

## Why MODUS ?

MODUS Hispanica S.L. is the leading service provider for the holistic validation method by, **testing automotive products in the reality of the entire system**, focusing on the European market conditions.

### MAIN ACTIVITY :

Testing by durability runs for

- **SYSTEM VALIDATION** of total vehicle
- **MODULE VALIDATION** of modules & components

### VALIDATION EXPERIENCE :

38 mio. km      1993 – 2008  
 23 mio. km      SYSTEM VALIDATION  
 15 mio. km      MODULE VALIDATION

### SUBJECT :

Anticipatory analysis of product quality & reliability by neutral, highly experienced experts, evaluators & engineers.

### OBJECT :

Passenger cars, motorbikes & light commercial vehicles.  
 Production, pre-production & prototype vehicles.

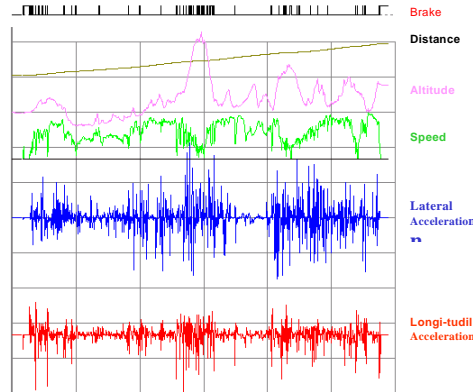
### CLIENT BENEFIT :

- ⇒ increased efficiency & reduced warranty costs ;
- ⇒ increased customer satisfaction.

## Why tyre test ?

MODUS Hispanica S.L. is the leading company for evaluation & complete measurements of **tyre performance and tyre tread wear** on prototypes, new and benchmark vehicles, by the validation of :

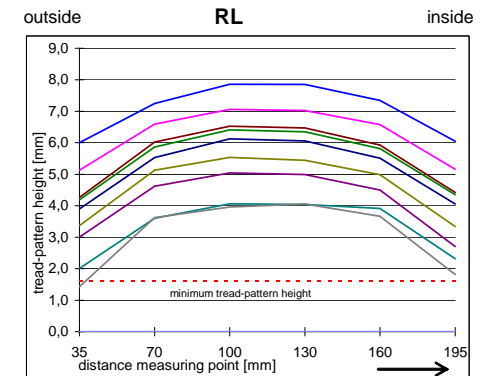
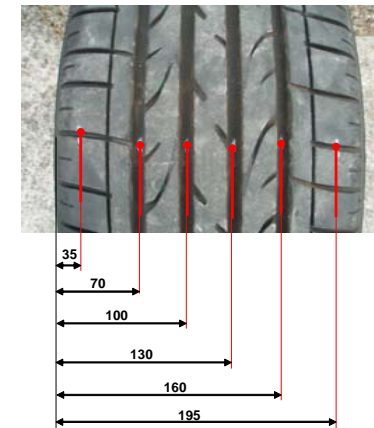
- **Wear & lifetime:** wear uniformity, edge wear on different road types.
- **Riding comfort:** tire rolling noise, vibrations, harshness.
- **Handling performance:** stability, road contact & grip, impact on steering effort & characteristic.
- **Effectiveness:** stopping distance on different road surfaces, including low- $\mu$ .
- **Benchmarking:** tyre brand comparison.



## What do we measure ?

MODUS Hispanica S.L. performs measurements & engineering analysis:

- Wheel alignment
- Specific wear
- Edge wear
- Expected lifetime
- Rim slippage
- Tyre defects - pictures
- Temperatures
- Stopping distance
- Slalom (time)
- Longitudinal & lateral acceleration
- Test run control 100% by GPS

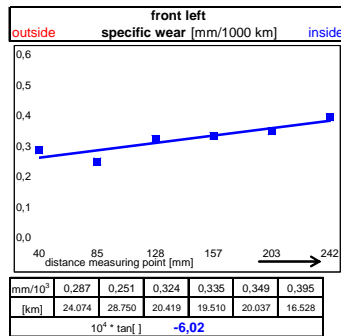


## Why southern Spain ?

The tire tests are mainly performed in southern Spain in the province of Cadiz for its variety of route types and the vicinity of mountains.

This area is ideal for tire testing, because of the following conditions :

- **Climate:** most of the time dry and stable weather conditions for repeatable driving conditions.
- **Few traffic:** to control driving conditions like constant speed or no strong braking
- **Wide variety of road types & surfaces:**
  - highway
  - country good / medium / bad
  - city with cobble stone
  - severe mountain with many curves
  - dust & gravel
  - different levels of  $\mu$
- **Vicinity of proving grounds:** circuits in Jerez, Ronda, Gaudix, Huelva.



Tyre edge wear measurement

## Europe & special conditions

**MODUS Hispanica S.L.** has permanent facilities in different areas in Europe to represent **average European or special local conditions.**

### SPAIN – Conil/Jerez:

southern European conditions  
dry, repeatable, wide variety of roads

### GERMANY - Wiesbaden:

central European conditions  
with smooth roads and more rain

### SLOVAKIA - Banska Bystrica:

eastern European conditions with bad roads

### SWEDEN – Alvsbyn (arctic circle):

northern European conditions for testing of winter tires in cold and low- $\mu$  conditions.



## Global Clients

Toyota, BMW, GME-Powertrain, Opel, Daewoo, Daihatsu, Hyundai, KIA, KTM, Nissan, Yamaha, Akebono, Aisin, BBA-Friction, Bosch, Brembo, Continental, Goodyear, Delphi, Hankook, Kumho, TRW, TMD-Friction, ZF-Lenksysteme, Mitsubishi, Porsche.

## MODUS TYRE TEST



## EVALUATION OF TYRE TREAD WEAR & TYRE PERFORMANCE



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