

Bathroom Safety

Electrical Products & Bathroom Safety



Bathrooms are considered to be a 'special location' for electrical installations because they have an increased risk of electric shock for the users, due to the proximity of water.

Electrical contractors make bathroom installations as safe as possible with careful adherence to wiring and building regulations, wise choice of equipment and a good 'splash' of common sense (pardon the pun!).

We all know all the sorts of products that can be found in bathrooms, lighting, showers, fans, heaters, shaver sockets and towel rails. But what are the rules for the installation of these products that contractors must follow and can, using certified products, help them comply with the regulations?

The rules: Wiring regulations in the UK: all fixed electrical installations in dwellings must legally comply with BS7671 the 'Requirements for Electrical Installations'. This Standard gives specific guidance on the design, installation, testing, verification and certification of such installations. Section 601, particularly covers 'Locations containing a bath or shower'.

Section 601, divides a bathroom into zones which take into account windows,

doors, walls ceilings and partitions and is based on a perceived level of risk zone. Each zone has specific requirements regarding the electrical equipment that can be used in that zone.

Zone 0: the interior of the bathtub or shower basin.

Zone 1: the area around the bathtub or shower basin up to a height of 2.25m above the floor and at a radius of 1.2m from the water outlet.

Zone 2: is limited by the vertical planes external to zone 1 and parallel vertical plane (s) 0.60m external to zone 1.

Zone 3: is limited to the vertical plane(s) external to zone 2 and the parallel vertical plane(s) 2.40m external to zone 2.

Products for bathrooms

First and foremost, Electrical equipment used in bathrooms must not be adversely influenced by environmental factors. These can include condensation, humidity, steam, drops of water or sprays from showers. There are a number of different indicators relating to electrical products that identify the products safety and suitability for bathroom use.

IP zoning * Zone 0 - Inside the bath or shower. Any fittings used here must be SELV (Separated Extra Low Voltage - max. 12Volts) and have a minimum rating of IPX7 (IP67) (protected against immersion in water - total immersion proof);

* Zone 1 - Above the bath or shower to a height of 2.25m. A minimum rating of IPX4 (IP44) is required. In this zone, if there is likelihood of water jets being used for cleaning purposes, a minimum of IPX5 is required. Also, subject to IP rating, SELV or 240V luminaires may be used in this zone; if the fitting is 240 volts, a 30mA residual current device (RCD) must also be used to protect the circuit in this zone.

* Zone 2 - The area stretching to 0.6m outside the bath or shower and above the bath or shower if over 2.25m. An IP rating of at least IPX4 (IP44) is required. In this zone, if there is likelihood of water jets being used for cleaning purposes, a minimum of IPX5 is required. Also, subject to IP rating, SELV or 240V luminaires may be used in this zone. In addition, it is a good practice to also consider the area around a wash basin (within a 60cm radius of any tap) as Zone 2.

* Outside the zones - anywhere outside zones 0, 1, and 2. Where water jets are not to be used for cleaning purposes, the general rules of BS7671 apply. Here, there is no requirement for any lighting solutions to be protected against particles or solid objects, e.g. IPX4 - no IP rating required.

IP ratings explained (IP = Ingress Protection)

1. The first digit - protection against ingress of foreign bodies, like: tools, dust, fingers, etc.
2. The second digit - protection against ingress of liquids. Ex. IP44 offers protection against solid objects greater than 1 mm and water sprayed from all directions.

The first digit - protection from foreign bodies

- * 0 - no protection from foreign bodies;
- * 1 - protected against solid objects greater than 50mm(e.g. accidental touch by hands);
- * 2 - protected against solid objects up to 12mm(e.g. fingers);
- * 3 - protected against solid objects greater than 2.5mm(e.g. tools and wires);
- * 4 - protected against solid objects greater than 1mm(e.g. small tools and wires);
- * 5 - protected against dust, limited ingress(e.g. no harmful deposit);
- * 6 - totally protected against dust.

The second digit - protection from liquids

- * 0 - no protection from liquids;
- * 1 - protection against vertically falling drops of water(e.g. condensation);
- * 2 - protection against direct sprays of water up to 15 degrees from vertical;
- * 3 - protection against direct sprays of water up to 60 degrees from vertical;
- * 4 - protection against water sprayed from all directions - limited ingress permitted;
- * 5 - protected against low pressure jets of water from all directions - limited ingress permitted; * 6 - protected against high pressure jets of water (use on ship deck) - limited ingress permitted; * 7 - protected against the effects of immersion between 15cm and 1m;
- * 8 - protected against long periods of immersion under pressure.

Although there are numerous combinations of IP ratings, the most common ones are: IP67, IP65, IP44, IP20.

For specially IP rated luminaires you will find each product clearly marked with its IP rating PLUS the highest zone in which it can be installed.

Because Safety certification for domestic electrical equipment is based on the successful completion of a full set of tests against the appropriate electrical standards and has the requirement for factory inspection and ongoing product surveillance, contractors can feel particularly confident in the continued safety of certified goods.

Particularly, as these items have had to undergo specific test programmes related to their performance in damp and wet environments.

The products

As well as looking for independent product safety certification marks, common sense and the wiring regulations further govern the choice of products.

i) Lighting

Many manufacturers do not get lighting products certified by a third party, but electrical contractors are required to look for an appropriate IP rated product (recommended IPX4 or above).

If the luminaire has a cord pull switch and is compliant to BS 3676, these are not normally IP rated but can be installed in Zone 3. Some types of lights can be installed in Zone 0 (specifically for use in shower enclosures) but they must be 12V SELV.

If a bathroom is big enough to have an area outside of zone 3 then portable appliances are permitted in the bathroom but they must be plugged in outside the bathroom and their flex must not enable them to be used in zone 3. Similarly, if a user is likely to plug their appliance into a socket outside the bathroom in the hall or landing, the installer should try and position that socket far enough away from the bathroom that the likely length of flex on the appliance will not enable it to be used inside zone 3.

Simply reducing the length of a flex on a product could contribute to reducing the risk of a product being used in a bathroom - further ensuring the safety of end users.