



## SEMI-ANECHOIC EMC TEST CHAMBER

Steatite's Redditch facility is home to our compact semi-anechoic EMC test chamber. The facility allows EMC testing for emissions, both radiated and conducted, and immunity, both radiated and conducted including electrical fast transients, surges and voltage dips. Having these in-house EMC test capabilities allows Steatite to significantly reduce design risks, while minimising the likelihood of additional external retest costs, which ultimately results in a solution that is delivered sooner and at lower cost than would otherwise be possible. This means that we can offer pre-compliance testing in conjunction with many of the projects that we work on, resulting in greater speed and resilience within the project framework.

The Rainford EMC systems EMC-3C compact semi-anechoic chamber measures 7m x 4m x 3m, and is suitable for pre-compliance testing against CISPR, MIL STD 461 and DEF STAN 59-411 for both radiated and conducted emissions and immunity.

This facility will allow regulatory CE or UKCA pre-compliance testing to be carried out against a range of product / family standards in areas such as land, sea and air defence, medical and transportation sectors, for example, BS EN 55032 for emissions and BS EN 55035 for immunity for information technology equipment; BS EN 60945 for maritime electronic equipment and BS EN 50121-3-2 for railway equipment, among others.



The chamber will also allow pre-compliance testing to a range of basic standards such as, among others, BS EN 61000-4-2 for electrostatic immunity; BS EN 61000-4-3 for radiated radio frequency immunity and BS EN 61000-4-6 for conducted radio frequency immunity.

In addition to the above, ad hoc testing is carried out during the design and development phases to allow for verification and validation and the de-risking of EMC issues for later pre-compliance and full compliance certification.

### Calibration and compliance

The test equipment includes a Rohde and Schwarz Receiver going from 20 Hz up to 40 GHz and a range of pre-amplifiers, RF signal generators and RF power amplifiers up to 6 GHz.

A range of transducers are available such as various antennas going from 9 kHz up to 18 GHz; line impedance stabilisation networks; coupling; decoupling networks; current probes and current clamps, among others.

The facility is operated under the Steatite ISO9001:2015 quality management system and all test equipment is calibrated and traceable to national and international standards by UKAS accredited companies. Certificates of test and test reports can be provided for pre-compliance testing carried out as above.

## What can we test? Some examples

The following table gives examples of some of our testing capabilities. Our total testing capabilities are far more extensive so for more detail please contact us:

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Product standard	Description	Test levels	Basic standard
<b>BS EN 55032:2015</b>	<b>Electromagnetic compatibility of multimedia equipment</b>		
<b>Emissions</b>	Conducted emissions	150 kHz to 30 MHz	BS EN 55032:2015 Tables A.8 - A.13.
	Radiated emissions	30 MHz to 6 GHz	BS EN 55032:2015 Tables A.1 - A.7.
<b>BS EN 55035:2017</b>	<b>Electromagnetic compatibility of multimedia equipment</b>		
<b>Immunity</b>	Electrostatic discharge	Contact 4 kV; Air 8 kV	BS EN 61000-4-2:2009
	Radio frequency E field	80 MHz to 5 GHz	BS EN 61000-4-3:2006+A2:2010
	Electrical fast transients / burst		BS EN 61000-4-4:2012
	Surges		BS EN 61000-4-5:2006
	Radio frequency conducted	0.15 MHz to 80 MHz	BS EN 61000-4-6:2009
	Power frequency H field		BS EN 61000-4-8:2010
	Voltage dips		BS EN 61000-4-11:2004
<b>BS EN 60945:2002</b>	<b>Maritime navigation and radiocommunication equipment</b>		
<b>Emissions</b>	Conducted emissions	10 kHz to 30 MHz	BS EN 60945:2002 Table 5
	Radiated emissions	150 kHz to 2 GHz	BS EN 60945:2002 Table 5
<b>Immunity</b>	Electrostatic discharge	Contact 6 kV; Air 8 kV	BS EN 61000-4-2:1995
	Radio frequency E field	80 MHz to 2 GHz	BS EN 61000-4-3:1995
	Electrical fast transients / burst		BS EN 61000-4-4:1995
	Surges		BS EN 61000-4-5:1995
	Radio frequency conducted	0.15 MHz to 80 MHz	BS EN 61000-4-6:1996
	Power frequency H field		BS EN 61000-4-8:1993
	Voltage dips		BS EN 61000-4-11:1994
<b>BS EN 50121-3-2:2016</b>	<b>Railway applications - Electromagnetic compatibility.</b>		
<b>Emissions</b>	Conducted emissions	150 kHz to 30 MHz	BS EN 55016-2-1:2014
	Radiated emissions	30 MHz to 1 GHz	BS EN 61000-6-4:2007
<b>Immunity</b>	Electrostatic discharge	Contact 6 kV; Air 8 kV	BS EN 61000-4-2:2009
	Radio frequency E field	80 MHz to 6 GHz	BS EN 61000-4-3:2006
	Electrical fast transients / burst		BS EN 61000-4-4:2012
	Surges		BS EN 61000-4-5:2014
	Radio frequency conducted	0.15 MHz to 80 MHz	BS EN 61000-4-6:2014
<b>FCC</b>	<b>Federal Communications Commission</b>		
<b>Emissions</b>	Conducted emissions	150 kHz to 30 MHz	§15.107 Conducted limits.
	Radiated emissions	30 MHz to 20 GHz	§15.109 Radiated emission limits.
<b>MIL-STD-461G</b>	<b>Requirements for the control of electromagnetic interference</b>		
	Personnel borne electrostatic discharge	Contact ±8 kV; Air ±15 kV	CS118
	Radiated emissions; magnetic field	30 Hz to 100 kHz	RE101
	Radiated emissions; electric field	10 kHz to 18 GHz	RE102
	Conducted emissions; audio frequency currents	30 Hz to 10 kHz	CE101
	Conducted emissions; radio frequency potential	10 kHz to 10 MHz	CE102
<b>DEF STAN 59-411</b>	<b>Electromagnetic compatibility; Test methods and limits</b>		
<b>Pt 3 Iss 3</b>	Conducted emissions; primary power lines	20 Hz to 150 MHz	DCE01
	Conducted emissions; control, signal & power lines	20 Hz to 150 MHz	DCE02
	Radiated emissions; E field	10 Hz to 18 GHz	DRE01
	Radiated emissions; H field	20 Hz to 100 kHz	DRE02
	Electrostatic discharge	Contact ±8 kV; Air ±15 kV	DCS10

Product standard	Description	Test levels	Basic standard
DEF STAN 59-411	Electromagnetic compatibility; Test methods and limits		
Pt 3 Iss 3			
<b>MWP</b>	Conducted emissions; primary power lines	N/A	DCE01
	Conducted emissions; control, signal & power lines	500 Hz to 150 MHz	DCE02
	Radiated emissions; E field	10 Hz to 18 GHz	DRE01
	Radiated emissions; H field	20 Hz to 100 kHz	DRE02
	Electrostatic discharge	Contact ±8 kV; Air ±15 kV	DCS10
<b>Land</b>	Conducted emissions; primary power lines	20 Hz to 150 MHz	DCE01
	Conducted emissions; control, signal & power lines	20 Hz to 150 MHz	DCE02
	Radiated emissions; E field	10 Hz to 18 GHz	DRE01
	Radiated emissions; H field	20 Hz to 100 kHz	DRE02
	Electrostatic discharge	Contact ±8 kV; Air ±15 kV	DCS10
<b>Sea</b>	Conducted emissions; primary power lines	20 Hz to 150 MHz	DCE01
	Conducted emissions; control, signal & power lines	20 Hz to 150 MHz	DCE02
	Radiated emissions; E field	10 Hz to 18 GHz	DRE01
	Radiated emissions; H field	20 Hz to 100 kHz	DRE02
	Electrostatic discharge	Contact ±8 kV; Air ±15 kV	DCS10
<b>Air</b>	Conducted emissions; primary power lines	20 Hz to 150 MHz	DCE01
	Conducted emissions; control, signal & power lines	20 Hz to 150 MHz	DCE02
	Radiated emissions; E field	10 Hz to 18 GHz	DRE01
	Radiated emissions; H field	20 Hz to 100 kHz	DRE02
	Electrostatic discharge	Contact ±8 kV; Air ±15 kV	DCS10

Product standard	Conducted emissions	Radiated emissions	Electro static discharge	Conducted susceptibility	Radiated susceptibility
BS EN 55032:2015	150 kHz to 30 MHz	30 MHz to 6 GHz			
BS EN 55035:2017			Contact 4 kV; Air 8kV	0.15 MHz to 80 MHz 1V to 3V	80 MHz to 5.0 GHz 3V/m
BS EN 60945:2002	10 kHz to 30 MHz	150 kHz to 2 GHz	Contact 6 kV; Air 8kV	0.15 MHz to 80 MHz 3V (rms) & 10V (rms)	80 MHz to 2 GHz 10 V/m
BS EN 50121-3-2:2016	150 kHz to 30 MHz	30 MHz to 1 GHz	Contact 6 kV; Air 8kV	0.15 MHz to 80 MHz 10V (rms)	80 MHz to 6.1 GHz 3 - 20V/m
FCC	10 kHz to 30 MHz	150 kHz to 20 GHz	Contact ±6 kV; Air ±8 kV	0.15 MHz to 80 MHz 1 V to 10 V	80 MHz to 6 GHz; 1V/m to 20 V/m
MIL-STD-461G	10 KHz to 10 MHz	10 kHz to 18 GHz	Contact ±8 kV; Air ±15 kV		
DEF STAN 59-411	20 Hz to 150 MHz	10 kHz to 18 GHz	Contact ±8 kV; Air ±15 kV	0.15 MHz to 80 MHz	80 MHz to 6 GHz

## Contact us

If you have a testing requirement please contact us on +44 (0)1527 512400 or email [sales@steatite.co.uk](mailto:sales@steatite.co.uk)

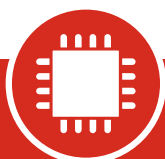
For more information regarding our in-house testing capability visit [www.steatite.co.uk](http://www.steatite.co.uk)

EMC test chamber Rev 8

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