TIRE ENGINEERING

An integrated Tire Design and Engineering Solution to accelerate innovation

Tires are the only connection between a vehicle and the ground. Their design and engineering prevent a car from skidding on wet roads , help a driver maneuver safely on snow days and contribute to fuel efficiency by reducing rolling resistance. Innovative tire design helps an excavator get traction to move on rough terrains or ensures safety during aircraft landing.

With changes in the mobility industry, tire manufacturers are challenged to design fuel efficient and quite tires without compromising safety. Dassault Systèmes offers best-in-class solutions tailored to help tire manufacturers meet these challenges and to accelerate innovation to remain competitive. These solutions further help them optimize their supply chain and improve the management of raw materials, while working towards increasing their operating margin by reducing their production cost.

INDUSTRY CHALLENGES

- High product design cost due to manual processes, disconnected tools and processes,
- Lack of collaboration between department and traceability of data and processes
- High innovation cost due to high cost of design space exploration
- Trade-offs between grip, wear and rolling resistance
- High testing cost for evaluating key tire performances indicators such as traction, drive-by-noise, wear, soiling, aerodynamic drag, wet grip, ride comfort, etc.
- Challenges to predict tire performances at low and high temperatures

BENEFITS AND DIFFERENTIATORS

- Multi attribute optimization and decision making for tire
- Fully automated process for easy design space exploration with design of experiments (DOE)
- Integrated design and simulation process in a single environment
- Full digital continuity and traceability across disciplines (requirements, design, simulation, project, etc.)
- Advanced simulation solutions:
  - Fluid-Structure Interaction (Abaqus-XFlow co-simulation) for evaluating tire performance in hydroplaning
  - Aerodynamic simulation using PowerFLOW for calculating aerodynamic drag
  - Vehicle Systems Dynamics using Simpack and Dymola
- More verification cycles in same amount of time with higher confidence
- Advanced simulations to support tire testing following the SAE standards like SAE J1269, SAE J1987, SAE J2704, SAE J2710, SAE J2717 etc.

USERS

- Tire Engineer
- Tire Designer
- Tire Research Engineer

KPIs

- With the integrated solution, key tire performance evaluation time reduced to hours instead of days and weeks.
- High fidelity simulations (such as Tire Traction, Tire Wear, Wet Grip, Noise, Aerodynamic Drag, Soiling, Ride Comfort etc.) help significant cost saving with virtual validation (cost saving is the main performance index)
- Reduce engineering change by 20 – 60%
- Single Platform reducing peer checking time / error and increase productivity by 20-40%, reduce retrieval time by 40-60%
- Enable faster 3D tire design based on modularity / template in long term, reduce tire design time by 15-30%

WORKFLOWS

Our **3D**EXPERIENCE® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

Dassault Systèmes, the **3DEXPERIENCE®** Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 210,000 customers of all sizes in all industries in more than 140 countries. For more information, visit **www.3ds.com**.

3DEXPERIENCE®

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