for different levels of protection not specified in the table above, Olivetel S.A. follows the same procedures according to the parameters and indications of the respective standard and for the specific requirements identified by the installation.



EN ISO 62262 - Degrees of protection provided by enclosures against external mechanical impacts (IK code)

For the development and manufacture of its products, Olivetel S.A. carries out tests according to the parameters of the standard EN ISO 62262, for definition and application in the manufacturing processes.

Within the scope of this standard, all standard products intended for outdoor installation or indoor installation in industrial environments are in compliance with IK10 level protection.

IK Code / Mechanical Impact Parameters

IK code	IK00	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10
Impact Energy (Joule)	-	0.14	0.2	0.35	0.5	0.7	1	2	5	10	20
Equivalent drop mass and height	Not Protected	Drop of 200g object from 7,5cm height	Drop of 200g object from 10cm height	Drop of 200g object from 17,5cm height	Drop of 200g object from 25cm height	Drop of 200g object from 35cm height	Drop of 500g object from 20cm height	Drop of 500g object from 40cm height	Drop of 1,7Kg object from 29,5cm height	Drop of 5Kg object from 20cm height	Drop of 5Kg object from 40cm height

IK Code / Impact Test Characteristics

IK Code	IK00	IK01 a IK05	IK06	IK07	IK08	IK09	IK10
Impact Energy (joules)	-	<1	1	2	5	10	20
R mm (radius of striking element)	-	10	10	25	25	50	50
Material	-	POLYAMIDE	STEEL	STEEL	STEEL	STELL	STEEL
Mass Kg	-	0,2	0,5	0,5	1,7	5	5
Pendumum Hammer	-	YES	YES	YES	YES	YES	YES
Spring Hammer	-	YES	YES	YES	NO	NO	NO
Free fall Hammer	-	NO	NO	YES	YES	YES	YES

In the development and manufacture of customized products Olivetel S.A. follows the same procedures according to the parameters and indications of the respective standard and for the specific requirements identified by the installation.



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EN ISO 12944 - Paints & Varnishes - Corrosion protection of steel structures by protective paint systems

For the development and manufacture of its products, Olivetel S.A. applies the appropriate surface treatments to each of the classes defined in the standard and carries out performance tests in the laboratory.

The EN ISO 12944 standard defines a set of guiding parameters, subdivided into eight parts:

- EN ISO 12944-1:1999 General Introduction
- EN ISO 12944-2:1999 Classification of environments
- EN ISO 12944-3:1999 Conception and constructive arrangements
- EN ISO 12944-4:1999 Types of surface and surface preparation
- EN ISO 12944-5:2007 Surface treatment by paint protection
- EN ISO 12944-6:1999 Laboratory performance tests
- EN ISO 12944-7:2000 Execution and supervision of painting works
- EN ISO 12944-8:2001 Development of specifications for new works and maintenance

In the scope of the standard EN ISO 12944-2 that classifies the environments with levels of corrosivity C1, C2, C3, C4 and C5, there are a set of variables to be taken into account by the installer and that together with the characteristics of the technical cabinets, indicate an estimate of durability of the products.

The probable durability is a technical consideration that allows the installer / product owner to define a maintenance plan. The prediction of durability can never be considered a manufacturer's warranty time.

Corrosivity Class ISO 12944 Paints and varnishes Corrosion protection of steel structures by protective paint systems	General Environment Characteristics	EXAMPLES OF TYPICAL ENVIRONMENTS	
		INDOOR	OUTDOOR
C1 VERY LOW	Dry environments	Heated buildings with very low clean atmospheres	
C2 LOW	Rural areas with low pollution	Unheated buildings where condensation may occur	Atmospheres with low level of pollution. Mostly rural areas
C3 MEDIUM	Urban, industrial or coastal zone, with moderate pollution / low salinity	Production rooms with high humidity and some air pollution	Urban and industrial atmospheres, moderate sulfur dioxide pollution. Coastal areas with low salinity
C4 HIGH	Industrial or coastal zone, with moderate salinity or near the sea	Chemical plants, swimming pools, coastal ship and boatyards	Industrial areas and coastal areas with moderate salinity
C5-I VERY HIGH (Industrial)	Industrial zone with high humidity and / or Salinity, aggressive environment	Buildings or areas with almost permanent condensation and high pollution	Industrial areas with high humidity and aggressive atmosphere
C5-M VERY HIGH (Marine)	Coastal zone with high humidity and / or Salinity, aggressive environment near the sea	Buildings or areas with almost permanent condensation and high pollution	Coastal and offshore areas with high salinity.

As the environment is dynamic and influenced by a set of natural and human factors, the classification provided by the standard does not dispense and advises the installers to collect detailed and updated



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information of the installation zones in order to assess the actual conditions and equipment protection needs.

In addition to the data on levels of corrosivity provided by local and designated official entities, there is a set of atypical and localized human factors that can enhance corrosivity levels (eg in areas with snow and ice occurrences, it is usual to use salt on pavement, which contributes to the acceleration of corrosion in the cabinets installed on the floor).

In the scope of the standard EN ISO 12944-4 / 5/6, Olivetel elaborates sample pieces for the respective tests. These tests are carried out with certified external entities and include, among others, procedures and evaluations inherent to specific standards such as:

- Tests of QUV-A (NP EN ISO 16474-3)
- Camera Testing Moisture – EN ISO 6270-2
- Neutral Saline Fog Testing – NP EN ISO 9227
- Evaluation according to standard NP EN ISO 4628
- Adhesion after aging according to standard NP EN ISO 2409

It is on the basis of these tests and evaluations that Olivetel S.A. develops and manufactures all its products, providing a set of products of different raw materials, different surface treatments, for different installation requirements.

In this context, and considering that the corrosion classes associated to the zones have a dynamic character, the sub-division (Low, Medium, High) within each of the classes shown in the figure below is only a guide and prediction of durability, and only provides guiding data to support the installer's decision regarding suitable raw materials, ambient corrosion categories and conditions of the installation zone. Unlike corrosion categories (C1, C2, C3, C4 and C5), there is no different approaches or manufacturing methods and surface treatments for subdivisions (L, M, H).

The table below is not directly associated to specific Olivetel products or their warranty, it provides only generic and empirical data to illustrate the behaviour of the different raw materials when exposed to several environments.

Regardless of the characteristics of raw materials and additional treatments for corrosion prevention, the durability of materials and products are always influenced by their exposure to uncertain and dynamic factors of natural and human characteristics, as well the preventive maintenance practices, with special attention to the periodic cleaning to minimize agents that promote corrosion, due to exposure to pollution and salinity.

Corrosivity Class ISO 12944 Paints and varnishes Corrosion protection of steel structures by protective paint systems	C1 VERY LOW Dry environments			C2 LOW Rural areas with low pollution			C3 MEDIUM Urban, industrial or coastal zone, with moderate pollution / low salinity			C4 HIGH Industrial or coastal zone, with moderate salinity or near the sea			C5 VERY HIGH (Industrial and Marine) Industrial and coastal zones with high humidity and / or Salinity, aggressive environment		
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
Estimated Durability by raw-material with 80 µm Standard Polyester exterior powder coating without presenting corrosion levels	2-5 Years	5-15 Years	>15 Years	2-5 Years	5-15 Years	>15 Years	2-5 Years	5-15 Years	>15 Years	2-5 Years	5-15 Years	>15 Years	2-5 Years	5-15 Years	>15 Years
Carbon Steel	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate
Galvanized Steel	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	With Restrictions	With Restrictions	With Restrictions	With Restrictions	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate
Aluminium with Chroming Surface treatment	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	With Restrictions	With Restrictions	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate	Not Appropriate
Stainless	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	With Restrictions	With Restrictions	With Restrictions	With Restrictions	With Restrictions	With Restrictions

■ Appropriate
 ■ With Restrictions
 ■ Not Appropriate



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In the development and manufacture of customized products and / or in need of increased protection by surface treatment / painting techniques, Olivetel SA follows the procedures according to the parameters and indications provided by the respective standard and according to the specific requirements identified and provided for the installation zone.



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