

Special Electromagnetic Radiation Protection Coating

COATING CHARACTERISTICS

- Water – based coating
- Absorption of EMR :
1 Hz to 20000MHZ (20GHZ)
- Attenuation : 2 – 20 db
(depends on coating thickness)
- Decay rate : up to 99.872 %
(peak) and 98.031% (min.)
- Anti – static
- Fire resistant
- Non – toxic (even during fire)
- Absorbs formaldehyde
- Absorbs scatter ionizing
radiation (as 2nd or 3rd barrier)

ACCREDITATIONS

- SIRIM Witness Test Report No:
2012 EMC237 (Function Test)
- SIRIM Witness Test Report No:
2012 EMC238 S11 Reflective
Performance Testing
- Korea Function Test Report
SSRB18001
- SIMT Function Test
Report No:2011F33-60-000244
- National Utility Model
Patent No : 200820030798.4

TEST REPORTS

- MSDS
JST20110321051M
- Anti-Static Test Report
SC110820988
- SVHC Test Report
SHAEC1103527501
- Formaldehyde Test Report
SZ12030073X02
- Fire Resistant Test report
SC110820986
- Ionizing Shield Test Report
SIMT 2011H00-30-017011

INTRODUCTION

Electrical / electronic systems emit Electromagnetic Magnetic Radiation (EMR). This radiation consists of an Electric Field and a Magnetic Field that is invisible to the naked eye. **Electric fields** are created by differences in voltage, and exist even when there is no current flowing whilst **Magnetic fields** are created when electric current flows.

Electromagnetic fields are generated from natural sources and man-made sources. As a natural source, it is present everywhere in the environment. Electric fields are produced by the local build-up of electric charges in the atmosphere due to thunderstorms. Whereas magnetic fields is believed to be generated deep down in Earth's core. Man-made EMR on the other hand are generated from various sources and at levels much higher than natural sources.



Electromagnetic radiation can affect our lives in two ways :

First, it causes **Electromagnetic interference** that can affect electrical circuits causing nuisance and **jeopardise critical operations** in server rooms, ICU / CCU, control rooms, etc. Like the use of cell phones during landings and take-offs interrupts the normal operation of key cockpit instruments, especially Global Positioning System (GPS) receivers, which is vital to safe landings.

Secondly, it has been known to cause several health issues ranging from migraines to changes at the cellular level. Research has shown higher occurrence of cancer amongst people living near power lines.

Hence, it is imperative that the impact of **electromagnetic interference and radiation be reduced** for both **technical cum commercial reasons and for health reasons**.

THE BENEFIT

This special A-R Coating can reduce interference and harmful electromagnetic radiation.

THE TECHNOLOGY

The Special Electromagnetic Radiation Protection Coating (A-R Coating) is the only high-tech water-based coating that can effectively absorb interfering electro-magnetic radiation. This coating technology is used to by the military to coat military vehicles (fighter jets, frigates, etc) to make them undetectable by enemy radar such as been seen on the F117 – Blackbird.

The patented coating is made of special ferrite absorbing materials and rare elements that have a much higher ability to absorb electro-magnetic frequencies and converts the radiation into heat, thereby effectively decreasing the total amount of electromagnetic radiation level / intensity in room. The A-R Coating can effectively **absorb electromagnetic waves** from any direction or angle and can be **CUSTOME-MADE to absorb EMF at specific frequencies**. Depending on the number of coats applied, the absorbing rate can reach 99.87%. With the ability of absorbing frequencies up to 20GHz (20,000 MHz) it covers current and future telecommunications frequency spectrum.

THE LIFE SPAN / DURABILITY

The Special Electromagnetic Radiation Protection Coating does not lose its efficiency to absorb electromagnetic waves over time. If applied correctly, no maintenance is required. The Coating has an average life span of approximately 50 years. It is manufactured using high technology compounding methods and unlike other coatings, it does not contain metals that cause corrosion over time.

ACCREDITATION

The Coating has been tested by accredited 3rd party labs in China, Korea and has been witness tested by **SIRIM QAS International Sdn Bhd Malaysia**. All reports have proven the efficiency of the Coating.



APPLICATION & DATA SHEET

APPLICATIONS

Electrical Power Plants

Reduce electromagnetic interference caused by the power generators.

Protects people (workers) from radiation hazard and clears working environment.

Its anti-static feature also is beneficial in areas where high chance of fire may occur.

Electronics industry and commerce:

Reduce electromagnetic interference in areas Server rooms, Broadcasting studios, data centres, telecom exchanges.

Military / Aircraft industry:

To reduce/avoid high powered electromagnetic pulse (EMP) from interfering with military strategic command and control centre.

Pharmacy:

Protect (EMI) highly sensitive equipment from electromagnetic interference, to ensure pharmaceutical process will not be affected.

Medical Industry / Bunker Rooms:

Absorbs EMR from PET, MRI and X-rays.

Coating can also absorb secondary ionizing (scatter) radiation from X-ray machines.

Light Rail/Mass Rapid Transport

Systems :

Reduces electromagnetic interference caused by the trains as they pass near residential / commercial areas.

COMPLETED PROJECTS

❖ Liaoshen high-speed road:

Control Rooms

❖ Guangzhou city Hospital

Operating theater rooms had high internal radiation despite the use of a metal cage.

Application of this A-R Coating solved the issue.

❖ Server Rooms

HSBC Bank Server Rooms, Shanghai

❖ Military facility China

CHARACTERISTICS	SPECIAL EMR PROTECTION COATING
Non Ionizing Shielding Range	1 Hz - 20,000 MHz (20GHZ)
Ionizing Shielding Range	12% (One layer/ 60KV X-ray beam) for 3rd barrier applications
Shielding Method	Absorbs electromagnetic radiation and converts into heat
Test Method	SJ 20524 - 1995 (Measuring methods for shielding effectiveness of materials, MIL STD of PRC) SIRIM 2012 EMC238 S11 Reflective Performance Testing
Screening - 2 layer coat	Attenuate: Upto 20DB
Absorbing Rate	99%
Decay Rate	100%
Screening basis	Graphite, Ferrite, potassium silicate, styrene-acrylic resin
Color	Black. Wall must be repainted with another coat of colour paint.
Application Area	For interior purpose. For external application water resistance coating must be applied.
Substrates	Almost all
Moisture resistance	For high humidity, putty / undercoat needed.
Ecology	Good. Coating is water- based.
Binding agent	Potassium silicate
Solvent	Water
VOC content	NIL
Toxic & side effect	NIL (as per SGS-REACH testing report)
Sd-value ~	0.1m
pH-value 7	7-8
Density	1.15kg/l
MFFT	0°C / 32°F
Dry time	6 - 24 hours
Delivery size (liter / tin)	10 Liter tin (= 11.5 kg)
Shelf life (if not opened)	24 month
Life span	Can be lasted 50 years if no fall off and crack on coating.
Typical coverage per 1 kg (1 kg coat = 0.87 liter)	Average Radiation : 1 m ² flat surface - 1 kg coating Number of application - 2 coats Heavy Radiation : 1 m ² flat surface - 2 kg coating Number of applications - 4 coats Note : Coverage is based on flat surface
Advantages	1. Reduces EMF interference / disturbance 2. Reduces EM radiation exposure to body (personal protection) 3. Anti-static 4. Fire Resistant 5. Absorbs formeldyhyde 6. Absorbs ionizing radiation (3rd barrier protection) 7. Water based option is safer for environment.
Certificates & Test Reports	SIRIM Test Reports, SIMT Test Reports, Korea Conformity Laboratory (KCL)Test Report, SVHC, Anti-static Test Report, Fire-Resistance Test report, Formeldyhyde Test Report, Ionizing Radiation test report.

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