

FRANKONIA

Frankonia BlueBox
- Mobile Load Machine -

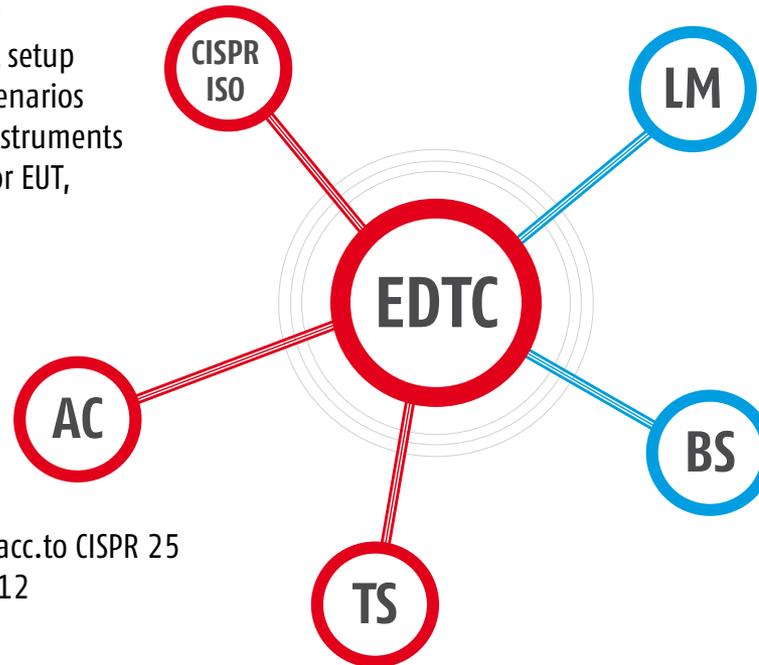
Requirements

Standards CISPR & ISO

- CISPR and ISO conform test setup
- Respect of different test scenarios
- Interference suppressed instruments
- Secure test environment for EUT, chamber and staff
- Future-proof functionality

Anechoic Chamber

- dedicated for component tests acc.to CISPR 25
- or for vehicle tests acc.to CISPR 12
- or both in a single solution



Load Machine (Dynamometer)

- fixed version up to 350 kW
- mobile version up to 120 kW

Battery System

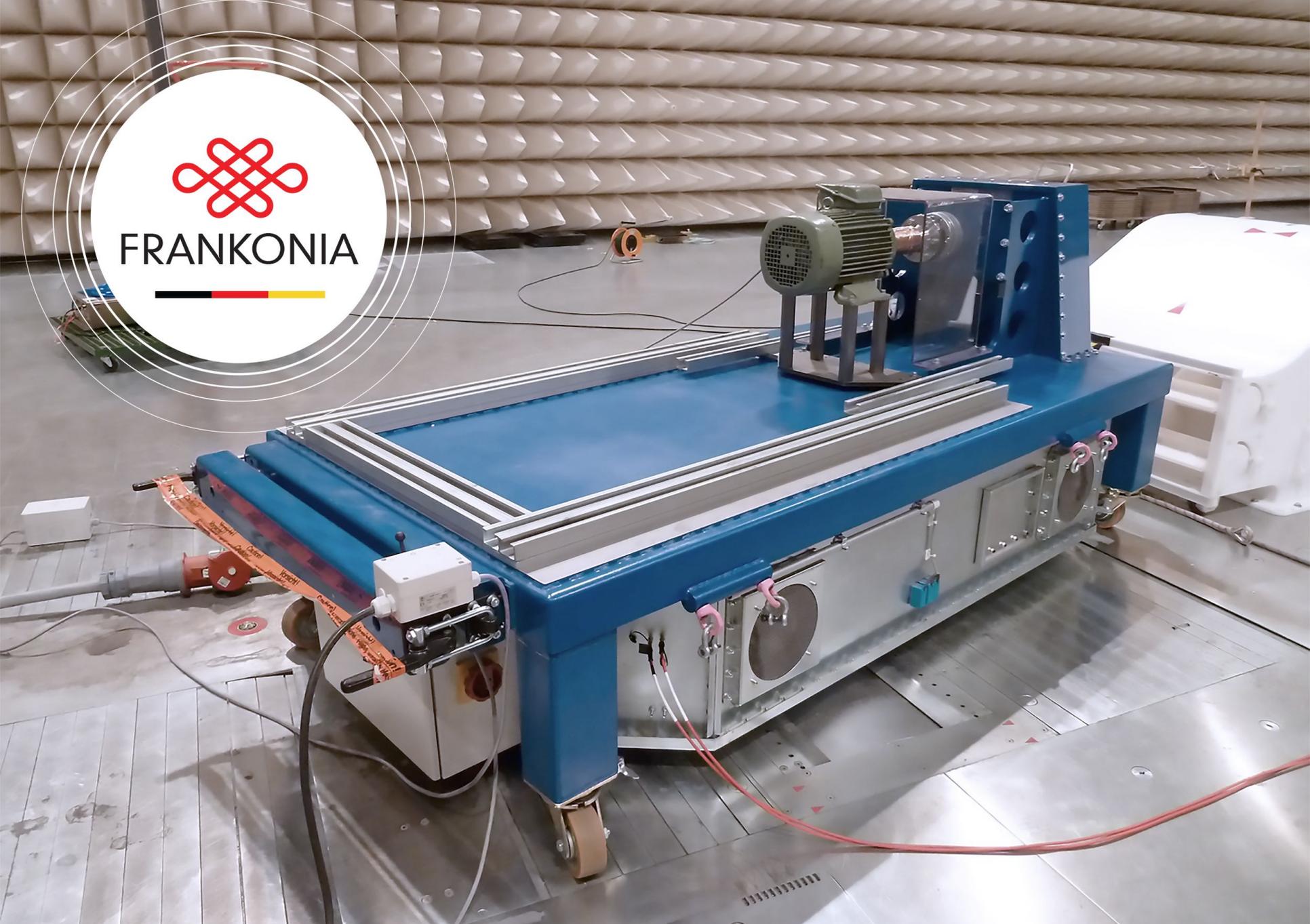
- Battery simulation
 - Battery test
 - Charging emulation
 - for components and vehicle tests
- Available power range:
- 300 A or 600 A
 - 100 kW up to 600 kW

Test System

- Defined according to CISPR and ISO standards
- dedicated for component tests
 - dedicated for vehicle tests



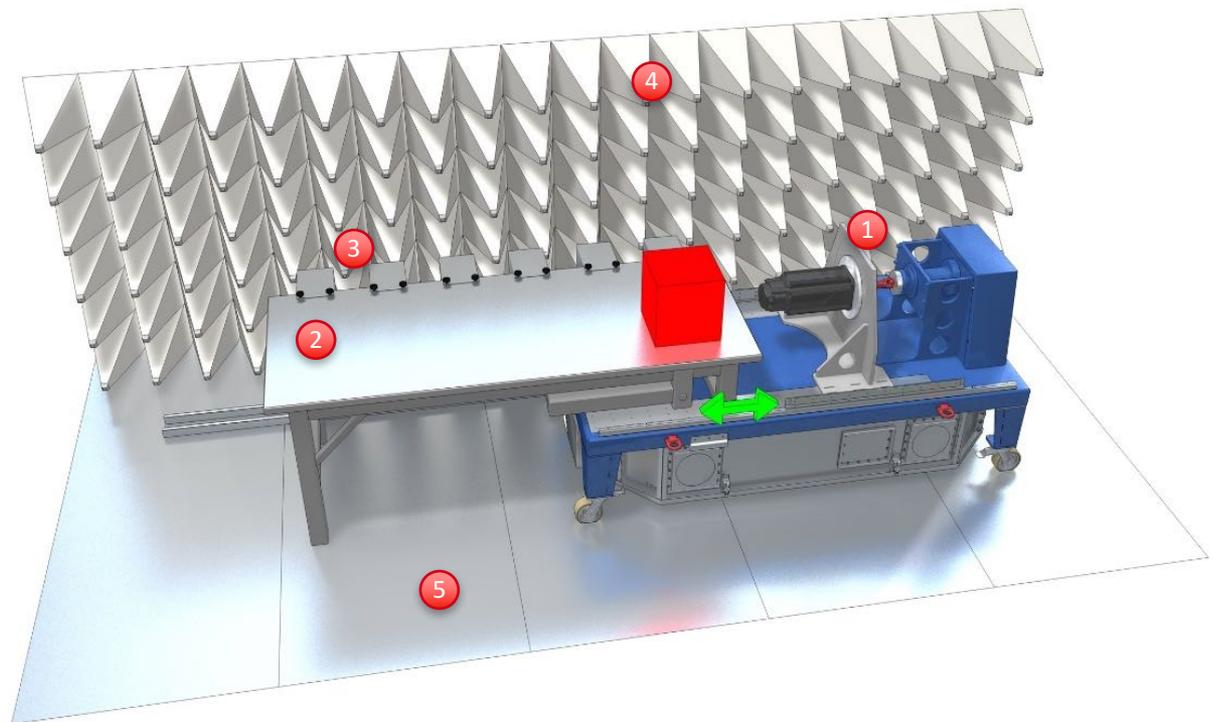
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BlueBox

Load Machine | Mobile Version

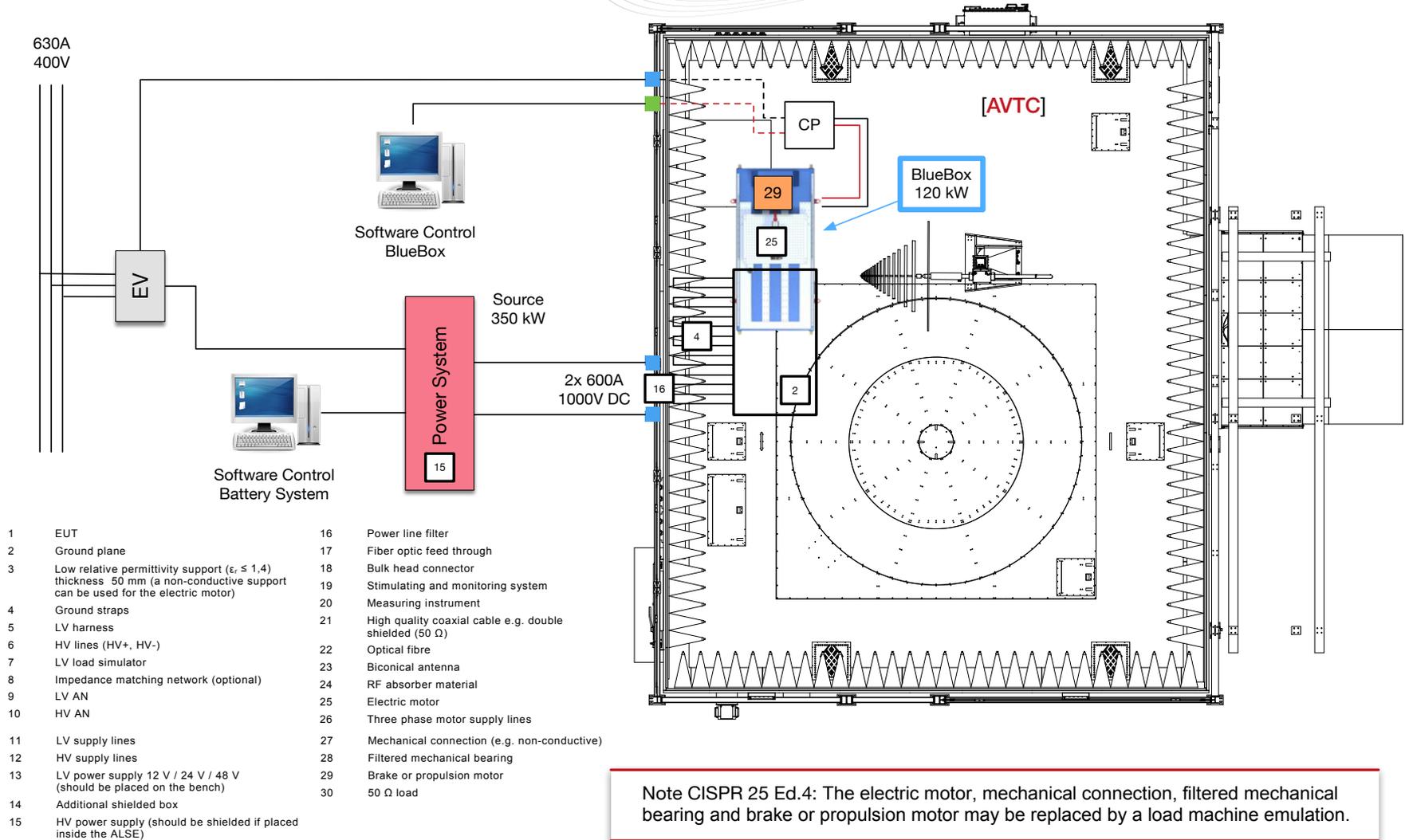
- ✓ The BlueBox is Frankonia's most versatile test solution for motor applications according to CISPR 25 Ed.4.
- ✓ The BlueBox is herewith a mobile alternative to the well known fixed version with an outside dyno.
- ✓ The BlueBox offers dynamic usability for motors, or in combination with battery tests.



- 1 Load Machine (BlueBox)
- 2 CISPR 25 Test Table
- 3 Contact strips
- 4 Frankosorb® A2 Absorbers
- 5 Ground Plane

Frankonia E-Drive Test Chamber

EMC Test on Motor using the BlueBox and HV Battery acc. to CISPR 25 Ed.4



BlueBox

Load Machine | Mobile Version – Power Range

BlueBox – Power Range and Specifications

Version:	BlueBox-30	BlueBox-40	BlueBox-63	BlueBox-120
Power range (kW)	30	40	63	120
Speed max. (1/min)	8.000	7.000	6.500	6.000
Acceleration (rad/s ²)	100	100	100	100
Torque (Nm)	82	130	240	470
Input Power (A)	63	95	125	2x120
Weight (kg)	1.000	1.300	1.700	2.500
Payload (kg)	800	1.000	1.000	1.400
Dimension (m)	2,0 x 1,3 x 1,3	2,2 x 1,3 x 1,3	2,5 x 1,3 x 1,3	2,8 x 1,6 x 1,3

BlueBox

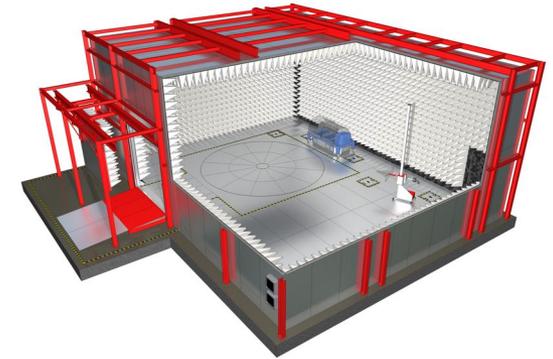
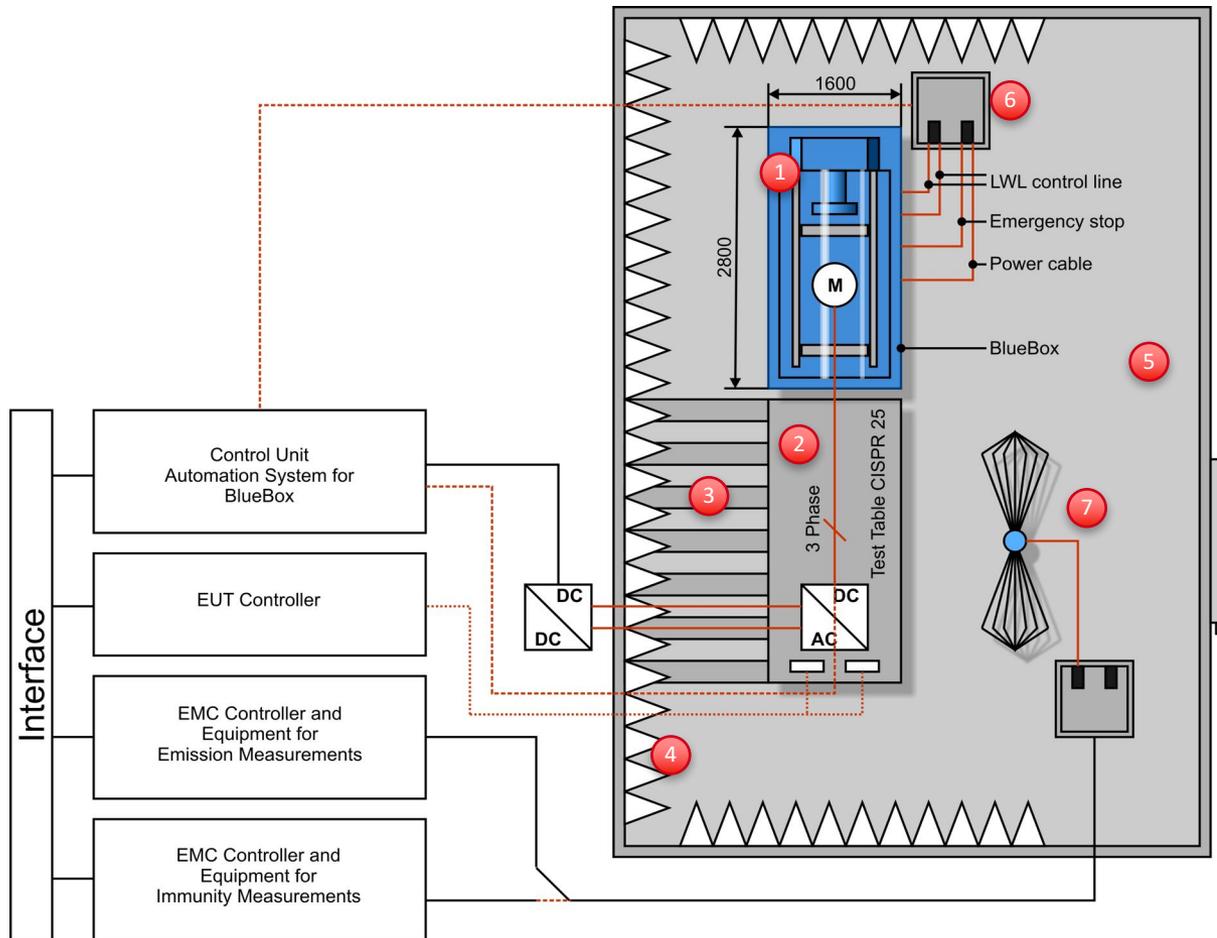
Load Machine | Mobile Version - Features

- Radiated Emission (EMI): Full compliant according to CISPR 25 Ed.4
- Radiated Immunity (EMS): Full compliant according to ISO 11452-2
- Load machine (dynamometer) available as a mobile version from 32 kW up to 120 kW
- Additional battery simulation up to 1.000 V, 600 kW and 600 A available
- 360° EMC test with position on a turntable, or in combination with CISPR test table
- Solutions for powertrain component (full flexible use)
- Test setup preparation outside the EMC chamber possible, Plug & Play function
- Bulk body of BlueBox can be considered as a vehicle structure
- Highest European safety standards
- Integration kit for existing chambers available
- Turnkey solution by Frankonia



BlueBox

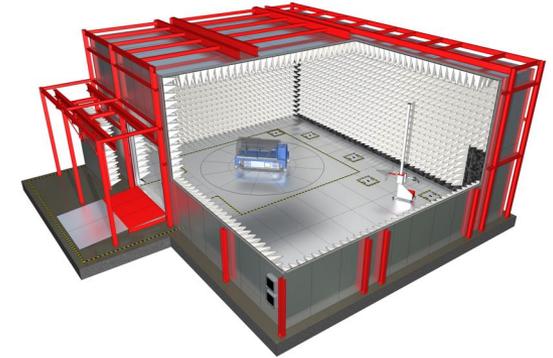
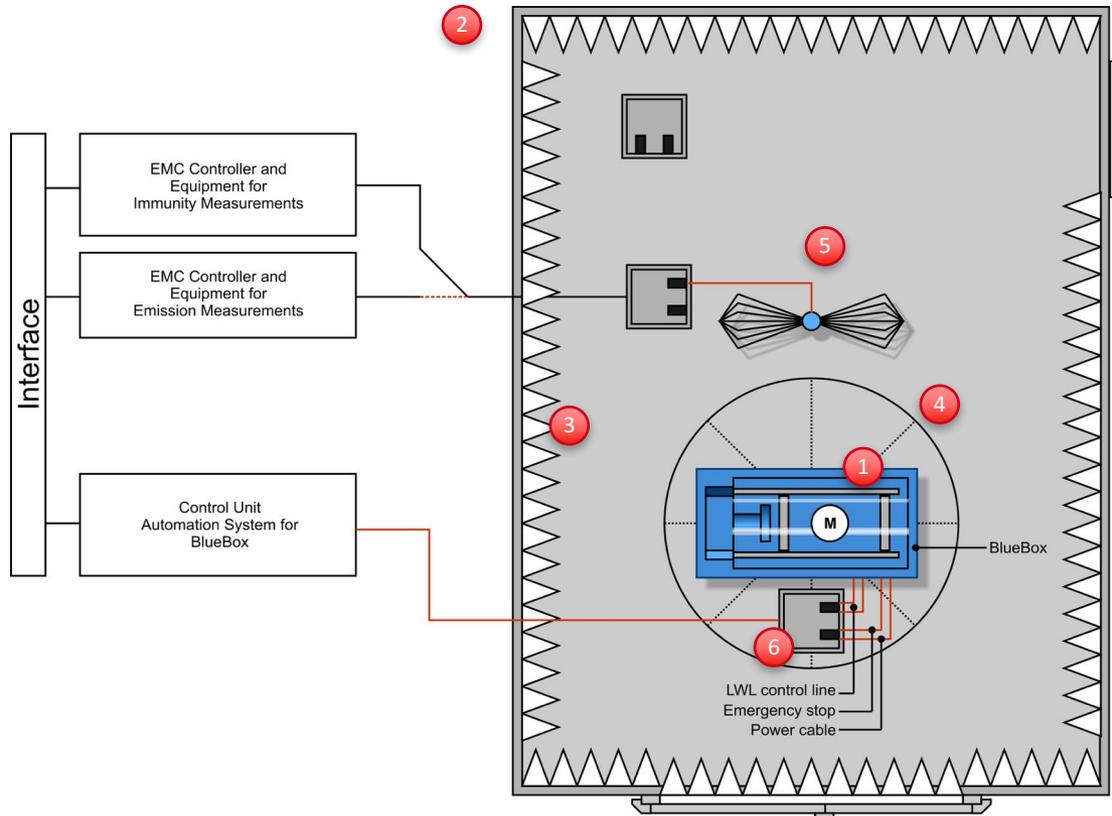
Load Machine | Mobile Version – Standard Setup



- ① Load Machine (BlueBox)
- ② CISPR 25 Test Table
- ③ Contact strips
- ④ Frankosorb® A2 Absorbers
- ⑤ Ground Plane
- ⑥ Connection Panel for BlueBox
- ⑦ Antenna

BlueBox

Load Machine | Mobile Version – Extended Setup

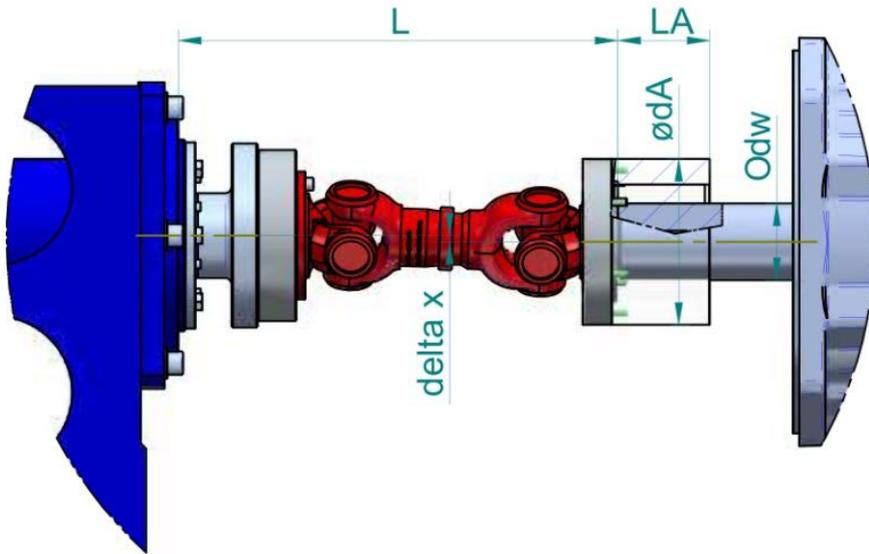


- ① Load Machine (BlueBox)
- ② Frankonia SAC Chamber
- ③ Frankosorb® A2 Absorbers
- ④ Turntable
- ⑤ Antenna
- ⑥ Connection Panel for BlueBox

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Load Machine | Mobile Version – Connection Mode

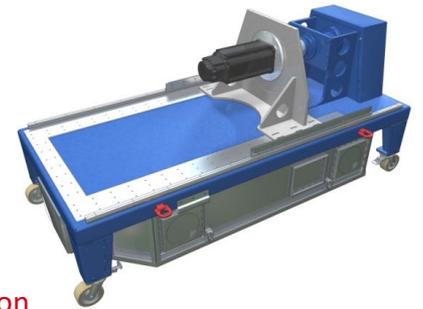
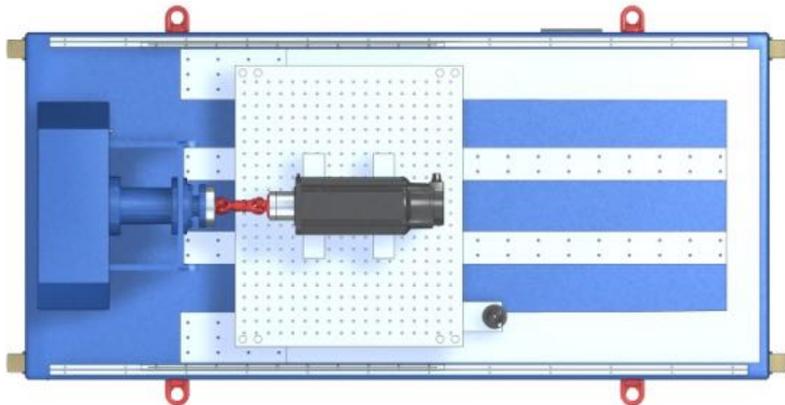
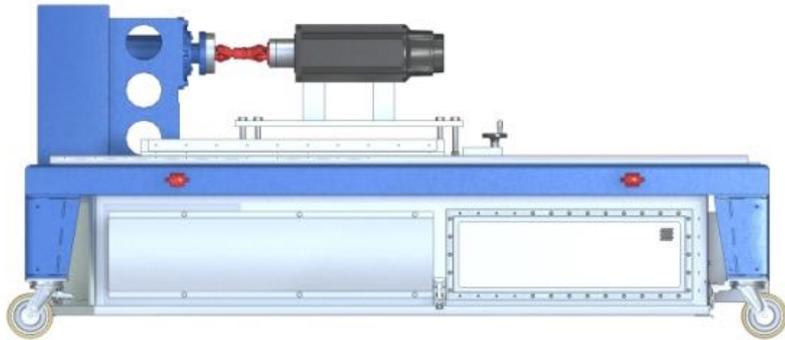
- The EUT (motor) can be installed in a minimum of time using a cardan shaft incl. carban protection shaft



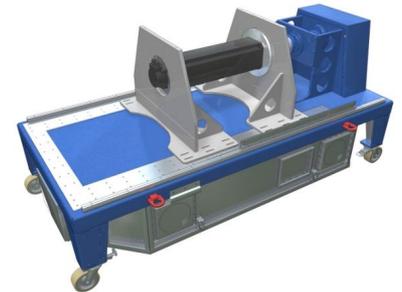
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Load Machine | Mobile Version – Motor Fixation

- The EUT (motor) can be installed to the BlueBox using standard parts, or with customized fixation units



Standard fixation



Extended motor fixation



Motor on guided platform

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Load Machine | Mobile Version – Chamber Setup & Software

Chamber Setup

- The BlueBox can be integrated in any chamber that meets CISPR 25 Ed. 4 requirements.
- The BlueBox requires a power and data line connection.
- Emergency stop integration is recommended.
- The BlueBox is ready to use within minutes, and the test setup can be arranged in advance and outside the EMC chamber.

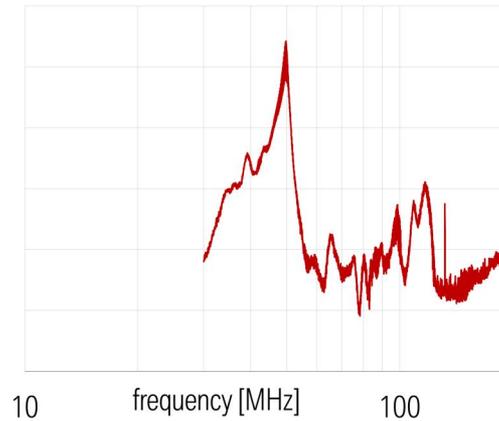
Software

- The BlueBox is designed as an independent solution for integration within an EMC environment.



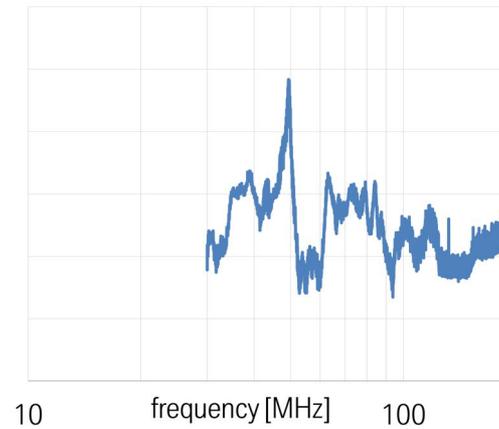
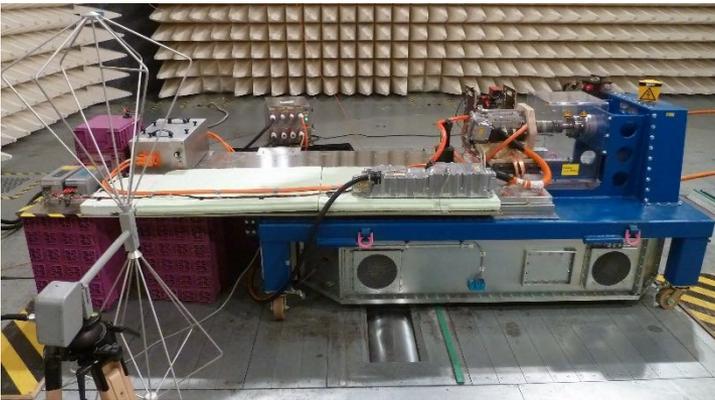
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Load Machine | Mobile Version – BlueBox vs. Component Test Bench



Setup 1:

- Setup based on CISPR 25
- Component test bench



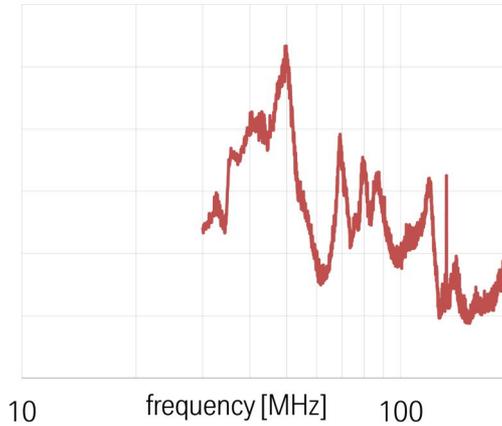
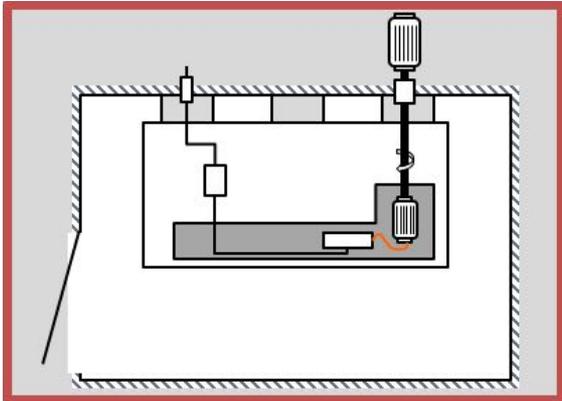
Setup 2:

- Setup based on CISPR 25 for BlueBox

Result:
Equal characteristics

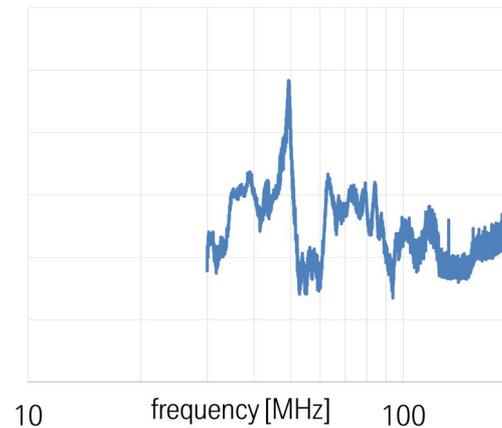
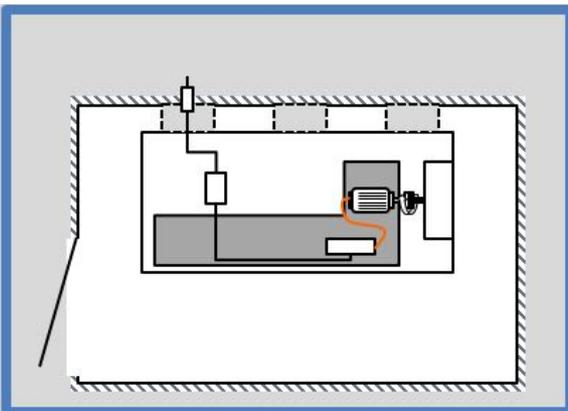
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Load Machine | Mobile Version – BlueBox vs. Shielded Shaft Version



Setup 1:

- Setup based on CISPR 25
- Test bench with fixed shaft-version



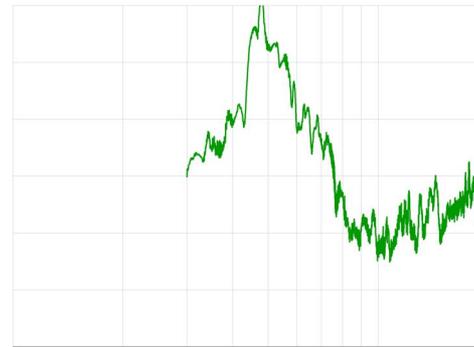
Setup 2:

- Setup based on CISPR 25 for BlueBox

Result:
Equal characteristics

BlueBox

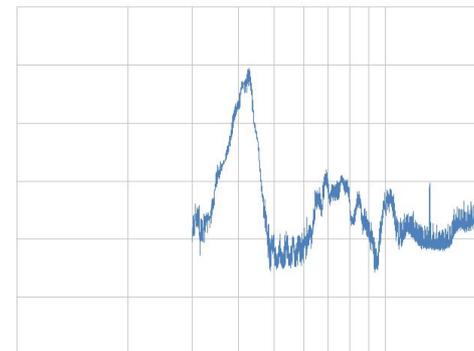
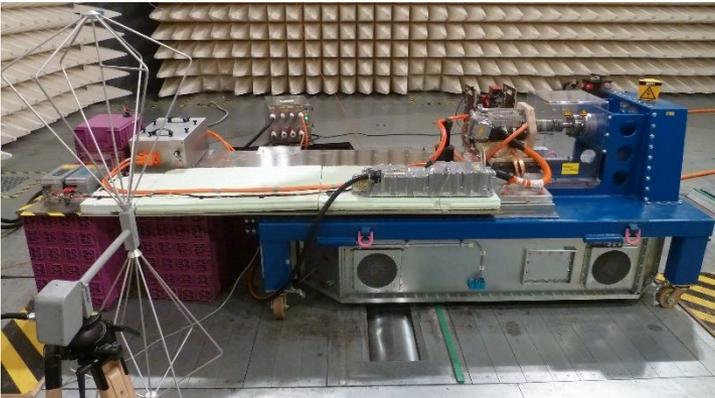
Load Machine | Mobile Version – BlueBox vs. Vehicle



10 frequency [MHz] 100

Setup 1:

- Setup based on ECE-R10
- Vehicle



10 frequency [MHz] 100

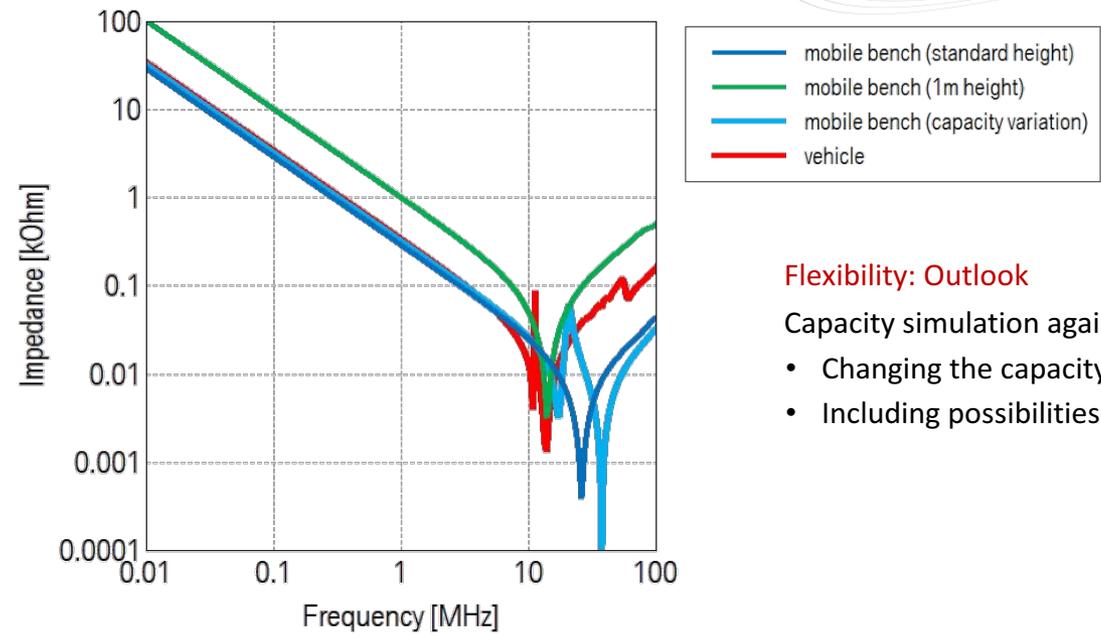
Setup 2:

- Setup based on ECE-R10 for BlueBox

Result:
Equal characteristics

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Load Machine | Mobile Version – Simulation

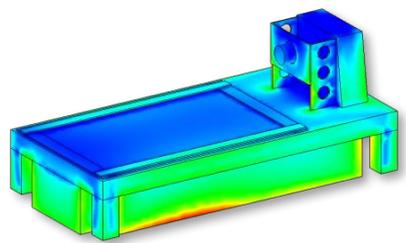


Flexibility: Outlook

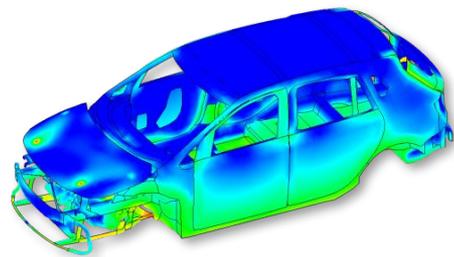
Capacity simulation against ground floor

- Changing the capacity to ground by variation of height
- Including possibilities for alternative setups in CISPR 25

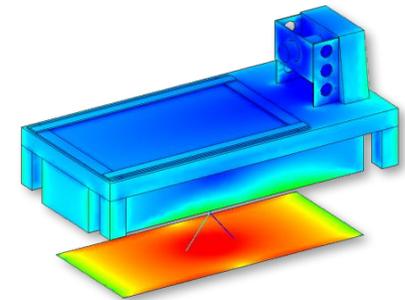
BlueBox
(standard height)



Vehicle



BlueBox
(capacity variation)



BlueBox

Load Machine | Mobile Version

- ✓ The BlueBox is the perfect and full compliant alternative when it comes to efficiency, flexibility and cost savings for EMC tests on motors, or in combination with battery tests.



Frankonia BlueBox

The alternative for EMC motor tests acc. to CISPR 25



Setup

Time-saving preparation of test setup and adjustable to any EMC specialities acc. to CISPR 25 and ECE-R10



Integration

Full control and adjustable to the specific test requirement, capable of being integrated in every EMC chamber



Moveability

Easy transport and preparation of the BlueBox test bench that improves the EMC chamber efficiency



Flexibility

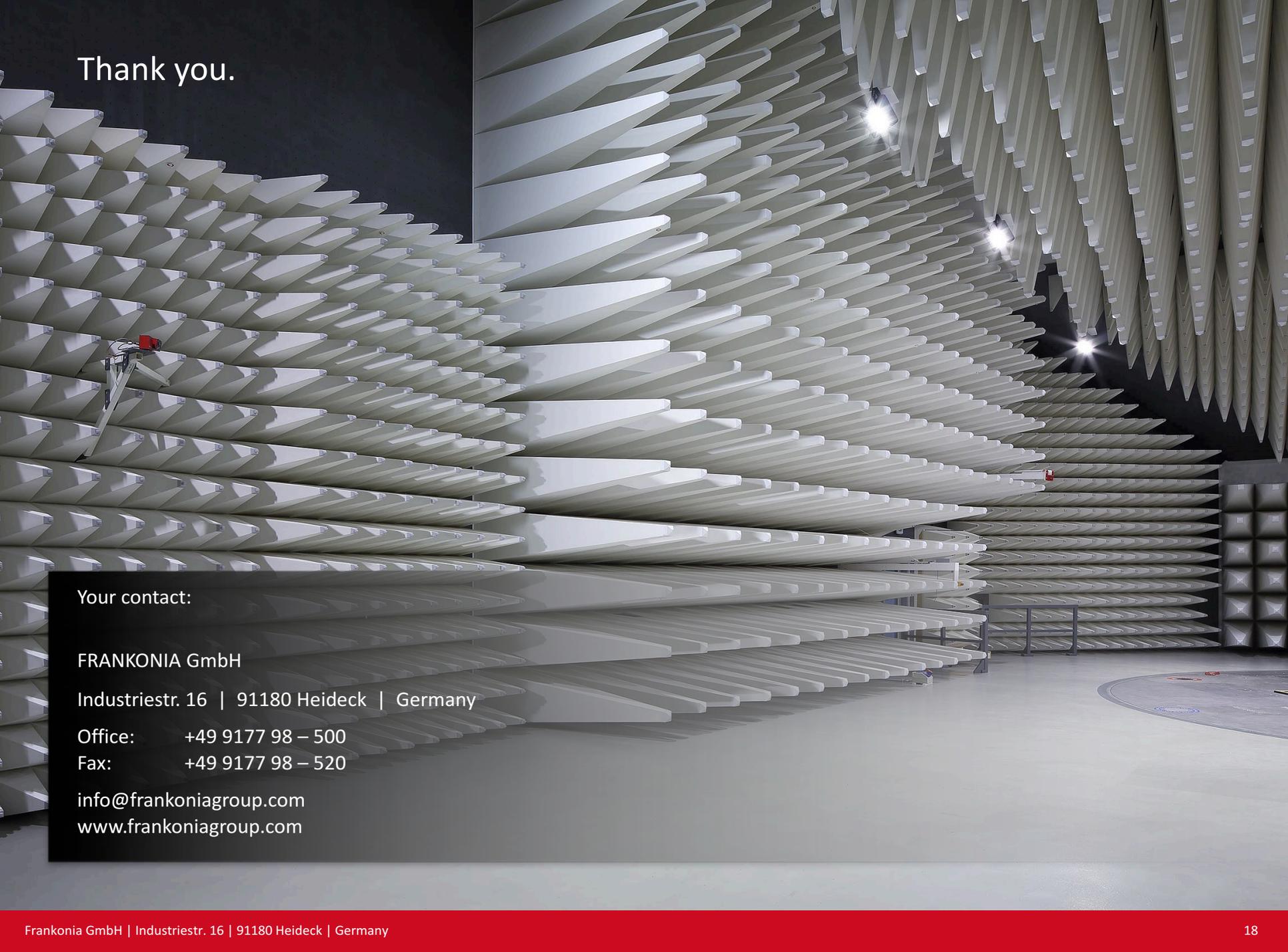
Highest flexibility for the test setup, comparable with the car structure and minimal interference with existing infrastructure



Usability

Setup acc. to CISPR 25 test conditions, or with 360° radiation pattern setup on a turntable

References: BMW Group, CSA Group, EETI China

A large anechoic chamber with white pyramidal absorbers. A person is visible on a ladder on the left side. The chamber is illuminated by several spotlights, creating a dramatic effect with strong highlights and deep shadows. The floor is a light-colored, polished surface.

Thank you.

Your contact:

FRANKONIA GmbH

Industriestr. 16 | 91180 Heideck | Germany

Office: +49 9177 98 – 500

Fax: +49 9177 98 – 520

info@frankoniagroup.com

www.frankoniagroup.com