Kitchen and Laundry Appliances and EMFs

Many clients ask if there are potentially unhealthy EMFs in their kitchens and laundry rooms, especially if they are building a new home and need to purchase new appliances.

Kitchen Appliances

Starting with the gas stove or electric range, I have been telling clients that if EMFs are their primary concern *and* they are not overly chemically sensitive, they should choose a gas stove rather than an electric range. Still, gas stoves can have a clock in the front where your abdomen would be located when you stand to cook, even if there is no clock or any evidence of electronic controls.

Any time you see a digital LCD or LED clock on either an electric range or a gas stove, there is likely to be a transformer behind it. This transformer produces a strong, but compact magnetic field, sometimes exceeding 10 milliGauss (mG). Being a point source of magnetic field exposure, that field strength drops off exponentially, meaning 90% of the decline occurs in the first one foot or so. Beyond that, the remaining 10% tapers off over the next one to two feet.

Generally I find that the safe distance from such a transformer is wherever a Gauss meter goes below 1.0 mG, which is usually about 3 feet. For an electrically sensitive person, that level should be below 0.5 mG or even less, depending upon the ambient magnetic field level in the room. Every electrically sensitive person should own a Gauss meter. A good, inexpensive three-axis Gauss meter is part of the new digital Tri-Field TF2 combination meter, available from LessEMF here. Other choices of Gauss meter are available here.

If you have a single axis Gauss meter, you must position the Gauss meter in three orientations (X, Y and Z axes) wherever you are measuring to make sure you catch the orientation with the highest reading. Then, hold the meter in that orientation and move it away from the point of highest magnetic field reading until you find the safe distance. Then, stand outside that circle, where the reading

is less than 1 mG (or less).

As mentioned above, I have seen gas stoves with no digital clock and no electronic controls that still had a magnetic field at the front panel where the mechanical gas knobs were located. You must measure all stoves, electric or gas, with a Gauss meter, slowly sweeping the meter across the front of the stove where your abdomen would be, from left to right to see if a hidden transformer exists. If so, then determine the safe distance and always stand back of that circle.

Ideally, choose a model of stove or range with the clock and electronic controls at the back or side, not the front. Such a stove or range should have no magnetic field at the front. However, if your stove or range does have it's clock and electronic controls at the front, that is not always an indication that a transformer is behind it. I have measured no increase in magnetic field level in front of some digital clocks, meaning, that stove's transformer is located somewhere down inside. You always have to measure to be sure.

You can see a video of me showing how to properly measure magnetic fields (in that case using a single axis Cornet ED88T Plus combination meter) by clicking here. On that website, scroll down and click on the video below the Cornet meter.

Turning to another source of magnetic field EMFs from an electric range, there will be a point source of magnetic field exposure from a front burner when it is on. These turn on for roughly 10 seconds, and off for roughly 10 seconds to hold the temperature you have dialed in with the control. The field occurs when it is on and extends out from the burner roughly 2 to 3 feet. Once again, you have to measure with a Gauss meter to find the safe distance (below 1.0 mG) when either front burner is on. Some electrically sensitive clients are forced to only use back burners on their electric range to avoid the magnetic field, which usually dissipates before it reaches the front of the stove. Or, they stand to one side when using a front burner.

Regarding ovens with an electric heating element, when they are turned on, there will be a large magnetic field coming out from the front at calf level. Measure this with your Gauss meter to determine the safe distance if you are cooking on a stove-top burner or gas flame while cooking something in an electric oven.

Induction cooktops are a different story altogether. They are designed to heat up a metallic pan or skillet by alternating the orientation of electrons in the metal by

reversing a magnetic field at high speed. The magnetic field that is created is, of course, not confined to the one or so inch around the burner that the metal cookware is sitting upon. I have measured magnetic fields at levels we consider to be unhealthy (more than 5-10 mG) several feet away from an induction cooktop when on. One model filled half the kitchen with unhealthy levels of magnetic field exposure (above 1-2 mG). I suggest to my clients that they forego induction cooktops in favor of a gas stove, or an electronic range using the precautions mentioned above.

Microwave ovens are a source of magnetic fields in two ways. First, the digital clock and electronic control circuitry needs a transformer, which is often located right behind the clock. This creates a magnetic field that can extend 2-3 feet out from the front of the microwave oven, often at head level, 24/7. Many clients who don't use their microwave oven will unplug it if they have access to the plug, or flip off the breaker for it's outlet (which is usually dedicated, with no other outlet on that breaker at the panel).

When running, a microwave will produce exceedingly high magnetic fields that can extend 10 feet or more in all directions. Besides devitalizing essential life energy of the food you are cooking inside it, according to some reports, microwaves produce a large magnetic field in your kitchen when running.

Furthermore, they produce high levels of radio frequency (RF) EMFs at 2.4 GHz, the frequency of WiFi. This is the frequency that heats up water in vegetables, which is how it cooks. The seal around the door of the microwave oven does not always hold up, and RF often leaks into the kitchen when the microwave is running (the sides, top and bottom and the glass in it's small window are supposed to be shielded). I customarily measure very high and unhealthy radio frequency EMF levels in a kitchen when the microwave is turned on, often in the thousands of microWatts/meter squared, even six or more feet away. We recommend that clients stand across the kitchen when using it (or forego the microwave and instead heat their and beverages in a pan on a stove top burner or countertop convection oven).

Regarding dishwashers, you should also measure the front of your dishwasher for the presence of magnetic fields because manufacturers are now putting a transformer at the top of the lid where electronic controls are located. Watch out for this and if present, determine the safe distance to stay away from the

dishwasher if you stand in front of it to do food prep on the countertop above. Most dishwashers do not have a transformer in the lid, but they are becoming more common. Of course, when any dishwasher is running, it will have a high magnetic field from the motor, and heater coil during the drying phase. Don't stand or sit near any dishwasher when it is running.

When you purchase a new dishwasher, you can't measure magnetic fields in the showroom, as most models are stored in a warehouse, wrapped in plastic. You often don't learn whether your dishwasher has a transformer in it's lid or not until it is installed. For this reason, we often suggest that new homeowners have an electrician install a shut off switch under the kitchen sink or on the back splash on the counter above the dishwasher. This switch would control the outlet that the dishwasher is plugged into. Keep it off except when running the dishwasher and you won't have this field when you stand close to it's front to do food prep.

To finish our review of the kitchen, the biggest source of magnetic field EMFs in any kitchen is the compressor motor of the refrigerator. That field often extends a good 3-4 feet, and sometimes farther, but only when it is running. When it is not running, there is no significant magnetic field. This field usually does not reach the front of the refrigerator where you would stand to get food in and out, but occasionally the field can extend beyond the front when running. You just have to measure. The field will, of course, also extend to the sides and back, so don't stand and do food prep right next to a refrigerator.

We tell our clients to see what is on the other side of a refrigerator or freezer. There should be no beds, couches, chairs or desks behind a refrigerator or freezer. Otherwise, you or your family could be sitting or sleeping in a large magnetic field every 20 minutes or so as the compressor motor comes on and off. Measure with your Gauss meter to determine the safe distance.

Laundry Appliances

Turning to the laundry, both your washing machine and dryer will produce a magnetic field when the motor is running. However, when you are not washing or drying a load of laundry, there will be no significant magnetic field. That occurs only when the appliances are in use. The magnetic field will extend through the wall when either the washer or dryer are running, so make sure a bed, desk,

couch or chair is not located on the other side of the wall from these appliances.

Also, make sure your electric washer or dryer have a four-wire AC power cord and that the outlet is also wired with a four-wire cable (hot, hot, neutral and separate ground). You can pull the plug out of the outlet to see if it has three or four prongs. If four-pronged, which is what we want, an electric dryer can still have a strip of metal bonding the neutral wire with the ground where the power cord attaches to the back of the dryer. An electrician can remove this. All new dryers come with four-wire cables, but the strap will be present. When the metal strap is connected, electric current will flow onto the ground wires of the house's electrical system and from there, potentially onto some metal water pipes, gas lines, air ducts, and conduits. This can cause magnetic fields.

Also, if you still only have a three-wire cable between the breaker panel and the laundry room electric outlet (hot, hot, combined neutral/ground wire), then you will need to discuss with an electrician the possibility of replacing the three-wire cable with a proper, code-compliant four wire cable containing a separate dedicated ground wire). This would likely involve opening up walls and can be costly, so before undertaking such a project, have a building biologist and electrician evaluate whether this is necessary.

"Smart" Appliances with WiFi and Bluetooth

Finally, many new appliances now contain a WiFi or Bluetooth transmitter and receiver to participate in the new "smart home" as part of the emerging IoT, or "Internet of Things". This WiFi or Bluetooth transmitter allows you to monitor your appliance with your smart phone, tablet or computer, and allows the electric utility to monitor appliance electrical use through their smart meter in homes where the Home Area Network, or HAN, has been set up. That has not yet happened in all utility service areas, including those for LA DWP and Southern California Edison, that I am aware of. However, appliance manufacturers are now making and selling appliances that are compatible with HANs as part of the coming samrt home network. Even if your smart meter does not yet have a Home Area Network set up, these new appliances can talk to your smart phone and tablet.

The strength of the RF signal from such transmitters in smart washers, dryers and refrigerators is generally low and intermittent and does not exceed the levels coming out of your cell phone, tablet, router, laptop, printer, cordless phone handset and base unit, cordless mouse and keyboard, thermostat, smart TV device, and the myriad other wireless devices many of the readers of this website already have in their homes now. Those devices, unbeknownst to most people, emit RF signals that are far stronger than the signals I have measured coming from smart kitchen and laundry appliances. That does not mean that any of them, smart appliances included, are safe. I am just pointing out that many of my clients and readers of this website tend to focus on one RF source, because that is what they read on other EMF-related websites, and are completely unaware of the signals they are exposing themselves from the dozen or so other devices that are silently emitting RF signals on a regular basis within inches of their body, round the clock. That is no one's fault. We, as building biologists, make a point of showing our clients the full picture of RF exposure when we do our home EMF evaluations. As you choose your kitchen and laundry appliances carefully to avoid RF exposure, take the same time and care in choosing hardwired alternatives for computers, phones, media (TVs), thermostats, speakers, baby monitors, and surveillance cameras. This is all covered in my articles Safer Use of Computers and Radio Frequency EMFs.

If you are electrically hypersensitive, or EHS, you know all this already and generally will not have such devices in your home in the first place. For you, you need to ask for appliances that are not "smart" and therefore do not have WiFi or Bluetooth. The sales person should know that, although, often they do not. They may have to contact the manufacture for you. If you want a particular model for other reasons and it has these RF transmitters, again, the power density, or strength, of the RF signal is relatively low compared to other devices that many of my EHS clients surprisingly still have in their homes (cell phone). I usually cannot measure the RF signal from the washer or dryer outside the laundry room with my Gigahertz Solutions HF59B RF meter, which is pretty sensitive. It all depends upon the degree of your particular RF sensitivity and also the fact that not all models of smart appliances emit RF signals at all times. Some models that I have measured only emit signals when running, and not when idle. That helps.