

Rail Noise and Vibration

Frazer-Nash can offer a wide range of noise and vibration engineering services to support the design, build, and operation of rail assets and infrastructure. We have many years' experience of solving noise and vibration problems for a wide range of applications; combining practical experience with access to state-of-the-art simulation and measurement techniques to provide a complete service.

PREDICTION

We utilise a wide range of noise and vibration predictive tools from finite element, boundary element, and statistical energy analysis codes through to bespoke software packages for structural noise and vibration analysis. Prediction can enable cost effective solutions to be devised before the physical representation of the system is available to test empirically and, therefore, help reduce programme risks.

MEASUREMENT

We have the ability to measure a variety of parameters using multi-channel data acquisition systems. Synchronous measurements of noise, vibration, acoustic intensity, structural strain, rotational speed, shaft power, velocity, pressure, temperature, and other parameters can be recorded and analysed. In addition, we can dynamically characterise systems using a range of measurement and analysis techniques including the use of reverberation time measurement and modal analysis and testing.

ASSESSMENT

We have the specialist domain knowledge, together with the wider understanding of engineering to ensure that the implications of the noise and vibration drivers for your business are fully understood and translated into high level understanding of issues and options available.

NOISE AND VIBRATION CONTROL

Having assessed a given situation we are well qualified to provide practical, pragmatic, and cost effective solutions. In particular, our specialist acoustic engineering capabilities are integrated with our understanding of environmental impact, safety & risk management, design and manufacturing and overall systems engineering to enable us to provide advice or designs for noise or vibration control options that suit your project.



TECHNOLOGY TRANSFER

Where our clients have wished to develop in-house capabilities we have assisted with:

- ▶ Training;
- ▶ Software Tool Development;
- ▶ Acoustic Engineering Process Development.

LEGISLATION AND STANDARDS

Frazer-Nash has the experience to conduct noise and vibration assessments against a range of legislation and standards, including:

HEALTH & SAFETY

- ▶ Noise Exposure - Control of Noise at Work Regulations 2005 (SI 2005 No. 1643);
- ▶ Whole Body & Hand Arm Vibration Exposure - Control of Vibration at Work Regulations 2005 (SI 2005 No. 1093).

REGULATORY COMPLIANCE

- ▶ Audibility Requirements for Trains (GM/RT2484).
- ▶ Engineering Acceptance and Design of On-Track Machines (GM/RT2400).
- ▶ Environment Inside Railway Vehicles (Audibility of detonators) (GM/RT2160).
- ▶ Noise TSI (2006/66/EC).
- ▶ The Machinery Directives (98/37/EC and 2006/42/EC).

QUALITY AND COMFORT

- ▶ BS ISO 10056:2001 Mechanical vibration. Measurement and analysis of whole-body vibration to which passengers and crew are exposed in railway vehicles;
- ▶ BS EN ISO 3381:2005 Railway applications. Acoustics. Measurement of noise inside railbound vehicles.

ENVIRONMENTAL

- ▶ BS EN ISO 3095:2005 Railway applications. Acoustics. Measurement of noise emitted by railbound vehicles.

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