Application & Grounding Instructions For RF-ECO Paint

Non-Toxic Waterbased Interior/Exterior Base Coating for Shielding Electromagnetic Fields and Radio Frequencies (RF)

Safe Living Technologies Inc.

70 Watson Pkwy S Unit 6
Guelph, ON N1L 0C3
1-888-814-2425
support@safelivingtechnologies.com
www.safelivingtechnologies.com

Introduction

Utilizing our Safe and Sound RF-ECO Paint is an ideal way to shield a home or office that requires protection from radio frequency radiation such as wireless routers, smart meters, cell towers, cordless phones and more. When grounded, it can also protect from low frequency electric fields produced by wiring in your walls, outdoor power lines, lights, appliances and more. It is suitable for both indoor and outdoor application and is the one of the few RF shielding paints which offers freeze protection. This allows it to be shipped year-round to anywhere in the world. The Safe and Sound RF-ECO Paint must be grounded once it is applied; this document will explain that process in detail.

Is This Paint Non-Toxic?

This is a frequently asked question as some paints on the market contain harmful chemicals or VOC's. This paint is a non-toxic high quality pure acrylic binder which offers excellent ecology and contains only 0.027 oz/Gal. VOC's which is classified as a Zero VOC Paint. When this paint is applied, it has a faint odor, which typically dissipates within 24-48 hours.

Shielding

The Safe and Sound RF-ECO Paint is a highly effective shield against radio frequencies. This product can be applied with one or two coats depending on your requirements. One layer will achieve 39 dB, 2 layers = 45 dB, 3 layers = 51 dB. Shielding is greater than 99.9% attenuation (shielding effectiveness is dependant on the density of application). The Safe and Sound RF-ECO

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Paint applies to the wall **black**, so you will likely require two topcoats of regular water base latex paint to fully cover the black. This also adds a layer of protection from scuffs to the Safe and Sound RF-ECO Paint, which could otherwise create gaps in the shield. Unlike other types of shielding products, the Safe and Sound RF-ECO Paint is fairly consistent in shielding characteristics across all frequencies, whereas other products will have varying shielding results dependent on the frequency it is blocking.

Coverage

The Safe and Sound RF-ECO Paint is available for purchase in 1 gallon bins. When applying the Safe and Sound RF-ECO Paint to an interior surface such as existing latex paint, wallpaper, construction board, etc., the typical coverage is 344 sq. feet / gallon, for optimal shielding results 172 sq. feet / gallon. When painting an exterior surface such as concrete, exterior latex paint, polystyrene, masonry surfaces, etc., you will need to cover 344 sq. feet / gallon to achieve optimal shielding results. For a porous surface it is recommended to apply a coat of latex primer to prevent the RF-ECO Paint from absorbing into the surface. ***NOTE*** Do not apply over mineral based products like silicate paints, clay paints, lime cement paints, plasters, spackles, etc. as the Safe and Sound RF-ECO Paint may not adhere well to these surfaces. If applying Safe and Sound RF-ECO Paint over oil-based paint be sure to lightly sand surface with fine sandpaper (180 – 220 grit) to remove gloss, then apply a "quality bonding primer". **DO NOT apply oil based**

paints over the Safe and Sound RF-ECO Paint.

Grounding Accessories

There are some accessories required in order to ground the paint. The GSX Conductive Tape, also sold by Safe Living Technologies, is externally conductive on both sides and is used to enhance the conductivity of the paint. This ensures the entire painted surface remains grounded at all times - even if a hairline crack occurs. One horizontal strip of tape is required to connect all walls, and if you are painting the ceiling, adding a second strip vertically to one wall, and across the ceiling will be required. A grounding plate will be required to connect the paint to ground. There are interior or exterior plates available. A general rule of thumb is to use one interior grounding plate per room if you are painting an entire room, or one grounding plate per painted wall if the walls are not adjoining. For the exterior plates or extremely large interior rooms, it is recommended to use one plate every 60 feet.

Interior Grounding Kit GS2

Interior Grounding Kit GS3

Interior/Exterior Grounding Kit GF4

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General Parts List

- Drop cloth or plastic sheet to protect your floor from spills
- Painters tape to protect baseboard, trim, and outlets
- Drill with mixing paddle for 1 Gal. paint bins
- Quality paint roller - 10 to 15 mm fiber length (pile height)
- Quality paint brush for edges and corners
- Paint tray
- Damp cloth for spills
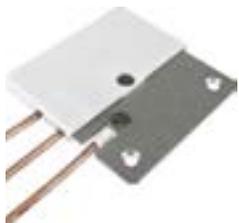- Drill with mixing attachment (2 3/8" W x 13" L)

Once you have acquired the correct amount of paint and grounding accessories, you are ready to begin. Here is the installation process for interior painting:

Preparation For Interior & Exterior Grounding

Prior to painting, it is strongly recommended to measure the location you wish to shield for RF exposure as well as EMF. This is important to ensure that you are painting in the correct area and maximizing the effectiveness of the paint. Be sure to identify the location(s) of the main source(s) of RF exposure, as this will be important in choosing which walls to paint. It is also advisable to measure the AC electric field values at various points throughout the room to use as a baseline for the final testing to ensure grounding has been done correctly. ***NOTE*** A licensed electrician is required to complete the grounding process.

Grounding Tape GSX10 / GSX50

Interior Application & Grounding

Step 1

Begin by preparing the surface you are about to paint. Use regular painters tape to ensure edges are protected in case there are surfaces you do not wish to apply the shielding paint to (window frames, outlet covers etc.). It is also advised to use a drop cloth in order to protect the floor from smudges or paint drips. Wipe off any stains quickly with a damp cloth. Remove baseboards and door trim if you wish. It is advised to not remove light switch covers or receptacle covers as it is **VERY** important to not apply paint to the metal fixture of the light switch or power outlet. *****NOTE***** If you do remove the outlet covers instead of taping them, stay 2 cm away from any portion of the metal box housing the outlet or light switch. Multiple connections to the grounding system can potentially cause ground loops, resulting in an increase of AC magnetic field exposure.

Step 2

Apply the GSX Grounding Tape horizontally to the wall(s) you are going to paint. This can be at any point in the wall, note that it will create a slight ridge which is noticeable if you are consciously looking for it. It is acceptable to run the tape along the base of the wall and then cover it by the baseboards and door trim to hide it if worried about the aesthetics. You will need to run an additional vertical strip of conductive tape, beginning at the base of the wall and running up to the top of the painted surfaces.

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Step 3

Once the Grounding Tape is applied and your prep work is complete, you are ready to apply the Safe and Sound RF-ECO Paint. Application is recommended with the use of a high quality professional paint roller (10 to 15 mm fiber length (pile height) is recommended), however, it can also be sprayed to the surfaces. Before you apply the paint, the container will need to be mixed in order to ensure the paint applies smoothly, and evenly. For a 1 gallon bin, it is required to use a mixing attachment for a drill (shown below). When applying the paint, ensure there are no colored spots showing through and that the wall looks completely black (excluding gaps between electrical outlets, light switches, etc., or anything that is grounded). When applying the shielding paint, verify regularly that you are applying at your predetermined rate of wall space.

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Step 3 (Cont.)

NOTE This paint contains carbon fibers and is very dense, therefore it should be sprayed with a tip that would be used for a heavy latex paint. The manufacturer recommends a nozzle orifice diameter of 0.021 inches to 0.025 inches. It is important to ensure you equally cover each portion of the wall to maximize shielding effectiveness. The paint will not reach its maximum shielding capacity until completely dried, which depending on the environment, can take between 24 to 48 hours. It is important to note that the paint is blocking greater than 99.9% of radio frequency signals, however, if there are surfaces you are unable to paint or shield with another material, you will have decreased overall shielding effectiveness.

Step 4

Choose a convenient location to mount the grounding plate. For best results it is recommended to mount the grounding plate where the horizontal and vertical pieces of tape intersect as shown in the pictures below. Once you have chosen your location, drill 6 mm (15/64 in) holes to mount the grounding plate to the wall. ***NOTE*** Be sure to verify there are no cables or wires behind the location you are drilling. At this point, apply a second coat of Safe and Sound RF-ECO Paint where the grounding plate will be mounted and let it dry. Once it has dried, you can mount the grounding plate onto the wall using the accessories provided in the grounding kit.

Step 5

The grounding process MUST be completed by a licensed electrician. The final step is to cover the grounding plate with the white plastic cover by sliding it over the metal grounding plate.

Step 6

Once you have grounded the painted surface, an electrician can verify the electrical conductivity by measuring the resistance of the paint with a digital multimeter. If the paint has a resistance less than 10 ohms per square inch, then the installation has been done successfully.

Step 7

Re-measure the RF in the same location(s) as you did when preparing to paint. Compare the values, and determine how much reduction has been gained. Measure throughout the room and search for high readings (aka hotspots) resulting from areas that may not yet have shielding applied to them. Cover any additional areas you wish to shield until you achieve the desired shielding results. Also measure the AC electric fields in the same locations as when preparing to paint, if your grounding has been completed correctly your levels should be similar or lower than previously as well.

Once you are satisfied with the shielding, apply two topcoats of regular water based latex paint on top of the Safe and Sound RF-ECO Paint to both cover and protect the shielding paint from damage or scuffs.

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Exterior Application & Grounding

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Step 1

Begin by preparing the surface you are about to paint. Use regular painters tape to ensure edges are protected in case there are surfaces you do not wish to apply the shielding paint to (window frames, outlet covers etc.). It is also advised to use a drop cloth in order to protect the floor from smudges or paint drips. Wipe off any stains quickly with a damp cloth. Remove window shutters or drainage pipes if you do not wish to paint them in order to not have a gap in the shielding. Remove baseboards and door trim if you wish. It is advised to not remove light switch covers or receptacle covers as it is **VERY** important to not apply paint to the metal fixture of the light switch or power outlet. ***NOTE*** If you do remove the outlet covers instead of taping them, stay 2 cm away from any portion of the metal box housing the outlet or light switch.

Multiple connections to the grounding system can potentially cause ground loops, resulting in an increase of AC magnetic field exposure.

Step 2

The GSX Grounding Tape does not apply very well to most exterior surfaces, so in its place you can add the AF3 Carbon Additive to enhance the conductivity of the paint. Add the entire container into a 1 gallon bin of Safe and Sound RF-ECO Paint and mix for at least one minute with a drill and mixing paddle. If adding AF3 to paint, a paint sprayer cannot be used.

Grounding Tape
GSX10 / GSX50

Step 3

Once the paint and surfaces are prepared and you have determined the surfaces you are going to paint, you are ready to apply the Safe and Sound RF-ECO Paint. This paint is best applied with the use of a high quality professional paint roller (10 to 15 mm fiber length (pile height).

NOTE This paint contains carbon fibers and is very dense, therefore it should be sprayed with a tip that would be used for a heavy latex paint. The manufacturer recommends a nozzle orifice diameter of 0.021 inches to 0.025 inches. It is important to ensure you equally cover each portion of the wall to maximize shielding effectiveness. Before you apply the paint, the container will need to be mixed in order to ensure the paint applies smoothly and evenly. For a 1 gallon bin, it is required to use a mixing attachment for a drill (shown below). When applying the paint, ensure there are no colored spots showing through and that the wall looks completely black

(excluding gaps between electrical outlets, light switches etc). When applying the shielding paint, verify regularly that you are applying at your predetermined rate of wall space. The paint will not reach its maximum shielding capacity until completely dried, which depending on the environment can take between 24 to 48 hours.

Step 3 Cont.

It is important to note that the paint is blocking greater than 99.9% of radio frequency signals, however, if there are surfaces you are unable to paint or shield with another material, you will have decreased overall shielding effectiveness.

Step 4

Next, choose a convenient location near the final ground connection to mount the grounding plate. It is important to mount the plate on a smooth surface to ensure a quality connection to the shielding paint. If the surface is textured, you will need to create a smooth surface with a fine filler (fine mortar). Once the filler has dried and the surface is smooth, drill 6 mm (15/64 in) holes to mount the grounding plate to the wall and insert the provided dowels.

Be sure to verify there are no cables or wires behind the location you are drilling. At this point, apply a coat of Safe and Sound RF-ECO Paint under and around where the grounding plate will be mounted to cover the filler and let it dry. Once it has dried, apply a second coat to the same location and allow the paint to dry. Ensure to bolt down the provided cable lug tightly to the plate and connect the grounding cable securely. Screw down the plate tightly and seal the edges with the waterproof glue provided. Finally, clip the plastic cap into place to completely seal the ground connection.

Step 5

The grounding process MUST be completed by a licensed electrician. The final step is to cover the grounding plate with the white plastic cover by sliding it over the metal grounding plate.

Step 6

Once you have grounded the painted surface, an electrician can verify the electrical conductivity by measuring the resistance of the paint with a digital multimeter. If the paint has a resistance less than 10 ohms per square inch, then the installation has been done successfully.

Step 7

Re-measure the RF in the same location(s) as you did when preparing to paint. Compare the values, and determine how much reduction has been gained. Measure throughout the room and search for high readings (aka hotspots) resulting from areas that may not yet have shielding applied to them. Cover any additional areas you wish to shield until you achieve the desired shielding results. Also measure the AC electric fields in the same locations as when preparing to paint, if your grounding has been completed correctly your levels should be similar or lower than previously as well.

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Step 7 Cont.

Once you are satisfied with the shielding, apply two topcoats of regular exterior water based latex paint on top of the Safe and Sound RF-ECO Paint to both cover and protect the shielding paint from damage or scuffs.

Technical Data

Application	Interior, Exterior
Coverage	43 - 86 SqFt/Qt. or 172 - 344 SqFt/Gal.
Substrates	Almost All
Shielding Type	Radio Frequency, AC Electric Fields
Shielding Effectiveness @ 1GHz (43 SqFt/Qt.)	1 Layer = 39 dB 2 Layers = 45 dB 3 Layers = 51 dB
Ecology	High
Binding Agent	Pure Acrylic
VOC Content	0.027 oz/Gal. (Virtually Zero)
Minimum Application Temperature	5°C / 41°F
Weight	12.38 lbs per 1 Gal. Bin
Color	Black
Adhesive Strength	392 lbs/SqIn
Viscosity	1200 mPas
Sd-Value	~ 0.1 m
pH-Value	7.5
Density	1.19
Frost Resistance	High
Shelf Life	3+ Years

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Disclaimer

CAUTION

This paint is electrically conductive. All painted areas must be grounded by a licensed electrician. All connections should be visually inspected and tested and comply with local electrical codes. In all shielded areas/shielded rooms, a personal protection circuit-breaker (GFI) should be installed. Always switch off power supply before starting to perform shielding work and before application of shielding paint. For grounding, SLT approved grounding kits must be used. Avoid contacting ground at multiple points.

WARNING

Like all electrical products and installations EMR-shielding products can and do pose a risk to consumer safety if improperly handled. Safe Living Technologies therefore disclaims all responsibility for damages to persons and material due to improper handling of Safe Living Technologies products.

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