

Client Help Sheet 1 of 4

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Earthing, Bonding & Supplementary Bonding Explained

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

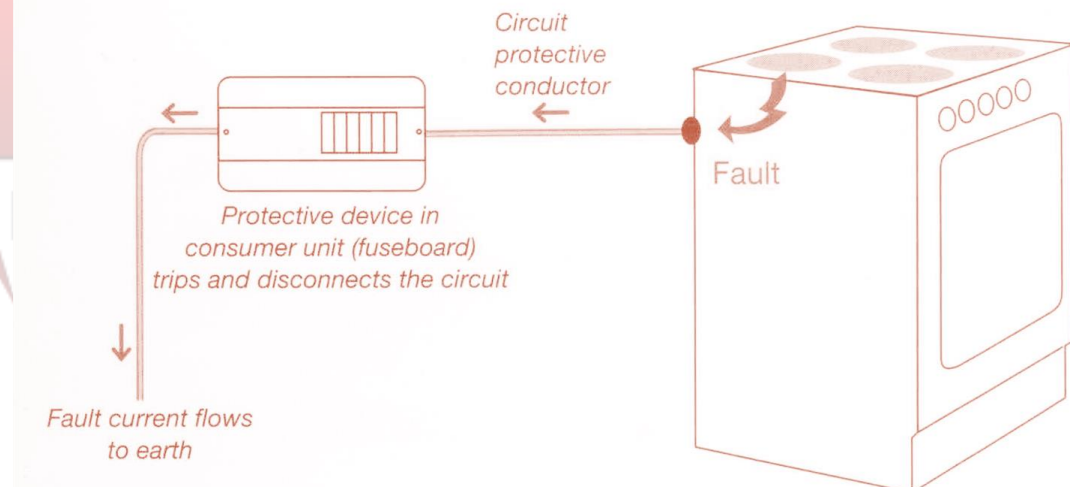
A: If you are having additional or alteration works to your electrical system, however small, your electrician must check your existing earthing and bonding arrangements prior to starting work. These are checked to verify that the conductors are correctly sized, installed and correctly terminated. This 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 your 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.

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.



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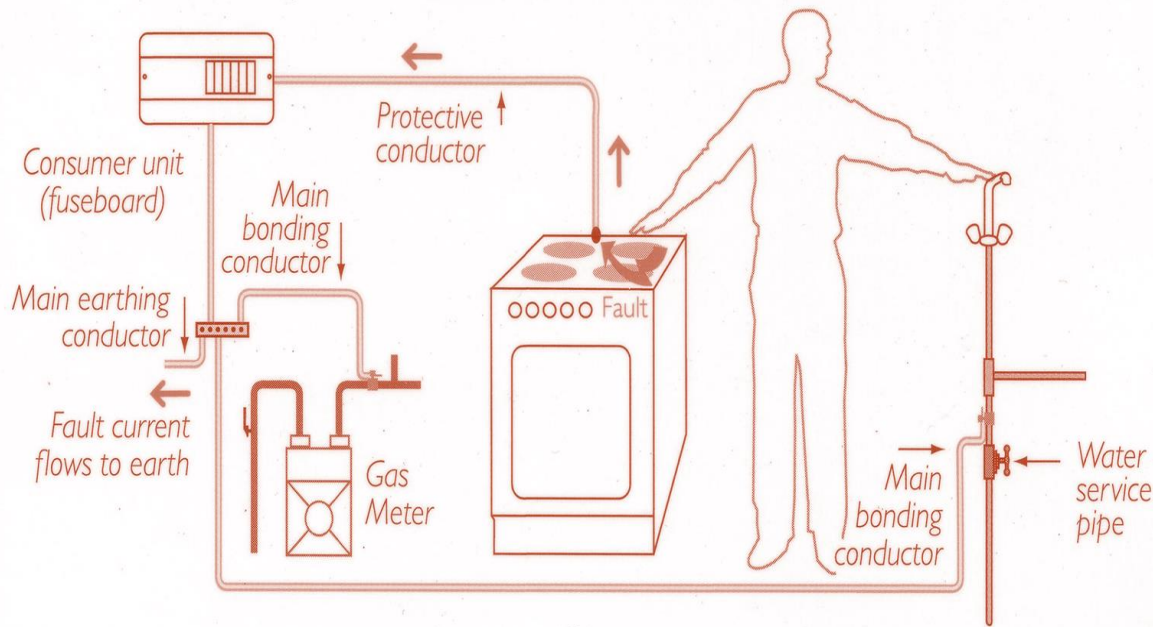
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Q: Right got that, so what does the term 'Bonding' mean?

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 'earthbonding' 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 on the left. A protective bonding conductor is a physical connection between a cooker, a water pipe and tap.

What is bonding?

This illustration shows: MAIN BONDING



the physical connection i.e.: 'bonding' a faulty oven could become 'live'. You could make contact with the 'live' oven and the touch or make contact with the tap. You then become 'earth' which means you would receive a potentially fatal electric shock.

“Remember in fault conditions you or a family member become the earth path if the earthing and bonding is nonexistent or incorrectly fitted”

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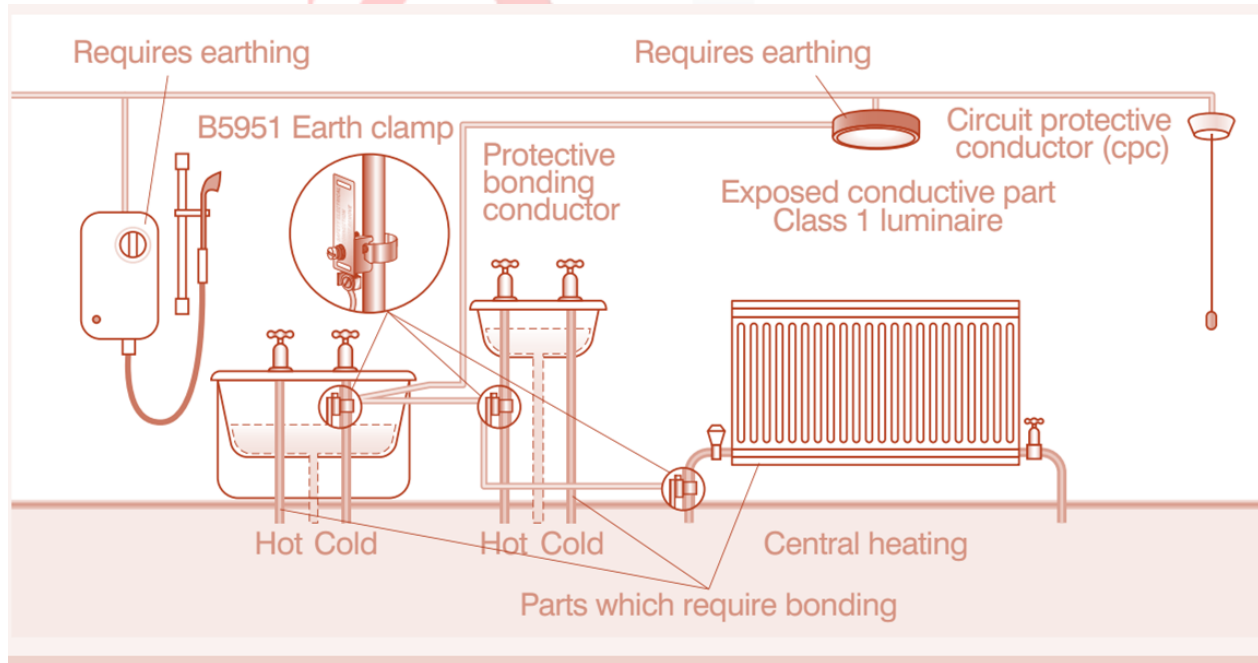
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Q: OK, so finally what is supplementary bonding?

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 (2008) 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 other room containing a bath or a shower”
“This is to reduce the risk of electric shock”

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Q: One last short question, is there ONE thing you would recommend to make my home and family safer electrically?

A: Absolutely! I would recommend having a 17th Edition Dual RCD consumer unit/fuse box fitted. I have one installed at my house and I have installed them at all my family's properties. They are simply that good at saving lives. Please contact us using the details below for further information.

So in summary.....

Bonding – *A way of reducing risk of getting an electric shock*

Conductors – *Wires that can carry electricity around your home*

Consumer Unit – *A fuse box that is used to feed electricity around your home.*

It usually contains a main switch, fuses or circuit breakers MCB's and one or more residual current device

Current – Flowing electricity

Earth – A connection to the ground

Earthing – A way of preventing electric shocks

Electrical Installation – Your fixed wiring system

Live – Active

Main Bonding – Green and yellow conductors that connect metal pipes (gas, water or oil) from the inside of the building to the main earthing terminal of the electrical installation

Main Earthing Terminal – Where earthing and bonding conductors are connected together

Residual Current Device (RCD) – A sensitive switching device that trips a circuit when it finds an earth fault

Supplementary Bonding – Green and yellow conductors that connect accessible metal parts of electrical equipment (heated towel rail) to accessible metal parts of items of electrical equipment and or accessible metal parts that are not electrical (water pipes)

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“Absolutely! I would recommend having a 17th Edition Dual RCD consumer Unit/Fuse Box fitted”

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