

A close-up photograph of kitchen appliance controls. On the left, three circular knobs are visible on a white panel. On the right, a silver panel features a circular power button with a green indicator light and the text "ON/OFF" above it. The background is slightly blurred, showing more of the appliance's surface.

Guidelines for Selecting Appliances



EcoNest® Architecture Inc.
Healthy Home Design & Consulting

Appliance Selection and Use

New Appliance Odors

New dishwashers, ovens and refrigerators all have components that can offgas and have a negative impact on indoor air quality. New appliances are not always well-tolerated by chemically sensitive people. You can reduce the impact of the offgassing by airing out the appliance in a protected location prior to installing it inside your home. The time required will depend on the sensitivities of the individual. We suggest the following measures:

- Have appliances delivered at least one month in advance of installation date. Appliances should be unpackaged upon arrival and alternately aired out and operated in a protected location, such as the garage, prior to installation in the house.
- Clean the appliance interiors and exteriors. Soap and water can be used to remove manufacturing oils. Minor residual odors may be helped by cleaning with baking soda.

Dishwashers

Typically, dishwasher tubs are either made of polypropylene or stainless steel. There are trade-offs to each option.

Stainless steel tubs would seem to be a safer choice, but due to the noise generated in a stainless-steel tub and inherent heat loss through the metal, manufacturers coat the exterior of the tub with bitumen as a sound barrier. Many consumers have reported unpleasant odors or fumes when using their stainless-steel dishwashers.

While we generally recommend seeking healthier options than plastic, polypropylene is one of the healthier plastic options as it does not contain plasticizers such as BPA, BPS, lead, or phthalates.

Another concern while choosing a dishwasher is the composition of the racks. Avoid PVC coated racks – opt for racks with a nylon coating instead. If the product is not specifically labeled as nylon coated it is likely PVC.

Brands that offer nylon coated rack options include Bosch, Café, Electrolux, Frigidaire, GE, KitchenAid, LG and Samsung.

Choose a dishwasher that will shut off automatically if a leak is detected!



One of the most important features of a dishwasher is built-in flood control. Oftentimes a dishwasher leak will go undetected, leading to extensive (and costly) damage as well as potential mold growth. Many manufacturers are starting to incorporate leak detectors that will trigger the appliance to stop the washing cycle. The level of protection can vary from a simple built in pan under the dishwasher which becomes obvious when it's filled with water to systems that will automatically shut off the cycle when a leak is detected and pump the water out of the unit. We recommend choosing a model that has an auto shutoff feature. Manufacturers that offer this feature include Bosch, Café, Electrolux, GE, KitchenAid, LG, Samsung and Summit.

Microwave Ovens

Microwave ovens are designed to heat food by creating enough microwave radiation energy to vibrate molecules in the food until heat is produced. During operation they emit both elevated Radio Frequency (RF) radiation (2.4GHz range) and AC Magnetic fields.

The Radio Frequency microwave radiation produced during operation is supposed to be contained in the oven by internal shielding. If leaks do occur in the shielding, they can create dangerous injury in proximity to the microwave unit.¹ However, even if the seal is effective, the operating microwave oven will emit RF far beyond Building Biology recommended levels, which can extend throughout the home. The FDA's safety limit of exposure for this type of radiation is $5\text{mW}/\text{cm}^2$ or $50,000,000\ \mu\text{W}/\text{m}^2$. This is an astounding 50,000 times higher than Building Biology Safety Guidelines at the extreme level of radiation (which is any radiation measurements above $1000\ \mu\text{W}/\text{m}^2$).

Following are user guidelines for safer operation:

- The safest option with the lowest exposure to radiation and magnetic fields is to forgo the microwave oven all together. If essential, place it on an exterior wall and as far away from lounging areas as possible.
- Exposure to the magnetic field can be minimized by standing a safe distance away, as measured on a gaussmeter, while the oven is in operation.
- The shielding within a microwave oven is delicate. An exceedingly small amount of damage, or even a paper

towel stuck in the door, can cause a shielding failure. Have your appliance professionally checked for microwave leakage on an annual basis or you can check it yourself on a more frequent basis (see EMR Meters section below for gaussmeter; microwave leakage tester is available through [Grainger Test Instruments](#) or [Amazon](#)). Any detected leakage is unacceptable.

- Do not microwave food in plastic containers. Chemicals from the plastic can leach into the food. Some of these chemicals are known to disrupt the endocrine system.²
- Do not use a microwave that appears to be malfunctioning. Signs of this would include sparks flying, funny noises, fires, or the unit turning on or cycling when the door is open. If any of these occur, leave the area and shut off the circuit breaker to the microwave oven before unplugging the unit and removing it from the house.

Trash Compactors

When choosing a trash compactor, examine it carefully to be sure it is easily cleanable. Verify that accidental liquid spills inside the unit will be contained and not run under or behind the unit. Some trash compactors come with a deodorizer chamber. With the exceptions of baking soda and zeolite, most deodorizers contain chemicals of concern and should be avoided.

Refrigerators

There are many styles of refrigerators available in a variety of materials. Interior plastics, motors, and insulation may all be a source of offgassing. The odors decrease over time and after the refrigerator has reached cooler operating temperatures. The initial offgassing period may be shortened by thorough cleaning with enzymatic cleaning products or scrubbing with baking soda. We recommend purchasing the refrigerator as far in advance as possible if there is a covered, airy space where the unit can be stored. Ideally the unit can also be plugged in and allowed to operate. Consider buying floor model refrigerators that have had time to release chemical odors outside of their factory packaging and operate in appliance showrooms. Selecting a refrigerator with glass

Choose a refrigerator with coils and drain pans that are easy to access and clean!

and stainless-steel interiors eliminates many of the plastics components and provides less toxic, easily cleanable surfaces.

Because the refrigerator motor will cycle off and on of its own accord, we recommend selecting the quietest refrigerator available. Manufacturers publish their decibel ratings for each model. Some energy-efficient models have motors that do not need to operate as frequently while others gain their efficiency by running the motor at a low level all the time, which is not desirable from a noise perspective.

Currently, **Meile**, **Gaggenau** and **Liebherr** (RoHs certified) manufacture higher-end refrigerators that meet a variety of the above criteria with special consideration given to quiet operation.

Other manufacturers such as **Sunfrost**, **Sub Zero**, **Northland**, **Summit**, **Fisher Paykel**, Marvel by **AGA** and **Dacor** make models that are also worth investigating. The average noise level of a modern refrigerator is about 39 dB.

Many refrigerators are now manufactured with bright blue interior LED lights that can impact melatonin production, especially when opened at night. Incandescent or halogen interior lights are preferred but becoming increasingly difficult to find.

Refrigerators with built-in door water filters commonly use carbon filters. These filters remove compounds that affect taste and smell, but not necessarily chemical or microbial contaminants. Most do not provide adequate purification for municipal or private drinking water supplies. If the dispenser malfunctions the refrigerator must be moved to access the shut off valve in the back of the unit.

Refrigerator/Freezer Maintenance

Coils

The coils on a refrigerator require cleaning. Dirty condenser coils will cause the condenser to overheat and shut off. The coils are located on the back or the bottom of your refrigerator. Once accessed they can be either vacuumed or cleaned with pressurized air. According to the [Consumer Energy Center](#) cleaning coils can save up to 30% of the energy costs to operate a refrigerator which is the largest energy user of all appliances in the home. Many newer refrigerators have the coils underneath them which requires the addition of a fan

to move air over them. These are easier to access for cleaning, but the fan produces an additional noise consideration.

Drain Pan

Self-defrosting or “frost free” stand-alone freezers eliminate frost by raising the temperature inside the freezer several times per day, from about 0 degrees to 32 degrees. Essentially, the freezer cycles on/off periodically, melting the ice that would otherwise build up in the interior. During the defrosting process, water from melting ice is continually discharged through a small hose at the back of the freezer and emptied into a drip tray positioned at the base of the unit. Normally, the water in the refrigerator drain pan evaporates but it must be routinely monitored. The potential for standing water and the persistent supply of moisture may promote microbial growth within the drip pan. Air movement can easily disperse these contaminants into kitchen air and negatively impact indoor air quality. The drip pan is located somewhere, out-of-sight under the unit. Some units have drip pans located in the back or mounted internally, where they are inaccessible. When purchasing a unit, make sure the drip pan is easily accessible from the front and has adequate clearance underneath for easy cleaning or make the back of the unit easily accessible. [Castors or appliance rollers](#) can be added to a refrigerator to facilitate access to rear drip pans and cooling coils.

Cook Tops, Ovens, and Ranges

The act of cooking generates significant amounts of indoor air pollution through vapors and airborne particulate matter such as grease. In addition, food particles left on burners are incinerated and release combustion byproducts.

Gas-fueled appliances are a significant source of indoor air pollution as they can release carbon monoxide, carbon dioxide, nitrogen dioxide, nitrous oxides, and aldehydes into the air. For chemically sensitive individuals, any combustion appliance may be undesirable, and we recommend choosing electric over gas for a range/oven. Many cooks, however, prefer to cook with gas because it allows for better timing and temperature control. A dual fuel unit with electric oven and gas cooktop is a better solution than an all-gas unit. The following measures will help reduce the amount of pollution:

Self-cleaning ovens can emit toxic fumes during the cleaning cycle.

- Verify that flames are adjusted to burn correctly. They should burn blue. A yellow flame indicates incomplete combustion and the subsequent production of carbon monoxide.
- Choose an appliance with electronic ignition instead of a pilot light. Any model built in the US after 1991 that is designed for domestic use will be equipped with electronic ignition. Commercial models may not have electronic ignition.
- Follow the guidelines for proper ventilation discussed below.

Various smooth cook top surfaces are available, including magnetic induction and halogen units. Because they are much easier to clean than coiled elements, they produce less pollution from the burning of trapped food particles.

All electric cook tops, ovens, and ranges produce elevated magnetic fields. On gas ranges the built-in clock and electronic controls also produce surprisingly high fields. Induction cooktops produce the highest fields.

For the safest operation from an EMR perspective:

- Choose a model that has the clock on the side or back or have an electrician disable the clock.
- Use a gaussmeter to determine where the magnetic field drops off to a safe level and minimize exposure by keeping a safe distance whenever possible.

Refer to *Electromagnetic Guidelines for Appliances* below.

Oven Cleaning

Oven cleaning is another source of pollution generated in the kitchen. Continuous cleaning ovens contain wall coatings that continuously outgas noxious fumes. Self-cleaning ovens produce polynuclear aromatic hydrocarbons during operation.

There are several forms of built-in cleaning mechanisms in residential ovens. Some of these are not suitable for chemically sensitive individuals.

Pyrolytic self – cleaning cycle: The oven is cleaned by heat at high temperatures between 800-1000 degrees Fahrenheit (~427 degrees C to 538 degrees C) for 3 to 4 hours to burn off food residue, leaving a thin layer of ash in the bottom of the oven to wipe up. Many self-cleaning ovens are coated with a



pyrolytic enamel coat, which is known to offgas at 600° Fahrenheit. Some people choose to purchase a self-cleaning oven and not use the self-cleaning feature.

Issues with pyrolytic self-cleaning ovens include:

- The high temperature during the cycle requires safety locks and extra insulation around the oven chamber.
- The high temperatures during the cycle requires a large amount of energy.
- Toxic fumes, such as carbon monoxide, acrolein, and formaldehyde, with an accompanying odor, have been known to offgas. Fumes from PTFE (polytetrafluoroethylene) can be fatal to birds. Birds must be removed from the area during the self-cleaning cycle until all odors have dissipated.
- The high heat for the extended period of 3 hours has been known to reduce the overall service life of ovens.

Steam clean cycle: With water and liquid soap, this cycle runs at about 200° Fahrenheit (~100° Celsius) for about 30 minutes to an hour. Reviewers have noted that it may only clean the bottom of the oven and overall does not work well. Odor is also released during the first few cycles.

Manual clean: Ovens typically come with an interior enameled metal finish. Cleaning these units the old-fashioned way can require a lot of time and a lot of elbow grease. These models usually come without the insulation that self-cleaning ovens do, but some do come with removable doors for easier access for scrubbing.

Other Options:

- Ovens with cast iron interiors such as **AGA**.
- Ovens with stainless steel interiors. Wolf manufactures a stainless steel, steam convection oven. Stainless steel may require more frequent cleaning as food tends to stick to it.

Most ovens are likely to outgas when first operated. Temporarily hook up any new unit outside of the home and bake off the initial off-gassing.

Ovens will require cleaning far less often if certain measures are taken while using the appliance:

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- Be diligent in keeping spills and splatters to a minimum by covering food.
 - Place a baking sheet on the bottom rack to help catch any drips or spills.

Kitchen Ventilation

The kitchen generates significant indoor pollution and moisture. Point source ventilation of this room should be given special consideration above and beyond general home ventilation. Code only requires that gas ranges be vented to the outside and many electric ranges are installed with only a recirculating filter vent, but all cooking generates pollution that should be vented directly to the outside.

- All range hoods should be ducted directly to the outside, preferably through the roof. The exhaust should be located away from any air intake. Exhaust should not be routed through soffits due to potential condensation issues.
- Make sure that the range hood is properly sized for the cooking appliance, and that the ventilation rate is adequate for the room size, cooktop location (island or wall) and type of cooking you do. This [online CFM calculator](#) can help you determine the right range hood for your home.
- Range hoods are often underused because of the noise. Some models come equipped with remote fans, which are quieter. A fan with several speed choices will allow you to run it at the quietest cycle except when cooking pollution or moisture warrant a higher speed. A vent needs to be turned on to work!
- Provide make-up air. Systems designed to ventilate homes are not designed to provide make-up air from the operation of range hoods. When range hoods are in operation, especially at higher speeds, it is important that make-up air be supplied in conjunction with the fan to prevent negative pressurization and back-drafting within the home. Code may require make-up air depending on a ratio of the capacity of hood and size of kitchen. Make-up air is not provided in most residential hoods.

A properly sized range hood should be installed with both gas and electric ranges.

Range Hood Make-Up Air

We recommend the addition of a range hood make-up air kit that will provide fresh outside air while the hood is operating. In mild climates a slightly opened window in proximity to the range can provide sufficient make-up air.

- **Broan-MD8TU-8-Universal-Auto-Make-Up-Air-Damper-w-Pressure-Sensor-Kit:** Designed to equalize pressure between indoors and outdoors, while providing effective ventilation for a cleaner, healthier home. [Website](#)
- **Fantech MUAS 750 Makeup Air System:** A “powered” or “fan forced” system which is triggered when the compensated exhaust system is energized: the motorized shut-off damper opens and the MUAS fan is powered on. [Website](#)

Laundry Appliances

Top Loading vs. Front Loading

Top loading washing machines are considered standard in the North American market. They are less expensive than front loading machines, cycles are shorter, and clothing can be added to a load once the machine is operating.

Front loading washers have become far more popular over the last 20 years. They are more energy efficient and require less water and detergent than top loading machine. They are quieter during their spin cycles and can spin clothes dryer, so the clothes require less drying time. Because they work by tumbling the clothes and don't require a central agitator, they are gentler on the clothing. Some models have flat tops allowing for easy stacking or for countertops over them.

However, front loaders have one fatal flaw that makes them less than ideal for the healthy home. They are prone to mold.

The door requires rubber gaskets to hold the water in. The rubber gaskets may have an initial smell that will bother some sensitive people. They also trap water and quickly become a prime location for mold unless meticulously dried out after each use and the washer door is left ajar when not in use.

The drum itself can harbor mold on either style washer if too much or the wrong kind of detergent has been used and if it is not dried out between loads. This can be remedied by running an empty self-cleaning cycle with a specialized cleaner made

A front loading washer is more prone to mold growth than a top loading machine.



for this purpose. Cleaners for this purpose must be checked out by the sensitive individual as some are scented.

Washers and dryers with porcelain-on-steel or stainless-steel interiors are preferable to those with plastic interiors.

Maintaining a low mold washing machine

The gasket on front loading washers readily traps water and quickly becomes a prime location for mold unless it is meticulously dried after each load and the door is kept ajar. There are many folds and crevices in the gaskets which make them difficult to clean and dry. Top loaders are preferred because they do not require these gaskets.

To maintain a clothes washer that is free of mold spores and allergenic mycotoxins, meticulously dry off the gasket, remove the detergent drawer and set aside and leave the door open until the drum and everything is completely dried out – sometimes this can take up to 72 hours.

Clothes Dryers

By planning a laundry room with easy access to a drying yard, you can take advantage of the most energy efficient of all dryers: the sun.

Although gas dryers are more energy efficient than electric dryers, we do not recommend them because combustion gases can be released into the indoor air instead of being vented outdoors.

Dryers should be located against or adjacent to an exterior wall to vent effectively.

Condensing dryers are a relatively new introduction in North America. They collect the moisture from wet clothes into a reservoir that must be emptied when full. They can be located in any space - even spaces that are not near an exterior wall because they don't require a vent. This makes them an attractive option for renovation but from a healthy home perspective any appliance with a water reservoir must be carefully maintained so that it does not become a mold reservoir.

Dryer Vents

Lint will build up in dryer vent ductwork unless it is accessible and regularly cleaned. Not only does dryer lint buildup create a potential fire hazard it creates an inviting environment for

mold as the lint mingles with warm moist air travelling through it. Following are guidelines for proper venting:

- Locate dryer on or perpendicular to an outside wall to minimize length of ductwork.
- Vent dryers through an outside wall at least 10' away from any intake vents.
- Avoiding bends in the ductwork.
- Use rigid metal ductwork for longevity and cleanability.
- Vents should be easily accessible for cleaning.
- Avoid venting through the roof because of the difficulty in accessing it for routine cleaning.
- Do not use energy recovery devices that blow warm dryer exhaust back into the building envelope.
- Never vent a dryer directly into an attic or crawl space.

Vacuum Cleaners

Conventional portable vacuum cleaners suck air through a filter bag and then pump the “cleaned” air back into the room. The air that is returned is only as clean as the filtering mechanism is efficient. In fact, conventional vacuuming can stir up dust and pollen to such an extent that the ambient air is more polluted with small particulate matter than it was before the cleaning. Several brands of HEPA vacuums are available and are far superior to conventional vacuum cleaners. Their HEPA (high- efficiency particulate air) filter effectively traps microscopic particulate matter.

Models with a light will reveal dirt and allow for much more thorough cleaning.

A new generation of lightweight, cordless, HEPA filtered vacuum cleaners have revolutionized the convenience of vacuuming. [Dyson](#) and [Tineco](#) both make powerful lightweight models.

The following models have been studied with a particle counter and found to be effective:

- **Miele True HEPA Vacuums:** Make sure that the Miele product you are considering contains a HEPA Filter. Some of Miele’s economy vacuums do not contain a HEPA filter. They have HEPA collection bags which leads some consumers to believe that they have a HEPA vacuum, but these models are not as effective. [Website](#) | [Product](#)

Choose a vacuum cleaner with true, effective HEPA filtration.



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- **Shark Rotator and Navigator Series:** Impressive lower cost upright vacuums with true HEPA filtration. John has personally tested over 200 of these vacuum cleaners and found their “complete seal technology” to consistently perform at the high standards advertised. Shark [Rotator](#) | [Shark Navigator](#)

Built-in Central Vacuum Systems

If you are building a new home, you have the opportunity to install a central vacuum system. Although more expensive than conventional portables, central vacuums cost only slightly more than a good HEPA or water-filter model, they are more powerful (2-3x more powerful than a portable model), will last longer, and increase resale value of the home. They are convenient and easy to operate. The long hose is inserted into one of the wall receptacles that have been placed in walls throughout the house so that all floor areas are accessible and there is no machinery to lug around. The hose itself requires a storage closet. When the motor and dirt receptacles are exhausted to the outside and located in an uninhabited space such as a basement, exterior wall, garage, or isolated utility room, central vacuums avoid the pollution problems associated with most portable vacuums. There are many central vacuum systems to choose from based on your specific needs. Some of them come with a Teflon coated (or PTFE) HEPA filter which we do not recommend.

Steam Mops

Domestic steam mops produce high temperature steam that can effectively emulsify fats, kill bacteria, and loosen dirt without the use of chemicals. Water is heated past the boiling point and forced out through a nozzle as pressurized steam. It works best on hard surfaces. It should not be used on painted walls or unsealed floors as the heat could damage them. It should not be used on cold glass because the glass could crack. The moisture dries quickly and then the loosened dirt can be wiped away. They are very helpful for some cleaning tasks that would otherwise require a large dose of elbow grease or toxic cleaners like oven cleaning, but the steam is not effective in removing all mold growth and spores.

Electromagnetic Radiation (EMR) Guidelines for Appliances

The purpose of the following guidelines is to reduce environmental exposures to man-made EMR in the home through thoughtful placement and selection of appliances.

Further information: [What are EMFs](#) | [EMR Building Biology Guidelines for Sleeping Areas](#)

There are four areas of electro-magnetic radiation concern as summarized below:

AC Magnetic Fields and Appliances

Electromagnetic fields occur with the generation and transmission of electrical power and especially when appliances that have fans or motors are operating. Following are simple guidelines to limit exposure to magnetic fields from appliances:

- Plan for major appliances to be located a safe distance of at least 10 feet away from sitting and sleeping areas. Note that magnetic fields travel with ease through walls made of common building materials, and that areas located out of sight behind an appliance are also exposed. For example, placing a refrigerator back-to-back with a headboard, even though separated by a wall, will continually expose a person in that bed to an elevated magnetic field.
- A gaussmeter can be used to determine the strength of field and safe distance from appliances and may be helpful when selecting appliances in a showroom. See EMR Recommended Meter section below.

AC Electric Fields and Appliances

Whereas magnetic fields exist only when an appliance is operating, electric fields are present when an appliance is plugged in. Electric fields from appliances are relatively easy to control by following these suggestions:

- Arrange cords, chargers, and power strips so they are 6 or more feet away from where your family spends a lot of time. They emit high electric fields the full length of the charger and cord when they are plugged in.
- Keep appliances, device cords and chargers unplugged when they are not in use, especially in bedrooms. Alternatively, you can use outlet switches. These

eliminate the electric field in the cord when they are switched off. Examples: [Manual Outlet Switch](#) | [Remote Outlet Switch](#). The remote option is great for hard to reach places such as behind major appliances.

Radio Frequency (RF) Radiation and Appliances

RF radiation is produced by any appliance, device or accessory that emits pulsed microwave radiation in the form of Wi-Fi or Bluetooth. Most new appliances are 'smart' appliances which means they are Internet-enabled and come with Zigbee antennas that transmit Radio Frequency (RF) microwave radiation and connect to the electric company's smart meter. Dishwashers, washing machines, dryers, refrigerators are all examples. The following are guidelines for the reduction or elimination of sources commonly found within a home.

- To eliminate appliances as a source of RF in the home, choose appliances that aren't set up to connect wirelessly (non-zigbee) or verify with the manufacturer that Wi-Fi and/or Bluetooth can be deactivated or never initiated. If the manufacturer can not verify on an appliance of interest, reach out to an EMR specialist.
- Manually disable the Wi-Fi and/or Bluetooth in the settings menu of appliances whenever possible.
- Do not initiate Bluetooth pairing with your devices or connecting appliances with your wireless router. An EMR specialist can verify RF is not being emitted with specialized equipment and recommend remediation as appropriate.
- In the case that the use of a wireless appliance can not be avoided, plug-in the appliance to an outlet switch, remote outlet switch, or timer switch to activate the appliance only when in use or during typical hours of usage.

Microsurge Electrical Pollution (MEP) / Dirty Electricity and Appliances

MEP consists of high frequency spikes that ride on household electrical wiring and metallic pipes and can rise from zero to thousands of milli-volts and back to zero again in fractions of a second.

- The more basic the model is, the more likely the appliance is to be lower EMR.
- Appliances with inverter motors, solid-state transformers, or switch mode power supplies will produce MEP. MEP filters added to the electrical panel that feeds the associated appliances will help to suppress the electropollution created.
- Consult with an EMR specialist when selecting appliances, measuring MEP, or adding MEP filtration.

DIY EMR Meters for Homeowners

Below are meter recommendations that will enable you to accurately measure all four categories of man-made EMR coming from appliances: AC Magnetic, AC Electric, Radio Frequency (RF) microwave radiation and Microsurge Electrical Pollution (aka dirty electricity). If you want to select low-EMR appliances, options will need to be measured and compared against each other Unfortunately, not all models are hooked-up in the retail showroom to fully test.

	Option #1 Intermediate	Option #2 Entry-Level
AC Magnetic	UHS2 Gaussmeter	F5 Pocket EMF Detector
AC Electric	Gigahertz Solutions ME3830B	
RF	Safe and Sound Pro II	Safe and Sound Classic II
MEP/Dirty Electricity	Line EMI Meter + Radio Shack AM Radio #12-467	Radio Shack AM Radio Model #12-467
Price	~\$1,100	~\$325

Note: There are lower end meters which measure a combination of the EMR fields in one meter (e.g. [TriField TF2](#) or [Cornet ED88TPlus](#)). These are great for starting out but lack the frequency ranges necessary to help make bigger price point purchase decisions .

¹ [Microwave Oven Radiation](#); US Food and Drug Administration, 12.12.2017

² [Is it Safe to Microwave Plastic Containers](#); Balthazar, Deborah; Leonard, Daniel; McConnel, Tatum; ScienceLine, 09.08.22