

CASE STUDY

United Kingdom

Sound Research Laboratories Ltd. Environmental and Building Acoustics

Environmental
Sound Level Meters, Software

Sound Research Laboratories Ltd. (SRL) was founded in 1967. Based in Sudbury, Suffolk, some 50 miles north-east of London, SRL is an independent noise and vibration consultancy and test laboratory. The company is one of the UK's major consulting companies focusing on building acoustics. It works within the UKAS quality system and has Department of Trade and Industry approval (DTI is a UK government body) for tests to European and International standards.

SRL's relationship with Brüel & Kjær dates back to the formation of the company in 1967. A wide range of microphones, preamplifiers, calibrators, analyzers and sound level meters are used, together with a range of software. Brüel & Kjær products are used extensively for all noise and vibration measurement and analysis.



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Thirty-five Years of Expertise

S R L Formed in 1967, the company expanded rapidly and moved, first to offices in Colchester, Essex and then to its present picturesque and quiet location of Sudbury, Suffolk in the 1980s. Today, SRL has a staff of more than 35 acoustic consultants at its head office, and at locations in the UK and the Middle East.

Acoustic Experience

Fig. 1
SRL's headquarters was built in the 1980s. It was chosen for its quiet location – it's also very picturesque



SRL is one of the leading and most experienced acoustic consultancies in the UK. It focuses on design, consultancy and testing in all areas of noise and vibration. SRL has a reputation for a practical, cost-effective approach to problems, and for providing cost-effective solutions. With the latest state-of-the-art measurement and analysis equipment, noise prediction and performance programs and a noise performance database, its acoustic consultants have the necessary tools to work globally on the largest projects.

Accredited Testing and Measurement

Testing is a key part of SRL's service. The specially built laboratory at its Sudbury headquarters has the facilities to carry out a wide range of noise and vibration measurement and analysis tasks.

Fig. 2
Snow blowers hard at work. This is an example of a product that must be tested to conform to EEC Directive 2000/14/CE when sold in the European Union



SRL is accredited under the UKAS quality system, issued by the UK Government's Department of Trade and Industry to make certified tests to European and International standards. SRL now has UKAS certification for on-site testing.

SRL is also accredited as a 'Notified Body' by the UK Government. This enables it to validate tests on a range of products that manufacturers throughout the world wish to sell in the European Union, according to EEC Directive 2000/14/CE. The Directive demands a guarantee of limit values of sound power on a variety of powered indoor and outdoor machinery. As a Notified Body, SRL is authorised to audit the measurements made by other consultants or manufacturers that make their own tests.

Noise and Vibration Testing and Analysis

SRL is involved in a very wide range of noise and vibration aspects including:

- Maintenance engineering
- Condition monitoring
- Vibration monitoring
- Vibration analysis
- Shock pulse monitoring
- Thermographic surveys
- Spectrographic oil analysis
- Training courses
- Plant criticality audits
- Architectural

- Marine
- Offshore
- Planning, public enquiries and expert witness
- Prediction and numerical modelling
- Environmental noise – a high proportion of SRL's work is in the prediction, measurement and control of environmental noise

SRL's list of clients is extensive and impressive. To name just a few, it includes British Airways, Cadbury Schweppes, Electrolux, Flymo, Ford Motor Company, Motorola, Sony Music and AstraZeneca Pharmaceuticals.

Fig. 3
The European Court of Human Rights, Strasbourg. SRL advised on the acoustics of the building



Architectural and Building Acoustics

Within SRL, there is a special focus on architectural acoustics, and the company has been involved with the design of many of the world's most prestigious buildings. Noise is key issue in all buildings down to the smallest dwelling. SRL's success and reputation is built upon its 35 years of experience and knowledge of construction processes.

Air conditioning, lifts, plant-rooms are sources of noise and provide transmission paths for noise transfer. Noise control in these is critical to producing a quality, low-noise building and SRL is heavily involved in this area both for equipment manufacturers and designers and architects.

Noise and Vibration Experience

Fig. 4
Jack Dalziel is one of SRL's consultants. He joined the company straight from university



Jack Dalziel is a one of SRL's consultants. He has a B.Sc, in Audio and Music Technology from Anglia Polytechnic in Cambridge, and joined SRL three years ago.

Jack says, "Our engineers have a wide range of backgrounds and disciplines. We work closely with our clients and present the best practical cost-effective solutions that respect budgets and time-scales".

"My own personal interest is the design of film and television studios. I travel around the world and have learnt a huge amount in a short time – it's fascinating and exciting. We are already one of the UK's largest independent consultancies, and we want the company to continue to grow."

Testing Facilities

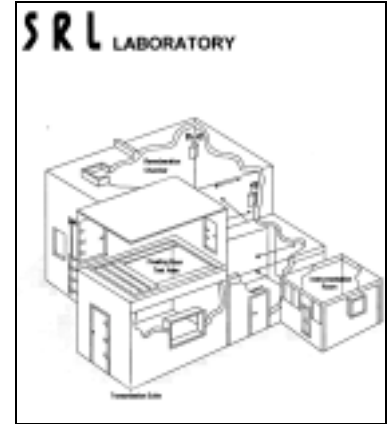
Jack continues, "We work with all the relevant BSEN and ISO standards in our laboratory. The testing we make in the lab backs up our recommendations, and gives both us and our clients total confidence in our suggested solutions".

Fig. 5
SRL's laboratory was designed and built to provide all the necessary testing facilities. The lab and its equipment are constantly updated to ensure that the latest state-of-the-art technology is used

The laboratory has facilities for a wide range of tests including:

- Absorption testing on materials
- Sound insulation
- Partitions
- Products used in mechanical service applications – for example, fans, pumps, compressors
- Panel insulation Whole systems – for example, doors and windows in frames

In addition to the laboratory, SRL also has its own outdoor UKAS certified site for free-field measurements, and for even larger objects, a UKAS certified airfield is available.



Building Acoustics

Fig. 6
Not so beautiful perhaps, but SRL also works on building and noise issues in the industrial sector

Jack continues, “A large proportion of our work is focused on building acoustics. We help planners, architects and constructors at all stages from concept to completion. Our involvement ensures good acoustic performance while avoiding over design and the associated extra costs. Many of the projects come from existing clients and from references and referrals – our customers have confidence in our solutions”.

Although SRL has worked globally on the acoustics of some of the world's most beautiful and well known buildings, it has also earned a reputation in the leisure industry.

“We work on the acoustics of night clubs in the popular holiday areas such as Greece, Tenerife and Spain. This is new buildings but also refurbishments – our goal is to optimise the acoustic performance of the building while ensuring that there is minimal environmental impact on the neighbourhood”, Jack explains.



Fig. 7
If you don't get seasick noise testing for the marine industry has it compensations!

SRL is a member of the Association of Noise Consultants, and most of its consultants are members of the Institute of Acoustics.

New Building Regulations

The new edition of Part E Building Regulations were introduced in the UK in July 2003. Prior to this, a building was deemed to be satisfactory if it was constructed according to the laid-down specifications. Now, all domestic houses, hotels, and student accommodation must be physically tested to ensure that the noise transmission parameters of adjoining walls conform to the specifications. Not every wall needs to be tested – the current legislation requires that 10% be tested. There is an exemption from testing for new-build houses which use Robust Details in their construction. There are special rules for schools, but nonetheless, the requirements are onerous.



Jack adds, “As you can imagine, the effect of this legislation is that there is a huge amount of new work for consultants. It is the responsibility of the builder to have these tests made, following examination by a Building Inspector. On large projects, testing is done at an early stage to avoid a risk of failure at the end of the construction work. Our goal is to always be ahead of new legislation, and to have the right solutions for both existing and future standards. In fact, we often hold seminars and give talks to our clients to pass on our knowledge and experience, and to explain the practical effects of new noise regulations”.

The new regulations state that testing should preferably be done by a UKAS accredited company. SRL is UKAS accredited for these tests and its clients appreciate SRL's ability to carry out testing at short notice.

“This is due to the number of consultants we have but also because we have three full sets of testing equipment and it must come from an accredited source, and for us this means Brüel & Kjær”, says Jack.

A Long Relationship

Fig. 8



SRL's relationship with Brüel & Kjær dates back to the formation of the company in 1967.

Jack continues, “Historically, we use Brüel & Kjær products extensively and, as we say in the company, ‘green is good’. Brüel & Kjær is the market leader in the total field of sound and vibration testing. We regard our relationship with our customers as a partnership, and so it is also with Brüel & Kjær, and it is mutually beneficial to us all.”

The building regulations specify that all noise measurements be made with a Class 1 sound level meter, including the facility for measuring reverberation time.

Fig. 9
One of SRL's recent projects – a power plant in the Philippines

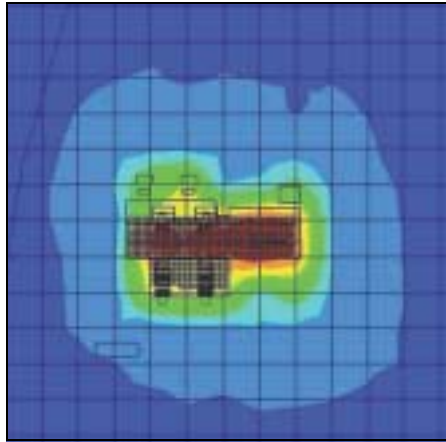


Jack comments, “Our choice is Brüel & Kjær's 2260 D Investigator™ with Qualifier™ Type 7830 and Evaluator™ Type 7820 software. The complete test setup includes Power Amplifier Type 2716, OmniPower Sound Source™ Type 4296, and Tapping Machine Type 3207. We use also use a graphic sound equaliser supplied by Brüel & Kjær. We are very demanding. Having the right equipment means quick and efficient testing – Brüel & Kjær is superb in this area – their products are always reliable and accurate, and the backup service and support is excellent.

Getting quick answers is as important for us as it is for our customers. I think it's also beneficial to get everything from one source. In this way we are sure that all the components integrate together efficiently”.

"A huge benefit is that we can get results on site and this unique facility enables us to have discussions with architects, builders and contractors on site, immediately the tests are completed. Of course we also post-process the test data and make written reports", says Jack.

Fig. 10
Post-processing the test data enables a noise contour map of a building to be created



SRL has five 2260 Investigators, six Type 2231 Sound Level Meters, Brüel & Kjær microphones, preamplifiers, calibrators and a Real-time Frequency Analyzer Type 2143 which is used in the laboratory.

Jack concludes, "We are currently considering an 8-channel PULSE™ data acquisition system. This will be used in the lab for sound power measurements, material testing, sound intensity analysis, material absorption and conformance testing. We will also use it extensively for R&D – it's such a versatile test and analysis platform".

Key Facts

- SRL was formed in 1967
- Today, SRL has a staff of over 35 acoustic consultants in the UK and Middle East
- SRL is one of the leading and most experienced acoustic consultancies in the UK
- The company focuses on design, consultancy and testing in all areas of noise and vibration
- SRL is accredited under the UKAS quality system, issued by the UK Government's Department of Trade and Industry to make certified tests to European and International standards
- SRL is accredited as a 'Notified Body' by the UK Government
- There is a special focus on architectural acoustics, and the company has been involved with the design of many of the world's most prestigious buildings
- SRL's laboratory has facilities for a wide range of noise and vibration testing
- New building regulations were introduced in the UK in July 2003. Now, all domestic houses, hotels, and student accommodation must be physically tested to ensure that the noise transmission parameters of adjoining walls conform to the specifications (there is an exemption for new houses which use Robust Details)
- "We have three full sets of testing equipment and it must come from an accredited source, and for us this means Brüel & Kjær"
- SRL's relationship with Brüel & Kjær dates back to 1967
- "Historically, we have always used Brüel & Kjær products"
- "Brüel & Kjær is the market leader in the total field of sound and vibration testing"
- "We regard our relationship with our customers as a partnership, and so it is also with Brüel & Kjær, and it is mutually beneficial to us all"
- "Our choice is Brüel & Kjær's 2260 D Investigator™ with Qualifier™ Type 7830 and Evaluator™ Type 7820 software"
- "Having the right equipment means quick and efficient testing – Brüel & Kjær is superb in this area – their products are always reliable and accurate"
- "It is beneficial to get everything from one source – in this way we are sure that all the components integrate together efficiently"
- "We are currently considering an 8-channel PULSE™ data acquisition system for use in the lab – it's such a versatile platform"