

About DEP: Detroit Engineered Products (DEP) is an engineering services, product development, software development, consulting, and talent acquisition company. Since its inception in 1998 in Troy, USA, DEP is now a global company with footprints in Europe, China, Korea, Japan, and India. DEP uses an accelerated and transformed product development process accomplished by utilizing our proprietary platform, DEP MeshWorks, which rapidly reduces the development time of products for all industry segments.

Power Electronics Services: Electrification technology pervades every aspect of evolution in major industry segments, and power electronics has emerged as a vital component of this transformation. With adoption of more and more digital technologies in sectors like consumer electronics, industrial automation, automotive industry, and stand-alone power supplies, the demand for a complete solution provider is in all-time high. DEP has been at the forefront of addressing these challenges by creating futuristic solutions that caters to multiple applications, helping our clients stay ahead of the curve in a world that is increasingly electrified. Leveraging over a decade of experience in power technologies with state-of-art R&D facility, we helped OEMs in designing and manufacturing power electronics solutions such as Battery Management Systems, Power Conversion, Smart Meters, EV Chargers, Motor Controllers, Inverter AC Controllers, Mobile Charging Solutions, etc.

Our team of engineering experts are constantly pushing the boundaries of what is possible in the field of power electronics to make the most innovative engineering projects required by our clients a reality. Our power electronics design includes testing and debugging, preparing BOM, Gerber files, and other technical documentation necessary for mass production. We can also assist you with product certification. By using advanced design software and methodology we create solutions for varied electronic motor systems that range between mW-kW, such as rechargeable batteries, lighting control systems, chargers, power converters, motor controls, and other power electronic devices. Our teams extensive knowledge and experience in power electronics engineering projects also includes the latest PCB, magnetic design, and thermal simulation tools for minimum design iterations, and peak performance and quality for high-power electronics products used from heavy machinery to solar grids and nuclear plants.



Power Electronics Solutions

Power Electronics

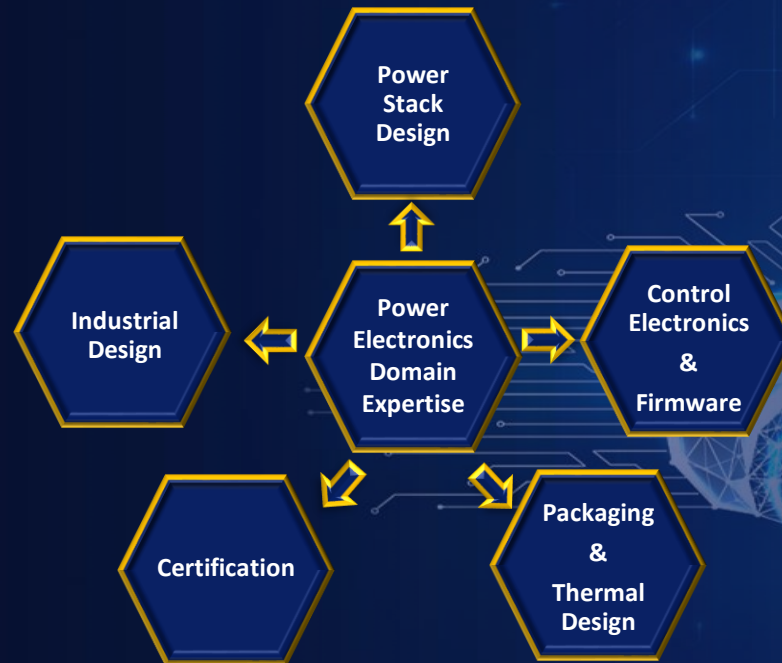
- Electric Power Train
- Drives for E-Vehicles, HVAC, Industrial
- Grid Tied Inverters for Renewables
- High-Density Power Converters
- Battery Management Systems
- LED lighting – Low to High Power
- Wireless Charges
- Programmable Power Source
- Energy Storage Solutions

Smart Building/Campuses/Cities

- Smart Parking
- Smart Surveillance
- IoT connectivity and Security
- Smart spaces and Digital Twins

Industry 4.0 - Robotics

- AI/ML for operations
- Cell layout design and reviews
- Customized grippers
- AI/ML and IT/OT integration
- UX-centric Application SW



POWER TRAIN

Expertise in drive system design for Electric Vehicles for Various types of motors- ACIM/BLDC/PMSM/SRM

BMS

Design of Battery Management System for various battery Chemistries- Lead Acid, Lithium Ion (various chemistries)

CHARGERS

Design of on board and offboard chargers for Electric Vehicle. AC and DC Chargers Fast Charging considering Long battery life.

Power Electronics – Technologies

- AC-DC Converters
- DC-DC Converters
- Battery Charging and monitoring systems
- PWM Drivers for Solenoids
- AC and DC Motor drives
- Electronic Ballast
- UPS Systems
- Regenerative braking systems
- Active Filter
- Active Rectifier



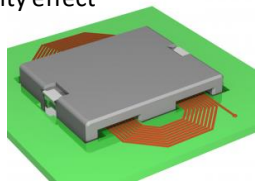
Power Electronics – Applications up to 100kVA

- Power Supply systems for various Applications
- Medical – X Rays, Surgical Diathermy and Medical Diagnostics (CT/MRI)
- Robotics and Material Handling
- Engine Vane Control, Fuel Pump, Servo valve - Avionics
- Electronic Ballast and Dimming Systems
- UPS Systems
- Automotive – EPS, ABS, Hybrid Vehicles



Magnetics and their Characteristics

- Core material, geometries and peak flux
- Density selection
- Temperature rise calculation
- Copper and core loss optimization
- Skin effect and proximity effect
- Optimization
- Planar Transformers



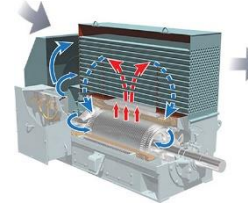
Harmonic Reduction

- Active rectifier
- Active Filter
- Vienna Rectifier
- Interleaved PFC
- Series and Shunt Active filter



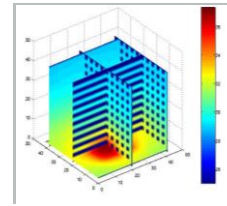
Cooling Technologies

- Natural Convection Optimization
- Forced Air/ Liquid Cooling Systems
- Cold plates and other alternative solutions
- CFD Analysis
- Thermal Imaging



Simulation

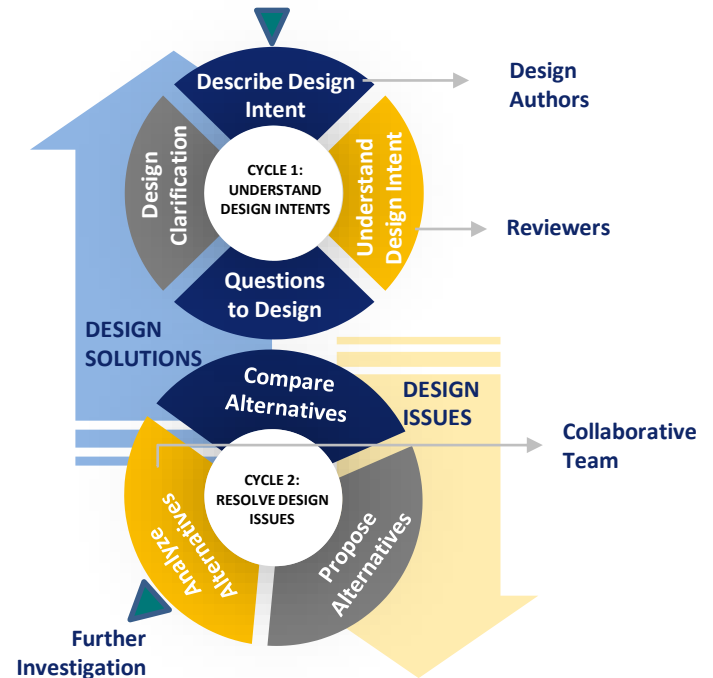
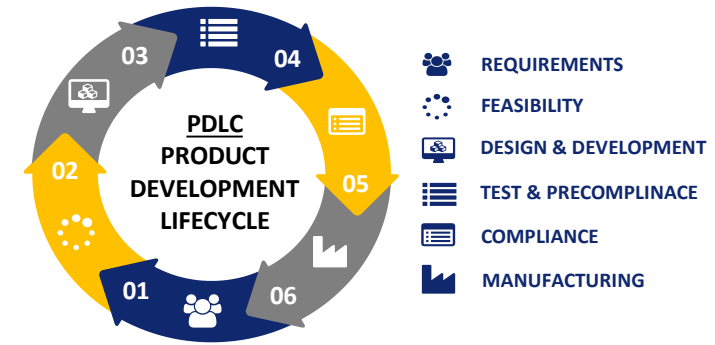
- Electrical Power System
- Fault Analysis
- Control Systems
- Electro mechanical Systems
- Power Supply Topologies
- UPS System
- Electronic Circuits



Why DEP?

- Power Stack Design Expertise**
- Hardware and Firmware Expertise**
- PCB Design Expertise**
- Thermal Design & Packaging Expertise**
- Reliability, Pre-compliance & Certification**

Design Process



Success Stories

- EV Traction Test Capabilities
- Electric Mobility 7.2 kW On-Board Charger
- Solar Grid-interactive & Hybrid Inverter Design Capabilities
- BMS for 16/24 Cells in Series
- Electric Vehicle Fast Charger – 15kW DC
- 2/3 kVA & 5/6kVA Hybrid Solar Inverter

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