

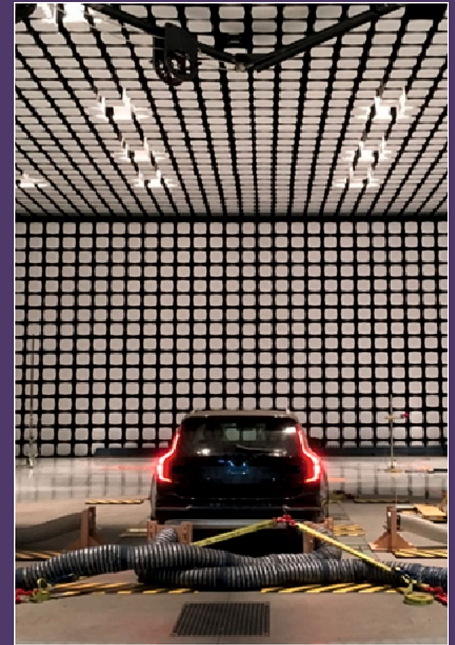


ELECTROMAGNETIC COMPATIBILITY LAB (EMC)



INTERNATIONAL CENTRE FOR AUTOMOTIVE TECHNOLOGY

ICAT has a state-of-the-art facility to conduct EMI/EMC development and certification tests on vehicles and automotive electrical/electronic components. ICAT EMC lab is among the best maintained and managed automotive testing labs in the country and hold NABL certification (Certificate No. TC - 5360).



MAJOR TECHNICAL CAPABILITIES ARE:

- ⤴ Developmental tests on electrical/electronic components as well as vehicles.
- ⤴ Troubleshooting, research and development of component and vehicle designs from EMC perspective.
- ⤴ Component and/or vehicle certification tests for type approval according to Indian/European directives.
- ⤴ Production conformity tests compliant with manufacturer's standards.

S. No.	Group of Products Tested	Specific Tests or Types of Tests Performed	Indian and/or International Standard(s)
1	EMI /EMC testing for Electrical/ Electronic automotive components	Off - Board Radiated Emissions (RE)	AIS 004 (Part 3), ECE R10, CISPR 25
		Conducted RF Emissions (CE) by voltage method	CISPR 25
		Conducted RF Emissions (CE) by current probe method	CISPR 25
		Off - Board Radiated Immunity (RI), ALSE Method	ISO 11452-2, AIS 004 (Part 3), ECE R10
		Radiated Immunity (RI), TEM Method	ISO 11452-3, AIS 004 (Part 3), ECE R10
		Bulk Current Injection (BCI)	ISO 11452-4, SAE J1113-4, AIS 004 (Part 3), ECE R10-05,
		Radiated Immunity (RI), Stripline Method	ISO 11452-5, AIS 004 (Part 3), ECE R10
		Radiated Immunity (RI), Direct RF Injection	ISO 11452-7
		Radiated Immunity (RI), Triplate Method	SAE J1113-25
		Immunity to magnetic fields	ISO 11452-8
		Electrostatic Discharge (ESD) test	ISO 10605, IEC 61000-4-2, SAE J1113-13
		Conducted Transient Emissions on Power Leads	ISO 7637-2
		Immunity to Conducted Transient Disturbances	AIS 004 (Part 3), ECE R10, ISO 7637-2, ISO 7637-3, SAE J1113-11, SAE J1113-12, SAE J1455, JASO D001, COST 28751-90
Environmental Conditions and Testing of Electrical Loads	ISO 16750-2		

S. No.	Group of Products Tested	Specific Tests or Types of Tests Performed	Indian and/or International Standard(s)
2	EMI /EMC testing for 2/3/4 wheeler passenger vehicles, commercial and agricultural vehicles	Off - Board Radiated Emissions (RE)	AIS 004 (Part 3), ECE R10, CISPR 12
		On - Board Radiated Emissions	CISPR 25
		Off - Board Radiated Immunity (RI), ALSE Method	ISO 11451-2, AIS 004 (Part 3), ECE R10
		Onboard Transmitter Simulation Electromagnetic Immunity	ISO 11451-3
		Bulk Current Injection (BCI)	ISO 11451-4
		Electrostatic Discharge (ESD) test	ISO 10605, SAE J551-15
3	EMI /EMC testing for Electrical/Electronic non - automotive components	Radiated Emissions (RE)	CISPR 11, CISPR 14-1 CISPR 22, CISPR 32
		Conducted Emissions (CE) on power lines	CISPR 11, CISPR 14-1 CISPR 22, CISPR 32

STANDARDS / REGULATIONS COVERED

Component Level:

- ⤴ Radiated/Conducted emissions for components as per CISPR25.
- ⤴ Radiated Immunity test for components, ALSE method, as per ISO 11452-2.
- ⤴ Radiated Immunity test for components, TEM method, as per ISO 11452-3.
- ⤴ Bulk Current Injection (BCI) test for components, as per ISO 11452-4/SAE J1113-4.
- ⤴ Radiated Immunity for components, Stripline method, as per ISO 11452-5.
- ⤴ Direct RF power injection, as per ISO 11452-7.
- ⤴ Immunity to radiated magnetic fields for components, as per ISO 11452-8 (Helmholtz coil method).
- ⤴ Radiated Immunity for components, Triplate method, as per SAE J1113-25.
- ⤴ Immunity to Electrostatic Discharge (ESD) for components, as per ISO 10605/IEC 61000-4-2.
- ⤴ Conducted transient emissions on power leads, as per ISO 7637-2.
- ⤴ Immunity to conducted transients disturbances, as per ISO 7637-2/ISO 7637-3 (CCC and DCC).



Vehicle Level:

- ⤴ Vehicle On - board Radiated Emissions, as per CISPR 25.
- ⤴ Vehicle Off - board Radiated Emissions, as per CISPR 12.
- ⤴ Off - Vehicle Electromagnetic Immunity, as per ISO 11451-2.
- ⤴ Whole Vehicle Electromagnetic Immunity, Onboard Transmitter Simulation, as per ISO 11451-3.
- ⤴ Bulk Current Injection (BCI) test for vehicles, as per ISO 11451-4.
- ⤴ Immunity to Electrostatic Discharge (ESD) for vehicles, as per ISO 10605.

COMPLIANCE

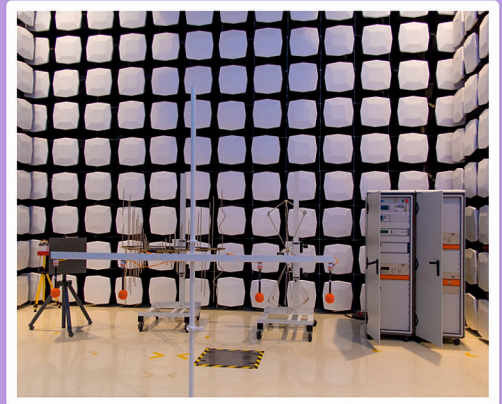
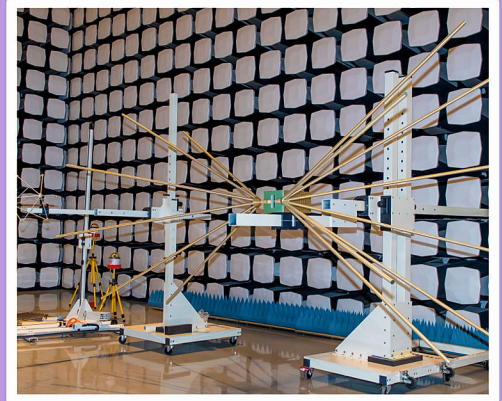
ISO 17025/ NABL

**BENCHMARKING &
CORRELATION**

Benchmarking and correlation is done with Bosch, TUV and other associated laboratories.

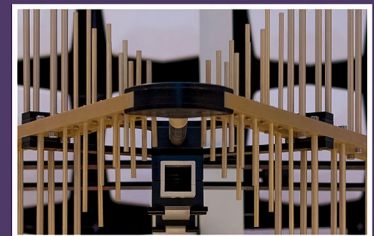
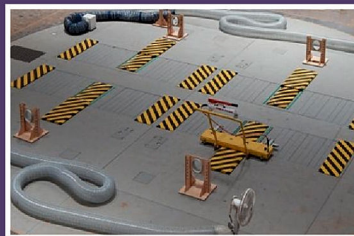
SPECIFIC FACILITIES

- ⤴ Component Semi - Anechoic Chamber (CSAC) and Vehicle Semi - Anechoic Chamber (VSAC).
- ⤴ Capability upto 8 GHz for Radiated Emissions & 18 GHz for Radiated Immunity.
- ⤴ Overall Dimensions of CSAC: 8.5 m X 7 m X 6 m (L X W X H). RMS field strength of 200 V/m.
- ⤴ Overall Dimensions of VSAC: 30 m X 20 m X 10 m (L X W X H). RMS field strength of 200 V/m.
- ⤴ Both chambers have dedicated shielded control rooms with advanced instrumentation.
- ⤴ VSAC has a 11 m turntable, 4X4 chassis dynamometer with advanced electronic control system functions, for a vehicle up to 19 tons.
- ⤴ Both chambers can be used for AIS 004 and ECE R10 compliance tests.
- ⤴ CSAC and VSAC are fully operational.



SPECIFIC FACILITIES

- ⤴ Troubleshooting and solution providing for EMC issues on:
 - Electrical/electronic components
 - Vehicles (including xEVs)
- ⤴ Development and validation projects of OEMs and Tier 1 suppliers.



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