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WATERPROOF LIGHTING SOLUTIONS WITH LED STRIPS

WHAT YOU SHOULD THINK ABOUT WHEN CHOOSING THE RIGHT PRODUCTS

"LIGHT MAKES A BUILDING OR ENVIRONMENT STANDOUT"

© Axioma

By using light, you can make an environment stand out, make it more beautiful and stylish or you can create a certain atmosphere. Lighting is always visible and you want it to look great, even in the long run. Of course, you don't want any hassle during installation or afterwards.

There are various LED strips on the market. Each with unique specifications and suitable for certain applications. In this article, you will learn what you have to keep in mind when choosing the right products for a **waterproof lighting solution.**

A high-quality waterproof lighting solution in five steps

Are you planning to create a waterproof lighting solution? Follow these steps.

Step 1   Look carefully at the environment the LED strip will be installed and determine to what extent the lighting will come into contact with moisture/water.

Step 2   Choose a basic LED strip of high quality.

Step 3   Choose an LED strip with the right waterproof protection (IP67 or higher).

Step 4   Choose a good waterproof connector and end cap (with which you achieve an IP value of IP67 or higher).

Step 5   Decide how you want to mount the LED strip and choose the right products.

Step 1
Map the situation properly

Every project is unique and the used products must meet specific requirements. A LED strip is not universal and therefore not suitable for every situation. Especially if you are seeking good quality, you need to choose a product that meets the requirements and needs of that situation. To maintain quality, for fantastic light over a long period of time, and to avoid hassle afterwards.

Therefore, before looking for a lighting solution, it is important to take a good **look at the situation.**

- ☑ What does the environment look like?
- ☑ How will the lighting be installed (wall/side, floor/ top or ceiling/ bottom)?
- ☑ Where exactly will the lighting be located?
- ☑ Will the lighting be placed in a swimming pool and permanently submersed?
- ☑ Is it placed on the ground or low to the ground and is it going to be in contact with rainwater or the water from a pressure washer?
- ☑ Is it placed on a facade and does it occasionally come into contact with rainwater?
- ☑ Is the lighting placed just below the eaves?

By mapping this out properly, you will know exactly what requirements the LED lighting needs to meet and you can start looking for the right solution.

# *Step 2*

Choose a high-quality basic LED strip

Before we focus on the waterproof lighting solution, it is important to be aware of the quality differences between LED strips on the market. A quality strip is the foundation of your lighting solution.

A basic LED strip consists of a flexible electronic circuit board, also known as a PCB (Printed Circuit Board).

Among other things, LED chips and components that regulate current are soldered onto the PCB.

A basic LED strip has no housing or other form of protection against environmental influences.

COPPER CONNECTING PADS

VOLTAGE RATING

SOLDERING PADS

SUPPORTING CIRCUTRY

LED SMD CHIP

CONNECTION POLARITY MARKINGS '+ & -'

CUT INTERVAL

5.0

5050 CHIP

5.0

DC12V +

DC12V -

IO WIDTH

Source: littleanvil.com

A high-quality LED strip will provide years of fantastic light without colour discrepancies over time, you don't have to deal with voltage drops or entire sections that fail. Also the warranty length is longer with high-quality LED strips.
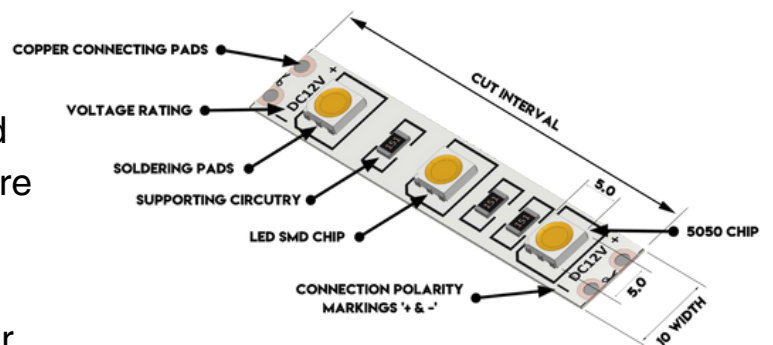
Quality difference due to production method

The quality difference starts with the production of the circuit board itself. Most of the time this is done in the following ways:

1. Production of individual half-metre pieces soldered together to get the right length (can be cut at the desired length by using indicated cutting sections).
2. Production as a single unit of, say, 50 metres on a reel. This is also called reel-to-reel technology (can be cut at the desired length by using indicated cutting sections).

Soldering points
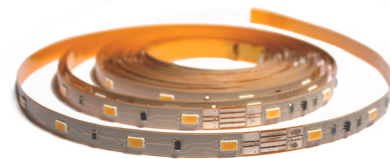

Reel-to-reel technology

A LED strip where the pieces are soldered together is more likely to fail or have other problems. The solder points create weak spots, which create higher resistance, causing voltage drop.

Want a true quality lighting solution? Choose a LED strip produced according to the reel-to-reel production technology.

Quality difference and colour deviations

The extent to which deviations in colour temperature are visible is also an important component of quality. This is indicated by MacAdam Ellipses (colour temperature). The measurements are scaled in 5 gradations, the MacAdam steps.

1 SCDM: almost no detectable deviations (even with instruments)
2 SCDM: deviations are only observable with instruments
3 SCDM: some deviations are observable with the human eye
4 SCDM: observable deviations (can be seen directly)
5 SCDM: clearly observable deviations

At step 4, you can see a clear difference in colour temperature between the two lamps.
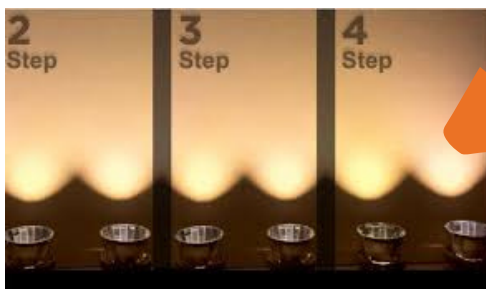
source: info.elektroshop.nl

So choose a lighting solution with a high-quality PCB LED strip as a basis to avoid problems during or after installation or in the longer term.

The best choice is a PCB LED strip with 1, 2 or 3 SCDM and produced via reel-to-reel technology.

Step 3

Choose a solution with the right protection

Because the PCB LED strip is not protected from environmental influences, the strip is very fragile and cannot be used in environments where moisture occurs. The delicate components on the PCB will fail or short-circuit. Therefore, it is very important to protect the basic LED strip properly.

The best protection is an enclosure, also called an extrusion. While extruding, liquid material, such as heated PVC or Silicone, is sprayed around the PCB LED strip and cooled immediately.

The potting method can also be chosen, where material, such as PU or Silicone, is poured into a mould from above.

However, it is important that the heat management of the LED strip is well regulated to ensure a long lifespan.

Is the LED strip going to be placed in a situation where it can be exposed to chemicals, salt water or UV? This can damage both the LED strip and the connector. PVC is known for its chemical resistance, so in this case the best choice.

When creating a waterproof lighting solution, it is important that you choose an LED strip that has a waterproof casing made of high-quality material.

What does IP-rating mean?

The degree to which the LED strip is protected is indicated by the protection value or IP value. When choosing a particular product for a waterproof solution, the protection value is very important. You can find it in the specifications of the strip in question.

It is expressed in two digits.

1. The first digit indicates the degree to which the LED strip is resistant to solid objects/dust.
2. The second digit indicates the degree to which the LED strip is protected against moisture/water.

The PCB LED strip has an IP00 protection rating.

IP-rating	Solid objects/dust	Moisture/water
IP00	Not protected.	Not protected.
IP10	Protected against solid objects over 50mm, e.g. accidental touch by hands.	Not protected.
IP20	Protected against solid objects over 12mm, e.g. fingers.	Not protected.
IP40	Protected against solid objects over 1mm, e.g. wires & nails.	Not protected.
IP65	Totally protected against dust.	Water jets; water projected by a nozzle (6.3 mm (0.25 in) against enclosure from any direction shall have no harmful effects.
IP67	Totally protected against dust.	Protected against immersion, up to 1 meter (3 ft 3 in) depth
IP68	Totally protected against dust.	Protected against immersion, 1 meter (3 ft 3 in) or more depth; the equipment is suitable for continuous immersion in water.
IP69	Totally protected against dust.	Protected against powerful high-temperature water jets; close-range high pressure, high-temperature spray downs.

The waterproof lighting solution, both the LED strip and the connector, should always have an IP-rating of IP67 or higher. This way, you can be sure that the quality is good and you won't have any problems afterwards.

Step 4
Make sure the connection is watertight

A LED strip needs voltage/power to generate light. The power supply is connected to the LED strip by a connector. This is attached directly to the end of an LED strip.

When creating a good waterproof LED lighting solution, it is important that both the connector and its connection to the LED strip are resistant to moisture.

Absolutely no open space should be left between the LED strip and the connector (and the end cap on the other side). The space may allow moisture to enter the extrusion, leading to short circuits or damage to components of the PCB LED strip.

Some connectors contain rubber seals or additional protection measures such as waterproof clamps or housings.

To be 100% certain the lighting solution is waterproof, it is better to outsource the assembling of the connector to the LED strip and leave it to a specialist with special equipment.

You provide the dimensions and you receive the LED strip ready-to-use, tested and including connector and cable on site. All you have to do is mount the strip and connect the power supply or any other components such as controllers. This way, you have no problems on site or afterwards.

Step 5

Mount the LED strip with the right products

There are several options for mounting an LED strip. A self-adhesive tape is not sufficient in a humid environment. You can mount the strip using waterproof mounting kit, mounting brackets or in a profile.

The best mounting option is the profile. The advantage of a profile is that you can remove the LED easily, when it is needed, and no interruptions are visible (as with mounting brackets).

With the right profile, the LED strip stays in place for a long time without being damaged.

An important consideration you make when choosing the right profile is the material. The profile should have a long lifespan and not damage the LED strip over time.
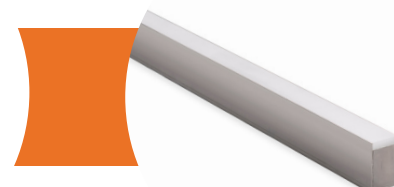
Therefore, choose a profile that cannot rust or otherwise deteriorate. Good material choices for a profile are aluminium, stainless steel, PVC or PETG.

Aluminium profile   *PETG/ PVC profile*   *Stainless steel profile*

Together we make the world more beautiful, sustainable and safer…

Quality consulting

High-quality products with unprecedented possibilities

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Active assistance (or support)

We create beautiful and clever linear lighting solutions with fantastic light, which can be installed quickly and flawlessly, without any hassle.

There is always a (light) solution

Want us to think along with you? Contact us now.

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