

# CASE STUDY

Spain

## FILTROS MANN Vibration Testing

Automotive

Shaker, frequency analyzer, transducers

*FILTROS MANN, a division of the MANN+HUMMEL group, is a leading manufacturer of air, oil and fuel filters for the automotive Industry. In Spain, the company employs more than 800 people in two production plants – at Zaragoza (FILTROS MANN S.A.), and at Gavá, near Barcelona (MANN + HUMMEL IBÉRICA S.A.).*

*In 1995, Filtros Mann purchased a complete vibration testing system from Brüel & Kjær. The solution includes a TIRA shaker, frequency analyzer and transducers.*



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## The Company and its History

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The MANN + HUMMEL Group was founded in Ludwigsburg, Germany in 1941. The automotive division develops, manufactures and markets air, oil and fuel filters, air filter systems, air intake systems, and other components for the automotive industry. Identical products are supplied to the automotive aftermarket under the MANN FILTER brand name. The Group also develops and produces industrial filters and filtration systems for the engineering industry, and units and systems for materials handling in the plastics processing industry. With 41 locations throughout the world and some 8800 employees, MANN + HUMMEL is one of the world's major producers of automotive components.

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## FILTROS MANN – a Market Leader

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FILTROS MANN, a division of the MANN + HUMMEL group, is a leading manufacturer of air, oil and fuel filters for the automotive industry. Founded in Spain in 1964, today the company employs more than 800 people in two plants – at Zaragoza (FILTROS MANN S.A.), about 180 miles (290 km) north-east of Madrid, and at Gavá, near Barcelona (MANN + HUMMEL IBÉRICA S.A.). The Zaragoza facility mainly focuses on the production of air, oil and fuel filters and complete plastic-bodied air cleaners for cars and industrial vehicles, while the Gavá factory produces plastic covers, engine air ducts and air filters, Helmholtz resonators and silencers. The Zaragoza plant alone manufactures more than 19 million units each year. FILTROS MANN S.A and MANN+HUMMEL IBÉRICA S.A. customers are many of the world's major automotive manufacturers including the Volkswagen Group, General Motors, Renault, DaimlerChrysler, Ford, PSA, Nissan, etc.

Filters in a vehicle have two main purposes:

- to keep the engine free of particles coming from the air, oil or fuel
- to retain impurities produced by the combustion residues and the wear on the engine

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## A Long Relationship

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FILTROS MANN has used Brüel & Kjær transducers, sound level meters and other products for many years. In 1995, the Laboratory and Quality Assurance Department, and local Spanish Brüel & Kjær office began working together on a system capable of fulfilling two specific test requirements from FILTROS MANN's customers:

- testing the endurance of filters to vibration – mainly based on customer specified tests
- measuring the dynamic stiffness of the filter enclosure – a special test required by a major French automotive producer

**Fig. 1**  
*The complete system included a TIRA 5880 shaker*

The local Brüel & Kjær office started cooperation with the German shaker manufacturer TIRA GmbH in the early 1990s. The goal – to fulfil the requirements of Spanish customers for mid to large size vibration systems.

TIRA GmbH, based at Schalkau, near Leipzig, Germany, manufactures products for:

- balancing
- material testing
- servo-hydraulic systems
- exciters for vibration testing

Three years ago, TIRA and Brüel & Kjær began worldwide cooperation. Brüel & Kjær markets TIRA's complete range of vibration exciters, thus complementing Brüel & Kjær's existing range of smaller electrodynamic shakers.



Ms. Eva Rodriguez, Laboratory Manager at FILTROS MANN says, “Following a product evaluation, which included comparison with other potential suppliers, we selected a Brüel & Kjær solution. Our decision was based on a number of factors. These included Brüel & Kjær's ability to deliver the complete system taking care of integration of the different components, our previous experience of their good after-sales support, and their ability to give us on-site training.”

Ms. Rodriguez continues, “A major factor was their knowledge and reputation in the field of sound and vibration and we felt confident that the dynamic stiffness measurement technique would give reliable results. The positive experience of our central R&D department in Germany with Brüel & Kjær was an important factor too”.

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## Turnkey Solution

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The complete system included:

- Vibration System Type TIRA 5880 (8 kN force system) with controller and accessories for vertical-axis operation
- Brüel & Kjær Type 2148 2-channel Frequency Analyzer.
- Miniature Type 4393 Accelerometers
- Type 8202 Impact Hammer
- special software (locally programmed) for the calculation of dynamic stiffness according to specific requirements

A few years ago, a climatic chamber was added for combined vibration/temperature testing.

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## Reliable Operation

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Ms. Rodriguez concludes, “The TIRA shaker has been running reliably, smoothly and safely for more than eight years. It’s so easy to maintain and we can do the basic maintenance ourselves”.

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## Key Facts

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- The MANN+ HUMMEL Group was founded in Ludwigsburg, Germany in 1941
- FILTROS MANN, a division of MANN+ HUMMEL is a leading manufacturer of air, oil and fuel filters for the automotive industry
- The company was founded in 1964 – today, together with MANN+ HUMMEL IBÉRICA, it employs more than 800 people
- The Zaragoza plant manufactures more than 19 million units each year
- FILTROS MANN customers are many of the world’s major automotive manufacturers including the Volkswagen Group, General Motors, Renault, DaimlerChrysler, Ford, PSA, Nissan
- FILTROS MANN has used Brüel & Kjær transducers, sound level meters and other products for many years
- In 1995, FILTROS MANN and Brüel & Kjær’s Spanish office began working together on a system capable of fulfilling specific test requirements – a complete testing system including a TIRA shaker
- “The TIRA shaker has been running reliably, smoothly and safely for more than eight years”