How to Measure the Effect of Earthing on Body Voltage

by
Gaétan Chevalier, Ph.D.
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This paper is designed to help people use a voltmeter to measure the effect of Earthing (grounding) on body voltage as well as determine whether an Earthing product is working properly.

Earthing studies show that indoor grounding significantly decreases common alternating current (AC) voltage induced on the body and is a safe practice in the presence of electromagnetic fields (EMFs).

The voltage comes from the electric field of electromagnetic fields (EMFs) generated by the alternating current (AC) electricity of wiring and appliances. The electric field excites electrons present on the surface of your body, increasing the voltage on your body. When ungrounded, your body becomes an antenna for such increased voltage, and some people are sensitive to this effect. When grounded, such electric fields cannot penetrate your body. This is called a Faraday cage effect.

While grounding protects the body from some common EMFs, others still penetrate a grounded body, such as from Wi-Fi and cell phones, but this situation is never made worse because the body is grounded. On the contrary, the body's healing mechanisms work best when grounded.

Before using a meter, which may not be familiar to you, consider using a continuity tester from Earthing.com, which is a simple way to determine whether a product is in working order. You can find it here: https://www.earthing.com/collections/all-accessories/products/continuity-tester-kit
The tester cannot measure voltage on the body.

Note: The most important benefit of Earthing is not reducing body voltage. That's a secondary effect. Most important is the reduction of inflammation, regarded as the cause of most common illnesses. Being grounded, that is, connected to the Earth, quickly calms the nervous system, and allows the Earth's electrons to flow into the body where they quench the free radicals that cause inflammation. This is what reduces pain.

If you have pain, your own subjective experience can quickly tell you the effectiveness of grounding. Place an Earthing patch on your palm or sole of the foot, whichever is nearest the source of pain. Snap one end of an Earthing cord to the patch, and the other end to a grounded outlet or ground rod. Score the pain on a 0 to 10 scale (10 being the worst). Wait about 10-15 minutes, then rescore your pain level. There is typically less pain.

This experiment can be done with acute or chronic pain, and is the single best test to show that grounding is having an effect on the physiology.

Measuring body voltage

Requirements: 1 multimeter with two terminal leads,
1 Alligator cord
1 Extra Earthing cord (you'll need to purchase it separately)
1 Outlet checker

Step 1: First, check if you have a good grounded (earthed) outlet. Use a simple circuit/outlet checker, as shown in Figure 1 below.

The example is a Type B grounded outlet, used in North and Central America, parts of South America, the Caribbean, Japan, Pacific Islands, and elsewhere. The Earthing grounding cord that comes with your Earthing.com product fits into the ground port (hole) that is connected to the grounding system of your house. It does not run on electricity.

Different countries around the world use differently designed grounded outlets, and you may need to use an adaptor that plugs into the outlet, and then you plug the Earthing cord into the adaptor. You can see what the grounded outlet in your country looks like by doing an outline search for world plugs. Click here for a website that shows you international outlets.

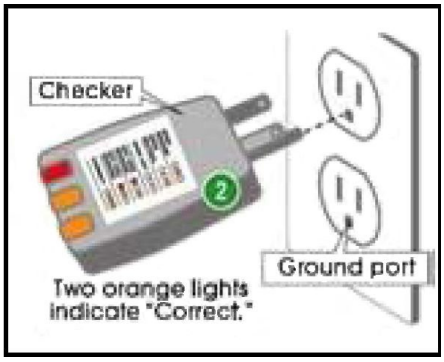

Figure 1: Circuit/outlet checker for Type B outlet

An outlet checker is supplied with Earthing.com products. The checker determines if the outlet is properly wired for ground. Outlets may not always be easily accessible. Or you may want to plug in

some appliances. In either case, you can optionally plug a regular grounded extension cord into a grounded outlet, and plug your Earthing product into the extension cord.

Older buildings and houses, built before the 1960s, may not be grounded. An obvious sign would be an outlet with two slits for electricity, as shown in Figure 2. It is possible also that the outlet could be miswired. In such situations, you will need to connect your Earthing.com product with a cord from a ground rod or consult with an electrician.

Figure 2: Ungrounded outlet

Step 2: Use a commercially available and inexpensive voltmeter or multimeter (Figure 3). We prefer a multimeter because of its versatility. It measures voltage as well as other parameters such as current and resistance.

Figure 3: Multimeter

For your purpose, you want the meter to tell you how much voltage is on your body as a result of electric fields in your environment and how much the voltage is reduced when you are grounded. Technically, voltage is a measure of energy per unit of electric charge.

The positive and negative terminal leads for measuring come with the meter. The positive terminal is usually the red wire. The black wire is the negative terminal. One end of the red wire connects to the "volts" port of the multimeter, as shown in Figure 3. One end of the negative terminal connects to the "com" port of, and then to the house ground.

The other end of the black (negative) lead looks like this:

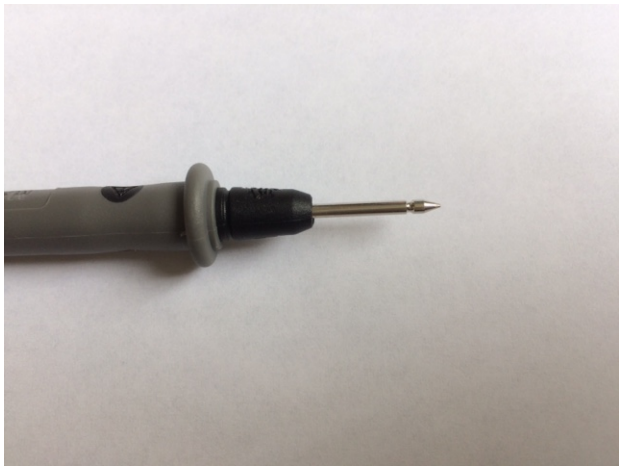

Figure 4: Tip of the black lead

As you can see, the needle-like tip of the black lead will not fit directly into the ground hole of a power outlet. In order to connect it securely to the ground hole we suggest using a combination of an Earthing grounding cord and another cord with alligator clips on both sides (Figure 5). Any home improvement or electrical supply store will have them, or you can order them online.

Figure 5: Cord with alligator clips on both ends

Now, plug the prong end of the Earthing grounding cord into the ground hole of the outlet, or a power strip as show below in Figure 6. Then clip on one end of the alligator cord to the snap end of

the Earthing grounding cord. Then clip the other end of the alligator cord to the tip of the black lead. Once you have done that you are ready for a measurement.

Figure 6: Setup with black meter lead, using an alligator clip cord, and Earthing grounding cord

On your meter you will see a display. Turn on the meter and set the dial to AC (alternating current) volts. Figure 7 below shows the display in AC mode. DO NOT SET THE DIAL TO DC (DIRECT CURRENT), as in Figure 8.

Figure 7. Set the dial to AC!!!

Figure 8. DO NOT SET THE DIAL TO DC!!!

Step 3: Figure 9 below shows an Earthing.com outlet adaptor. This adaptor allows you to plug in two Earthing products, or, for the purpose of measuring voltage, one Earthing product cord and the lead (connected to the alligator cord + Earthing cord) from the voltmeter. The cord from the meter is thus inserted into one hole of the adaptor, in the same way that it was shown inserted into the grounding hole of the power strip in Figure 6. The prong end of another Earthing cord is inserted directly into the other hole.

Figure 9. Earthing.com outlet adapter

Figure 10 shows how to also use a power strip, but without the adaptor, for the same purpose. Both the product and the meter cord (with an alligator cord) are plugged into the same ground source – the grounded power strip.

Either method requires using an alligator cord and an extra Earthing grounding cord. As seen below, the meter's black grounding cord connects to alligator cord, which then connects to the Earthing cord, which is how the meter is grounded. This setup is also demonstrated in Figure 6 as a close-up.

Important: <u>The meter must be grounded in order to conduct this measurement; and both the meter and the Earthing product must be connected to the same ground source.</u>

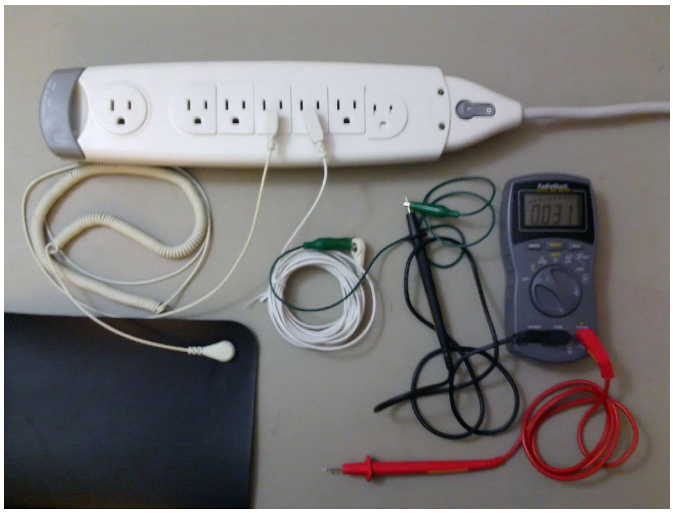

Figure 10. Using a power strip

Step 4: In Figure 11 below the person's right hand holds the meter's red wire between thumb and forefinger. The left hand is positioned on the mat. The white grounding wire of the Earthing product is seen to the left of the hand. One end is connected to the house ground through the Earthing.com adaptor or the power strip as in Figure 6, but the snap end has not yet been connected to the grounding mat. The mat is ungrounded and the person touching the mat is therefore not grounded. The meter is showing a voltage of 8.35 volts induced on an ungrounded body in this particular room environment.

Figure 11

In Figure 12 below, you see the snap end of the white grounding cord from the Earthing product now connected to the grounding mat. The mat is grounded, and with the left hand in contact with the mat, the person's body has been grounded. The body voltage has instantly dropped to 0.09 volts (90 mV) in this situation. This is a 93-fold decrease from the previous ungrounded situation.

Note: Currently (as of June 2020), Earthing.com uses white or red grounding cords. In the near future, they will be all black. All work similarly.

Figure 12

Any level decrease by a factor of 20 or more is considered well grounded. Let's say the voltage you measure, while holding the meter cord lead in your bedroom, is 5 volts. Then you touch a connected grounding mat, as in the picture. Your measurement should instantly drop down significantly. If it drops down 20-fold, the reading would be 250 mV. If it drops down 50-fold, the reading would be 100 mV. All good. All indicators that you are well grounded.

Don't expect it to drop to zero. A zero reading is attainable in a forest, in the ocean, where there is no AC electrical wiring and power lines. Outside of those locations there will usually be some background electrical "noise."

Discussion

The voltage in the example presented here of 8.35 volts indicated a relatively high level of EMFs in the room. Close by was a lamp with two compact fluorescent light bulbs that emitted a good deal of EMFs. A level like this is present in bedrooms filled with many appliances, such as lamps, clocks, and radios.

Additionally, if you take a measurement while sitting on a bed close to a wall, there will be a contribution from the electric wires in the wall, creating more EMFs in the sleeping area. Thus, you can get a wide variety of readings, ungrounded and grounded, depending on the spot where you are measuring. Both ungrounded and grounded readings on the meter will be lower the further you are from electrical sources, such as wiring in the wall or appliances. For instance, a few feet away from a lamp or wiring will be lower than six inches away. That's because the electric field diminishes with distance. In either case, you will be able to see the abrupt drop from an ungrounded to a grounded state.

Here's another example:

Measurements were taken of body voltage on a woman sitting on a bed with her back against the headboard next to a wall. See what happened as appliances in the room were initially on, then turned off, and then disconnected, one by one. The exception were the alarm clock and the radio which were turned on and then disconnected. The other appliances were: 2 small bed lamps, and 2 tall floor lamps.

- ***Ungrounded: 3.639 volts body voltage measured with all appliances turned on***
- ***Ungrounded: 3.329 volts with radio disconnected***
- ***Ungrounded: 3.267 volts with 2 small bed lamps turned off***
- ***Ungrounded: 2.733 volts with 2 small bed lamps disconnected***
- ***Ungrounded: 2.588 volts with 2 standing lamps turned off***
- ***Ungrounded: 2.462 volts with 2 standing lamps disconnected***
- ***Ungrounded: 1.434 volts with the alarm clock disconnected***
- ***Grounded: 0.041 (41 mV) volts grounded using a grounding mat with all appliances disconnected***

Note that even after all appliances were disconnected the ungrounded body voltage was still 1.434 volts. This level was produced by the wires in the wall against which the bed was placed. Grounding the person decreased the body voltage − with all appliances disconnected − from 1.434 volts to 41 millivolts, a factor of 35, and by a factor of 89 when all appliances were on (from 3.639 volts). Note also that disconnecting an appliance is more effective at reducing body voltage than turning it off.