

YSHIELD Shielding paints

1/6

Product overview / technical data

YSHIELD shielding paints are **electro-conductive coatings** for the protection of large areas against **high-frequency (HF)** radiation and (or) against **low-frequency (LF)** electric fields. Typical areas of application are single rooms, or the protection of whole buildings.

	HSF 54	HSF 74	NSF 34	EMV 84
Shielding HF	X	X		X
Shielding LF	X	X	X	X
Brief description	Well-established paint for HF (+ LF)	Pure silicate paint for HF (+ LF)	Well-established paint for LF	Electronic / EMC-lacquer for HF (+ LF)
Binding agent	Pure acrylate	Silicate	Pure acrylate	Pure acrylate
Screening 1-layer	36 dB (99.975%) at 7.5 m ² /l	37 dB (99.98%) at 7.5 m ² /l	40 dB / at 7.5 m ² /l	30 dB (99.9%) at 7.5 m ² /l
Screening 2-layer	43 dB (99.995%) at 2x 7.5 m ² /l	45 dB (99.997%) at 2x 7.5 m ² /l		
Screening basis	Carbon	Carbon	Carbon	Carbon
Color	Black	Black	Black	Black
Application area	Building interior / exterior	Building interior / exterior	Building interior / exterior	Building, EMC, electronic
Applicable with	Paint roller, paint brush	Paint roller, paint brush	Paint roller, paint brush	Lacquer roller, airless spraying, dip coating, knife coating, screen printing
Substrates	Almost all	Mineral	Almost all	Almost all
Surface, mechanical resilience	Medium elastic, limited resilient	Medium hard, limited resilient	Medium hard, normal resilient	Medium elastic, limited resilient
Pigmentation size	< 200 µm, 3 mm carbon fibers	< 100 µm	< 100 µm	d50 = 30 µm d90 = 70 µm
Electr. resistance	R□ > 3,0 Ω	R□ > 2,5 Ω	R□ > 100 Ω	R□ > 3,5 Ω
Temperature range	< 100° C	< 250° C	< 100° C	< 100° C
Ecology	Good	Very good	Good	Normal
Solvent	Water	Water	Water	Water
VOC content *	< 0.5 g/l	< 0.5 g/l	< 0.5 g/l	< 0.5 g/l
PAH content **	< 0,002 mg/kg	< 0,002 mg/kg	< 0,002 mg/kg	< 0,002 mg/kg
Sd-value	~ 0.1 m	~ 0.01 m	~ 0.1 m	~ 0.1 m
pH-value	8	12	8	8
Adhesive pull strength	1.9 N/mm ²	2.5 N/mm ²	4.1 N/mm ²	1.9 N/mm ²
Density	1.25 kg / l	1.3 kg / l	1.05 kg / l	1.25 kg / l
MFFT	5° C	5° C	5° C	5° C
Grounding required	Interior: ESW + EB2; Exterior: ESA	Interior: ESW + EB2; Exterior: ESA	Interior: ESW + EB2; Exterior: ESA+EB2	Depending on the application
Delivery frost resistance / Shipping	3 frost-/thaw cycles / Always	No / Only over 0° C	3 frost-/thaw cycles / Always	3 frost-/thaw cycles / Always
Delivery sizes	1 / 5 Liter	1 / 5 Liter	1 / 5 Liter	0.25 / 1 / 5 Liter
Shelf life	12 months	12 months	12 months	12 months
Typical coverage, 1 liter, single-layer	Int.: 7.5 m ² (81 ft ²); Ext.: 5 m ² (54 ft ²)	Int.: 7.5 m ² (81 ft ²); Ext.: 5 m ² (54 ft ²)	Int.: 7.5 m ² (81 ft ²); Ext.: 5 m ² (54 ft ²)	5 - 20 m ²
Price per m ²	EUR 5.60	EUR 5.60	EUR 4.48	EUR 2.10 - 8.40
Selection guide	Our standard paint for HF we always recommend! Superior mechanical and chemical properties.	Only recommended if the focus is on maximum ecology.	Our standard paint for LF we always recommend! Superior mechanical and chemical properties.	EMC-lacquer for buildings or in electronic applications. Fine surface, excellent substrate wetting.

* VOC = Volatile organic compounds. The actual EU limit value for wall paints is 30 g/l.

** PAH = Polycyclic aromatic hydrocarbons. The nonbinding EU limit value for children toys is 0.2 mg/kg.

YSHIELD Shielding paints

2/6

Shielding paint HSF54 (HF+LF)

Our recommendation!

Characteristics

Based on a high quality pure acrylic binder. Highly breathable, very low VOC content, free of solvents. For shielding of high-frequency radiation (HF) and low-frequency electric fields (LF).

- **Our top-selling, well-established shielding paint, with improved formula since april 2012**
- **All-purpose paint for interior and exterior application**
- Without metals, so long-term durable and corrosion resistant
- High attenuation, even at single-layer application

Underground

Interior and exterior: Excellent adhesion on various undergrounds like existing emulsion paints, sheetrock, wallpaper, cement, plaster, masonry, wood, etc.

Top coating

Preferably covered with plastic bonded, **water-based emulsion paints**, facade paints or silicon resin paints. Very recommended are KEIM **dispersion silicate paints** (Biosil, Ecosil, Optil). Depending on their chemical composition, natural resin paints adhere relatively well. We do not recommend pure mineral paints! Due to the adhesive tensile strenght (according to ETAG 004) of at least 0.25 N/mm^2 , usable directly under pure (not mineral) organic plaster.

Grounding

Must be grounded, please find more informations on our „grounding accessories“ pages! To bridge cracks in the underground, this paint is reinforced with conductive fibers. Nevertheless, we recommend our **grounding strap EB2** at the interior in combination with our **grounding set ESW** or **ESW+**.

Frost resistance

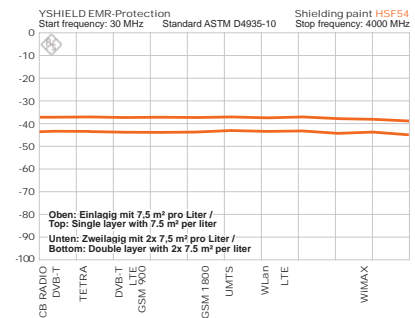
Due to a **limited frost resistance** (3 frost-/thaw cycles) this paint can dispatched the whole year, even in wintertime, by air cargo or by ship.

Shielding attenuation

Attenuation of 36 dB (shielding effectiveness of 99.98 %) in one layer, **attenuation of 43 dB** (shielding effectiveness of 99.995 %) with two layers. The shielding attenuation is **regularly tested in our own laboratory** or by **Professor Dipl.Ing. Pauli** at the University of the German Federal Armed Forces in Munich due to the standards ASTM D4935-10 and/or IEEE-STD-299-2006. Current expert report is available upon request.

Ingredients

Water, pure acylic binder, graphite, carbon black, additives, preservative, carbon fibers.



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YSHIELD Shielding paints

3/6

Shielding paint HSF74 (HF+LF)

Characteristics

Pure silicate paint based on potassium silicate. Highly breathable, very low VOC content, free of solvents, **without in-can preservation!** For shielding of high-frequency radiation (HF) and low-frequency electric fields (LF).

- Developed with a bare of ingredients for maximum ecology
- Application only by a professional painter with protective equipment due to the ph-value of 12 (superalkaline)
- Without metals, so long-term durable and corrosion resistant
- High attenuation, even at single-layer application



Underground

Interior and exterior: Good adhesion on absorbent, untreated, preferably mineralic undergrounds like chalk, silicate, clay, etc.. Restricted use on absorbent emulsion paints, wallpapers, etc., please check first! Not usable on gypsum based substrates!

Top coating

Can be covered with water-based, plastic bonded **emulsion paints**. Due to ecological reasons, KEIM **dispersion silicate paints** (Biosil, Ecosil, Optil) as well as AURO high-grade lime paint (no.344) and silicate paint (no.303) are highly recommended. Many natural resin paints and paints made of clay or lime putty are not recommended.

Grounding

Must be grounded, please find more informations on our „grounding accessories“ pages! To bridge cracks in the underground, this paint is reinforced with conductive fibers. Nevertheless, we recommend our **grounding strap EB2** at the interior in combination with our **grounding set ESW** or **ESW+**.

Frost resistance

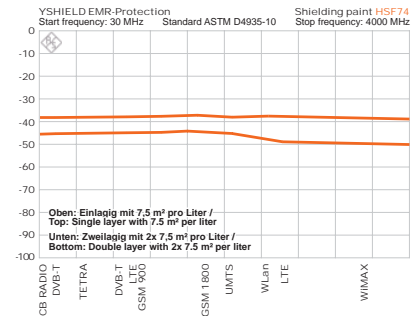
Not frost resistant, shipping only on temperatures over 0°C or with UPS Express.

Shielding attenuation

Attenuation of 37 dB (shielding effectiveness of 99.98 %) in one layer, **attenuation of 45 dB** (shielding effectiveness of 99.997 %) with two layers. The shielding attenuation is **regularly tested in our own laboratory** or by **Professor Dipl.Ing. Pauli** at the University of the German Federal Armed Forces in Munich due to the standards ASTM D4935-10 and/or IEEE-STD-299-2006. Current expert report is available upon request.

Ingredients

Potassium silicate, water, graphite, carbon black, additives.



YSHIELD Shielding paints

4/6

Shielding paint NSF34 (LF)

Characteristics

Based on a high quality pure acrylic binder. Highly breathable, very low VOC content, free of solvents. For shielding of low-frequency electric fields (LF).

- **Only for low-frequency electric fields (LF)**
- **Our top-selling, well-established shielding paint**
- **All-purpose paint for interior and exterior application**
- Without metals, so long-term durable and corrosion resistant

Underground

Interior and exterior: Excellent adhesion on various undergrounds like existing emulsion paints, sheetrock, wallpaper, cement, plaster, masonry, wood, etc.

Top coating

Preferably covered with plastic bonded, **water-based emulsion paints**, facade paints or silicon resin paints. Very recommended are KEIM **dispersion silicate paints** (Biosil, Ecosil, Optil). Depending on their chemical composition, natural resin paints adhere relatively well. We do not recommend pure mineral paints! Due to the high adhesive tensile strength even usable directly under pure (not mineral) organic plaster.

Grounding

Must be grounded, please find more informations on our „grounding accessories“ pages! To bridge cracks in the underground, we recommend our **grounding strap EB2** at the interior in combination with our **grounding set ESW** or **ESW+**.

Frost resistance

Due to a **limited frost resistance** (3 frost-/thaw cycles) this paint can be dispatched the whole year, even in wintertime, by air cargo or by ship.

Shielding attenuation

Attenuation of 40 dB (shielding effectiveness of 99 %) in one layer. The shielding attenuation is **regularly tested in our own laboratory** or by **Professor Dipl.Ing. Pauli** at the University of the German Federal Armed Forces in Munich. Current expert report is available upon request.

Ingredients

Water, pure acrylic binder, graphite, carbon black, additives, preservative.



YSHIELD Shielding paints

5/6

Shielding lacquer EMV84 (HF+LF)

Characteristics

Based on a high quality pure acrylic binder.
Breathable, low VOC content, free of solvents.

- **Water based lacquer for shielding buildings or in electronic applications**
- **With fine pigmentation without fibers and excellent substrate wetting for versatile uses: Airless spraying, dip coating, knife coating, screen printing, etc.**
- Without metals, so long-term durable and corrosion resistant
- High attenuation, even at single-layer application

Underground

Excellent adhesion on various undergrounds. **In buildings** on existing emulsion paints, sheetrock, wallpaper, cement, plaster, masonry, wood, etc. **In electronic applications** on various plastics, flexible foils, etc.

Top coating

In buildings plastic bonded emulsion paints, facade paints or silicon resin paints. We do not recommend pure mineral paints! **In electronic applications** depending on the requirements, as the surface is staining and is not scrub resistant .

Grounding

In buildings grounding is mandatory, please find more informations on our „grounding accessories“ pages! **In electronic applications** this depends on the requirements, LF-shieldings must be grounded, HF-shieldings must not be grounded necessarily.

Frost resistance / Shipping

Due to a limited frost resistance (3 frost-/thaw cycles) whole year shipping is possible. **No hazardous classification for shipping!**

Shielding attenuation

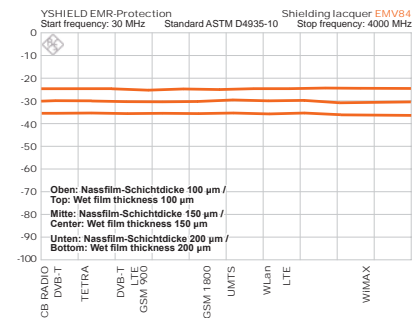
The shielding attenuation depends on the thickness of the coat and is up to 30 dB (shielding effectiveness of 99.9 %), the the right diagram. The shielding attenuation is **regularly tested in our own laboratory** due to the standard ASTM D4935-10. Current expert report is available upon request.

Ingredients

Water, pure acylic binder, graphite, carbon black, additives, preservative.

Customer developments

Starting at 100 liters order quantity we can vary several parameters for you: For screen printing there is a version with higher viscosity, for higher temperatures we vary the binding agent and some additives, the ohmic resistance can be adjusted depending on the film thickness of your application.



YSHIELD Shielding paints

6/6

Common characteristics

Simple handling and processing

YSHIELD shielding paints **can be universally applied**. Compared to wallpapers, fleeces or nettings they are easy to apply, even in structured rooms with bays, pitched roofs and dormers. Painters recommend our shielding paints for **ease of application**. All paints are best applied with a paint roller.

Perfect corrosion resistance

Many shielding products containing metals are not resistant to corrosion. Our shielding paints does not contain any metals, but a mixture of carbons. These are **long-term durable and stable against corrosion** even in humid environment.

Emissions VOC / PAH

Our shielding paints are tested regularly from the **TÜV-SÜD** on the content of VOC (volatile organic compounds) and PAH (polycyclic aromatic hydrocarbons). 1) The actual **VOC limit** is 30 g/l, our shielding paints contain a maximum of 0,5 g/l, so they are **60 times below the limit**. 2) The often recommended **PAH limit** (for category 1) is 0.2 mg/kg, our paints contain 0.002 mg/kg, so they are **100 times below the limit even for children toys**.

Sustainability

Due to its **paint-typical holohedral structure without holes**, our shielding paints have a nearly linear attenuation up to very high frequencies, regardless of the direction of signal polarization. Prooved up to 4/18/30 GHz (depending on the test method) they are very **future-proof**.

Carefully selected Ingredients

YSHIELD shielding paints **do not contain solvents, plasticisers or any other toxic ingredients**. All ingredients were **carefully selected, regardless of price** and according to their high quality and safety for the environment.

Grounding instructions

Please find more information about the necessary grounding under "grounding accessories".

Handling and processing instructions

Please find detailed handling instructions in our technical data sheets on our website on the corresponding product pages! Upon request, we will send you these data sheets!

Areas of application

In **private areas** for the protection against cell phone towers, TV and radio broadcasting antennas, radar, digital standard cordless telephones, wireless networks or power supply lines. In **commerce, science, research and defence facilities** to prevent interception of data from wireless networks (data-stealing), to protect potentially bugged conference rooms or to shield technical equipment. At **airports** to protect against radar. In the **medicine** to prevent wrong measurements in patients (ECG/EEG). In the **industry**, e.g. at car- or computer producers in development departments. **Further applications:** Data centers, technical rooms, schools, nurseries, hotel rooms, hospital rooms, recording studios, etc.



YSHIELD Shielding Paints

Project examples

Shielding data center (60-80 MHz), Germany



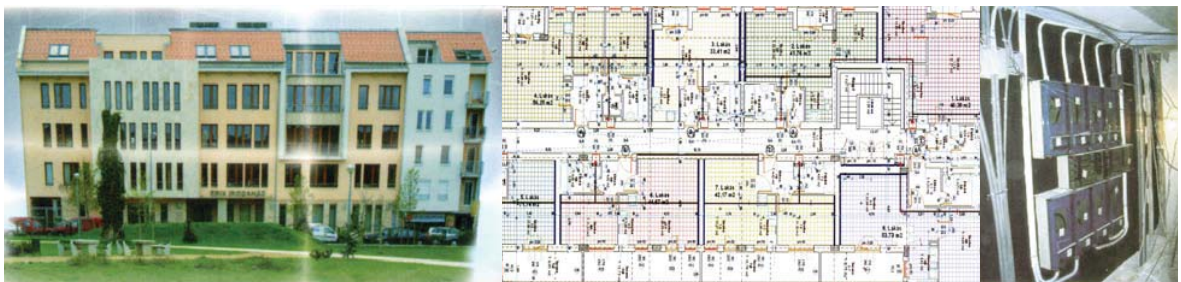
Shielding one-family house (798 $\mu\text{W}/\text{m}^2 \rightarrow 0.47 \mu\text{W}/\text{m}^2$), Austria



Shielding semi-detached house (2648 $\mu\text{W}/\text{m}^2 \rightarrow 10.2 \mu\text{W}/\text{m}^2$), Germany



Shielding multifamily building complex, Hungary



YSHIELD Shielding Paints

Project examples

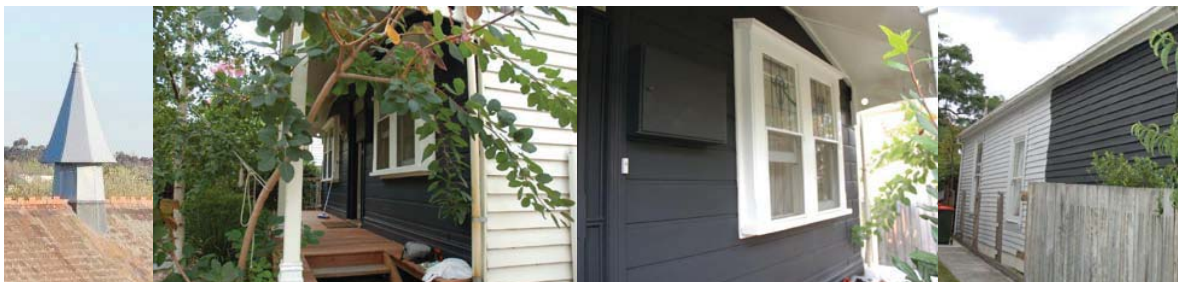
Shielding one-family house ($194 \mu\text{W}/\text{m}^2 \rightarrow 0.01 \mu\text{W}/\text{m}^2$), Austria



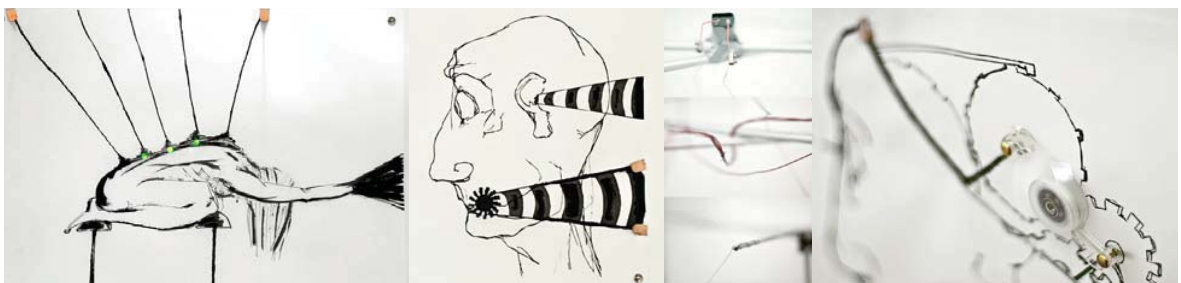
Shielding one-family house ($604 \mu\text{W}/\text{m}^2 \rightarrow 0.26 \mu\text{W}/\text{m}^2$), Australia



Shielding one-family house, Australia



Art installation with conductive paint HSF54, Great Britain



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Project examples

Shielding airport terminal, Asia



Shielding development department at Asus-computer, Taiwan



Shielding apartment houses, Greece



Shielding BAUFRITZ framehouses, Germany



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YSHIELD Shielding Paints

Project examples

Shielding one-family house, Germany



Shielding one-family house ($616 \mu\text{W}/\text{m}^2 \rightarrow 0.5 \mu\text{W}/\text{m}^2$), Hawaii



Shielding student project school building, Austria



Shieldings recording studios, Taiwan

