Community

Sound & Vibration

Innovation by experience

The demand for better sound quality and low vibrations has never been greater. Traffic and industry are required to generate as little noise and vibration as possible. We understand that quiet living and working conditions are decisive in achieving comfort and efficiency. Products with low vibrations are more durable, while low vibrations in machines are often equired to obtain higher production quality.

Traffic noise – unavoidable but manageable

To include possible measures against traffic noise in the earliest stages of planning makes sense. After all, prevention is always more cost-effective than cure.

Some 80 million people within the EU are subjected to unacceptable noise levels. And approximately 170 million are in some way disturbed by noise. In many of the world's bigger cities, noise has become a public health threat, adding to stress and other disorders.

The greatest noise problem is caused by traffic. In Sweden, it is estimated that over 1.5 million people are disturbed by the sound of traffic. Noise from trains and planes is a lesser problem – yet more than two million people (out of a population of nine million) are exposed to traffic noise exceeding 55 dB (A).

Unclear noise directives

Currently, there are no binding upper limits on noise levels. Though there are rules, guidelines and recommendations in existence, their legal status remains unclear. Ingemansson has worked with issues regarding traffic noise for many years, so we know what applies in practice. If we are involved in a project at the conceptual stage, we can help to resolve noise issues and contribute to a sound acoustic environment – with a minimum of noise and vibration.

On the quiet side of town

Urban environments are unavoidably noisy. But even in the most crowded cities, people have a right to a decent quality of life.

At the very least, all planning discussions regarding housing should stipulate peace and quiet. A 'quiet side' of the house, an undisturbed bedroom or a silent outdoor area should be minimum demands for any residence.

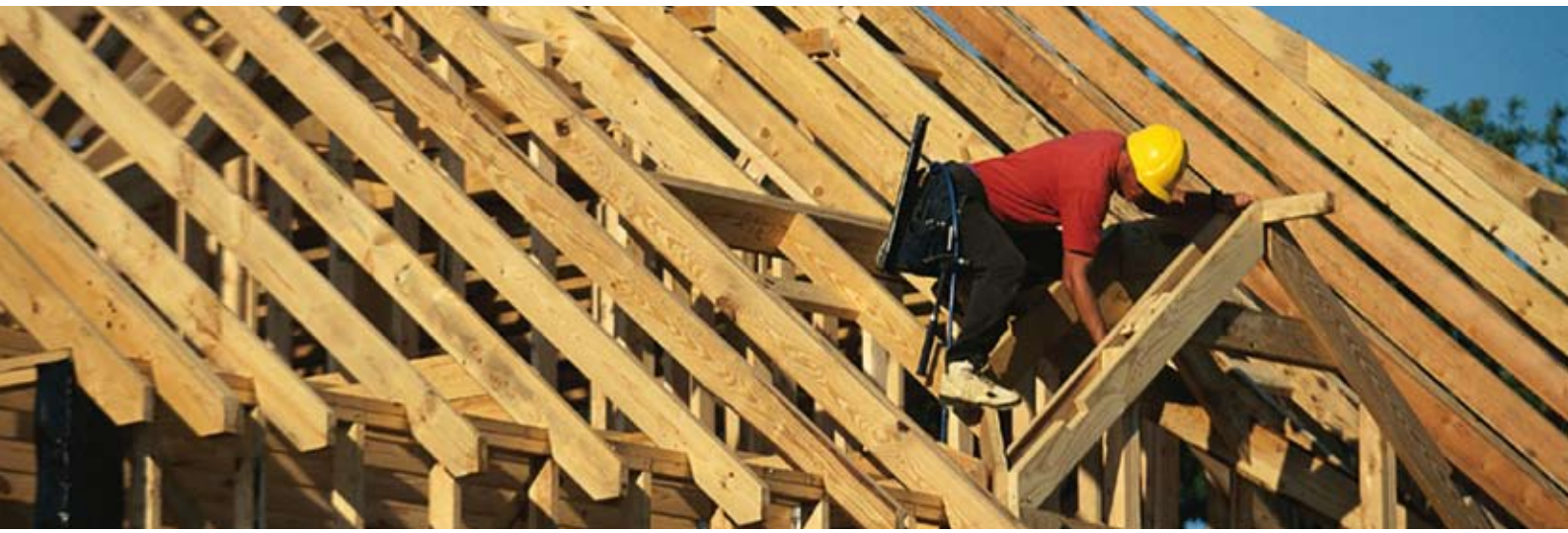
Surveys reveal that 70% of the population likes to sleep with an open window. Other reports indicate – unsurprisingly – that those with windows facing the street experience most noise, whereas those with at least one window facing a yard or garden do not complain of noise to the same extent.

Let competence and creativity go hand in hand

There have been numerous examples of successful housing projects – even in noisy environments. Common to all these success stories are two factors: 1) the problem of noise was raised early in the process and 2) the parties involved applied the principle of a 'quiet side.'

Working closely with ÅFs experienced acoustic consultants, a skilled architect can create exciting residential designs with good acoustic environments – even though prospects may seem bleak at the outset.

Other noisy activities



Sometimes noisy activities take place in surroundings where people want peace and quiet. The source may be a construction site, wind turbines, business activity, a firing range or a motor racing track. Even though absolute silence may be beyond our reach, ÅF can nevertheless help to reduce noise significantly.

Industries and plants
In an industrial environment, noise often emanates from a number of sources, ranging from small fans to big conveyors, or, in some cases, entire buildings that literally radiate sound. The key is to muffle noise at the source.

Noise varies according to distance and direction. We have developed an effective method for identifying the noise that needs to be muffled and to what extent.

This method carefully weighs which noise sources to address with respect to overall sound reduction demands as well as the cost of muffling. Thanks to this, we are in a position to offer the best possible solution.

Construction sites
For extensive, long-term construction projects there are environmental demands to be met. One such demand is that noise must remain within permissible limits for the duration of the project. That is why it is important to plan well in advance and select the working methods with the least sound emissions.

If it turns out that noise will likely exceed acceptable levels, it may be possible to take additional measures, including, for example, the erection of temporary sound barriers. During periods of noisy activity at the site, we are able to monitor sound levels.

Wind turbines
At ÅF, we have dealt with noise from wind turbines for more than 20 years, giving us unique insights into the many challenges. We act as advisors to leading manufacturers, power companies and authorities.

Leisure activities
Noise is not restricted to building and production. Some leisure activities are noisy too; ask anybody living near a motor racing track or a firing range.

We have extensive experience of conducting sound forecasts for a wide range of activities and proposing measures to meet demands for less noise. Moreover, we produce environmental impact assessment reports regarding the establishment or relocation of businesses or other activities.

There is demand for silence and a healthy living environment

We are subjected to noise and vibration daily – at work, in traffic and in our leisure time. Truly quiet 'zones' are few and far between.

Silence is a rare commodity
There are parts of the countryside that are preserved so that we may continue to enjoy their unique natural features. We also look after locations of particular cultural or historical interest. It is now becoming increasingly popular to protect some places because of their unusual acoustics – their silence, in other words.

Noise is a growing problem in society. Despite legislation and technical development resulting in ever-quieter sources of noise, the rapid growth in numbers of these sources nevertheless increases the overall noise level.

Noise and vibration can be controlled
When local plans are drawn up, it is important to bring issues noise and vibration to the table as early as possible. Only then is it possible to select the most effective countermeasures.

Sound and vibrations caused by traffic are key consideration in environmental impact assessment reports routinely drawn up whenever local planning will have a measurable effect on the environment, health or the depletion of natural resources. A good local plan should be followed by sound construction planning where issues concerning noise and insulation are explored thoroughly.

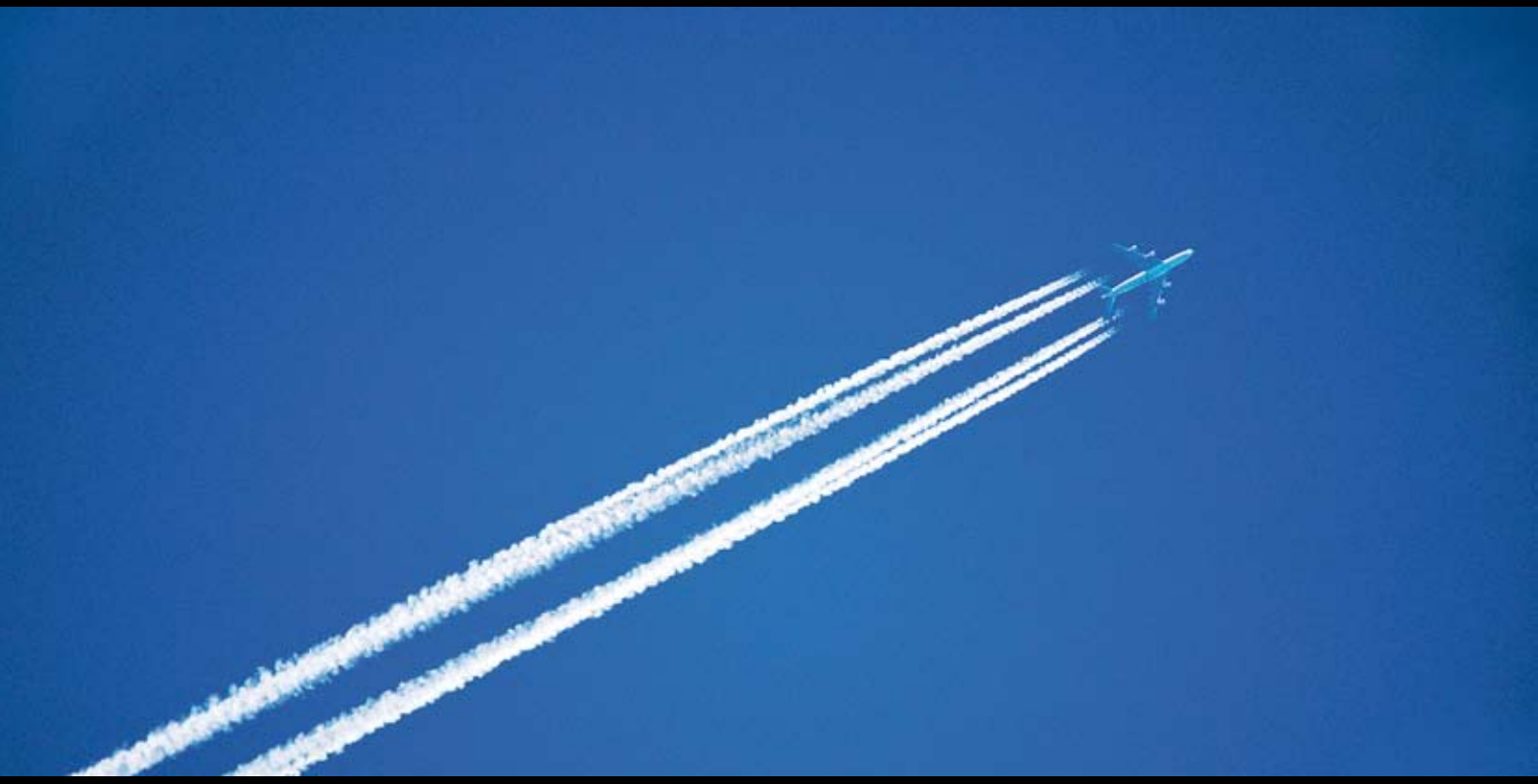
ÅF helps to lay the foundations for successful community planning
A good acoustic environment requires a variety of noise forecasts at an early stage. Equipped with the very latest tools – in the form calculation models and measuring equipment – ÅFs experts provide experience and know-how. A forecast from ÅF offers a sound and secure basis for informed decisionmaking.

At a number of places in Sweden, ground conditions are such that heavy transport causes vibrations, the effects of which are felt in residences several hundred meters away. We measure existing ground vibrations and predict future risks.

We navigate easily through the many rules and regulations that characterize modern bureaucracy. If you partner with ÅF, you will be working with an experienced and competent acoustic consultant. It is hardly a coincidence that we act as an independent expert advisor within noise and ground vibrations to Sweden's National Environmental Protection Agency.

We also possess extensive experience of pushing projects through municipal and state bureaucracies. Our experts know how the relevant authorities reason as they debate whether or not to grant a permit.

A step-by-step guide to a better sound environment



The earlier ÅFs sound and vibrations consultants are involved in a project the better. By considering sound and vibrations at an early stage of your project, you radically increase the chances of finding cost-effective measures. ÅF often work with sound and vibrations issues all the way from pre-study to finished project. We can also make a real contribution at any given stage of a project.

Investigation
ÅF carries out noise calculations and vibration surveys. These indicate the environmental impact of, say, a new road or stretch of rail track. The results provide the basis for environmental impact assessment reports, comprehensive surveys and local plans.

Grounds for assessment
We help our customers define and interpret the relevant demands and guidelines governing each project. These demands and objectives affect the extent and nature of possible measures taken later in the project.

Advice
ÅF acts as your sound and vibrations advisor when it comes to license applications, procurements, and, of course, in discussions with contractors and authorities.

Proposed measures
ÅF enjoys lengthy experience of reducing sound emissions from road, rail and air traffic as well as a range of other noise sources. Our customers benefit from our expertise. We offer solutions, provide cost assessments and help to implement the appropriate measures.

Monitoring and following up
ÅF performs sound and vibration checks using testing methods and calculations. We have extensive resources and state-of-theart equipment at our disposal. This means we always find the best possible solutions – whatever the assignment.

The ÅF Group is a leader in technical consulting, with expertise founded on more than a century of experience. We offer highly qualified services and solutions for industrial processes, infrastructure projects and the development of products and IT systems. We are also one of the leading names in certified third-party testing and inspection work. Today the ÅF Group has more than 3,500 employees. Our base is in Europe, but our business and our clients are found all over the world.

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