

## Ingress Protection Provided by Enclosures

This standard describes a system for classifying the degrees of protection provided by the enclosures of electrical equipment. Developed by the European Committee for Electrotechnical Standardization (CENELEC), these standards are designed to numerically rate an electrical product on the level of protection its enclosure provides. By assigning different number codes, the product's degree of protection can be identified quickly and easily. In the code IP 54, for example, IP identifies this standard, the 5 describes the level of protection from solid objects, and 4 describes the level of protection from liquids.

First Characteristic Numeral	DEGREE OF PROTECTION (First Number in Code)	
	Brief Description	Definition
0	Not protected	-
1	Protected against solid foreign objects of 50mm diameter and greater.	The object probe, sphere of 50mm diameter, shall not fully penetrate. 1
2	Protected against solid foreign objects of 12.5mm diameter and greater.	The object probe, sphere of 12.5mm diameter, shall not fully penetrate. 1
3	Protected against solid foreign objects of 2.5mm diameter and greater	The object probe, sphere of 2.5mm diameter, shall not penetrate at all. 1
4	Protected against solid foreign objects of 1mm diameter and greater.	The object probe, sphere of 1mm diameter, shall not penetrate at all. 1
5	Dust-protected	Ingress of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the apparatus or to impair safety
6	Dust-tight	No ingress of dust.

The full diameter of the object shall not pass through an opening of the enclosure

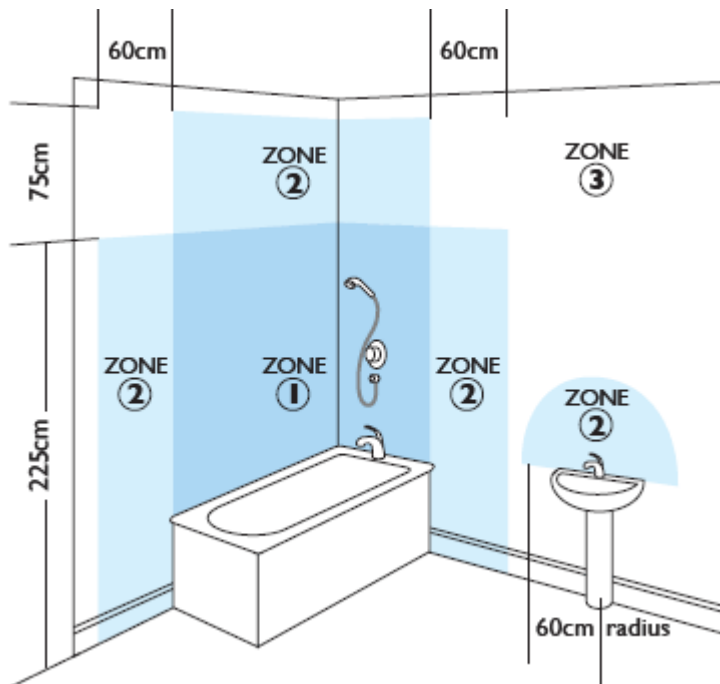
Second Characteristic Numeral	DEGREE OF PROTECTION (Second Number in Code)	
	Brief Description	Definition
0	Not protected	-
1	Protected against vertically falling water drops.	Vertically falling drops shall have no harmful effects.
2	Protected against vertically falling water drops when enclosure is tilted up to 15°.	Vertically falling drops have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical.
3	Protected against spraying water.	Water sprayed at an angle up to 60° degrees on either side of the vertical shall have no harmful effects.
4	Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effects.
5	Protected against water jets.	Water projected in jets against the enclosure from any direction shall have no harmful effects.
6	Protected against powerful water jets.	Water projected in powerful jets against the enclosure from any direction shall have no harmful effects.
7	Protected against the effects of temporary immersion in water.	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed 1 meter in water under standardized conditions of pressure and time.
8	Protected against the effects of continuous immersion in water.	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and the user, but are more severe than for number 7.

## Bathroom Zone Ratings

The following information is a guide to help you understand what fittings can be placed where in a bathroom. This is not an installation guide and reference should be made to the IEE Wiring Regulations (17th Edition) or a qualified electrician.

Firstly it is important to understand the rating by which bathroom lights are classified. IP rating stands for "Ingress Protection" and is always followed by two characters. These two numbers refer to the level of protection and it is important that you choose fittings with the correct rating according to where they are to be sited within the bathroom.

The diagram shows a bathroom split into four clear zones: 0, 1, 2 and 3.



**Zone 0** is inside the bath or shower itself. Any fitting used in this zone must be low voltage, (max 12v) and be rated at least IP67 which is total immersion proof.

**Zone 1** is the area above the bath to a height of 2.25m from the floor. In this zone a minimum rating of IP44 is required. If the fitting is 240v a 30ma residual current device (RCD) must also be used to protect the circuit in this zone.

**Zone 2** is an area stretching 0.6m outside the perimeter of the bath and to a height of 2.25 from the floor. In this zone IP rating of at least IP44 is required.

In addition it is good practice to consider the area around a wash basin, within a 60cm radius of any tap to be considered as zone 2.

**Zone 3** is anywhere outside zones 0,1 and 2 (subject to specific limits) and where no water jet is likely to be used. No IP rating is required.

In addition to the above, if there is a likelihood of water jets being used for cleaning purpose in zones 1,2 and 3 a fitting rated a minimum IP65 must be used.

Full details can be found in the latest copy of the IEE wiring regulations.