

Detroit Engineered Products (DEP) is an Engineering Solutions and Product Development company. Since its inception in 1998 in Troy, Michigan, USA, DEP is now a global company with footprints in Europe, China, Korea, Japan and India. DEP uses the 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.

Rapid time to market of new products across several industry sectors such as automotive, defense, aerospace, energy, oil & gas, consumer products and heavy equipment is a unique value proposition delivered to clients via DEP's world class engineers and the DEP MeshWorks platform.

With nearly 600 sub – system level Multi disciplinary projects for OEMs resulting in significant weight reduction in powertrain, chassis and interior components, we have lightweighting solutions that can rapidly transform your products resulting in about 20% weight reduction in an average. DEP has proven on multiple occasions that right material composition gives a right combination of steel grade with optimized shape, gage and other geometrical parameters, and these steel designs can have a cost and weight efficiency as compared to other alternate materials like aluminum, magnesium or composites.

DEP's experience in working with high strength materials coupled with our advance parametric tools for the mobility industry enables superior light weight solutions. DEP's ability to lightweight, along with performance has been a great enabler for our customers. Our engagements with various raw material suppliers & tier -1 & 2 manufacturers coupled with expertise of handling the material grades based on manufacturing knowledge delivers a superior edge to all customers.

DEP is a leading provider of innovative, value-creating lightweighting solutions, with innovative and upgraded material selection solutions. Appending our design & engineering to an efficient manufacturing process will enable the product development to achieve greater cost efficiency, higher performance and improved sustainability in vehicle system and components.



## LIGHTWEIGHTING SOLUTIONS

### Body Structures



### Lightweight Design

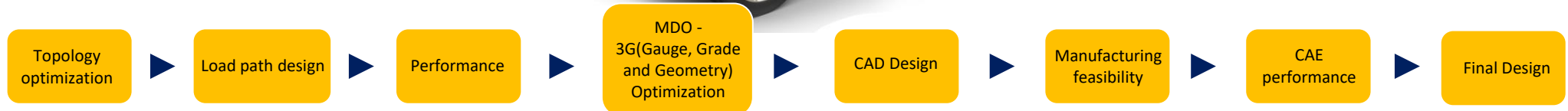
### Batteries

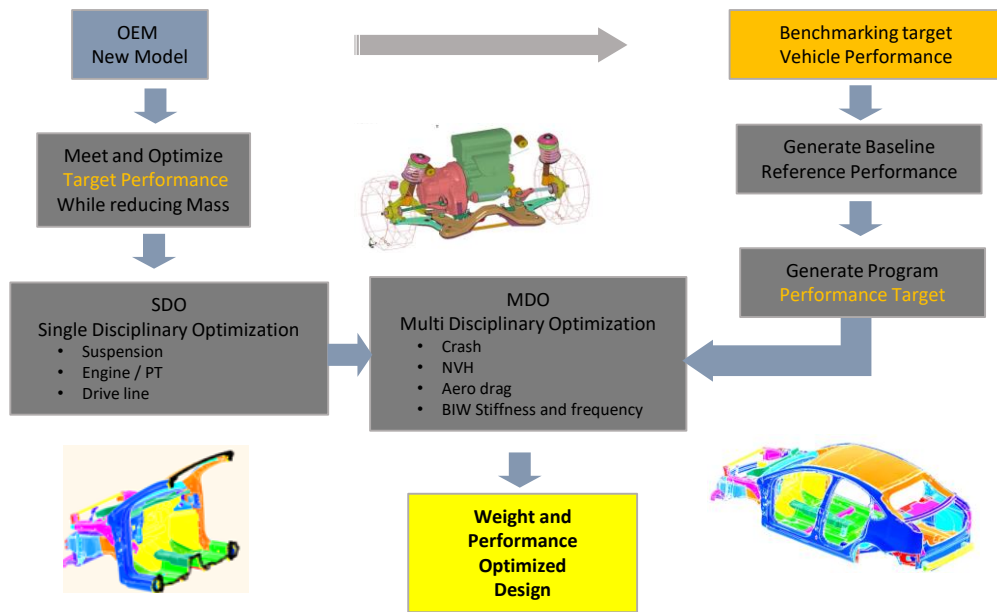


### Lightweight Engineering

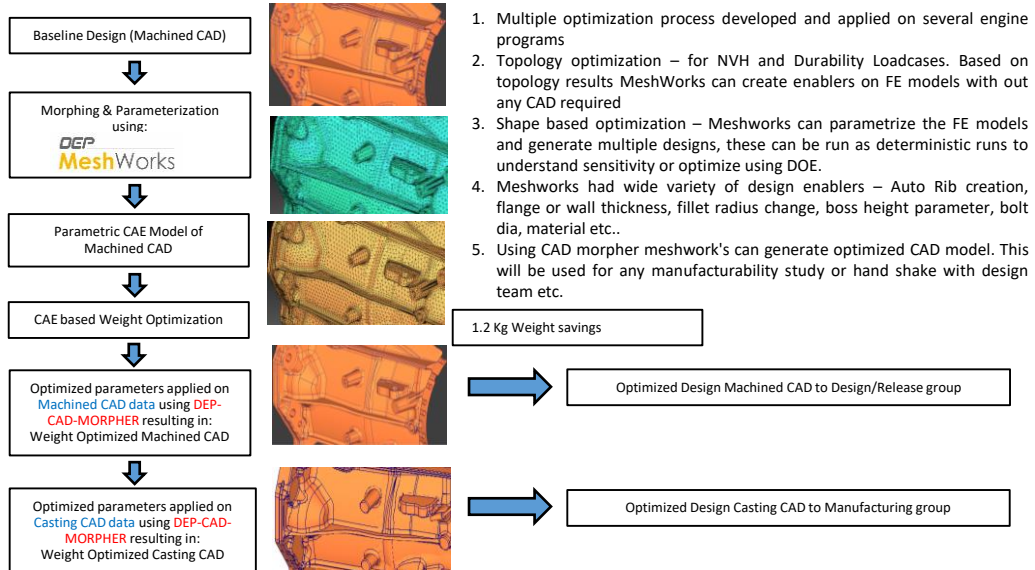


### Electric Drive Unit





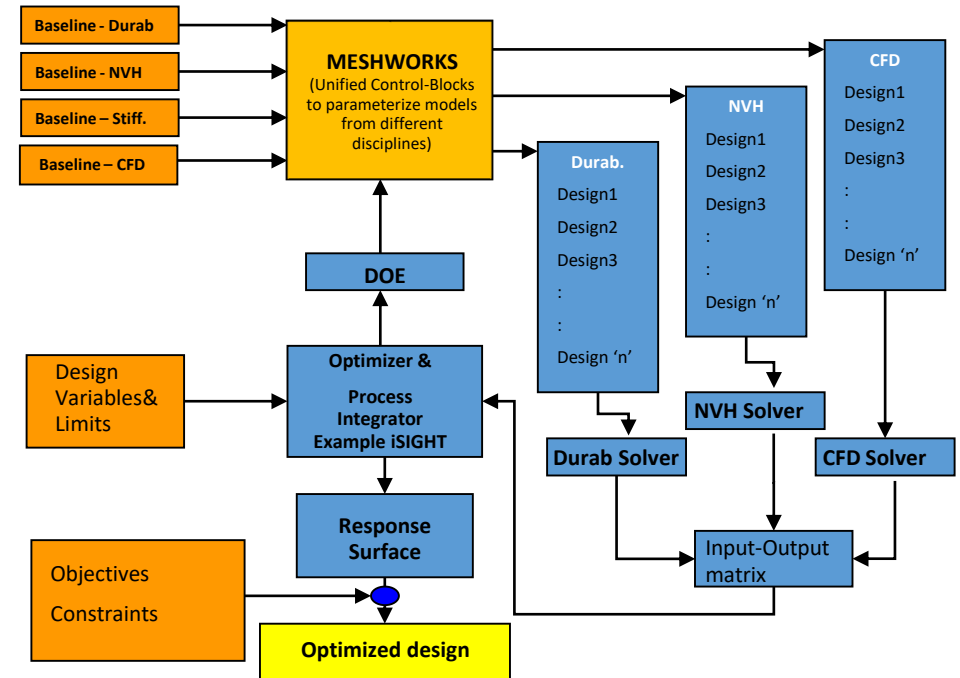
### Transmission housing Weight Optimization & CAD Morphing



### Various Lightweighting Techniques implemented by DEP

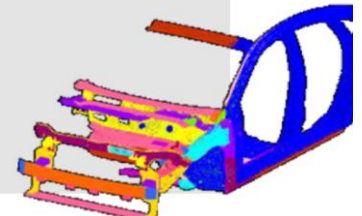
- Topology Optimization
- Section/Shape Optimization
- DOE Studies
- MDO/SDO Studies
- Welding /Adhesive Optimization
- Material Selection and Weight optimization
- RSM (Response Surface Method Analysis)
- Sensitivity Studies
- Rapid 1d Model Creation

### CAE/CAD Morphing, Parameterization & Multi-disciplinary Weight Optimization Flow Chart

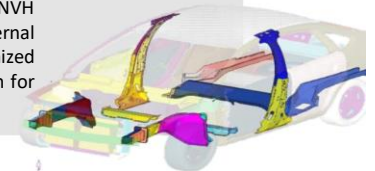


### Success Stories

A large OEM's current production mid-size sedan was significantly light weighted and weld count reduced by DEP through its MDO process. The OEM's powertrain group has benefitted from DEP's morphing based multi-disciplinary weight optimization process, and transformed its entire virtual analysis procedures embedding DEP's successes on major engine and transmission programs.



DEP's weight optimized ALLSTEELBIW for a very large OEM at 172 Kg is considered an industry first for lightest steel body meeting all crash, NVH & durability targets. The above design has been set as an internal benchmark cum target at the OEM and has been multidiscipline optimized (MDO) by DEP as per OEM load cases, modeling practices and design for manufacturing standards.



DEP performed full vehicle parameterization and MDO for an SUV, resulting in a mass saving of 11 kgs, with minimal packaging and tooling changes and without any degradation in performance. DEP MeshWorks driven MDO approach has been successfully extended beyond full vehicle to various other vehicle sub systems as well.



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