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Technical data sheet - Shielding paints

	HSF 44	HSF 54	HSF 64	HSF 74	NSF 34
Brief description	**Technically our best paint.** **Our exterior recommendation.** Suitable for living- and sleeping rooms after one day drying time.	**The All-in-One paint, if you cannot decide.** Frost-resistant classic paint for worldwide shipping. Low-emission.	**Ecological compromise.** **Our interior recommendation.** Dispersion-silicate paint with excellent adhesion. Low-emission.	**Pure silicate paint without preservative agent.** Only recommended with allergies against preservative agents. Low-emission.	**To shield electrical fields (LF) only.** Superior mechanical and chemical properties. Low-emission.
Shielding HF / LF	HF / LF	HF / LF	HF / LF	HF / LF	- / LF
Screening one-layer *	**38 dB** (99.984 %)	**37 dB** (99.980 %)	**39 dB** (99.987 %)	**39 dB** (99.987 %)	**40 dB**
Screening two-layer *	45 dB (99.997 %)	44 dB (99.996 %)	46 dB (99.997 %)	45 dB (99.997 %)	
Ecology	Normal	Normal	High	Very high	Normal
VOC content **	1 g/l	**0.2 g/l**	**0.1 g/l**	**0.1 g/l**	**0.1 g/l**
PAH content ***	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg	0.002 mg/kg
Binding agent	Synthetic dispersion	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, techical coatings	Interior, exterior	Interior only	Interior only	Interior, exterior
Typical coverage per 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)	Int.: 7.5 m^2 (81 ft^2)	Int.: 7.5 m^2 (81 ft^2); Ext.: 5 m^2 (54 ft^2)
Moisture resistance	**Very high**	**High**	Normal	Normal	**High**
Practical 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	**Very low**	**Very low**	Small splatters	Small splatters	Low
Adhesive tensile strength	**3.3 N/mm^2**	**2.3 N/mm^2**	**2.2 N/mm^2**	1.7 N/mm^2	4.1 N/mm^2
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 hard	Hard, frail	Elastic soft
Color	Black	Black	Black	Black	Black
Temperature max.	150 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	1.25 kg / l	1.25 kg / l	1.27 kg / l	1.3 kg / l	1.05 kg / l
Solids content	52 %	56 %	52 %	45 %	24 %
MFFT	5° C	5° C	5° C	5° C	5° C
Frost resistance ****	No	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
Price per m^2 net *	EUR 5.60	EUR 5.60	EUR 5.60	EUR 5.60	EUR 4.48

* Maximum at a coverage of 7.5 m^2/l per layer.
** 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 only valid liquid in the container, of course on the wall its permanent frost-resistant.

Product features

Intended use

Electro-conductive base coatings for the protection against high-frequency electromagnetic fields and/or low-frequency electric fields.

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 military facilities or 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 deparments. In prisons to hamper unauthorized cellular calls. Further applications: Data centers, technical rooms, schools, nurseries, hotel rooms, hospital rooms, recording studios, etc.

Area of application

Walls and ceilings: The typical application of the shielding paints interior and/or exterior (depends on the shielding paint, see table above).

Floor areas: • Bulk laid floor coverings (carpets, laminate, etc.) can be laid directly onto the shielding paints. Pay attention, that the shielding paints are not damaged! • In case of glued floor coverings (carpets, cork, laminate, etc.) the shielding paints have to be aftertreated with a solvent free priming coat to improve the adhesion. • We advise against bonding e.g. real-wood parquets, the adhesive tensile strength of the shielding paints are probably insufficient.

Under plaster (HSF44, HSF54, NSF34): Due to high adhesive tensile strenghts of the shielding paints, applicable directly under pure plastic bonded plaster.

Technical coatings (HSF44): On plastic materials, glass, flexible plastic sheets, carpet backsides, laminates, etc. with knife coting, immersion, roll application, etc. Often used as cheap replacement for silver(copper)laquers, or as electrically heated coating.

Corrosion resistance

All shielding paints does not contain metal particles. Based on carbons they are long-term durable and not oxidizing.

Shielding attenuation

The shielding 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. You find the test reports on our website on the corresponding product pages.

Safe material handling

Safety notes

All paints have a high coloring power, so please proceed with care. Wipe off stains immediately with damp cloth. Do not let stains dry up. Do not inhale spray mist! Absolutely make sure, that all areas are well ventilated during use and drying time. Do not eat, drink or smoke during painting! Rinse thoroughly immediately after skin or eye contact!

HSF64, HSF74: This shieldings paints have a pH-value of 12 (superalkaline), the application should be done by a professional painter, for use with protective equipment (gloves, safety glasses, etc.) only.

VOC-content

HSF44: 1 g/l VOC.
HSF54: 0.2 g/l VOC.
HSF64: 0.1 g/l VOC.
HSF74: 0.1 g/l VOC.
NSF34: 0.1 g/l VOC.

The EU limit value for cat. A/a is 30g/l (by 2010).

Ingredients

HSF44: Synthetic dispersion, graphite, water, carbon black, additives, preservative.

HSF54: Pure acrylics dispersion, graphite, water, carbon black, additives, preservative.

HSF64: Potassium silicate, graphite, water, pure acrylics dispersion, carbon black, additives, preservative.

HSF74: Potassium silicate, graphite, water, carbon black, additives, no preservative.

NSF34: Water, pure acrylics dispersion, carbon black, additives, preservative.

Preservative: If stated above, the shielding paint contains MIT (2-Methyl-4-isothiazolin-3-on) and BIT (1,2-Benzisothiazolin-3-on) as preservation substances. Advisory service for allergic persons under telephone number 0049-(0)8531-31713-0.

Grounding

Grounding regulation

Large area shieldings executed with shielding materials are no electrical equipment but „new conductive parts" according to IEV 826-03-03 or IEV 195-06-11 and thereby a new method of DIN VDE 0100-100:2009-06. By connecting the material(s) to the potential equalization they are an inherent part of the electrical system. Generally accepted rules of technology have to be respected.

According to the latest state of technology it is important to distinguish between protective equipotential bonding and functional equipotential bonding (FEB). The protective equipotential bonding (green/yellow cable) is a protective measure and ensures, in the event of contact voltage, the immediate action of safety devices (e.g. line safety switch). The function of the functional equipotential bonding (transparent cable) is the reduction of emission of low frequency electrical fields on large area shieldings (i.e. prevention of leaking electrical field).

Please find more information in our „grounding informations" sheet on our website.

Grounding accessories

To obtain an accordingly grounding, we exclusively recommend our special grounding accessories. For interior use: Grounding plate GW or GB in combination with grounding strap EB2. For exterior use: Grounding plate GE.

Handling

Interior approach

• Prepare the underground with a primer. • Drill holes for the grounding plate. • The ground-strap has to be applied uninterrupted in one piece through all to be painted surfaces, as stated in our grounding instructions sheet. • Apply the shielding paint in one or two layers, depending on the favored shielding attenuation. Apply second coat of shielding paint to the area where the grounding plate will be mounted. • Allow the paint 24 hours to dry. • Fix the grounding plate. • For further procedure references please follow up at subitem „Final coat".

Exterior approach

• Prepare the underground with a primer. • Level out the mounting surface for the grounding plate. • Drill holes for the grounding plate. • Apply the shielding paint in one or two layers, depending on the favored shielding attenuation. Apply second coat of shielding paint to the area where the grounding plate will be mounted. • Allow the paint 24 hours to dry. • Fix the grounding plate and glue the top cover. • For further procedure references please follow up at subitem „Final coat".

Application temperature

Minimum application temperature: 5°C / 41°F. This temperature applies also for the drying time!

Underground

HSF44, HSF54, HSF64, NSF34: Excellent adhesion on almost all undergrounds like existing emulsion paints, sheetrock, wallpaper, cement, plaster, masonry, wood, many plastics, etc.

HSF74: Good adhesion on absorbent, untreated, preferably mineral undergrounds like chalk, silicate, clay, etc.. Restricted use on absorbent emulsion paints, wallpapers, etc., please check first on a test area!

HSF64, HSF74: With potassium silicate as ingerient not applicable on gypsum based undergrounds.

The underground needs to be solid, clean, degreased and dry. Absorbent or porous surfaces must be prepared with a primer. Old coats of paint or old wallpapers which can be etched by water, should be removed.

Priming coat

Absorbent or porous surfaces necessarily must be prepared with a primer. In case of not using a primer, the binding agent will infiltrate together with the water in the substrate. In addition, this will lead to an aggravation of the physical characteristics of the shielding paints. **Optical control:** Paint a small test area and let dry. When the surface is silver shimmering, the underground is too much absorbent. When the surface is pure black, the underground is adequate primed.

Preparation

The conductive particles deposit on the bottom of the paint container after a prolonged storage. Therefore shake the paint container well before opening and and thoroughly mix the paint, with an electrical paint stirrer for several minutes.

Compatibility

The shielding paint is ready for use. Never mix with water or other coating materials.

Application

• Use a first-class paint roller with a pile height of 10-13 mm. To achieve a constant high attenuation, it is essential to apply the shielding paint with equal thickness and to ensure a full faced converting; do not skip areas! Always soak the paint roller with the equal amount of paint and try to coat equal surfaces! • Limited usable are lacquer-rollers, foam-rollers or brushes, as the coating often gets applied too thin for a good attenuation! • Airless spraying is possible with nozzles bigger than 525 (0.25 inch / 0.64 mm), smaller nozzles get chocked sometimes. • Application methods in technical coatings: knife coating, dip-coating, roll application, etc.

Drying time

• Allow to dry for 12-24 hours before overcoating. • Protect from rain at least for 12 hours. • The coating is entirely cured after 7 days.

Final coat

To protect the soft, viscoplastic surfaces of the shielding paints against mechanical damage and humidity, we recommend to apply 2 top coats.

On our website under "Paints" ➜ "FAQ top coatings" you will find a basic compatibility list. Worldwide variably paints are available. Therefore a guarantee for specific properties or the suitability of the product for a specific application purpose cannot be derived from the data given. We always recommend to apply a paint coat on a test area before processing.

Interior: With high-quality, good covering, plastic bonded dispersion emulsion paints or dispersion silicate paints. Alternatively paste over with wallpapers, glass fabrics, etc.

Exterior: With high-quality, good covering, highly hydrophobic dispersion emulsion paints or silicon resin paints.

Mineral paints: Pure mineral bonded coatings with clay, loam, chalk or silicate often adhere bad on the graphite surface of the shielding paints, and therefore must never be used!

Ecological paints: It is difficult to give a common recomendation. • Problematic: Slaked lime paints (e.g. Kreidezeit), natural resin dispersions (e.g. Livos, Auro), casein glue paints, clay paints (e.g. Claytec) or pure silicate paints (e.g. Kreidezeit, Auro). • Well suited: KEIM silicate paints (Biosil, Ecosil, Optil), VOLVOX clay paint, HAGA chalk paint.

Under plaster (HSF44, HSF54, NSF34): Due to the high adhesive tensile strenghts of the shielding paints, these are applicable (in conformity with ETAG 004 for EIFS-systems, minimum 0.08 N/mm^2) after prior priming under pure plastic bonded plaster. Never use mineral plasters, no adhesion!

Consumption

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

Tip: Referring to customer feedbacks we know, that our shielding paints are often applied far to thin. For a good levelling, our paints are of low viscosity and that´s why our customers tend to a thin coating. The problem is, that **a spreading rate of more than 7.5 m^2/l leads to a decrease in attenuation**! We request to apply the shielding paints quite thick, even if this seems to be prodigal to you.

Further information

Storage

Store cool and frost free. Keep safe from children. Once the paint container has been opened, close tightly after usage and store cool.

Period of storage

At least 12 months, see the batch sticker on the paint container.

Disposal

Utensils should be cleaned immediately after use with water and soap. Containers must be absolutely empty for recycling. Dried up paint remainders may be disposed of with the household garbage. Do not let escape into sewerage, water bodies or ground.

Identification marks

Produktcode: M-DF01 (GISCODE)
Water hazard class: 1 (VwVwS)
Waste code: 08 01 12 (AVV)
Hazardous ingredients: –
ADR: –
UN-number: –
Transport hazard class: –
Environmental dangers: –

Safety data sheet

The safety data sheet is available upon request under telephone number 0049-(0)8531-31713-0.

Disclaimer

Aforesaid inforamtions have been assorted to the state of processing and application technology. As we dont have any influence on processing and application, no liabilitay can be accepted out of the contents of this information sheet. Processors are in either case bounded to a skilled evaluation of the processing, in consideration of the product attributes and fitness. Details and notwithstanding details, transcending the content of this information sheet, require our confirmation in writing.

Our gereral terms and conditons are valid as mentioned. With this newest edition of our technical data sheet all previous versions loose their validity.