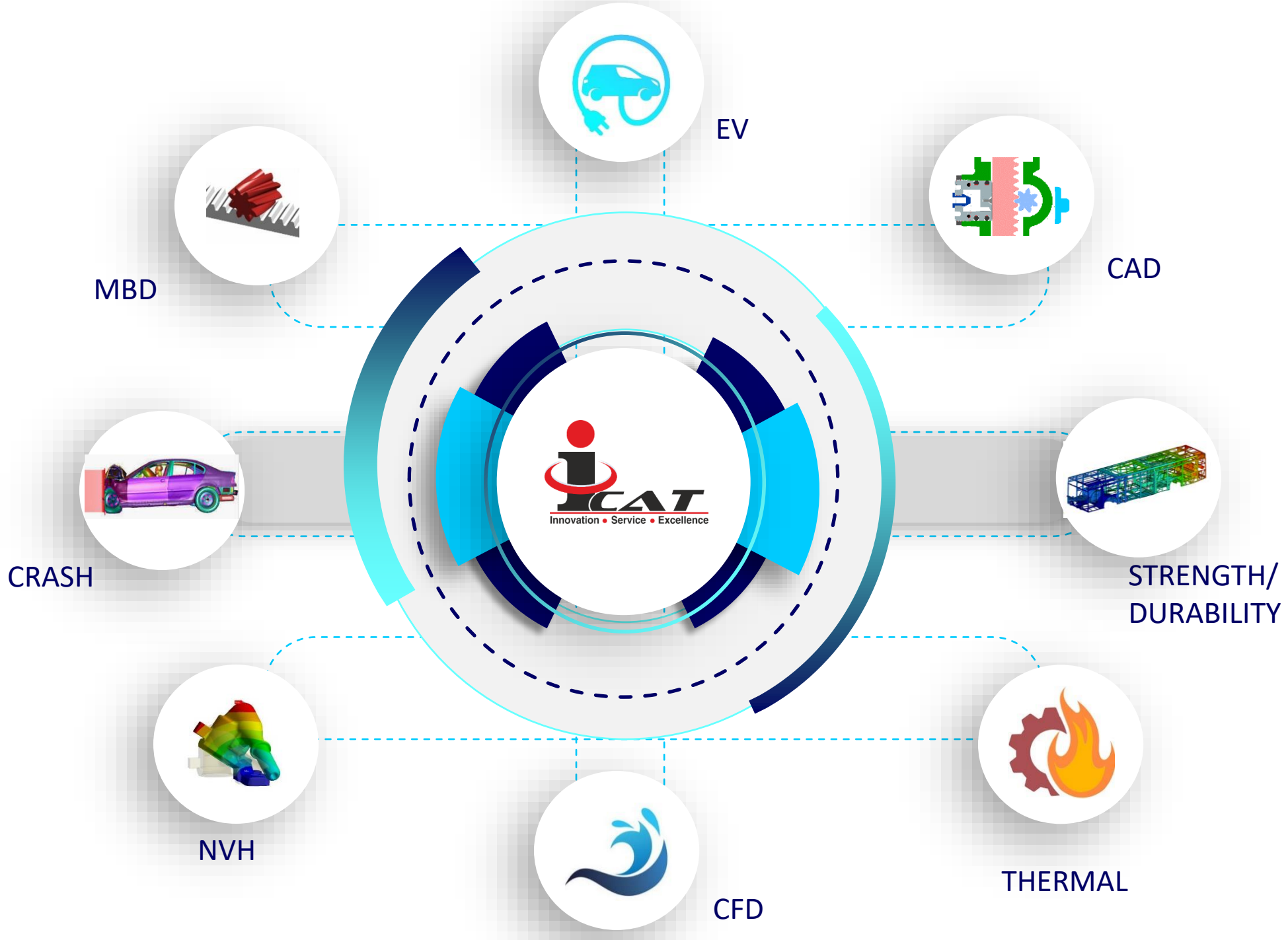
CAD-CAE LAB

HARDWARE

HIGH-PERFORMANCE COMPUTING POWER FEATURES

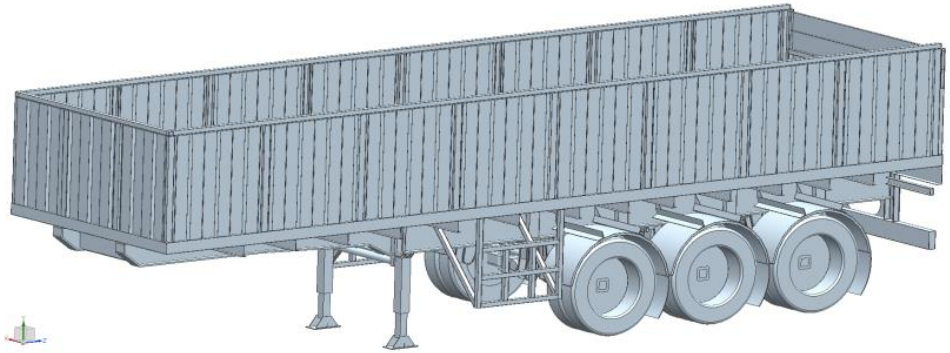
- Capability to solve full crash simulations.
- Altair PBS Job Scheduler for Job Management

Cluster Components	Processor	Storage	RAM
Node/CPU Total Nodes- 90	16 Core Intel XEON E5-2670 @ 2.60 GHz	900 GB X 5	64 GB
Four Shared Memory Processor	8 Core Intel XEON E7-8837 @ 2.67 GHz	900 GB X 6	128 GB
Backup Server	12 Core Intel XEON E5-2620 @ 2.00 GHz	900 GB X 6	16 GB
Infiniband Interconnect	Mellanox® IB QDR/FDR10, 40Gb/s		
Tape Library	Backup Storage		


EV
MBD
CAD
CRASH
STRENGTH/
DURABILITY
NVH
CFD
THERMAL
Innovation • Service • Excellence

CAD PROJECTS

Part Modeling and Assembly
Manufacturing Drawing
GD&T
Design Optimization



Truck Trailer

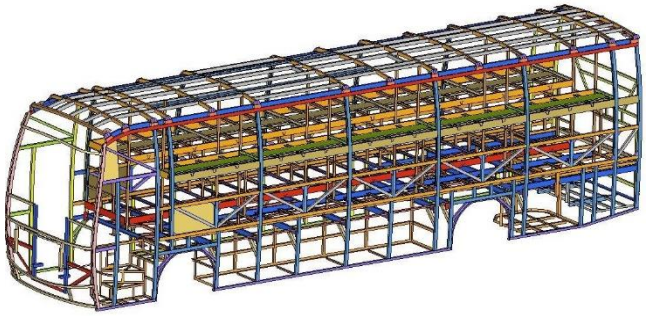
E-Rickshaw

Tools used as per Industry Standard

PLM Software SIEMENS NX

CATIA

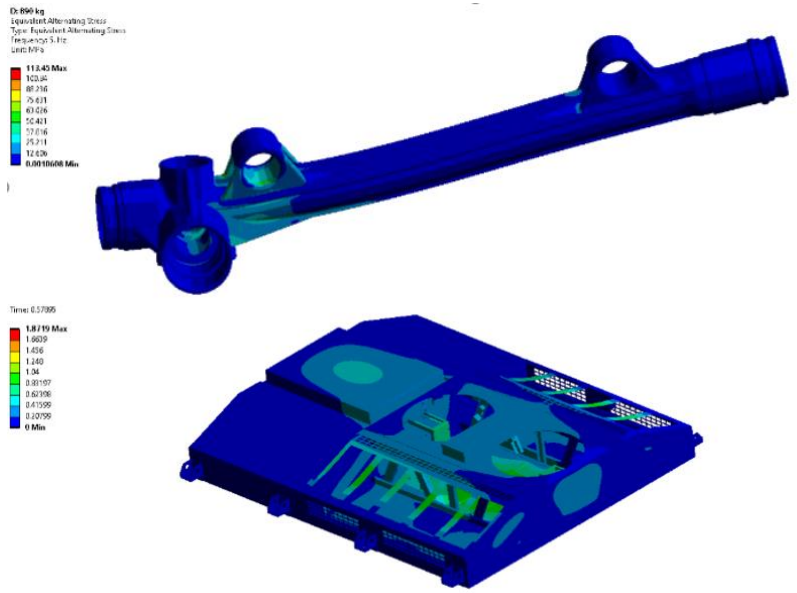
Seat

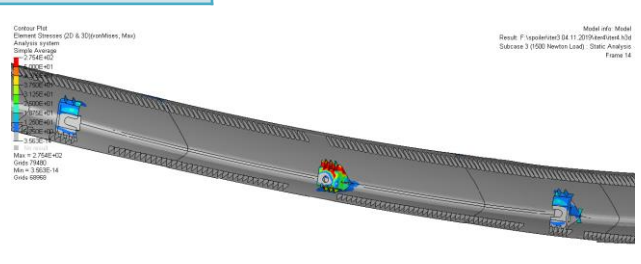


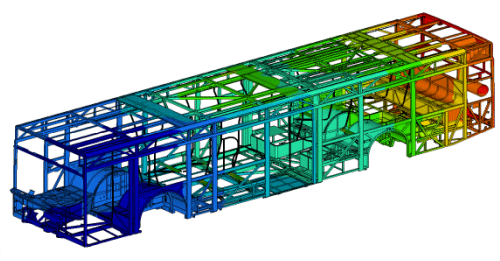
Sleeper Bus CAD Model

STRENGTH AND DURABILITY ANALYSIS

Component Structural Analysis
Low-cycle fatigue analysis
High-Cycle fatigue analysis
Hyper elastic Material analysis
Transient Shock Analysis
Nonlinearity – Contact, Geometry and material



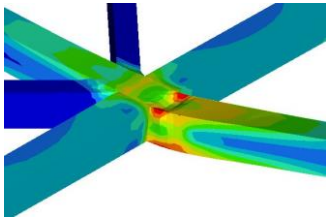


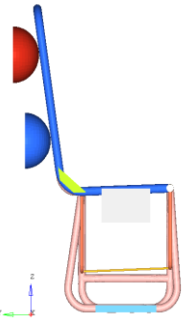


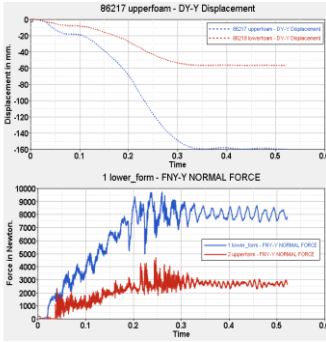
Tools used as per Industry Standard

Altair HyperWorks ANSYS MSC Software

SIMULIA

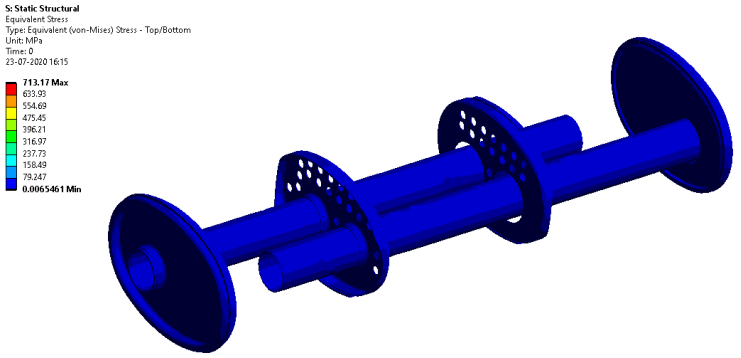


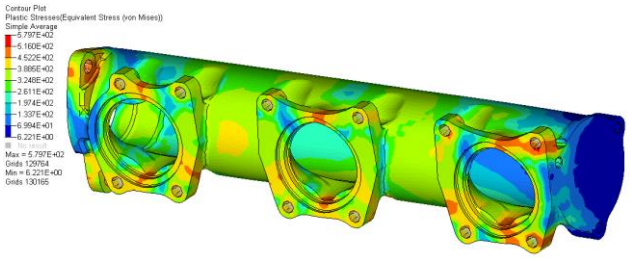


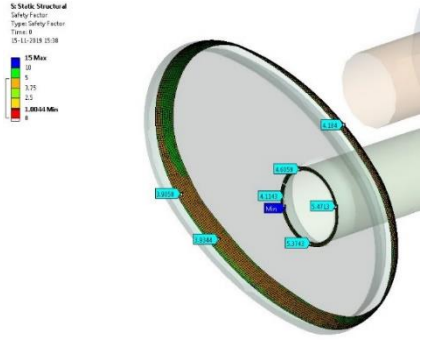


THERMAL ANALYSIS

Powertrain cooling
Thermal stress on the weld due to thermal shock
Exhaust system development
Battery Thermal Management
Thermal Stress fatigue analysis



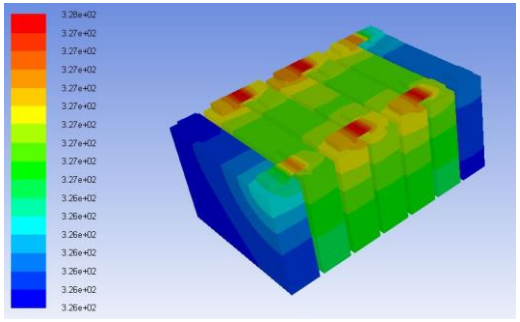


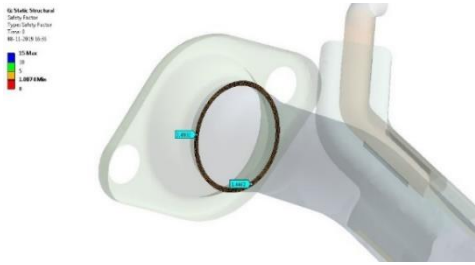


Tools used as per Industry Standard

ANSYS MSC Software

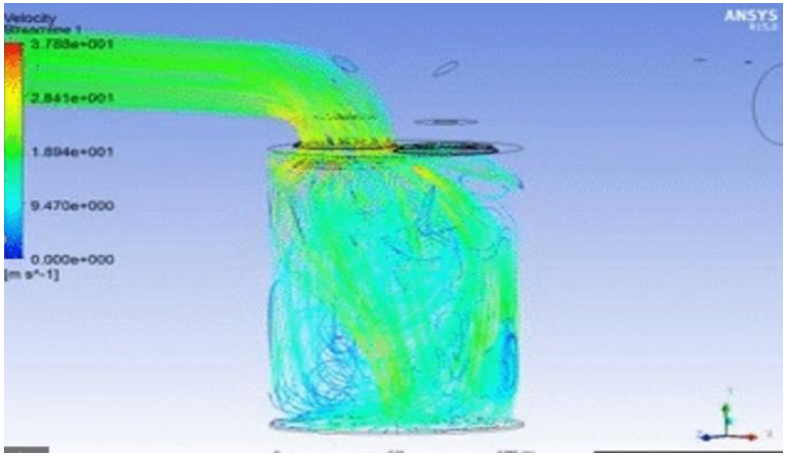
SIMULIA

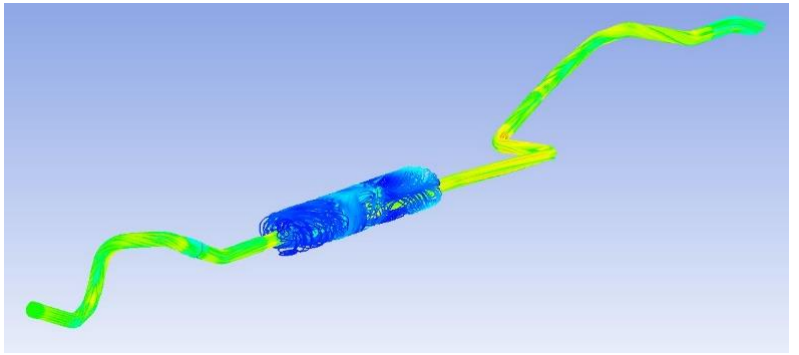


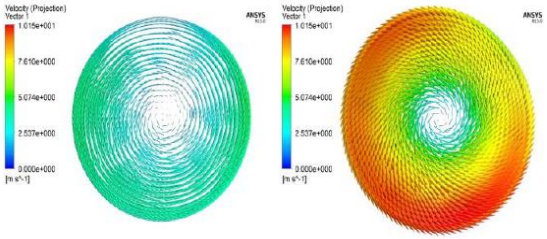


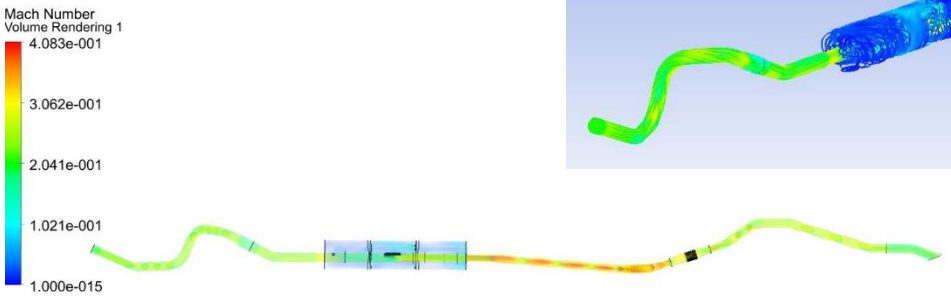
CFD ANALYSIS

Port flow analysis
Exhaust system analysis
Exterior aerodynamics drag and lift predictions
Battery cooling
Conjugate heat transfer analysis



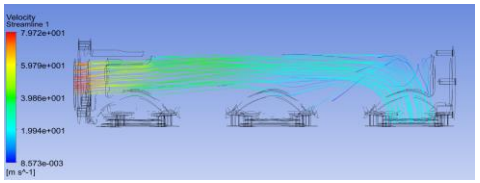




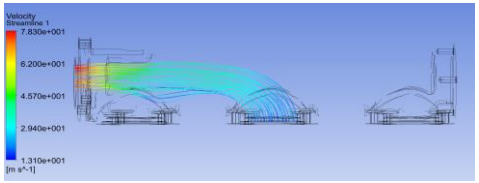


Tools used as per Industry Standard

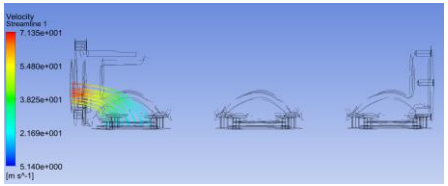
ANSYS®



Inflow 1



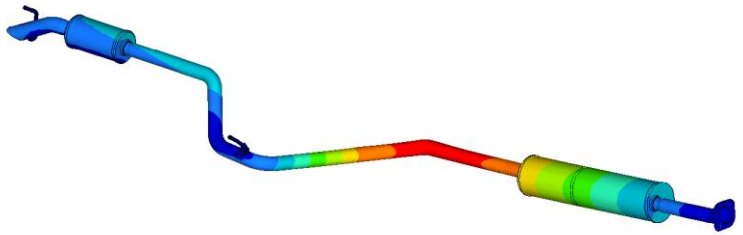
Inflow 2

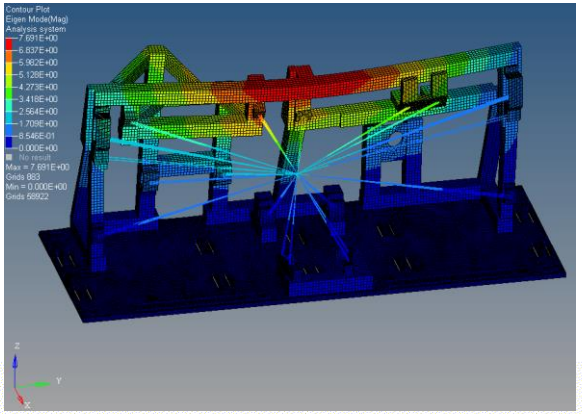


Inflow 3

NVH ANALYSIS

Benchmarking, target setting and cascading
Components Modal Analysis.
Harmonic Analysis
Random Vibration and Response spectrum Analysis by applying the
Vibration Fatigue analysis
Correlation to physical prototype
Methodology Establishment Through Correlation With In-house Physical Testing Facility



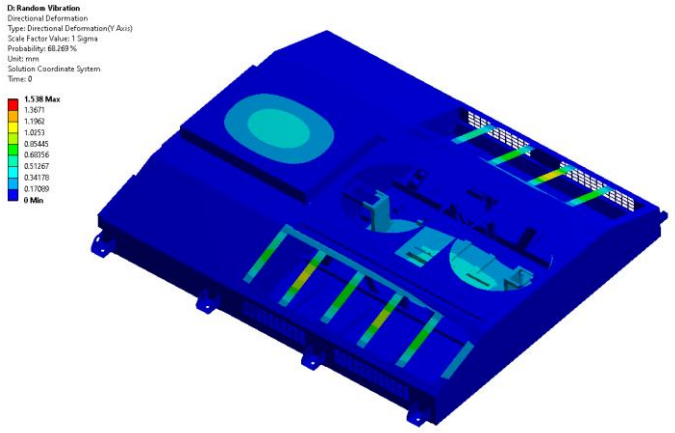


Tools used as per Industry Standard

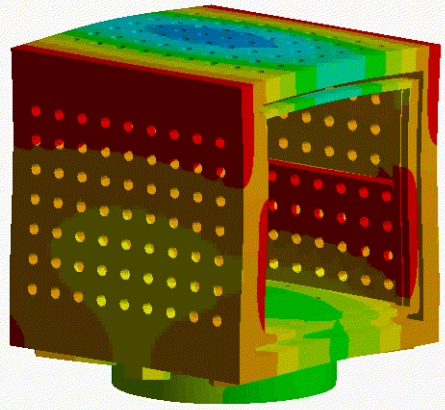
ANSYS

MSC Software

Altair HyperWorks

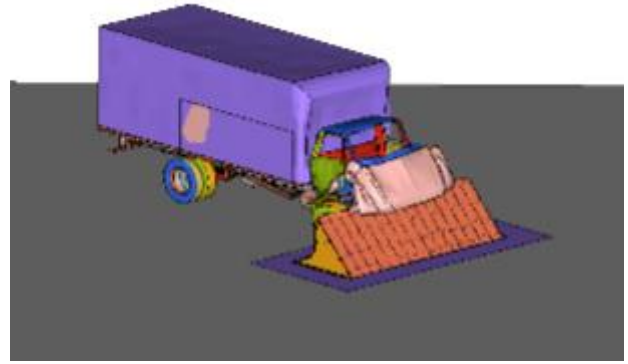


Random Vibration Analysis



CRASH/IMPACT ANALYSIS

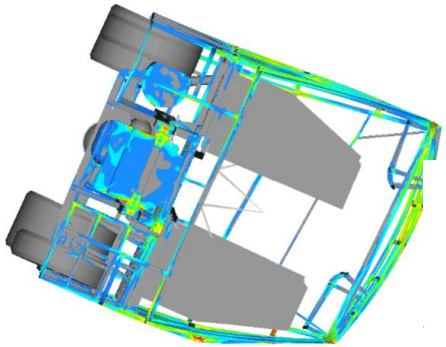
Energy Management Strategy
Structural Safety for meeting the Regulation and Customer test
Correlation to physical prototypes
Load Path definition
Evaluation of FOPS & ROPS for Construction Equipment & Mining Vehicles
Nonlinearity of contact can be defined for the crash
Drop Simulation of Transportation Packages & Electronic Items
Methodology establishment through correlation with in-house physical testing facility
Design of Vehicle Barriers (Bollard / Blocker) and Evaluation as per ASTM F2656 / PAS 68 / IWA 14-1

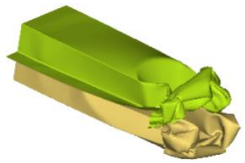


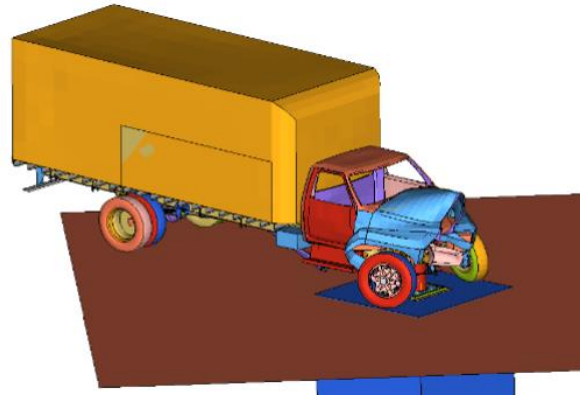
Tools used as per Industry Standard

Altair | HyperWorks

ANSYS

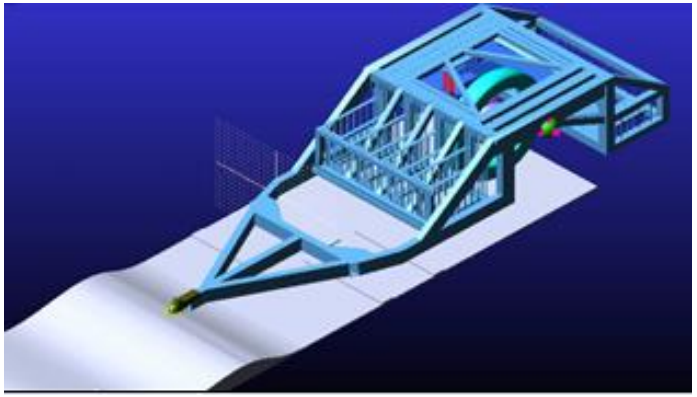


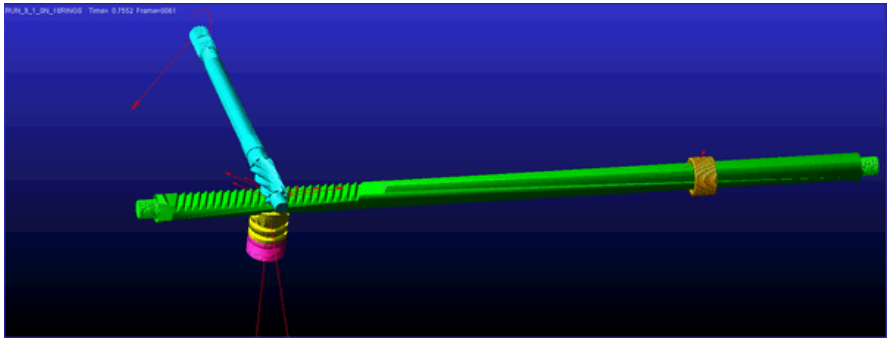


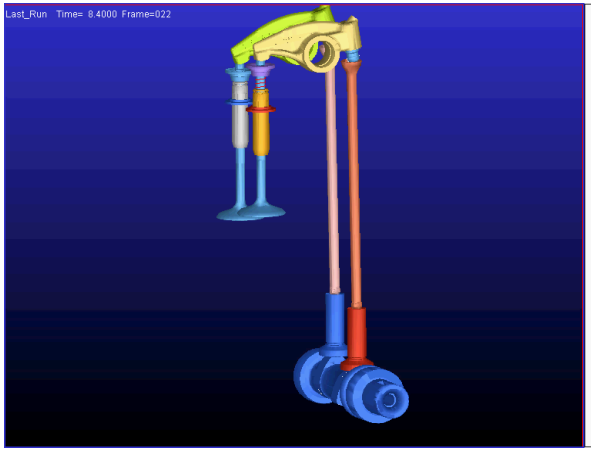


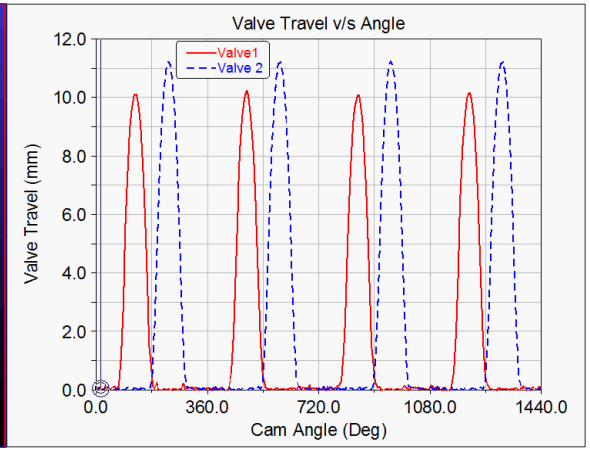
MULTI-BODY DYNAMICS

Mechanism Simulation
Calculation of forces through MBD
Vehicle dynamics







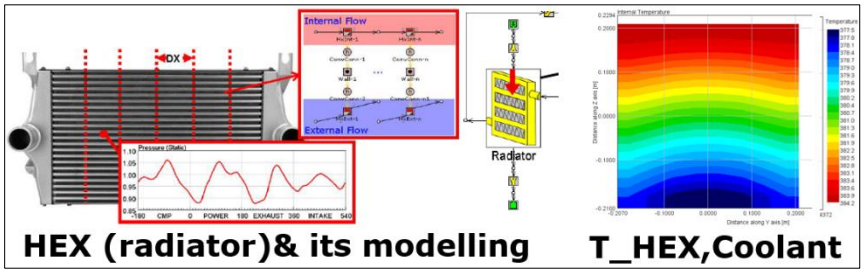


Tools used as per Industry Standard

MSC Software Adams

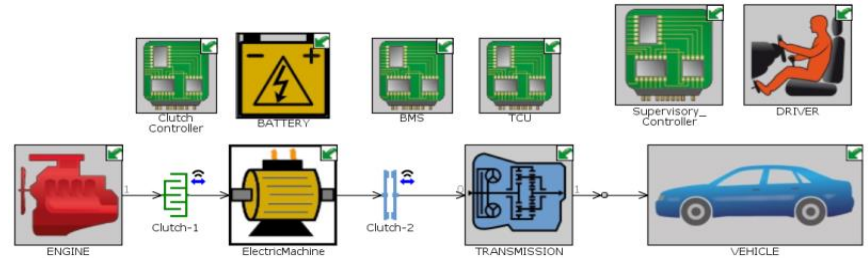
EV

- Drive cycle simulation (e.g. FTP, NEDC) for fuel efficiency and emissions prediction
- Engine transmission and vehicle dynamic performance (e.g. acceleration, max engine speed, max vehicle speed, distance travelled)
- Drivetrain components design (e.g. gear ratio and gear shifting strategy optimization)
- HEV & EV modelling and simulation
- Integrated simulation of vehicle drivetrain system with engine model/ cooling system
- Engine start/ stop, and electric launch & assist
- Implementation of advanced technologies (e.g. regenerative braking, CVT)

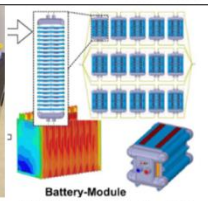


HEX (radiator)& its modelling

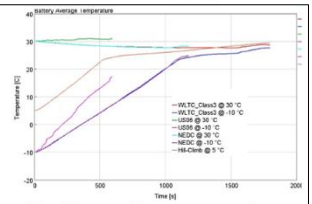
T_HEX,Coolant

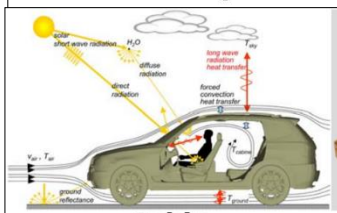


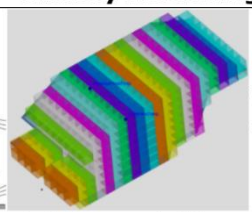
Battery

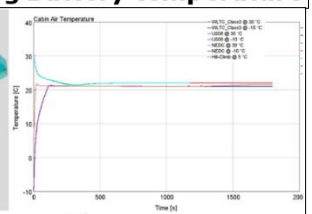


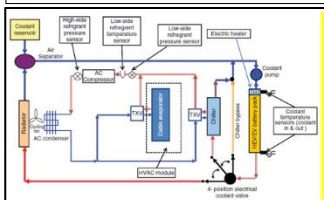
Battery modelling

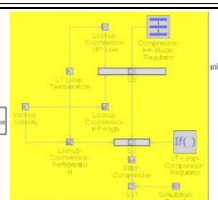

Battery temperature

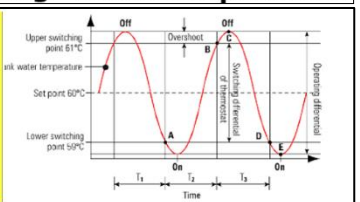

Cabin


Cabin modelling

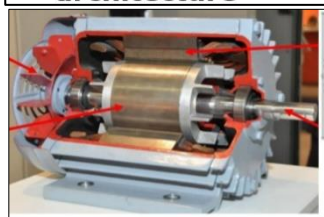

Cabin temperature

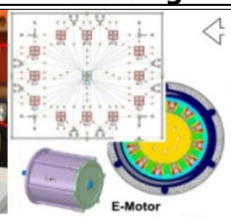

Control system architecture


Control system modelling

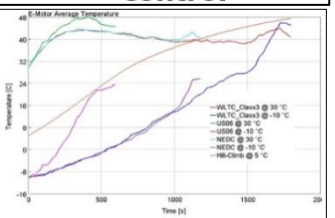


Battery temperature control


Motor



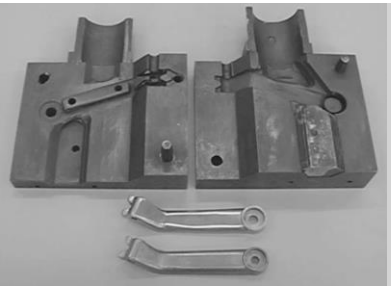
Motor modelling

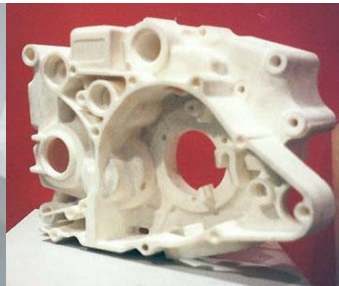

Motor temperature

3-D PRINTING/ADDITIVE MANUFACTURING

Alternative form of conventional manufacturing add each layer of material on another by thermoplastic
Manufacturing of Special tool dies for special purpose
It is cost efficiency method
The manufactured component is light weight
Quick turn around
The manufactured part have no residual Stress
Technology used • SLM- SELECTIVE LASER MELTING • SLS- SELECTIVE LASER SINTERING
Used in Automotive Components, Aerospace Industry, Art And Architecture, Tool And Dies, Medicine And Dentistry, Consumer Industry, Text And Logos.

SLS	SLM 250
Plastic Laser Sintering	Metal Laser Sintering
Build volume 340x330x450mm	Build volume 250x250x250mm
Accuracy of laser + 0.005mm	Accuracy of laser + 0.005mm
Aluminum Alloys, Titanium Alloys	Duraform Extreme Natural, Duraform Flexible





INDUSTRY DOMAIN

- Automotive
- Railways
- Aerospace
- Space & Satellite
- Marine & Ship Building
- Defense
- Electrical & Electronics

- Structures
- Construction Equipment & machinery
- White good Appliances
- Medical Devices
- Process Plant & Equipments