



# PRODUCTS WEATHER PROTECTION FEATURE OVERVIEW

## INTRODUCTION

With more than 30 years of accumulated experience in large-scale touring and permanent outdoor installations, L-Acoustics has a proven track record in delivering premium products with lasting performance. For all our loudspeaker products, we offer an elevated level of weather resistance as standard, removing the need for bespoke secondary finishes. The aim of this document is to provide information to assess L-Acoustics products weather protection.

## PRODUCT PROTECTION RATINGS

### Loudspeakers

Category - Series	Reference	IP Rating	UV Rating	MIL-STD-810G
Short throw - X Series	X4i	55 <sup>1</sup>	6	X
	5XT	30	6	- <sup>2</sup>
	X8 / X12 / X15 HiQ	43	6	- <sup>2</sup>
Short throw - P Series	108P / 112P / SB15P	30	6	- <sup>2</sup>
Medium throw - S Series	Syva	54	6	- <sup>2</sup>
	Syva Low / Syva Sub	55	6	- <sup>2</sup>
Medium throw - A Series	A10(i) Wide / A10(i) Focus	55	6	X
	A15(i) Wide / A15(i) Focus	55	6	X
Long throw - K Series	Kiva II	55	6	X
	Kara II(i)	55	6	X
	K2	55	6	- <sup>2</sup>
	K1	43	6	- <sup>2</sup>
	K1-SB	45	6	- <sup>2</sup>
Subwoofers	SB15m	55	6	X
	SB18(i/m)	55	6	X
	SB28	55	6	- <sup>2</sup>
	KS21(i)	55	6	X
	KS28	55	6	- <sup>2</sup>

<sup>1</sup> With connector sealing plate

<sup>2</sup> Products have not been submitted to MIL-STD-810G tests yet

### Electronics

Category	Reference	IP Rating	UV Rating	MIL-STD-810G
Amplified Controllers	LA2Xi	30	-	-
	LA4X	30	-	-
	LA8i	20	-	-
	LA12X	20	-	-
Processors	P1	30	-	-
	LISA Processor	20	-	-
Networking	LS10	30	-	-



Our product ratings are based on internationally recognized testing standards described below:

## **IEC 60 529 - IP Ratings**

The IEC 60 529 published by the International Electro-technical Commission (IEC) relates to loudspeaker protection against solid foreign objects and water using a two-digit metric. The first character describes the degree of protection against solid objects on a scale from 0 (not protected) to 6 (dust-tight). The second digit describes the degree of protection against water on a scale from 0 (not protected) to 8 (submersion in water).

Enclosure ratings are determined in configurations with the front of cabinet in a neutral tilt angle. To ensure durability, upward tilt angles should be avoided on loudspeakers permanently installed without external protection.

At L-Acoustics, a specific seal is applied to the NL4 speakerON connectors to reach a higher IP rating as standard on all loudspeakers fitted with speakON connectors.

## **ISO 105-B01 - UV Ratings**

The ISO 105-B01, published by International Organization for Standardization (ISO), relates to colour fastness of textiles. The UV rating describes the color fastness of textiles to daylight, on a scale from 1 (very extensive fading) to 8 (no fading). A rating of 6 indicates very good resistance to daylight (slight fading).

## **MIL-STD-810G**

The MIL-STD-810G is a set of test methods published by the US Department of Defense to evaluate the long-term outdoor durability of a given enclosure. At L-Acoustics, we conduct specific MIL-STD-810G tests on loudspeakers as part of the development process. These tests assess the long-term resistance of loudspeakers to extreme temperatures, humidity, solar radiation and corrosion. Below is a description of these tests:

High temperature for storage conditions (Basic Hot A2 and Hot Dry A1): Product is enclosed in a sealed chamber and subject to the following 24-hour climatic stress cycle: 63°C/145°F (44% HR) and 71°C/ 160°F (0% HR).

High temperature for operating conditions (Basic Hot A2 and Hot Dry A1): Product is enclosed in a sealed chamber and subject to a temperature of 50°C/122°F (95% HR) for 24 hours.

Low temperature for storage conditions: Product is enclosed in a sealed chamber and subject to the following 24-hour climatic stress cycle: 25°C/145°F (-13% HR) and 25°C/77°F (25% HR).

Low temperature for operating conditions: Product is enclosed in a sealed chamber and subject to a temperature of -5°C/23°F (20% HR) for 24 hours.

Humidity in aggravated cycle (warm humid atmosphere): Product is enclosed in a sealed chamber and subject to the following 5-day climatic stress cycle: 95% HR at 30°C/86°F to 60°C/140°F.

Solar radiation: Product exterior materials are enclosed in a UV machine exposing intense UV of 800 W at 50°C/122°F for 10 days. Only very slight color deviation is allowed after the test.

Salt spray: Product is submitted to continuous spray of a solution based on water with 5% of salt, prepared according to ISO 9227 norm, for 48 hours. This test assesses atmospheric and galvanic corrosions.

## **Compliance results:**

According to MIL-STD-810G, a product passes the tests above and thus obtain a self-certification if it "functions properly" after being tested. While this can be understood in various ways by manufacturers, L-Acoustics ensures that products pass internal quality control tests. This means that products reproduce identical acoustic performance (bandwidth, output, THD...) and are free of any mechanical or physical degradation.



## LOUDSPEAKER STANDARD PROTECTION FEATURES

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By design and choice of premium materials all L-Acoustics loudspeaker systems offer very-high weather resistance as standard.

### Enclosure

L-Acoustics exclusively uses class 3 exterior grade beech and birch plywood following the EN 314 norm and class D4 exterior grade glue following the EN 204 norm. The base coating is a bi-component polyurethane. The top coating is a mono-component waterbased polyurethane that ensures optimized UV stability and scratch protection. L-Acoustics has chosen polyurethane for the following reasons:

- Greater UV resistance and high color stability vs. epoxy resins.
- Greater resistance in humid environments and less brittle vs. fiberglass.

### Grills

All grills are coated with polyester powder coating following the ISO 9227 norm for salt spray tests and norm ISO 11341 for UV protection. Grills are covered with Airnet fabric with a UV protection rating of 6 following the ISO 105-B01 norm.

### Hardware

The primary design priority for rigging hardware is mechanical safety. Therefore, rigging is manufactured from high tensile steel (Yield strength > 700MPa) following the EN10149-2 norm. We exclude the use of aluminum for these sensitive parts. Other hardware is manufactured from standard steel (Yield strength > 170MPa). Both materials are treated with a dual anti-corrosion coating (zinc-based coating). All hollow bodies are treated in cathoresis<sup>1</sup>. Mounting hardware (screws and fasteners) uses stainless steel.

<sup>1</sup> Cathoresis: process of electro-coating metals to elevate resistance to atmospheric agents.

### Components

L-Acoustics selects transducers with the highest protection available from its suppliers with a water-resistant surface coating on both sides.

### Connectors

Install-specific loudspeakers feature recessed terminal connectors covered by a sealed connector plate with gland nut connectors. An optional sealed 5 meter cable (H07-RN-F) connector with gland nut connectors is also available for Kara/Karai, Kiva II, ARCS WIFO, X8, X12, SB18/SB18i and SB15m.

### Fire-retardant

Compliance with IEC 60065 or IEC 62368-1 standards ensures that the product will not be the cause of a fire start, thanks to the appropriate design and the use of fire-retardant material.

### Atmospheric conditions

Loudspeakers are tested and optimal performance are assured under the following operating conditions:

- Temperature: -5°C/23°F to 50 °C/122°F
- Humidity: up to 95% HR (humidity)

## Hardware

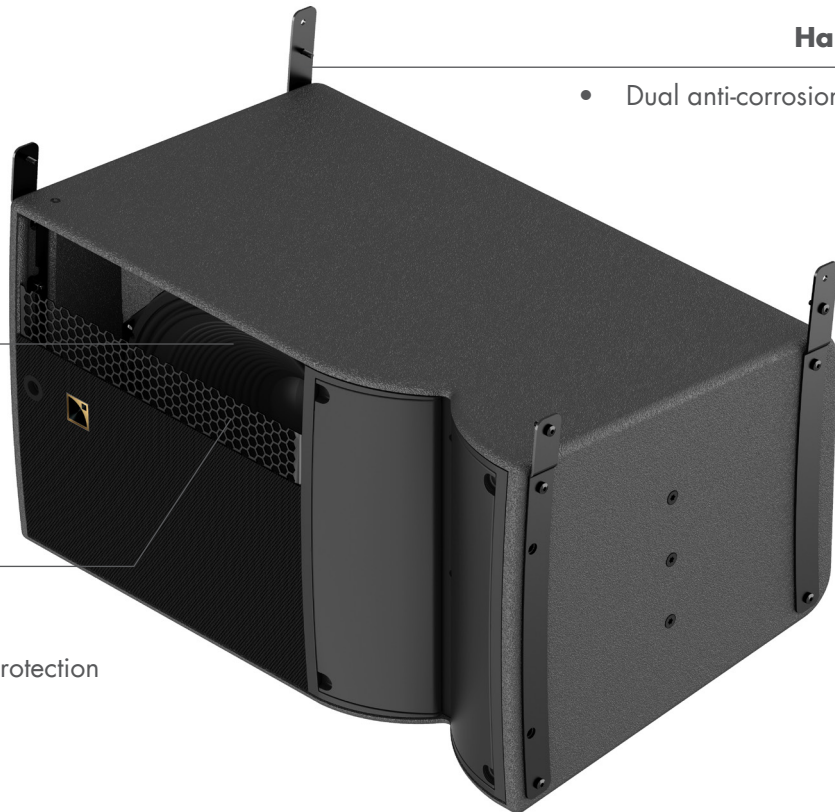
- Dual anti-corrosion coating

## Components

- Water-resistant surface coating on both sides

## Grills

- Polyester powder coating following the ISO 9227
- Airtex Fabric with a UV protection

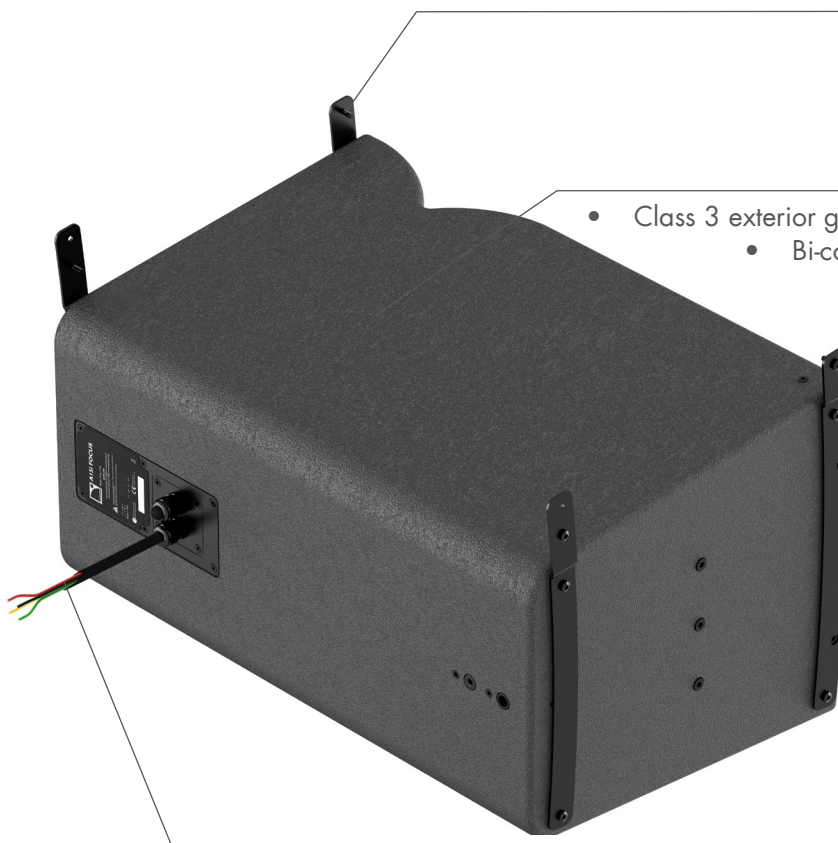


## Mounting hardware

- Stainless steel with an anti-corrosion coating

## Enclosure

- Class 3 exterior grade beech and birch plywood
  - Bi-component polyurethane coating
  - D4 exterior grade glue



## Cable connectors

Sealed connector plate with gland nuts



## GENERAL ATMOSPHERIC CONSIDERATIONS

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In general, loudspeakers performance and durability can be impacted by harsh atmospheric conditions. L-Acoustics loudspeakers offer optimal performance under the static or variable operating conditions mentioned below:

- Temperature: -5°C/23°F to 50 °C/122°F
- Humidity: up to 95% HR (humidity)

In very low temperatures (below 0°C), it is recommended to start operating loudspeakers at a low level and gradually increase this level. For permanent installations where temperatures are very low for a long period, it is recommended to operate loudspeakers at a very low level continuously to maintain components in proper conditions and ensure durability.

In very high temperatures (above 35°C), it is recommended not to operate the loudspeakers continuously at limiting levels.

## STANDARDS REFERENCE IN THIS DOCUMENT

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EN314: Plywood – bonding quality and durability. Classifies plywood by its bonding quality only (type of glue and core veneer quality). From Class 1 (interior conditions) to Class 3 (fully exposed conditions).

EN204: Adhesives - durability. Classifies wood glues for non-structural applications. From D1 (interior area) to D4 (exterior areas exposed to weather).

ISO 9227: Corrosion tests in artificial atmospheres – Salt spray tests

ISO 11341: Paints and varnishes – Artificial weathering and exposure to artificial radiation – Exposure to filtered xenon-arc radiation.

ISO 105-B01: Textiles – Tests for colour fastness – Colour fastness to light: Daylight. From 1 (extensive fading) to 8 (no fading).

EN 10149-2: Hot rolled flat products made of high yield strength steels for cold forming - Part 2: Technical delivery conditions for thermomechanically rolled steels