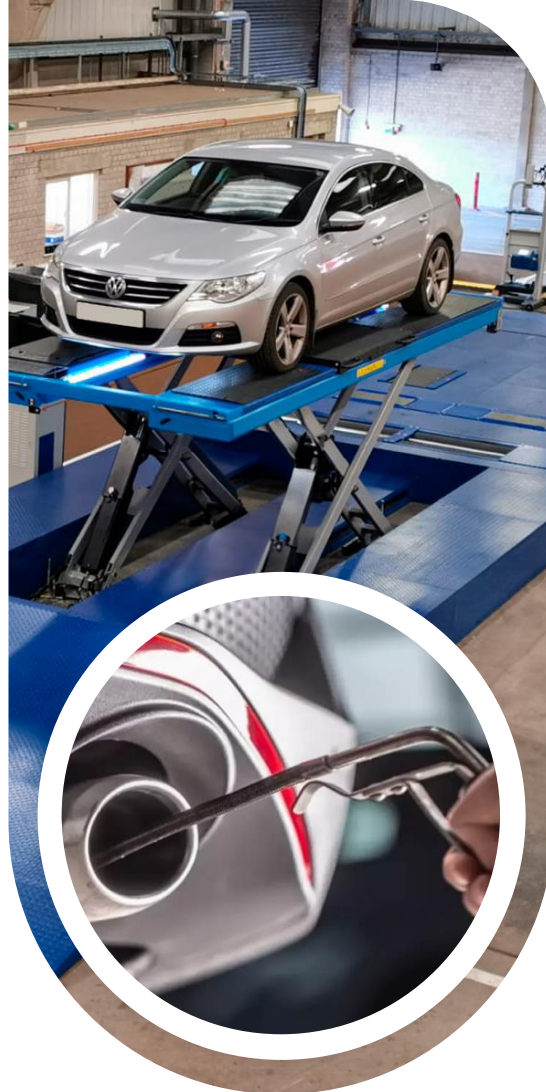


Ryme and PN in Spain: Regulatory Context and Pilot Test Results

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Ryme Worldwide

16th VERT Forum & VERT Focus Day
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Ryme 
worldwide

Technology for Vehicle Technical Inspection

1982

Ryme

Under the name of Ryme, Técnicas Reunidas de Automoción S.A.; Ryme begins its commercial activities in the PTI/MOT and automotive sectors.

1984

Worldwide Environmental

Emissions Supply Company begins selling vehicle testing and repair equipment parts and consumables in the U.S. and Mexico.

2020

Acquisition

The north american company Worldwide Environmental Products acquires a majority stake in Ryme, turning it into Ryme Worldwide.



Strengthening OUR International Presence



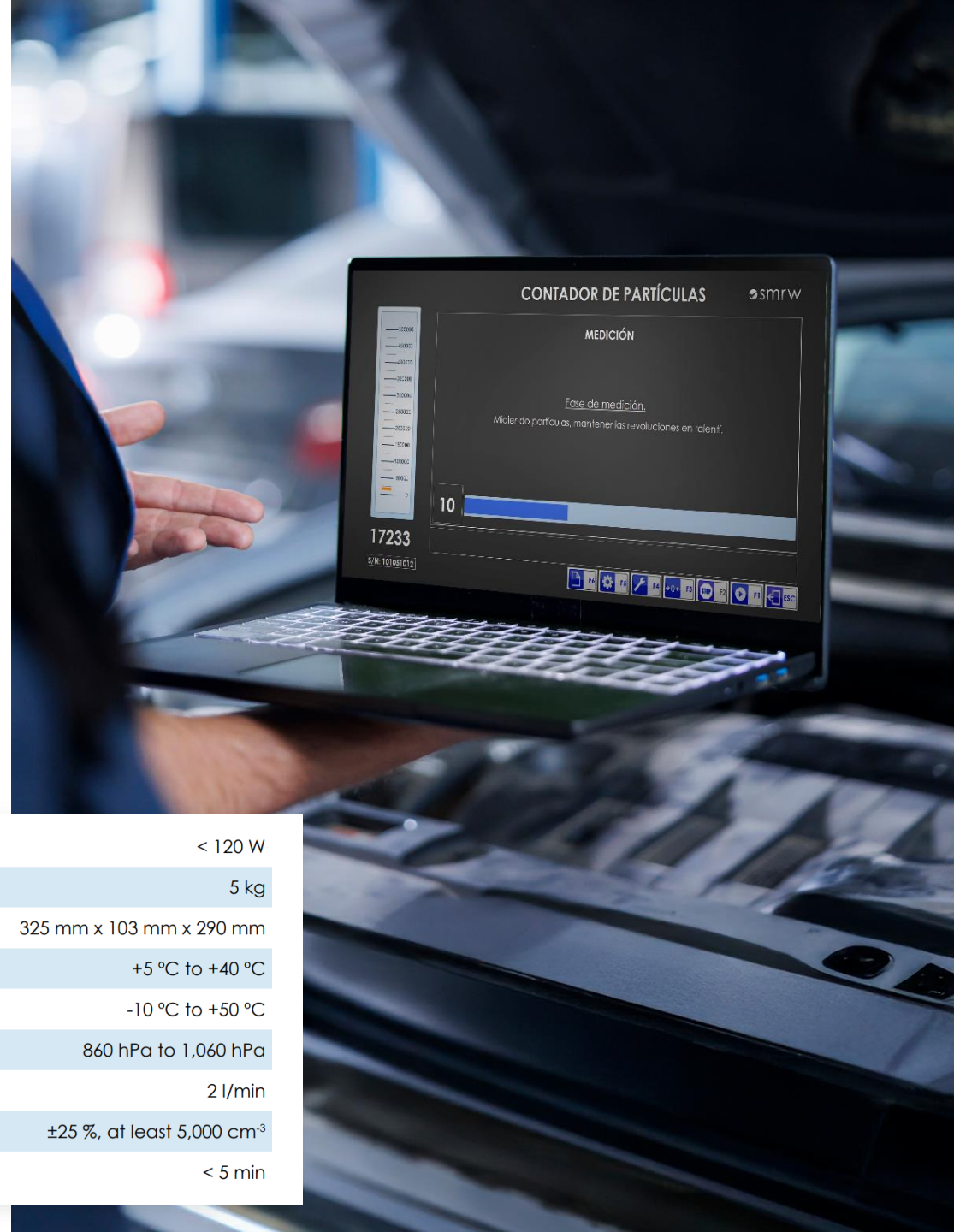
TOWARDS SAFER INSPECTIOS

R-PC300: Particle counter



DC technology
PORTABLE
MAINTENANCE-FREE
EASY TO USE
CUSTOM SOFTWARE

Power consumption	< 120 W
Weight	5 kg
Dimensions	325 mm x 103 mm x 290 mm
Operation temperature	+5 °C to +40 °C
Storage temperature	-10 °C to +50 °C
Environmental pressure	860 hPa to 1,060 hPa
Gas flow measurement	2 l/min
Accuracy (laboratory conditions)	±25 %, at least 5,000 cm ⁻³
Preparation and warm-up time	< 5 min



Current status of the particle counter regulations in Spain

Currently, in Spain's vehicle inspection system, the number of particles is not measured.

On December 17, 2024, ICT/155/2020 → ITU/1475/2024

Particle counters (PN) are regulated under Spain's legal metrology. Tests, inspections, and specifications that such equipment must meet are established.

The Ministry of Industry is responsible for setting the limit, which may or may not be aligned with the European directive.

In addition, the CEM (National Metrology Center) will be responsible for approving the equipment prior to its final use.



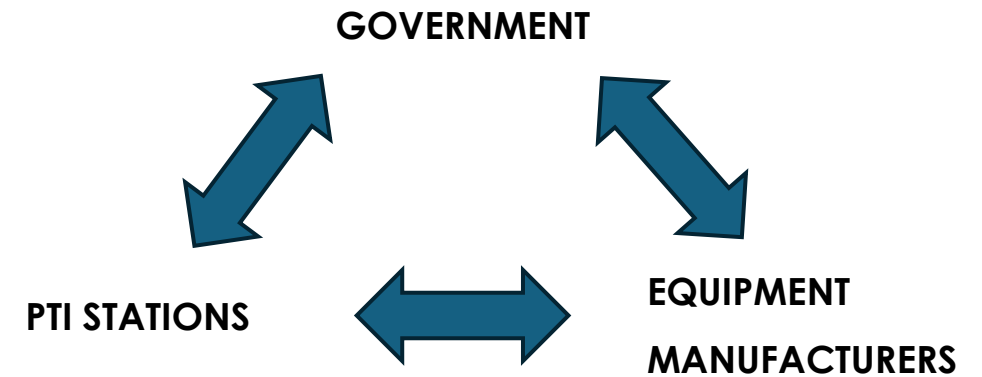
PILOT TEST

In October 2024, a nationwide pilot program will begin at select PTI stations in Spain.

This is done through an agreement between
GOVERNMENT - PTI STATIONS - EQUIPMENT MANUFACTURERS

The test would focus on Euro 5b and later M1 and N1 diesel vehicles.

Seven equipment manufacturers were selected (including those using DC and CTC technologies). Of the seven, six had already obtained European-level certifications.



PILOT TEST. PROCEDURE

Testing procedure.

- **Phase 1.** Vehicle preconditioning: The engine must be warm; for example, the engine coolant temperature must be $> 70\text{ }^{\circ}\text{C}$, as indicated by the vehicle's gauges.
- **Phase 2.** Stabilization. Duration: 15 seconds.
- **Phase 3.** Measurement. Measurement at idle for 15 seconds.

Result: the average of all measurements taken during the 15 seconds of the third phase.

This test is performed in conjunction with an EOBD scanner to obtain temperature and RPM readings, as well as to read DTCs and the MIL status.



PILOT TEST. RYME and TÜV SÜD ATISAE

Ryme Worldwide and TÜV SÜD Atisae, building on their long history of collaboration, are jointly setting up the pilot line at a PTI center in Tres Cantos, Madrid.



During the pilot project, 500 tests will be conducted at these facilities.

Overall results

The pilot test ran from October 2024 until May 2025.

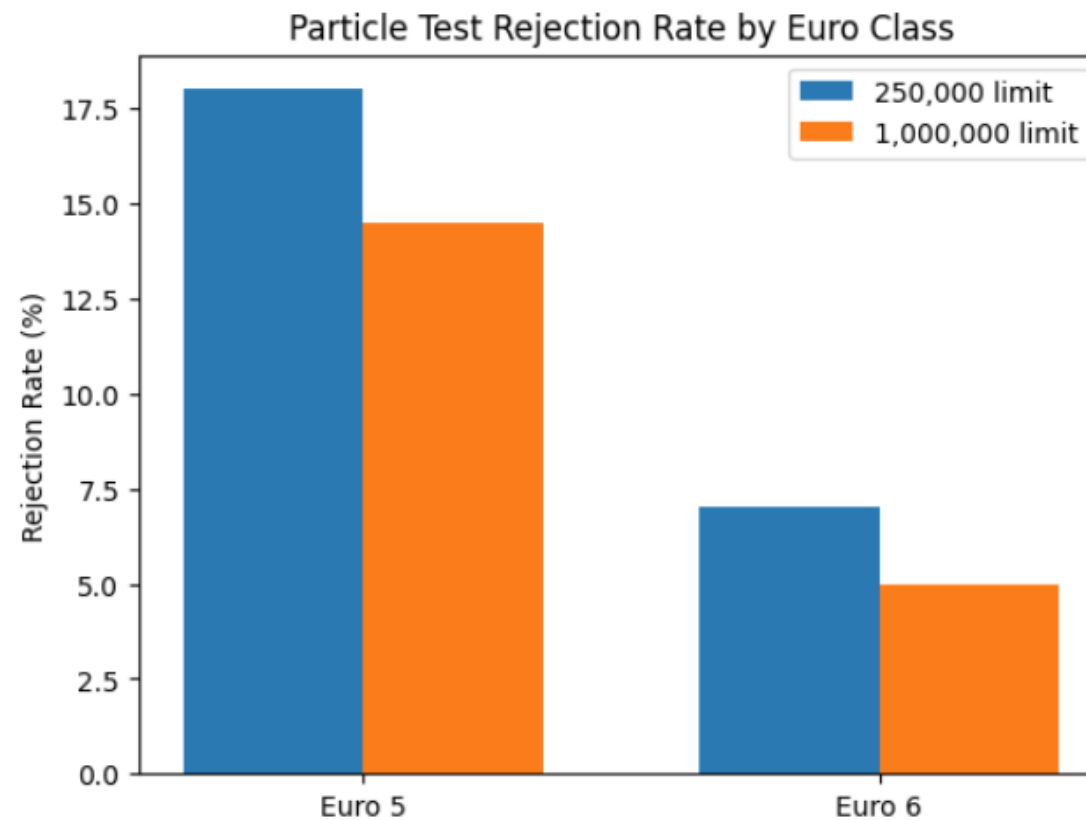
Total vehicles included in the study: 4,500 (1,400 Euro 5 and 3,100 Euro 6)

250K limit:

Failure rate: 18% for Euro 5 and 7% for Euro 6

1M limit:

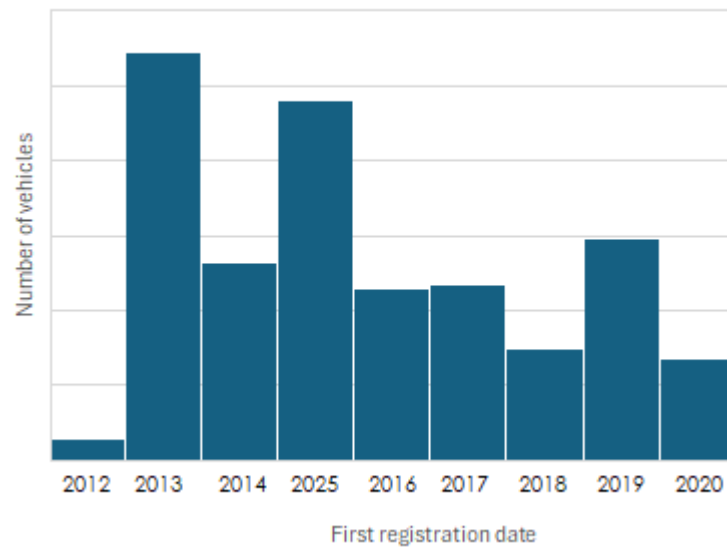
Failure rate: 14% for Euro 5 and 5% for Euro 6



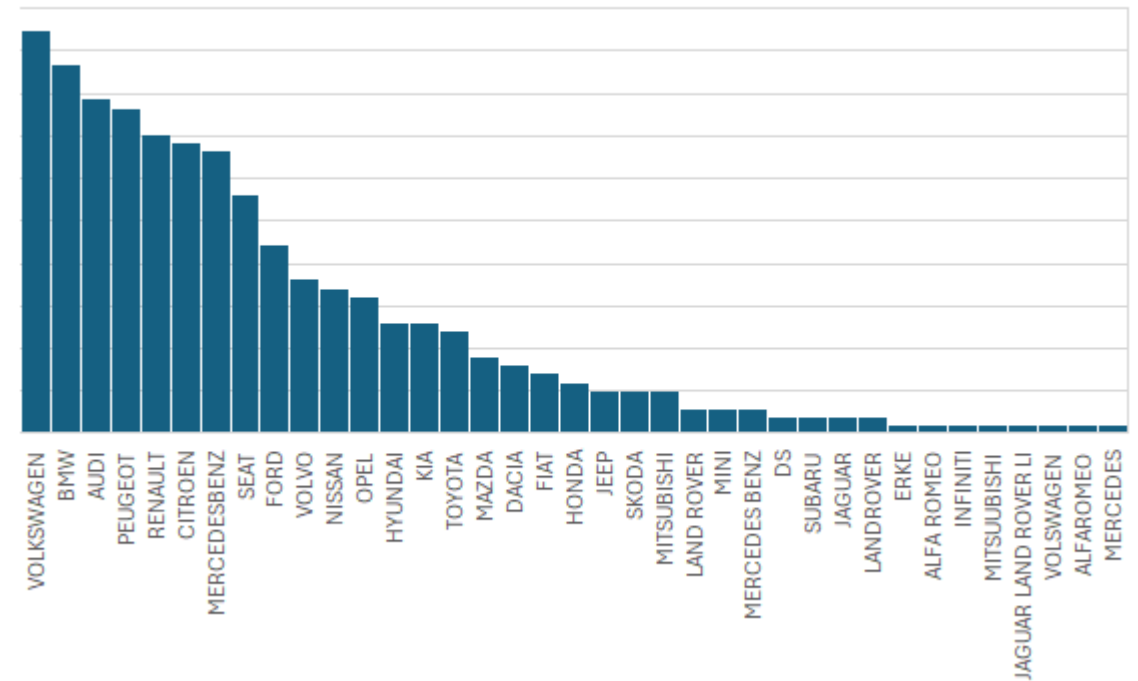
Overall results. RYME and TUVSUD ATISAE

In our case, over 600 tests were conducted, and we will be able to see more specific data.

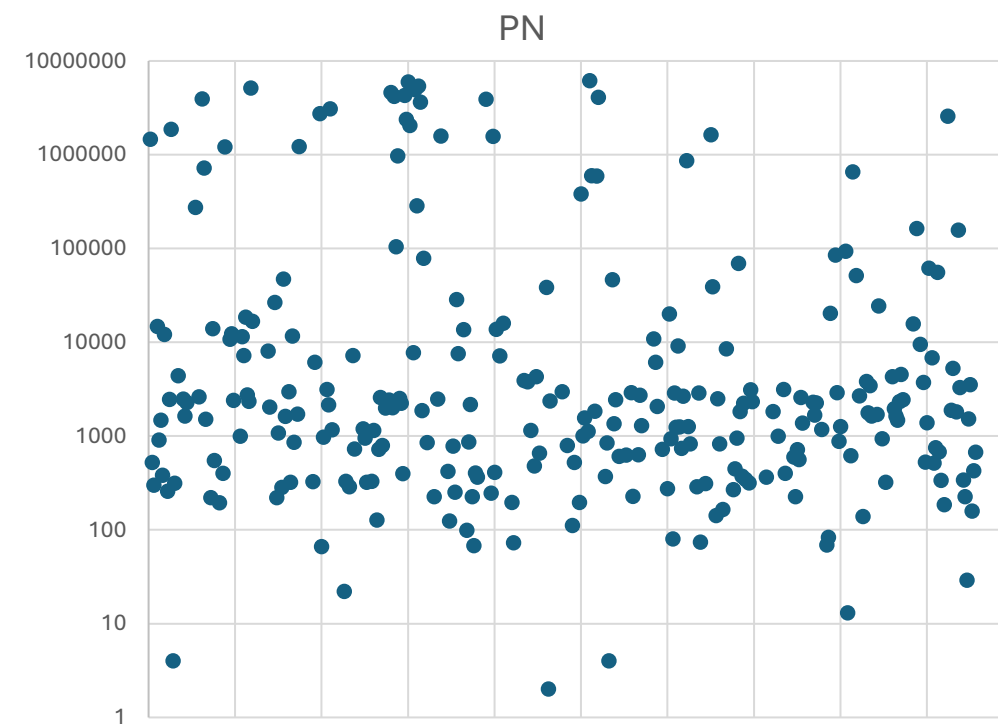
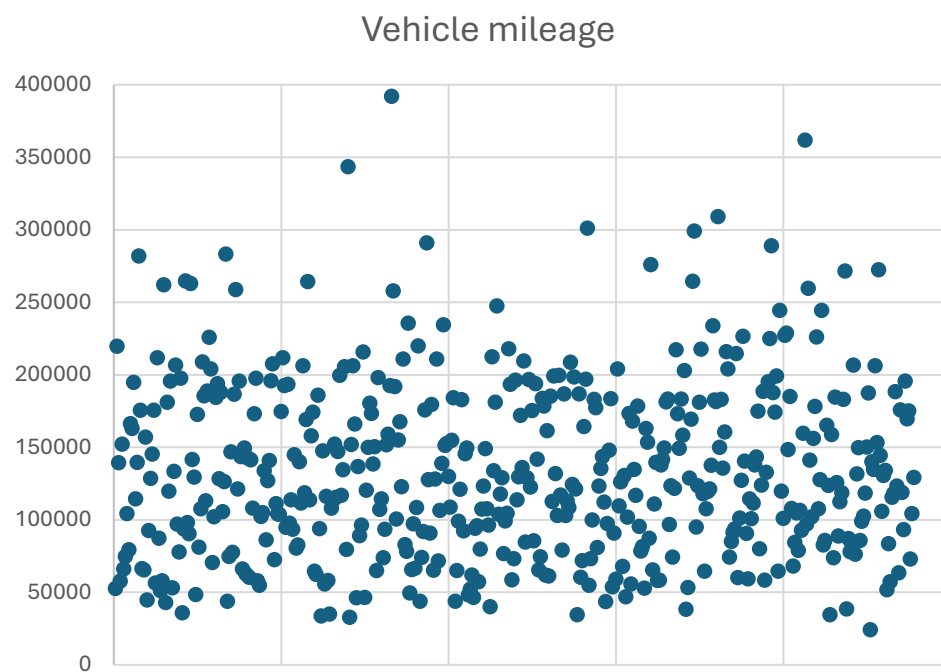
Age of the vehicles analyzed



Vehicle brands



Overall results. RYME and TUVSUD ATISAE



Conclusions

- The PN limit applied is almost irrelevant. It has not yet been decided which limit to apply.
- Surprisingly, no pattern has been detected linking higher mileage to a higher PN. There's just a higher concentration around 150,000 km, but that might be because it's the most common range.
- Opacity vs. PN: 1% rejection based on traditional opacity method vs. 8% based on PN (250K limit)



Thank you for your attention

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I want it!

Ryme 
worldwide

worldwide
group

