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100dB EMC shielding fleece Aaronia X-Dream®

Optimal for rf Shielding-Application of homes, offices, laboratories and manufacturing

References / examples of proof:

- ◆ EADS GmbH, Ulm, Germany
- ◆ BMW, Munich, Germany
- ◆ Daimler Chrysler AG, Böblingen, Germany
- ◆ Fraunhofer Institut für Kurzzeitdynamik, Freiburg, Germany
- ◆ EnBW, Karlsruhe, Germany
- ◆ BASF, Schwarzheide, Germany
- ◆ Volkswagen Motorsport GmbH, Hannover, Germany
- ◆ Institut für Luft- und Raumfahrtmedizin, Cologne, Germany



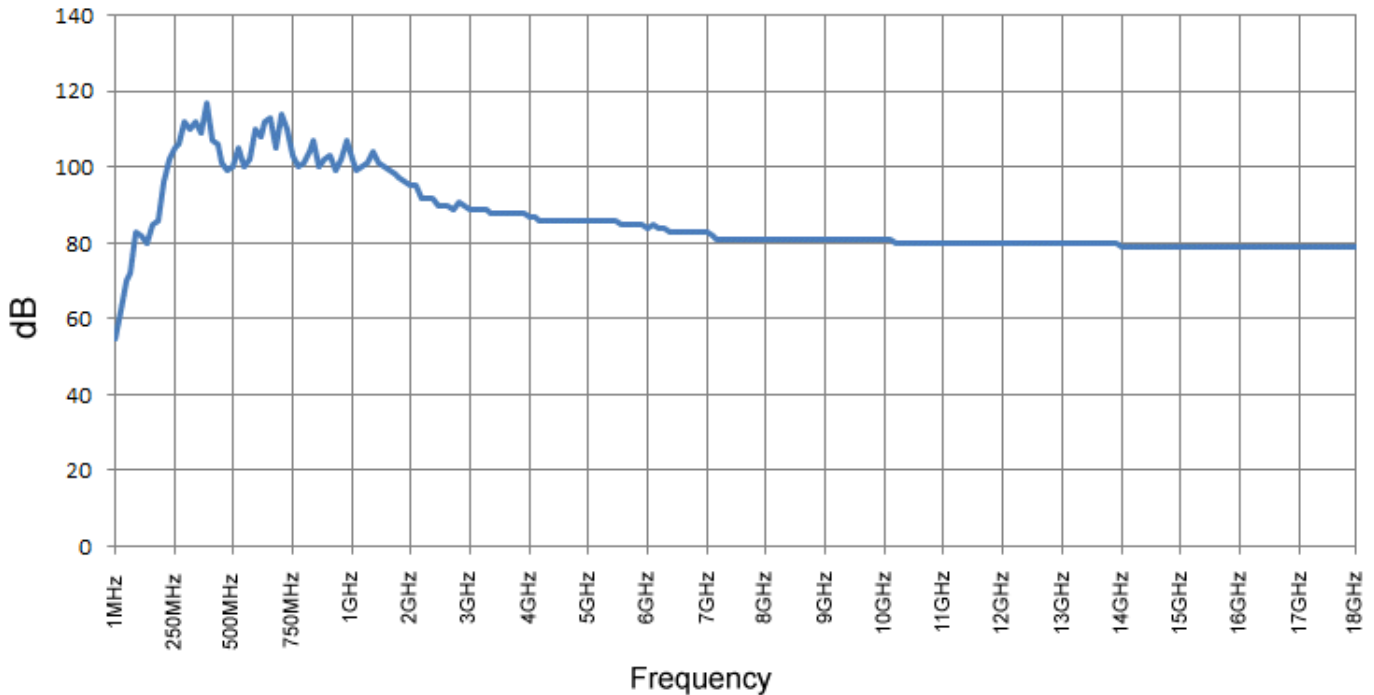
Specifications

Aaronia X-Dream

- ◆ Breathable
- ◆ Rot proof
- ◆ Frost proof
- ◆ Foldable
- ◆ Paintable
- ◆ Anti-static
- ◆ Very lightweight
- ◆ Usable inside concrete
- ◆ Very easy handling even for the novice
- ◆ Length per standard packaging unit: 0,7m, 7m or 36m (1m², 10m², 50m²). Also available as cut good.
- ◆ Lane width: 1,4m
- ◆ Thickness: 0,5mm
- ◆ Colour: Brown/Silver
- ◆ Weight: approx. 130g/m²
- ◆ Material: High-performance copper/polyester compound
- ◆ Screening efficiency **static fields**: 99,999.999% to 99,999.999.99% (only with grounding)
- ◆ Screening efficiency **low-frequency, electric fields**: 99,999.999% to 99,999.999.99% (only with grounding)
- ◆ Screening efficiency **high-frequency fields**: 70dB (99,999.99%) at 20GHz to over 110dB (99,999.999.999%) at 500MHz (even without grounding)
- ◆ Surface Resistivity: <=0.07 ohms/square

Damping chart

Aaronia X-Dream 1MHz - 18GHz



Standard-conformant tests according to MIL-STD-285 approve the extreme screening performance of Aaronia X-Dream®: The damping performance for pulsed high-frequency radiation in the frequency range between 1 and 2GHz, for instance caused by cell towers, is up to 100dB (99,999.999.99%). Compared to the also shown screening fleeces from other manufacturers, Aaronia X-Dream® offers a one hundred times (or more) better screening efficiency in the tested frequency range. Furthermore, allowing grounding, it is equally efficient against static and low-frequency electric fields such as caused by almost any cables running through homes, various home appliances, high-voltage lines, etc.

Description

Material characteristics:

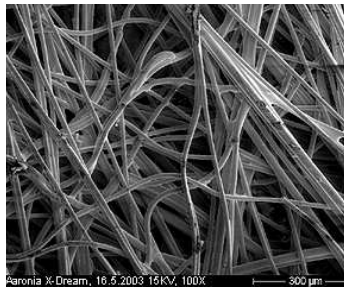
The various screening systems available on the market today differ widely in both affordability and protection efficiency. They are often far too difficult to handle, particularly for the novice, but also for professional users. Apart from this, they are mostly far too expensive. Also, customers currently mostly need two separate screenings simultaneously, as most screenings against RF offer hardly any protection against LF fields, and vice-versa.

With their EMC high-tech fleece Aeronia X-Dream®, Aeronia probably offers the world's most efficient screening performance of over 110dB, unique in this price category and with these material characteristics. Still, Aeronia X-Dream® is easy to handle even for the novice. Aeronia X-Dream® screening fleece offers simultaneous protection against high-frequency (RF) and low-frequency (LF) E-field radiation. The secret behind this extremely good efficiency is a patented tissue based on a compound of copper and polyester. Aeronia X-Dream® is easy to handle and to install. It can be folded without taking damage, is sturdy, frost proof, rot proof, breathable and can even be installed in concrete. As such, it is also applicable for outdoor use and can thus save a lot of cost.

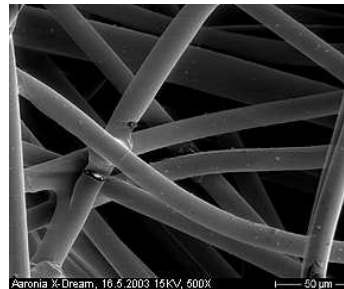
Aeronia X-Dream® can be used both for screening electric fields from local LF radiation sources like cables or distribution boxes, as well as for screening rooms or entire houses or other buildings against RF radiation. Installation is performed by laying the fleece in adjacent lanes which need to overlap approx. 15cm for guaranteeing a closed surface. It is noteworthy that it is not necessary to ground Aeronia X-Dream® for RF screening! Still, we generally recommend grounding using our grounding package, as this will also add protection against low-frequency electric fields from high-voltage lines, power cables etc.



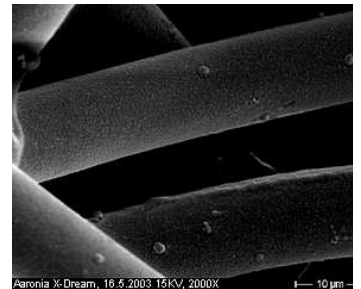
Aeronia X-Dream 16.5.2003 Leica-Stereo, 200X



Aeronia X-Dream, 16.5.2003 15kV, 100X 300 µm



Aeronia X-Dream, 16.5.2003 15kV, 500X 50 µm

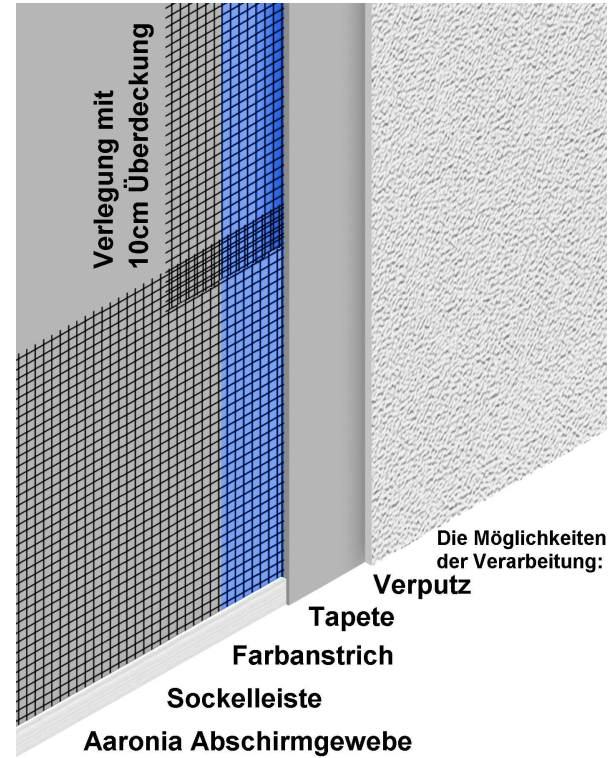


Aeronia X-Dream, 16.5.2003 15kV, 2000X 10 µm

High-resolution imaging shows the chaotic structure of Aeronia X-Dream® fleece, which provides exceptional screening performance. Also it shows the inseparable interconnections between the fibres, thus forming a structure impermeable to RF radiation.

Screening a room:

To protect a room (such as a bedroom) against high frequency radiation, the entire room needs to be covered with Aaronia X-Dream® completely. On the other hand, if shielding against low-frequency electric fields (such as the electrical distribution box or in-wall cables) is desired, only a small area around the radiation source needs to be covered. Attention: For achieving low frequency shielding, the fleece must be grounded! For this, we strongly recommend our Aaronia grounding package. For floors, the fleece can be installed invisibly under the carpet, or, in a new building, in the floor pavement. When attaching to walls, the fleece can be attached like usual wallpapers using a special glue. If walls are made from plasterboard, wood or similar, the fleece can simply be "stapled" to the wall. Though, the easiest alternative is the self-adhesive "PLUS" version of Aaronia X-Dream®. The surface needs to be dust-free, free of grease and dry. Attachment to ceilings can be performed similarly. Doors and their frames should be covered entirely and completely with the fleece, preferably using the self-adhesive Aaronia X-Dream PLUS®, yielding to an almost perfect connectivity between the door's fleece and the fleece used in the rest of the room. For window use, we recommend Aaronia-Shield® which allows elegant installation as an invisible "fly screen". After installation, the EMC fleece can also be painted and covered with wallpaper or plaster. It even offers an attractive surface with the original copper appearance. Our installation manual makes it easy even for the novice to construct a screened room without hassle.



Shielding a house or a building:

Houses and other buildings should be protected with Aaronia X-Dream indoors. This is achieved by glueing or "stapling" the EMC fleece to the walls. In roofs, the fleece should be installed directly beneath the vapor barrier. In floors, the fleece can even be installed in the floor pavement.

Always note that for professional RF screening, a hermetically sealed enclosure, a so-called Faraday cage, must be built. Be careful to always leave a bit of overlap when attaching the fleece to walls, floors and ceilings to be able to later connect the lanes without gaps! Windows need to be screened as well. For this, we recommend our highly-transparent shielding fabric Aaronia-Shield®.

Damping specifications for Aaronia high-performance shielding products

Product	Frequency	Damping in dB:	Damping factor	Damping in %	Application examples:
A 2000+	1GHz 10GHz	20dB 10dB	100 10	99,0% 90%	Indoor and outdoor shielding, low exposure
Aaronia-Shield®	1GHz 10GHz	50dB 45dB	100.000 30.000	99,999% 99,992%	Textile applications (Canopies, clothing, curtains etc.) Low and high exposure
Aaronia X-Dream®	1GHz 10GHz	100dB 80dB	10.000.000.000 100.000.000	99,999.999.99% 99,999.999%	Indoor shielding, measurement chambers High to highest exposure

Notice: when using the dB unit, an increase of 10dB is equivalent to a 10fold increase in strength. For example, 100dB is 10 times as strong as 90dB, or 100 times as strong as 80dB, etc.

References

Cross-Section of Aeronia Clients

Government, Military, Aeronautic, Astronautic

- ♦ NATO, Belgium
- ♦ Department of Defense, USA
- ♦ Department of Defense, Australia
- ♦ Airbus, Germany
- ♦ Boeing, USA
- ♦ Bundeswehr, Germany
- ♦ NASA, USA
- ♦ Lockheed Martin, USA
- ♦ Lufthansa, Germany
- ♦ DLR, Germany
- ♦ Eurocontrol, Belgium
- ♦ EADS, Germany
- ♦ DEA, USA
- ♦ FBI, USA
- ♦ BKA, Germany
- ♦ Federal Police, Germany
- ♦ Ministry of Defense, Netherlands

Research/Development, Science and Universities

- ♦ MIT - Physics Department, USA
- ♦ California State University, USA
- ♦ Indonesien Institute of Science, Indonesia
- ♦ Los Alamos National Laboratory, USA
- ♦ University of Bahrain, Bahrain
- ♦ University of Florida, USA
- ♦ University of Victoria, Canada
- ♦ University of Newcastle, United Kingdom
- ♦ University of Durham, United Kingdom
- ♦ University Strasbourg, France
- ♦ University of Sydney, Australia
- ♦ University of Athen, Greece
- ♦ University of Munich, Germany
- ♦ Technical University of Hamburg, Germany
- ♦ Max-Planck Institute for Radio Astronomy, Germany
- ♦ Max-Planck-Institute for Nuclear Physics, Germany
- ♦ Research Centre Karlsruhe, Germany

Industry

- ♦ APPLE, USA
- ♦ IBM, Switzerland
- ♦ Intel, Germany
- ♦ Shell Oil Company, USA
- ♦ ATI, USA
- ♦ Microsoft, USA
- ♦ Motorola, Brazil
- ♦ Audi, Germany
- ♦ BMW, Germany
- ♦ Daimler, Germany
- ♦ Volkswagen, Germany
- ♦ BASF, Germany
- ♦ Siemens AG, Germany
- ♦ Rohde & Schwarz, Germany
- ♦ Infineon, Austria
- ♦ Philips, Germany
- ♦ ThyssenKrupp, Germany
- ♦ EnBW, Germany
- ♦ CNN, USA
- ♦ Duracell, USA
- ♦ German Telekom, Germany
- ♦ Bank of Canada, Canada
- ♦ NBC News, USA
- ♦ Sony, Germany
- ♦ Anritsu, Germany
- ♦ Hewlett Packard, Germany
- ♦ Robert Bosch, Germany
- ♦ Mercedes Benz, Austria
- ♦ Osram, Germany
- ♦ DEKRA, Germany
- ♦ AMD, Germany
- ♦ Keysight, China
- ♦ Infineon Technologies, Germany
- ♦ Philips Semiconductors, Germany
- ♦ Hyundai Europe, Germany
- ♦ JDSU, Korea
- ♦ Wilkinson Sword, Germany
- ♦ IBM Deutschland, Germany
- ♦ Nokia-Siemens Networks, Germany