



Tire Development

Complete Virtual & Physical Development Solutions

Applus+ IDIADA provides comprehensive tire development solutions that bridge the gap between advanced virtual development and real performance validation through high fidelity vehicle Digital Twin and world class tracks and testing facilities. Tire development has become increasingly complex, requiring sophisticated integration between virtual modeling, physical testing, and vehicle dynamics. Modern tires must deliver exceptional performance across multiple dimensions: safety, comfort, efficiency, durability, and environmental responsibility.

VIRTUAL TIRE DEVELOPMENT

When it comes to virtual tire development, Applus+ IDIADA uses cutting-edge modeling technologies that enable comprehensive performance prediction before physical prototypes are manufactured.

1. Reference Model Generation

Create baseline virtual tire models from FEA data and initial characterization.

2. Variant Creation

Generate multiple design variants based on KPIs and performance targets.

3. Virtual Assessment

Evaluate performance using driving simulators and real-time models.

4. Optimization

Morphing and fine-tuning across different dimensions and conditions.

5. Physical Validation

Selected prototypes undergo comprehensive testing for final validation.

ADVANCED MODELING TECHNOLOGIES

TIRE MODELS

- Multi-physical 3D modeling up to 250 Hz
- Real-time simulation capability
- Complex tire phenomena prediction
- Thermal dynamics integration
- Uneven road surface interaction

MF-TIRE & MF-SWIFT

- Magic Formula mathematical models
- Handling performance prediction
- Extended comfort analysis
- Transient behavior simulation
- Vehicle integration optimization
- Uneven road surface interaction

CD-TIRE MODELS

- Belt dynamics specialization
- 3D road surface interaction
- High-frequency analysis
- Footprint pressure distribution
- Wear prediction capabilities
- Vehicle integration optimization
- Uneven road surface interaction

CO-DEVELOPMENT METHODOLOGY

Our unique three-way partnership model brings together OEM requirements, supplier innovation, and IDIADA's testing expertise to accelerate development while ensuring optimal vehicle integration.

IDIADA'S ROLE

- Advanced model development and validation
- Comprehensive testing and characterization
- Performance evaluation and optimization
- Vehicle integration optimization
- Regulatory compliance support
- Uneven road surface interaction

OEM RESPONSIBILITIES

- Define performance requirements and targets
- Provide validated vehicle models
- Specify operating conditions and use cases
- Review and approve development milestones

TESTING CAPABILITIES

IDIADA's testing capabilities span from component-level characterization to complete vehicle integration and testing, ensuring thorough validation across all performance parameters and operating conditions.

VEHICLE INTEGRATION TESTING



DYNAMIC PERFORMANCE

- Braking performance (dry/wet conditions)
- Handling evaluation and optimization
- Aquaplaning resistance testing
- Cornering stability analysis
- Active safety system integration



EFFICIENCY TESTING

- Rolling resistance measurement
- Fuel consumption impact analysis
- Electric vehicle range optimization
- Energy dissipation studies
- Thermal efficiency evaluation



NVH ANALYSIS

- Interior noise and vibration testing
- Pass-by noise measurements
- Road surface interaction analysis
- Frequency response characterization
- Comfort optimization studies



WEATHER CONDITIONS

- Winter performance (snow/ice)
- Wet traction and hydroplaning
- Temperature variation studies
- Seasonal durability testing
- All-weather capability validation

SPECIALIZED TESTING SERVICES



DURABILITY STUDIES

- Worldwide wear testing programs
- Driving Severity Number (DSN) methodology
- Impact damage assessment
- Rapid deflation testing



ELECTRIC VEHICLE FOCUS

- High torque performance validation
- Thermal management integration
- Range optimization testing
- Regenerative braking compatibility



INNOVATION PROJECTS

- Marie Curie program participation
- EU low emission research
- Noise reduction technologies
- Sustainable material studies



ADVANCED TEST EQUIPMENT

- **Skid Trailer:** On Track Real surfaces dynamic characterization with complete control over tire attitude and force measurement
- **K&C Rig:** Static stiffness measurement with 5-DOF platform control
- **Rolling Resistance Drums:** Certified testing for C1, C2, and C3 tire categories
- **Indoor Laboratory:** Controlled environment testing with temperature and humidity control



CERTIFICATION & COMPLIANCE

- **ISO 17025 Accredited** testing laboratory (ENAC certified)
- **EU Regulations:** Complete regulatory compliance testing
- **Global Standards:** FMVSS, INMETRO, GSO-SASO certifications
- **Pass-by Noise:** Standardized noise emission testing
- **Wet Grip:** Standardized wet braking performance

WORLD-CLASS FACILITIES

IDIADA's comprehensive global presence ensures testing capabilities across all climatic conditions and regulatory requirements worldwide.

SPAIN HQ



- Complete proving ground
- Advanced laboratories
- Engineering center

CHINA



- Complete proving ground
- Asian market focus
- Local certification

USA



- Los Angeles facility
- FMVSS compliance
- North American market

INDIA



- Facilities in Pune & Chennai
- Tropical conditions
- Emerging market focus

BRAZIL



- São Paulo operations
- INMETRO certification
- South American market

FINLAND



- Winter testing facilities
- Snow & ice conditions
- Extreme weather validation

PROVING GROUNDS

- Multiple surface types and conditions
- Wet and dry testing circuits
- High-speed oval tracks
- Noise testing facilities
- Vehicle dynamics evaluation areas

DRIVING SIMULATORS

- VI-grade DiM250 simulator
- Best-in-class motion fidelity
- Real-time F-Tire integration
- Digital twin proving grounds
- Professional driver validation

LABORATORIES

- ISO 17025 accredited facilities
- Environmental chambers
- MiniSHED & Passive SHED
- Material testing equipment
- Emissions analysis systems

CONTACT INFORMATION

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