

Environmental Analysis
Professional Measurement
of Electronic Smog



Spektrumanalyser



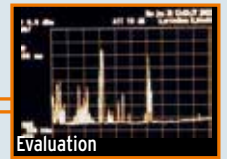
Laptop



Dipol Antenna



Measurement



Evaluation



Shielding

E-Smog Shielding



Broadband Antenna



USLP Antenna



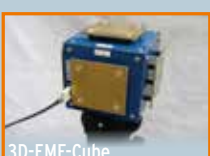
Field Probe



Horn Antenna



3D Data Logger



3D-EMF-Cube



Earth Connection



After-Check



High Living Quality

Special Fine Mesh
for Highly Effective Shielding
of Electronic Smog

Cuprotect®

Stress through E-Smog

As a matter of fact stress through electronic smog increases continuously.

- Mobile phone networks are expanding.
- Official radio services, television and radio broadcast are being digitalised (pulsed frequencies).
- Homes and offices are increasingly supplied with wireless electronic systems.
- Radar senders with a range of many kilometres pulse around the clock.
- Shielded electrics is not the official standard yet.
- Sensible areas for recovery and recreation could be designed without distortion of the natural magnetic field.



Mobile phone senders on roofs, chimneys and television masts

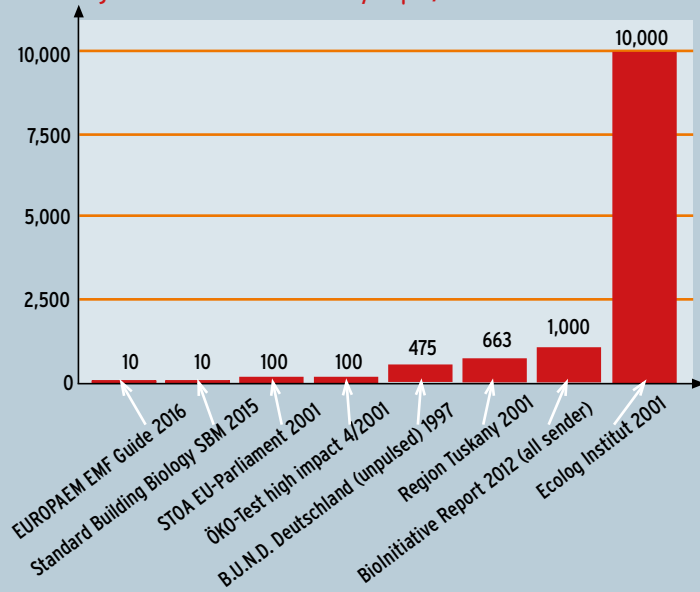


Electric supply, high-voltage power lines, wireless DECT-telephones, radar sender

Preventive Limits of High Frequency Stress

Comparing preventive limiting values and recommendations for pulsed (phase modulated) mobile phone radiation (January 2017)

electromagnetic radiation flux density in $\mu\text{W}/\text{m}^2$



Professional Measurement



Inspection of high frequency situations



High frequency electromagnetic radiation and low frequency electric fields should always be measured with professional, calibrated instruments previous to any shielding actions being taken.

Individual shielding advice includes both, saves costs and guarantees optimal effectiveness.



Radar measurement



Measuring result

E-Smog Services

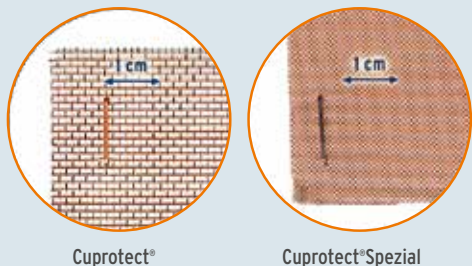
- Design of expert shielding measures for high frequency electromagnetic radiation and low frequency electric fields
- Building biological consultancy for architects, developers and construction companies
- High frequency measurements up to 26.5 GHz with calibrated measuring instruments
- 3D-measurements of low frequency electric and magnetic fields
- 3D-measurements of static magnetic fields
- Lectures on mobile phone radiation and electronic smog in general
- Preparation of location analyses and reports on the current situation of mobile phone radiation
- Trainings and seminars



Measurement: EMC-Test at NRW GmbH Dortmund, 23/11/2004
Box wrapped by double layer of Cuprotect[™] Spezial Shielding
effectivity up to 105 dB

Shielding with **Cuprotect®**

Cuprotect® and Cuprotect®Spezial are highly effective fine meshes for the shielding of low frequency electric fields and high frequency electromagnetic radiation up to a shielding effectivity of 99.99999999 %.



Cuprotect®

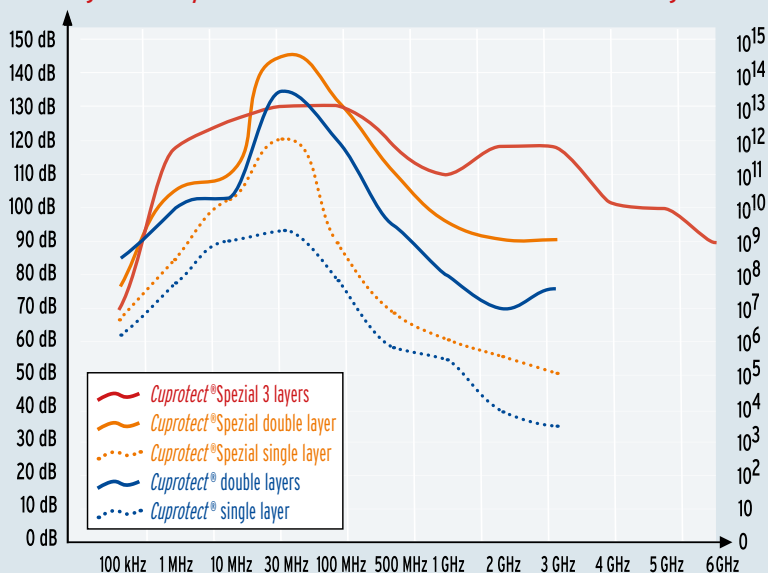
Cuprotect®Spezial

Effectivity of Cuprotect

Analysis of the high frequency transmission attenuation acc. to MIL-STD 188-125 from 100 kHz to 6 GHz by the accredited EMV-Lab EMCC Dr. Rasek, Ebermannstadt 28/9/2005, 31/7/2008 und 6/3/2009.

shielding effectivity in dB

shielding factor



Areas of Use

- Private and commercial residential building
- Timber and timber frame construction, dry-lining
- Roof and external walls
- Application into plaster or mortar

Properties

- Extremely high electrical conductivity
- Diffusivity, tensile strength, flexibility
- No alteration of the natural magnetic field
- Very high HF shielding effectivity
- Simple and inexpensive fixing

Note

Choosing Cuprotect® for your shielding measures guarantees a factor of 1,000 for the attenuation of electromagnetic waves under practice conditions, provided that other elements such as windows and doors are integrated into the shielding concept designed by a shielding expert.

Quality of shielding



After-check within a house subsequent to shielding

The extent and effectivity of completed shielding measures can be checked and documented on request.

We classify the shielding quality in three categories of living and working environments, which are rated by different criteria.

- Detached Houses
- Rehabilitation and Treatment Centres, Spas, Geriatric Care Centres
- Hotels and Holiday Homes
- Office Work Places

Rating Criteria

Category: Detached House	*** e-smog free	** e-smog low	* e-smog reduced
electric field strength (V/m)	< 1	< 3	< 6
magnetic flux density (nT)	< 30	< 60	< 120
electromagnetic radiation, (flux density in $\mu\text{W}/\text{m}^2$)			
pulsed (e.g. mobile, wifi):	< 1	< 5	< 10
peaks (radar):	< 100	< 500	< 1000
unpulsed (e.g. broadcast):	< 100	< 500	< 1000
static magnetic field, flux density deviation in nT	< 2000	< 4000	< 6000
electrostatic field, surface voltage in Volt	< 100	< 300	< 500

EUROPAEM Precautionary Guidance Values for Radio-Frequency Radiation:

RF source Max Peak/ Peak Hold	Daytime exposure	Nighttime exposure	Sensitive populations ¹⁾
Radio broadcast (FM)	10,000 $\mu\text{W}/\text{m}^2$	1000 $\mu\text{W}/\text{m}^2$	100 $\mu\text{W}/\text{m}^2$
TETRA	1000 $\mu\text{W}/\text{m}^2$	100 $\mu\text{W}/\text{m}^2$	10 $\mu\text{W}/\text{m}^2$
DVB-T	1000 $\mu\text{W}/\text{m}^2$	100 $\mu\text{W}/\text{m}^2$	10 $\mu\text{W}/\text{m}^2$
GSM (2G)	100 $\mu\text{W}/\text{m}^2$	10 $\mu\text{W}/\text{m}^2$	1 $\mu\text{W}/\text{m}^2$
900/1800 MHz			
DECT (cordless phone)	100 $\mu\text{W}/\text{m}^2$	10 $\mu\text{W}/\text{m}^2$	1 $\mu\text{W}/\text{m}^2$
UMTS (3G)	100 $\mu\text{W}/\text{m}^2$	10 $\mu\text{W}/\text{m}^2$	1 $\mu\text{W}/\text{m}^2$
LTE (4G)	100 $\mu\text{W}/\text{m}^2$	10 $\mu\text{W}/\text{m}^2$	1 $\mu\text{W}/\text{m}^2$
GPRS (2.5G) with	10 $\mu\text{W}/\text{m}^2$	1 $\mu\text{W}/\text{m}^2$	0.1 $\mu\text{W}/\text{m}^2$
PTCCH* (8.33 Hz pulsing)			
DAB+ (10.4 Hz pulsing)	10 $\mu\text{W}/\text{m}^2$	1 $\mu\text{W}/\text{m}^2$	0.1 $\mu\text{W}/\text{m}^2$
Wi-Fi 2.4/5.6 GHz (10 Hz pulsing)	10 $\mu\text{W}/\text{m}^2$	1 $\mu\text{W}/\text{m}^2$	0.1 $\mu\text{W}/\text{m}^2$

*PTCCH, packet timing advance control channel.
Based on: Bioinitiative (9, 10); Kundi and Hutter (260); Leitfaden Senderbau (221); PACE (42); Seletun Statement (40). 1) Precautionary approach by a factor of 3 (field strength) = a factor of 10 (power density). See also IARC 2013 (24) and Margaritis et al. (267).

Projects with our Seal of Quality

Realisation Process:

1. Measurement on site previous to design stage
2. Consideration of measuring results during project design
3. Consultation and supervision of the proposed shielding measurements with Cuprotect® in collaboration with the appointed construction companies
4. Re-measurement after completion
5. Documentation and proof of quality

The following projects have been checked after the shielding measurements and qualify with three stars in the category detached house:



Tegernsee, Germany



Fulda, Germany



Hameln, Germany



Hamburg, Germany



Oberding OT Notzing, Germany



Viebrockhaus Hamburg, Germany

Umweltanalytik Kessel

Environmental Analysis Wolfgang Kessel
Building Biological Measuring Technician IBN
Am Bargfeld 15
D-22941 Bargteheide, Deutschland
Tel.: +49 (0) 4532 / 6679
Email: umweltanalytik.kessel@t-online.de
www.umweltanalytik-kessel.de
www.cuprotect.de

