

Inductive Power Transfer

Services & Expertise at Fraunhofer IISB
E|Road-Center

*WPT3 ground assembly with high-
frequency litz wire winding.
@ Paul Dippold / Fraunhofer IISB*

The Fraunhofer IISB E|Road-Center in Hallstadt is a branch office of the Fraunhofer IISB, headquartered in Erlangen. It covers the entire value chain for inductive charging systems and complements the institute's expertise in power electronics with research in manufacturing and production automation. The technology center is an independent European research institution dedicated to the development, industrialization and evaluation of wireless power transfer technologies, serving as a driving force for new value creation.

Inductive Power Transfer (IPT) enables wireless energy transmission ranging from a few watts to hundreds of kilowatts,

bridging the gap between low power consumer electronics and high power industrial systems. IPT works for both static and dynamic charging scenarios. As a key enabling technology for electrification, IPT serves applications in automotive, logistics, robotics, and industrial automation. By eliminating physical connectors and cables, it reduces mechanical wear, minimizes maintenance, and enables autonomous charging without human intervention. Its benefits are compelling: smaller batteries reduce vehicle weight and costs, increased payload capacity improves efficiency, and enhanced operational resilience ensures uninterrupted workflows. Furthermore, IPT directly contributes to decarbonization by facilitating the transition from fossil fuel powered systems to fully electric operations.

Specification & Design

- Component simulation
- Inductive Power Transfer (IPT) design
- Use-case simulation

Prototyping & Industrialization

- Winding & contacting
- Potting / thermal management
- Assembly technologies

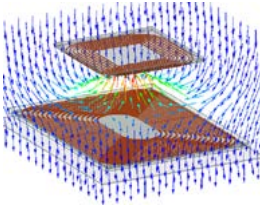
Integration & Testing

- Static & dynamic test bench
- Lifecycle testing
- EMC / EMF validation



www.iisb.fraunhofer.de/lipt

Component simulation



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Simulation of electronics and litz wire behavior in complex systems is a core expertise of the Fraunhofer IISB E|Road-Center. We model electro-magnetic losses, thermal behavior, and parasitic effects to optimize performance before prototyping.

Assembly technology



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Our expertise covers the full assembly chain: from coil integration and power electronics packaging to management unit assembly, including adhesive bonding solutions for secure component integration into road infrastructure.

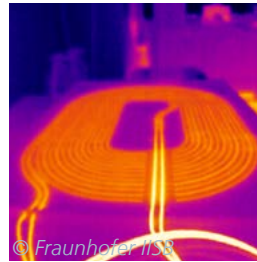
IPT design



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We design application-specific coil geometries and resonant circuit topologies to maximize coupling, efficiency, and power density tailored to your system's frequency, air gap, and misalignment requirements.

Static & dynamic test bench



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Our test facilities allow validation of IPT systems under both static and dynamic operating conditions including living object protection (LOP) and foreign object detection (FOD) in compliance with relevant standards (e.g., SAE J2954, IEC 61980, ISO 19363).

Use-case simulation



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Lifecycle testing



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Winding & contacting



© Risomat

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EMC / EMV validation



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Potting & thermal management



© FAU / FAPS

We develop advanced encapsulation solutions for high-voltage inductive charging coils. Using tailored thermoset potting compounds, we achieve mechanical integrity under vibration and road-load conditions, efficient thermal dissipation, reliable HV insulation, and long-term resistance against moisture and environmental exposure.

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