# Earthing, Bonding & Supplementary Bonding Explained

## Q: Firstly, why do I need my earthing and bonding checking?

A: If you are having additional or alteration works to your electrical system, however small, your electrician must check your existing earthing and bonding arrangements prior to starting work. These are checked to verify that the conductors are correctly sized, installed and correctly terminated. This is because the safety of any of your new works will depend on your earthing and bonding arrangements. As does the safety of your existing electrical system. If you're having trouble working out what the earth cable looks like it's the green and yellow sheathed cable often connected to water pipes around the home and found externally showing near your consumer unit or fuse box.

## Q: OK then so what is earthing and what does it do?

A: If there is a fault in your electrical installation you could get an electric shock if you touch a live metal part. This is because the electricity may use your body as a path from the live part to the earth part.

Earthing is used to protect you from an electric shock. It does this by providing a path (a protective conductor) for a fault current to flow to earth. In a correctly earthed installation, any appliance or equipment developing a fault to the metal casing should cause the protective device either a fuse, circuit breaker (mcb) to operate and switch off the electric current to the circuit that has the fault.

SAFETY FIRST: Before you attempt any work on your electrical system you must isolate properly the circuit you are working on. If you are in any doubt whatsoever then please call a qualified electrician who can advise you accordingly.

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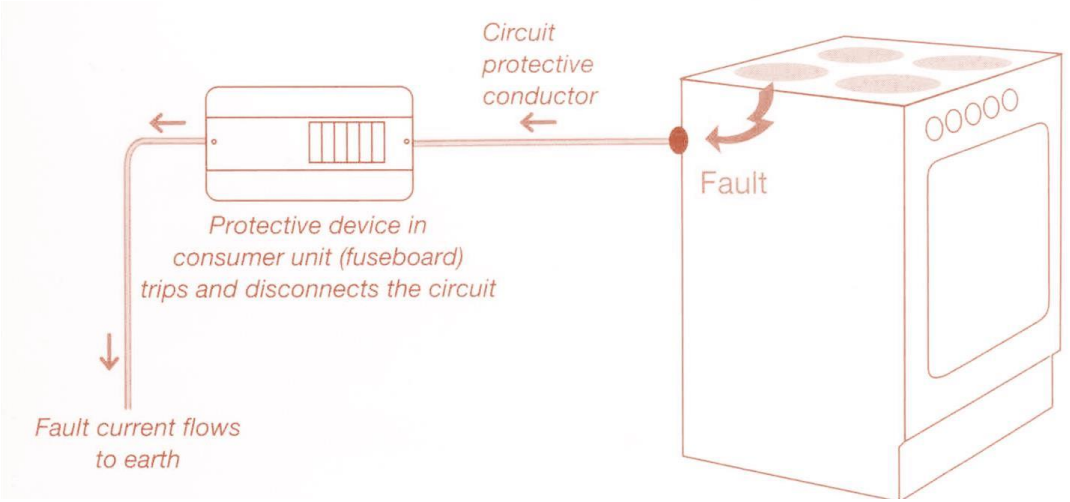
Here's an example on the right. If a cooker develops an electrical fault, the fault current i.e.: a live current flows through the protective (earthing) conductors. The protective device either a fuse, circuit breaker (mcb) will operate in the consumer unit or fuse box and will switch off the electrical supply to the offending cooker. The cooker is now isolated via the blown fuse or tripped circuit breaker (mcb) and is safe from causing an electric shock to anyone who touches it.

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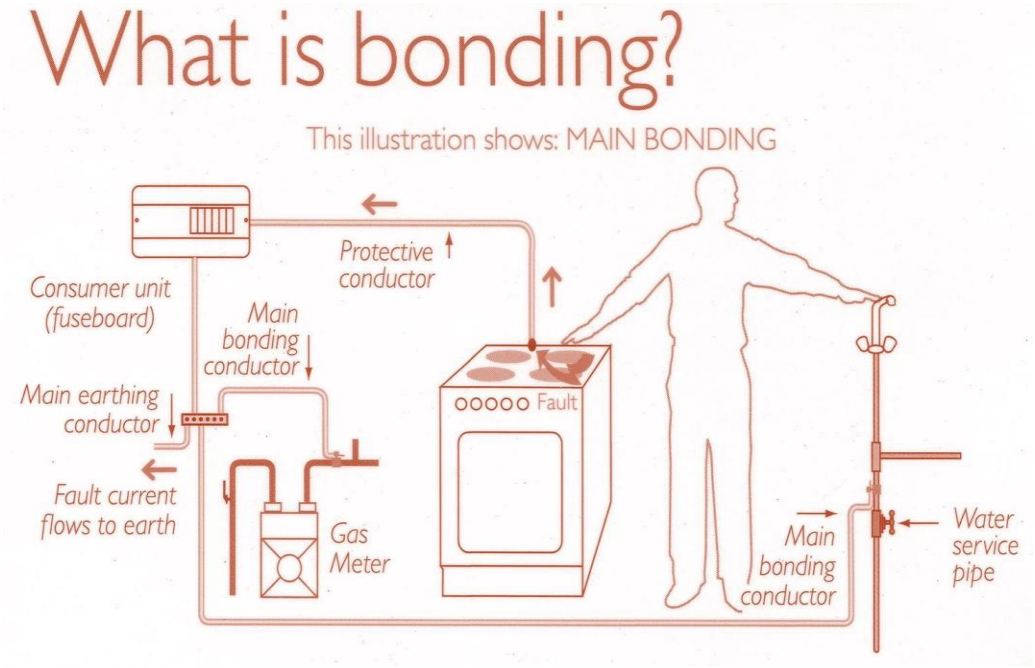
Q: Right got that, so what does the term ‘Bonding’ mean?

A: Bonding is the connection of the incoming metal gas and water pipes to the main installation earthing terminal and is vital for your protection from electric shock. Bonding and earthing are often confused as the same thing. Sometimes the term ‘earth bonding’ is used and this complicates things further as the earthing and bonding are two separate connections. Bonding is a connection of metallic parts with a ‘protective’ bonding conductor.

Here’s an example shown below. If a cooker has a fault, the fault current flows to earth through the protective (earthing) conductors. A protective device (fuse or circuit-breaker) in the consumer unit switches off the electrical supply to the cooker. The cooker is now safe from causing an electric shock to anyone who touches it.




“Remember in fault conditions you or a family member could become the earth patch if the earthing and bonding is non- existent or incorrectly fitted”.

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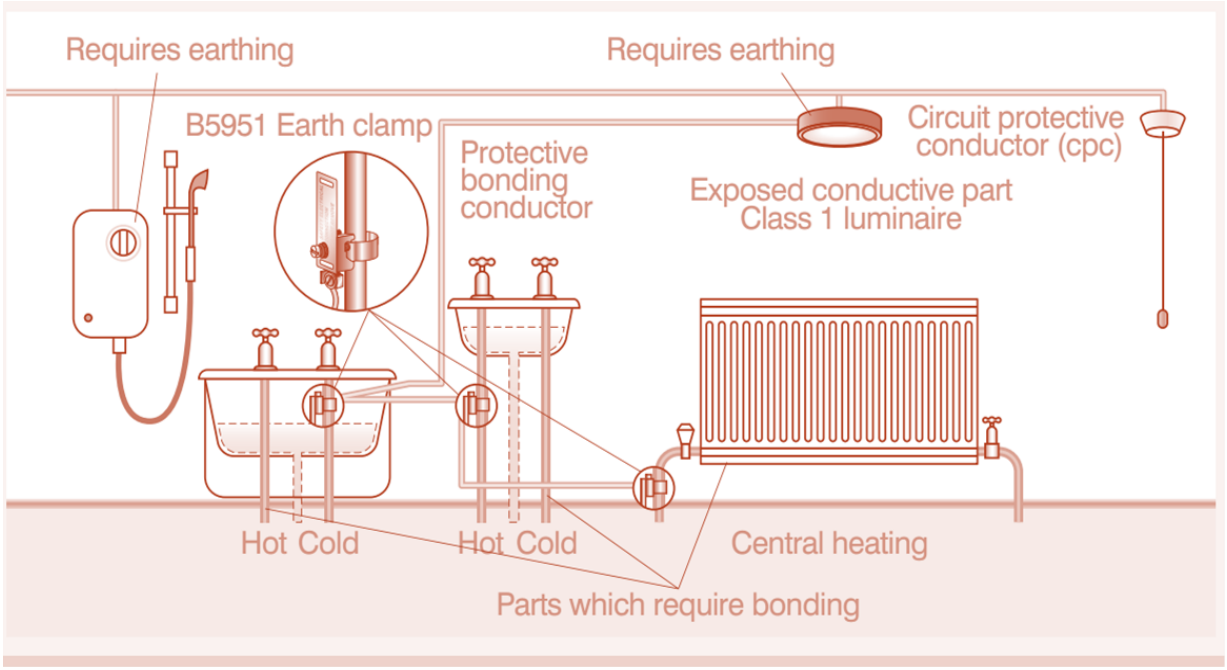
Q: OK, so finally what is supplementary bonding?

A: Supplementary bonding is often found in bathrooms or any other room containing a bath or a shower. This is to reduce the risk of electric shock where you may touch two separate metal parts, such as radiators and water pipes. In these locations supplementary protective conductors connect together your electrical circuit conductors from your electrical equipment e.g. your electric shower, lighting etc. to hot and cold metal water pipes and any metal radiators or towel rails.

The illustration below shows a typical bathroom earthing arrangement which was common on up to June 2008. With the introduction of new wiring IEE wiring regulations BS7671 (2018) the need for supplementary bonding has been reduced, as all new electrical installations in rooms containing a bath or shower need to have their circuits protected by a Residual Current Device (RCD).




"Supplementary bonding is often found in bathrooms or any room containing a bath or shower"

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