

What is PISTE 2 E?

PISTE2E is a validation method for quality monitoring, anticipative customer satisfaction, functionality & reliability focussed on electrical vehicles.

EUROPE

40.000 km Spain – hot, mountain 25.000 km Germany – city, high way 25.000 km Slovakia – severe hesitations 10.000 km Sweden – cold, high humidity

2E Stress conditions adapted to electric vehicle

- **10% trailer towing** in each country
- Stop & go city driving
- Special mountain routes



AUTOMOTIVE VALIDATION

TESTING ELECTRIC POWERTRAIN

New technology needs new testing methods, by using PISTE 2 E tool thanks to :

- Anticipated complete vehicle results
- European average
 - ⇒ increased efficiency
 - ⇒ reduced costs
 - ⇒ increased customer satisfaction

Project management by experienced engineers.

Mix of **professional drivers** representing European average : 30% female, age distribution.

Daily safety check & visual inspection, driving pre-defined routes & filling out logbook with comments & complaints.

Country & road distributions defined using number of vehicle registrations and road stress and scale factors for each area.

Subjective evaluations of powertrain &total vehicle brakes, chassis, according to Subjective Evaluation Index.

Test run control 100% by GPS

MODUS "PISTE 2 E"

What do we measure?

measurements & engineering analysis:

Specific electric measurements:

- Electrical current
- Battery voltage
- Battery charge status
- Battery density
- Temperatures (motor, battery)
- Motor revolution
- Brake events : frequency & duration

Standard measurements & tests:

- Suspension alignment & body level
- Tyre wear & expected lifetime
- Brake wear, runout & expected lifetime
- Dust penetration
- Stone chipping impacts
- Interior noise
- Tightening torque of bolts
- Climate data
- GPS data & brake events at 1 Hz
- Dealer service evaluation

Special tests:

- Mountain & highway brake test
- Slalom & lane change
- Acceleration & max. speed
- Power & emissions
- TÜV general inspections

What do we report?

Daily reporting in case of urgent issues or break-down.

Weekly report using FTP server:

- Daily shift data : driven routes & mileage
- Detailed description of new complaints illustrated with pictures & measurement data

Final report & presentation of results

at end of test:

- Conclusion
- Main complaints & strong points
- List of all complaints
- List of disassembled parts
- Subjective evaluation results
- All measurement results
- All special test results
- Product improvement recommendations

Driving conditions

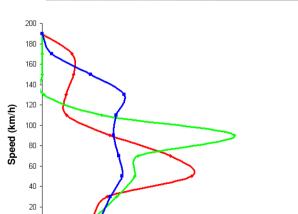
Driving conditions are specially adapted to electric vehicle durability testing :

- **10% trailer towing** for increased driving with high load
- **Stop & go** city driving, with controlled amount of brake events
- Mountain driving in southern Spain on mountain roads up to 2000 m all year round available

Uphill: severe high load driving Downhill: regenerative braking







% of time

4∩%

