

Detroit Engineered Products (DEP) is an engineering services, product development, software development, consulting, & talent acquisition company. Since its inception in 1998 in Troy, USA, DEP is now a global company with footprints in Europe, China, Korea, Japan, & 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 segments. DEP, as an engineering & re-engineering service provider, is committed to developing world-class products for our customers that involve rigorous research, design studies, detailed engineering, & testing.

From concept to completion, DEP's product development suite encompasses a whole gamut of engineering services for a diverse product range, making it superior to other competitors in terms of cost, features, & performance. As an extended engineering arm / R&D center, DEP aims to support various customers with tailored solutions integrated with value engineering techniques, making the products "manufacture-ready". As a technology-driven company, we leverage industry-best practices to innovate design, automate processes, & accelerate time to market for complex products in different industry segments.

The robust portfolio of our product development services includes research, benchmarking, reverse engineering, design and styling, detailed engineering (CAD/FEA/CFD/CHT), design for manufacturing, and prototyping. Our exceptional experience and vast expertise in the engineering domain made us 'the' trusted partners for many automakers, OEMs, Tier 1 & 2 suppliers, and various other organizations in multiple industry segments. The unique combination of efficient processes, advanced tools, & the right expertise at DEP helps deliver the most client-specific service at all times and at any stage of your project lifecycle. Our product designers and engineers know how to design an optimized product in terms of engineering and production while at the same time considering other aspects like innovation, scale, skills, cost, etc. With DEP's assistance, one can bring innovative & high-quality products to market efficiently and at a rapid rate, meeting and exceeding customer expectations.



PRODUCT DEVELOPMENT SOLUTIONS

- Product Ideation
- Industrial Design
- Competitive Benchmarking
- Concept Design
- Design for Manufacturing & Assembly
- Systems Engineering - Mechatronics
- Detailed Design – CAD, Packaging, Feasibility, FMEA, GD&T, etc.
- CAE Driven Virtual Verification - FEA, CFD, Crash & Durability, NVH, CHT, Mechanisms, Electro-Magnetism, 1d Simulation, etc.
- Optimization
- Prototyping
- Bench Testing
- Material Testing
- Analytical Methods Development

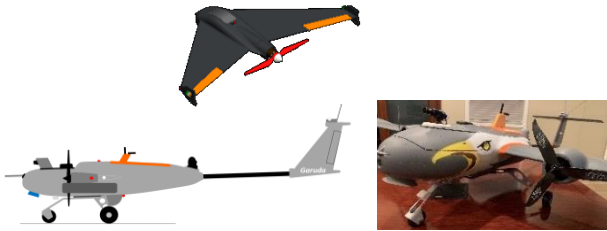


DEP Product Engineering & Design Solutions Showcase

UAV: DEP Product team has designed drones as a modular platform for various applications, including Bird Scattering, Surveillance, etc. A drone with a flight time of 45-60 min was developed for a Govt. Organization, with features including a menacing frontal appearance to intimidate birds, specialized sensors and sound emitters, "ultra bright" lights as additional deterrents, and a reliable night vision system. Using payload modifications, this design can suit any desired application.

UAV Development Capabilities:

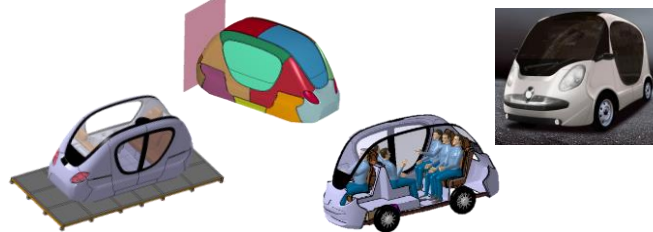
- System Design: Electronics and mechanical, Connectivity and Camera integrations, GPS Systems, Video streaming, Board bring-up, BSP, etc.
- Structural Engineering: Airframe, deterrence method, radio control and autopilot, power plant, ground control, drive train, pre-flight systems, etc.



PEOPLE MOVERS: Crafted by DEP's visionary design team, this Autonomous People Movers is a result of our commitment to environment friendly urban transport. These podcars are part of Masdar city's Private Rapid Transit or PRT project. Engineers at DEP took the responsibility of coming up with design, virtual validation, optimization and prototyping of people mover that runs on lithium batteries powered by solar energy and uses a virtual software to guide its journey. DEP team built a full size PoC including interior trim and the Styling to full Engineering Build happened in 10 weeks time.

Urban Transit - Product Engineering Capabilities:

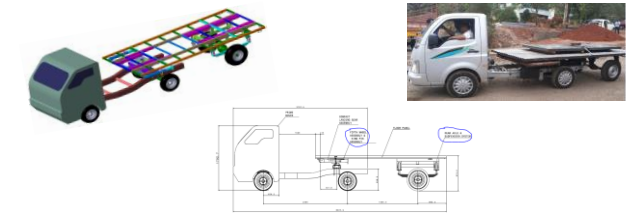
- Complete Engineering (Concept to Pre-Production): Conceptualization, Styling, Design & Engineering, Virtual Testing, Balanced Packaging, Performance Evaluation, Manufacturing support, Prototyping, etc.



MICRO-TRAILERS: Micro-trailer developed by DEP is a tailor-made offering meticulously crafted for the LCV segment. These trailers are detachable platform with fifth wheel assembly enabling LCV owner to tow additional weight greater than payload. Product design and innovation team at DEP used state of the art design tools and MeshWorks, our proprietary CAE platform, to virtually validate and optimize the product performance in record time. These Micro-trailer tow different cargo types ranging from mobile advertisement to ATMs, mobile offices, dispensary, showroom, eateries besides bulk cargo.

Value Added Products Development Capabilities:

- Styling & Design Engineering (based on environmental applications – Weather, terrain & Cargo conditions), Design & Performance Validation, Topology, Structural & CFD Optimization, Full Vehicle CAE, etc.



ENGINE IC SENSOR: DEP has developed & patented Smart Plugs with specialized shielding and an embedded electrode sensor that provide critical engine combustion and operational data to enable real-time feedback and control to optimize engine performance. DEP has conducted extensive testing and correlation studies to interpret combustion event and provide data for each cylinder on a cycle-by-cycle basis using our patented algorithms to detect malfunctions ensuring the engine meets stringent OBD regulations.

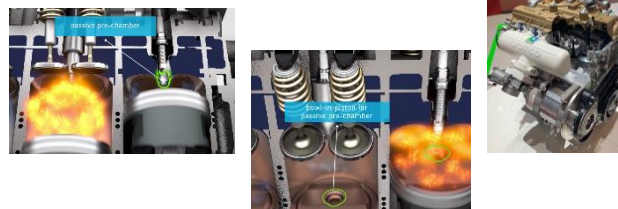
In-Cylinder Combustion Sensor Capabilities:

- Reduce emissions, Increase fuel economy, Enable Multiple Fuel Types, Corrects engine knock, misfire & cylinder imbalance, Optimize hybrid engines, Eliminate redundant sensors, Calculates peak pressure & soot, Diesel after-treatment optimization, Engine maintenance prognostics, Cold start emission reduction, etc.

GASOLINE COMPRESSION IGNITION ENGINE: DEP helped design and develop a high efficiency engine with Spark Assisted Gasoline Compression Ignition Technology. Our engine experts team delivered a functional valve train which included design, simulation and CAM lobe profile definition. At peak cylinder pressure of 200 bar and BSFC < 200 g/kwh @ 2000rpm/2bar our team achieved significant emissions reduction and fuel economy improvement benefits. Additionally this engine is capable of providing up to 50% brake thermal efficiency too.

Engine Design & Development Capabilities:

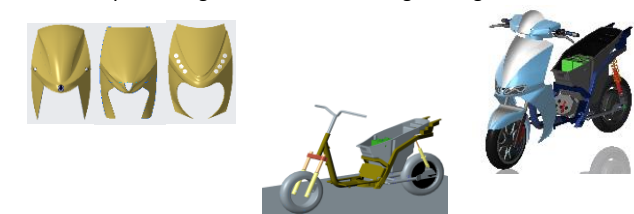
- Block-Head Durability/Sealability, Powertrain NVH, Engine Performance, Intake Manifold Optimization, Crank-train Dynamics, Rotating & reciprocating component durability, Port & Combustion Chamber Optimization, Lubrication Performance, Cooling Performance, Ventilation Performance, Packaging, Manufacturability



ELECTRIC 2-WHEELER: DEP's Product Innovation team has developed a technology prototype of an e-scooter, which displays our various engineering capabilities for the EV 2-Wheelers. Our team used an existing conventional vehicle, retrofitted with an electric powertrain. The exterior body panels have been restyled for aerodynamic performance. Frugal engineering principles have been used to ensure that an electric scooter can be developed at the same price as a conventional one, while delivering an optimal performance in the shortest possible time.

EV 2-Wheeler Development Capabilities:

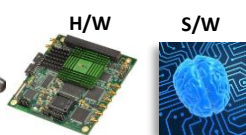
- Design: Benchmarking, Concept CAD, Simulation, 3D Modeling, Detailed Engineering, CAE Analysis, DFMA, Structural Analysis & Optimization, etc.
- Systems Modeling and Engineering: Physical modeling, Control systems development, S/W Model Libraries, etc.
- Battery Modeling, Inverters, Reverse Engineering, etc.



IC Multi-Sensor



Decoder Black Box



Diagnostic Kit



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