DPTR
Dynamic Patch Test Rig

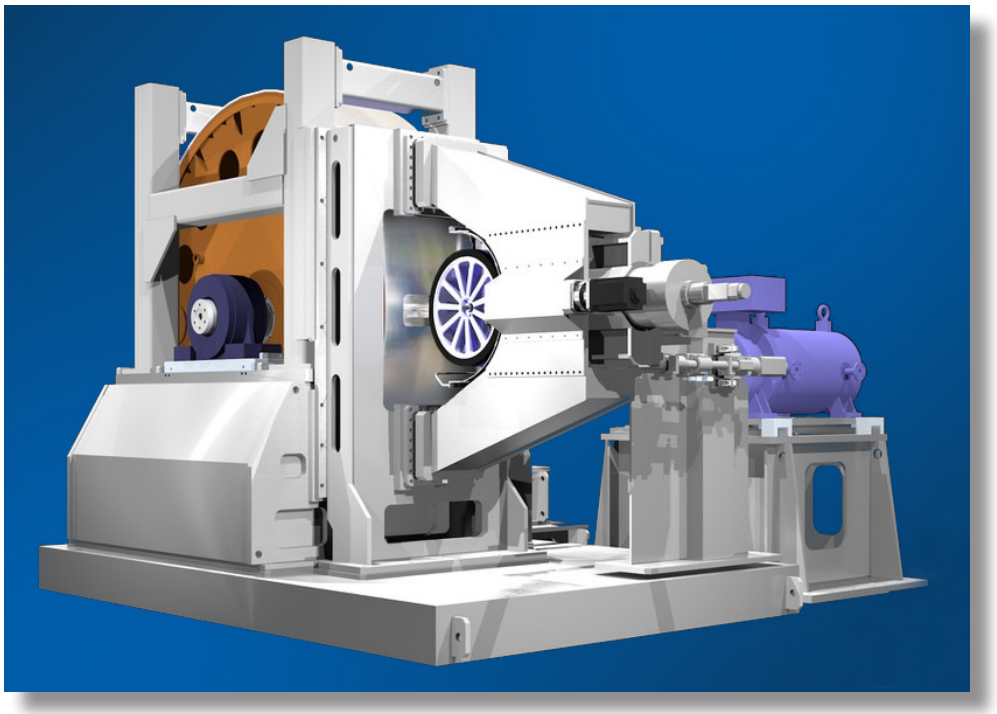
A&D Technology

Dynamic tire contact pressure distribution measurement

The next-generation dynamic patch test rig measures tire contact pressure distribution through an A&D Force Matrix Sensor built into the drum. By combining the large curvature of a φ3.2m steel drum with a high-precision tire stand in an environment that simulates a flat road, measurement of the various forces generated between the tire and the road surface can be measured.

The tire stand has the ability to reproduce the conditions of an actual running vehicle, and can analyze the tire transfer function and characteristics from the recorded data during operation.

By equipping the steel drum with an optional cleat three-component force sensor, the force generated between the tire and an uneven road surface when the tire crosses the cleat can be measured. Also, by attaching a simulated road surface made of metal or resin to the outer surface of the drum, you can vary the road surface as desired.



A&D's Dynamic Patch Test Rig

Highlights

- φ3.2m diameter drum simulates a near-flat road test environment
- Mechanical adjustments
  - Tire force
  - Camber angle
  - Slip angle
  - Tire pressure
  - Tire speed
  - Drum speed
- A&D Force Matrix Sensor (FMS) built into drum
- Advanced rotation synchronization and slip ratio settings available
- Additional 3-component cleat force sensor available
- Optional drum surfaces available to replicate a variety of road surfaces

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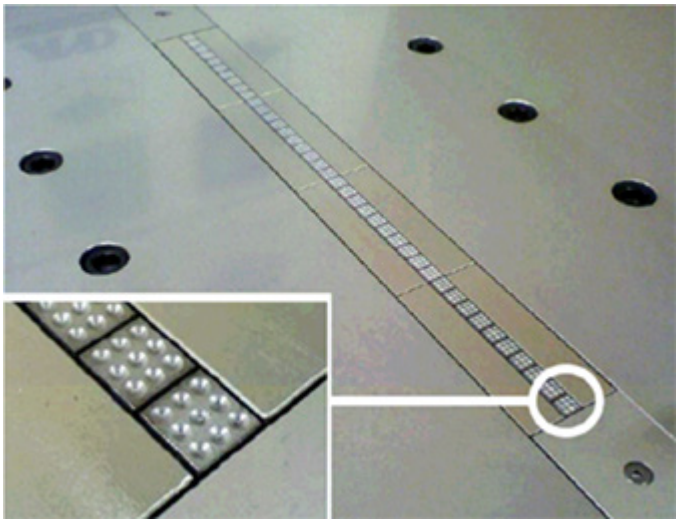
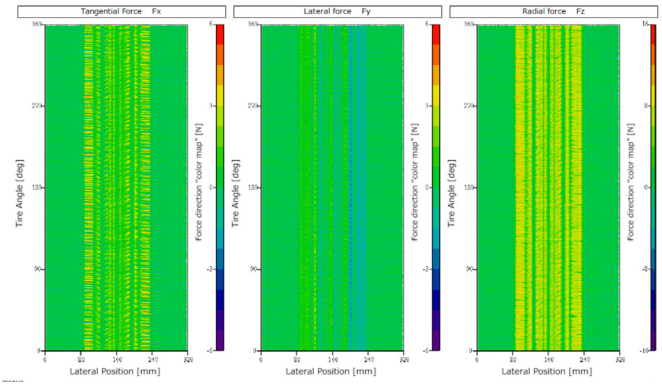
Measurement Examples

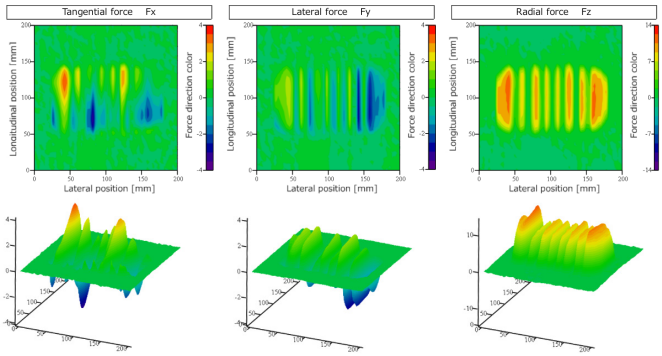
With the FMS installed on the line on the drum surface, the tire contact pressure distribution passing over the sensor can be converted into data.



From the tire and drum position information and grounding force data, the contact pressure distrubution for the circumference of the tire can be converted into data.



The acquired data is post-processed using application software to analyze the force distribution of the 3-component forces, and draw a contour figure and time-based 3D graph that provide visual understanding.



Specifications

Parts	Specifications	Remarks
Drum outer diameter	3.2m	When equipped with segments: ϕ3.33m
Rotational power	300kW AC motor	
Position resolution	18000 P/R	High resolution encoder output
Speed	Max 180km/h	
Speed accuracy	0.10%	
Built-in sensor	FMS (small six-component force sensor)	
	Cleat 3 component force meter	Option
Conformity tire	PC, LT size	
Tire speed	Max 180km/h	
Movable axis	SA: ± 20°, 50°/sec	
	CA: ± 10°, 20°/sec	
	Load: Max 10kN , 40000N/s	
Other	Drum outer circumference segment	Metal, resin simulated road surface

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