

**Overview - Shielding paints**



YSHIELD® HF-SAMPLES

YSHIELD shielding paints are **electroconductive base coatings** for the protection of large areas against **high-frequency (HF)** radiation and/or against **low-frequency (LF)** electric fields. The typical application is the shielding of rooms and buildings.

**Sample set HSF:** There is a sample set of all HF-paints with each 0.1 liter, see left picture.

	<b>PRO 54</b>	<b>HSF 54</b>	<b>HSF 64</b>	<b>HSF 74</b>	<b>NSF 34</b>
Brief description	<b>Technically our best paint. Contains no graphite and does not stain.</b> Must be applied in two layers. Low-emission.	<b>The All-in-One paint. Recommendation interior and exterior.</b> Frost-resistant for worldwide shipping. Low-emission.	<b>Ecological compromise.</b> Dispersion-silicate paint with excellent adhesion. Low-emission.	<b>Pure silicate paint without preservative agent.</b> Only recommended with allergies against preservative agents. Low-emission.	<b>To shield electrical fields (LF) only.</b> Superior mechanical and chemical properties. Low-emission.
Shielding HF / LF	HF / LF	HF / LF	HF / LF	HF / LF	- / LF
Screening one-layer	25-30 dB (99.9%)	<b>37 dB</b> (99.980 %)	<b>39 dB</b> (99.987 %)	<b>39 dB</b> (99.987 %)	<b>40 dB</b>
Screening two-layer	<b>35-40 dB</b> (99.99 %)	44 dB (99.996 %)	46 dB (99.997 %)	45 dB (99.997 %)	
Ecology	Normal	Normal	High	Very high	Normal
VOC content *	<b>0.2 g/l</b>	<b>0.2 g/l</b>	<b>0.1 g/l</b>	<b>0.1 g/l</b>	<b>0.1 g/l</b>
PAH content **	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg
Binding agent	Pure acrylate	Pure acrylate	Silicate, pure acrylate	Silicate	Pure acrylate
Solvent	Water	Water	Water	Water	Water
Screening basis	Carbon	Carbon	Carbon	Carbon	Carbon
Application area	Interior, exterior	Interior, exterior	Interior only	Interior only	Interior, exterior
Coverage one-layer	5 - 7.5 m <sup>2</sup> /l	5 - 7.5 m <sup>2</sup> /l	5 - 7.5 m <sup>2</sup> /l	5 - 7.5 m <sup>2</sup> /l	7.5 m <sup>2</sup> /l
Coverage two-layer	2.5 - 3.75 m <sup>2</sup> /l				
Moisture resistance	<b>High</b>	<b>High</b>	Normal	Normal	<b>High</b>
Substrates	Almost all	Almost all	Almost all	All absorbent	Almost all
Applicable with	Paint roller, airless (nozzle>525)	Paint roller, airless (nozzle>525)	Paint roller, airless (nozzle>525)	Paint roller, airless (nozzle>525)	Paint roller, airless (nozzle>515)
Spatter behavior	<b>Very low</b>	<b>Very low</b>	Small splatters	Small splatters	Low
Adhesive tensile strength	<b>4.8 N/mm<sup>2</sup></b>	<b>2.3 N/mm<sup>2</sup></b>	2.2 N/mm <sup>2</sup>	1.7 N/mm <sup>2</sup>	4.1 N/mm <sup>2</sup>
Viscosity (Brookfield)	2000 mPas	2000 mPas	2500 mPas	2000 mPas	1500 mPas
Rheology	Newtonian	Newtonian	Shear thinning	Shear thinning	Newtonian
Film character	Elastic hard	Elastic soft	Elastic soft	Hard, frail	Elastic soft
Color	Black	Black	Black	Black	Black
Temperature max.	100° C	100° C	100 C	200° C	100° C
Sd-value	0.1 m	0.1 m	0.05 m	0.01 m	0.1 m
pH-value	8	8	12	12	8
Pigmentation size max.	100 µm	100 µm	100 µm	100 µm	10 µm
Density	1.15 kg / l	1.25 kg / l	1.27 kg / l	1.3 kg / l	1.05 kg / l
Solids content	44 %	56 %	52 %	45 %	24 %
MFFT	5° C	5° C	5° C	5° C	5° C
Frost resistance ***	5 frost-/thaw cycles	5 frost-/thaw cycles	No	No	5 frost-/thaw cycles
Delivery sizes	1 / 5 Liter	1 / 5 Liter	1 / 5 Liter	1 / 5 Liter	1 / 5 Liter
Shelf life	12 months	12 months	12 months	12 months	12 months

\* Volatile organic compounds. The EU limit value for cat. A/a is 30 g/l (by 2010).

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

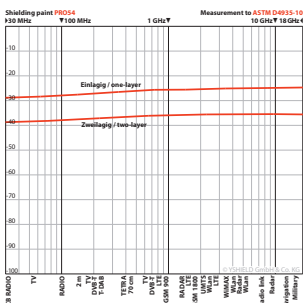
\*\*\* The given frost resistance is valid liquid in the container, of course on the wall its permanent frost-resistant.

## PRO54 - Shielding paint (HF+LF)

### TECHNICALLY THE BEST



YSHIELD® PRO54



#### Characteristics

For the shielding of high-frequency radiation (HF) and low-frequency electric fields (LF).

- **Frost resistant: Suitable for shipping during winter time and for sea freights in containers**
- Breathable, solvent free, **low-emission, low odor**
- **Application:** Interior, exterior
- **Attenuation:** 25-30 dB, **two-layer 35-40 dB**

#### Special feature

**Technically our best paint, that is formulated without graphite, which has many advantages:**

- Does not stain off while overpainting with white wall paint.
- Impacts against the white covering paint don't produce black stripes any more.
- The surface of the paint film is microporous rough and offers top coatings a catchy underground for excellent adhesion.
- With 4.8 N/mm<sup>2</sup> this paint has an extremely high adhesive tensile strength (adhesive power on the underground) for a wall paint which is two times higher than with our graphite paints.

**The lack of graphite has only one disadvantage:** The electrical resistance and therefore the shielding attenuation is 10 dB lower per layer. **We always highly recommend a two-layer application with this paint,** to reach the typical 35-40 dB attenuation. The slightly higher costs due to the second coat are compensated by the many advantages.

#### Underground

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

#### Top coating

Preferably covered with plastic bonded, **water-based emulsion paints**, dispersion silicate paints, facade paints or silicon resin paints. Not applicable are pure mineral paints (clay, loam, chalk, silicate). Please find appropriate product recommendations in the technical data sheet.

Due to the high adhesive tensile strength (to ETAG 004 for EIFS-systems, minimum 0.08 N/mm<sup>2</sup>), applicable directly under pure organic plaster, no mineral pasters!

#### Grounding

Must be grounded! We recommend interior the **grounding strap EB2** plus **grounding set GW** or **GB**, exterior the **fiber additive AF3** plus the **grounding set GE**.

#### Frost resistance

**This product is frost resistant** (proved for 5 frost/thaw cycles), can be shipped throughout the year by air cargo or ship.

#### Screening attenuation

The screening attenuation is **regularly tested in our own EMC laboratory**. We have measurement setups due to the following standards: **ASTM D4935-10, IEEE Std 299-2006, IEEEE Std 1128-1998, ASTM A698/A698M-07**. Please find the test report at our homepage directly on the product page.

#### Ingredients

Water, pure acylic dispersion, carbon fibers, carbon black, additives, preservative (MIT, BIT).

#### Optional: Fiber additive AF3

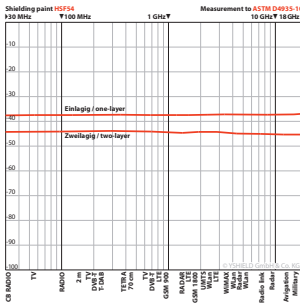
This paint is formulated without long conductive carbon fibers to allow airless spraying. For crack bridging and consequential a better grounding we advise to mix in the fiber additive AF3.

**HSF54 - Shielding paint (HF+LF)**

**UNIVERSAL CLASSIC**



YSHIELD® HSF54



**Characteristics**

**Our longtime classic was improved again in 2014.** Based on a high quality **pure acrylic binder**. For the shielding of high-frequency radiation (HF) and low-frequency electric fields (LF).

- **Frost resistant: Suitable for shipping during winter time and for sea freights in containers**
- **Breathable, solvent free, low-emission, low odor**
- **Application:** Interior, exterior
- **Attenuation: 37 dB, two-layer 44 dB**

**Underground**

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

**Top coating**

Preferably covered with plastic bonded, **water-based emulsion paints**, dispersion silicate paints, facade paints or silicon resin paints. Not applicable are pure mineral paints (clay, loam, chalk, silicate). Please find appropriate product recommendations in the technical data sheet. Due to the high adhesive tensile strength (to ETAG 004 for EIFS-systems, minimum 0.08 N/mm<sup>2</sup>), applicable directly under pure organic plaster, no mineral pasters!

**Grounding**

Must be grounded! We recommend interior the **grounding strap EB2** plus **grounding set GW or GB**, exterior the **fiber additive AF3** plus the **grounding set GE**.

**Frost resistance**

**This product is frost resistant** (proved for 5 frost/thaw cycles), can be shipped throughout the year by air cargo or ship.

**Screening attenuation**

The screening attenuation is **regularly tested in our own EMC laboratory**. We have measurement setups due to the following standards: **ASTM D4935-10, IEEE Std 299-2006, IEEE Std 1128-1998, ASTM A698/A698M-07**. Please find the test report at our homepage directly on the product page.

**Ingredients**

Pure acylic dispersion, graphite, water, carbon black, additives, preservative (MIT, BIT).

**Optional: Fiber additive AF3**

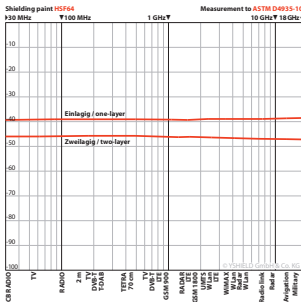
This paint is formulated without long conductive carbon fibers to allow airless spraying. For crack bridging and consequential a better grounding we advise to mix in the fiber additive AF3.

## HSF64 - Shielding paint (HF+LF)

### ECOLOGICAL COMPROMISE



YSHIELD® HSF64



### Characteristics

**Ecological compromise. Recommendation for interior use.** Based on **potassium silicate** combined with a **pure acrylic binder** for enhanced adhesion. For the shielding of high-frequency radiation (HF) and low-frequency electric fields (LF).

- Dispersion-silicate paint with **limited moisture resistance, therefore for interior use only**
- Breathable, solvent free, **low-emission, low odor**
- Because of a **pH-value of 12** (superalkaline), application only with protective equipment
- **Application:** For interior use only
- **Attenuation:** 39 dB, two-layer 46 dB

### Underground

**Interior:** Excellent adhesion on almost all undergrounds like existing emulsion paints, sheetrock, wallpaper, cement, plaster, masonry, wood, glass, plastic substrates, etc. Not usable on gypsum based substrates!

### Top coating

Preferably covered with plastic bonded, **water-based emulsion paints** or dispersion silicate paints. We restricted recommend pure mineral paints (clay, loam, chalk, silicate). Please find appropriate product recommendations in the technical data sheet.

### Grounding

Must be grounded! We recommend interior the **grounding strap EB2** plus **grounding set GW or GB**.

### Frost resistance

**This product is not frost resistant on shipping.** At long frost periods during winter time, the shipping can be rescheduled by a few days. Our frost resistant shielding paint HSF54 is our alternative that can always be shipped.

### Screening attenuation

The screening attenuation is **regularly tested in our own EMC laboratory.** We have measurement setups due to the following standards: **ASTM D4935-10, IEEE Std 299-2006, IECIEE Std 1128-1998, ASTM A698/A698M-07.** Please find the test report at our homepage directly on the product page.

### Ingredients

Potassium silicate, graphite, water, pure acrylic dispersion, carbon black, additives, preservative (MIT, BIT).

### Optional: Fiber additive AF3

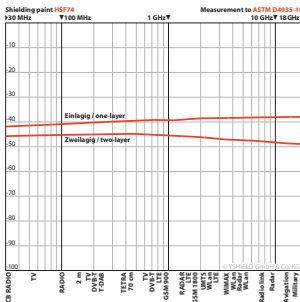
This paint is formulated without long conductive carbon fibers to allow airless spraying. For crack bridging and consequential a better grounding we advise to mix in the fiber additive AF3.

**HSF74 - Shielding paint (HF+LF)**

**MAXIMUM ECOLOGY**



YSHIELD® HSF74



**Characteristics**

Pure silicate paint with an absolute modicum of ingredients, also without a preservative agent. To be recommended only with an allergy against preservative agents. Based on potassium silicate. For the shielding of high-frequency radiation (HF) and low-frequency electric fields (LF).

- As a pure silicate paint with limited moisture resistance, therefore for interior use only
- Highly breathable, solvent free, low-emission, neutral odor, without preservative agent
- Because of a pH-value of 12 (superalkaline), application only with protective equipment
- **Application:** For interior use only
- **Attenuation:** 39 dB, two-layer 45 dB

**Underground**

**Interior:** Good adhesion on absorbent, untreated, preferably mineral 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**

Preferably covered with plastic bonded, **water-based emulsion paints** or dispersion silicate paints. We restrictedly recommend pure mineral paints (clay, loam, chalk, silicate). Please find appropriate product recommendations in the technical data sheet.

**Grounding**

Must be grounded! We recommend interior the **grounding strap EB2** plus **grounding set GW** or **GB**.

**Frost resistance**

This product is not frost resistant on shipping. At long frost periods during winter time, the shipping can be rescheduled by a few days. Our frost resistant shielding paint HSF54 is our alternative that can always be shipped.

**Screening attenuation**

The screening attenuation is regularly tested in our own EMC laboratory. We have measurement setups due to the following standards: **ASTM D4935-10, IEEE Std 299-2006, IEEE Std 1128-1998, ASTM A698/A698M-07**. Please find the test report at our homepage directly on the product page.

**Ingredients**

Potassium silicate, graphite, water, carbon black, emulsifier, defoamer, cellulose, no preservative agent.

**Optional: Fiber additive AF3**

This paint is formulated without long conductive carbon fibers to allow airless spraying. For crack bridging and consequential a better grounding we advise to mix in the fiber additive AF3.

## NSF34 - Shielding paint (LF)

### ONLY AGAINST ELECTRICAL FIELDS



YSHIELD® NSF34

#### Characteristics

Paint against low frequency **elektrel fields only**. Based on a high quality **pure acrylic binder**. For the shielding of low-frequency electric fields (LF).

- This paint is **frost resistant for shipping in the winter or on pallets in shipping containers**
- Breathable, solvent free, **low-emission, low odor**
- **Application:** Interior, exterior
- **Attenuation: 40 dB (99 %)**

#### Underground

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

#### Top coating

Preferably covered with plastic bonded, **water-based emulsion paints**, dispersion silicate paints, facade paints or silicon resin paints. Not applicable are pure mineral paints (clay, loam, chalk, silicate). Please find appropriate product recommendations in the technical data sheet. Due to the high adhesive tensile strength (to ETAG 004 for EIFS-systems, minimum 0.08 N/mm<sup>2</sup>), usable directly under pure organic plaster, no mineral pasters!

#### Grounding

Must be grounded! We recommend interior the **grounding strap EB2** plus **grounding set GW or GB**, exterior the **fiber additive AF3** plus the **grounding set GE**.

#### Frost resistance

This product is **frost resistant** (proved for 5 frost-/thaw cycles), can be shipped throughout the year by air cargo or ship.

#### Screening attenuation

The screening attenuation is **regularly tested in our own EMC laboratory**. We have measurement setups due to the following standards: **ASTM D4935-10, IEEE Std 299-2006, IEEEE Std 1128-1998, ASTM A698/A698M-07**. Please find the test report at our homepage directly on the product page.

#### Ingredients

Pure acylic dispersion, graphite, water, carbon black, additives, preservative (MIT, BIT).

#### Optional: Fiber additive AF3

This paint is formulated without long conductive carbon fibers to allow airless spraying. For crack bridging and consequential a better grounding we advise to mix in the fiber additive AF3.

## Accessories

### AF3 - Fiber additive



YSHIELD® AF3

#### Characteristics

**Special additive for mixing with our shielding paints.** All our shielding paints are formulated without crack-bridging carbon fibers for airless spray application. In case of cracks forming in the substrate, this additive contains long, electrically conductive carbon fibers which guarantee the grounding even without using the grounding strap.

#### Processing

Stir in the additive (90 ml) into **5 liter shielding paint**. Use an electro mixer that all mixes homogeneously.

#### Ingredients

Water, carbon black, carbon fibers, additives, preservative (MIT, BIT)

### GK5 - Primer concentrate



YSHIELD® GK5

#### Characteristics

**Special coordinated high quality primer concentrate** for surface preparation with our shielding paints. For priming of solid old coats of paint, brittle, chalky and absorbent substrates. Consolidating, adhesion promoting, good penetration, regulates the absorbency. Also recommended on our smearing graphite shielding paints, if problematic (mineralic) coatings should be applied.

#### Processing

Use a first-class paint roller. Do not work at temperatures below 5°C/41°F.

#### Consumption

The consumption depends on the character and absorbency of the underground. Typical **interior productivity: 7.5 m<sup>2</sup>/l**. Typical **exterior productivity: 5 m<sup>2</sup>/l**.

#### Preparation

Mix the concentrate (1 liter) with 4 liters of water. Gives 5 liters of primer. If you use tap-water, process within 48 hours.

#### Ingredients

Pure-acrylic binder, additives, preservative (MIT, BIT).



## AR40 - Paint stirrer

### IMPORTANT FOR OUR 1-LITER BINS



YSHIELD® AR40

#### Characteristics

Paint stirrer to mix up our shielding paints. Our **1-liter paint containers have an opening of 40 mm diameter**. None of the usual paint stirrers will fit in this opening. That's why we have developed a stirrer by ourselves. Our paint stirrer is mixing up shielding paints quickly and consistently, even in slim and high paint containers.

## DKL90 - Dispersion glue

### FOR OUR NETTINGS AND FLEECES



YSHIELD® DKL90

#### Characteristics

**Special coordinated dispersion glue for binding our sheet materials** to walls, ceilings, floors, doors, etc.. High quality class water-resistant special glue based on acrylics, breathable, low-emission and solvent-free. **Electrically conductive**, that the materials don't get isolated for grounding.

#### Processing

The application is identical to a wallpaper glue! Avoid bucklings and wrinkles in the materials! The wall surface and the backside of the material is primed with a painter's roller. The material is inserted

wet-on-wet and fixed by hand (with disposable gloves) or with a pressure roller. Work quickly and strip by strip so that the glue won't get dry.

#### Technical data

- **Specially for the following materials:** HNG80, HNG100, NCV95
- **Delivery sizes:** 5 liter
- **Coverage:** 17.5 m<sup>2</sup> - 25 m<sup>2</sup>, depending on the underground
- **Ingredients:** Acrylic binder, water, carbon black, additives, preservative (MIT, BIT)
- **Color:** Black
- **Surface conductivity:** 400 ohm (square resistance R□)



## Common characteristics



### Easy handling and processing

YSHIELD shielding paints **can exceedingly be applied for all purpose**. 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 metalliferous shielding products are not resistant to corrosion. Our shielding paints do not contain any metals but a mixture of carbons instead. That's why our shielding paints are **chemically stable and permanent corrosion-free**, even in damp environment.

### Emissions VOC / PAH

Our shielding coatings 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 paints contain only 0.1 g/l to 1 g/l. 2) The 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 for children toys**.

### Preservation

Any kind of aqueous paint must be preserved. Controversial discussed is the use of Isothiazolinone- compounds, referring to CIT only. CIT is not contained in our paints. Further to this we reject preservation with BIT/silver, like utilized in eco-paints, as we don't want to use nanosilver. **Our preservation with MIT/ BIT has a very low allergenic potential, which is regularly confirmed by MCS-customers.** As an alternative, our shielding paint HSF74, is free from any kind of preservatives.

### Sustainability

Due to its **paint-typical holohe-dral structure without holes**, our shielding paints provide a nearly linear attenuation up to very high frequencies, regardless of the direction of signal polarization. Proved up to 18 GHz they are very **future-proof**.

### Carefully selected ingredients

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

### Grounding instructions

Please find more information about the necessary grounding at „grounding“.

### Handling and processing

Please find detailed handling instructions in our **technical data sheets on our website** on the product pages! Upon request we will be happy to send this data sheets to you!

Paints

## Project examples

Sheet products

### Shielding data center (60-80 MHz), Germany



Fabrics

### Shielding industrial building (airless), Germany



Textile products

Canopies

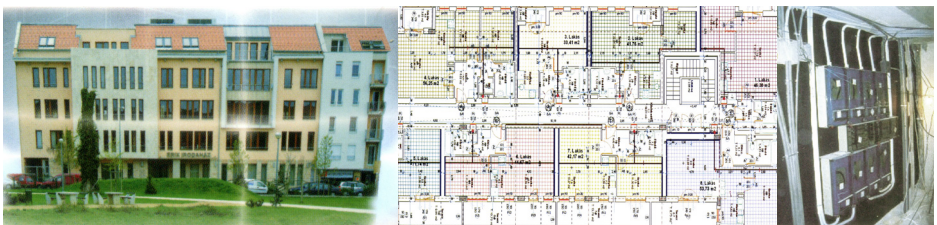
### Shielding semi-detached house (2648 $\mu\text{W}/\text{m}^2 \rightarrow 10.2 \mu\text{W}/\text{m}^2$ ), Germany



Grounding

Measurement

### Shielding multifamily building complex, Hungary



Electro

Prices

**Project examples**

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



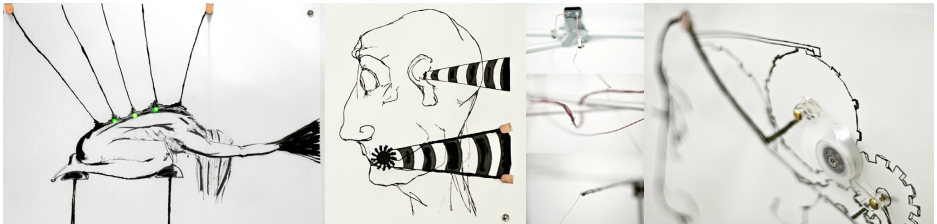
**Shielding one-family house ( $604 \mu\text{W}/\text{m}^2 \rightarrow 0.26 \mu\text{W}/\text{m}^2$ ), Australia**



**Shielding one-family house, Australia**



**Art installation with conductive paint HSF54, Great Britain**



Paints

Sheet products

Fabrics

Textile products

Canopies

Grounding

Measurement

Electro

Prices



**Project examples****Shielding airport terminal, Asia****Shielding development department at Asus-computer, Taiwan****Shielding apartment houses, Greece****Shielding BAUFRTZ framehouses, Germany**

**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**



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