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**Principles for selection of rail fastening systems for control of
railway noise and vibration**

Stephen Cox
Pandrol Rail Fastenings Ltd, 63 Station Road, KT15 2AR Addlestone, UK

Railways generate noise and vibration as trains pass along the track. It is usually ultimately noise that causes annoyance to those above or alongside the track, but this noise is often generated as a result of vibrations transmitted along and away from the track. Examples of ground-borne vibration at the surface above railway tunnels; airborne noise from trains passing at grade; and noise from trains passing over structures such as viaducts and bridges are each considered in turn. The selection of suitable rail fastening systems, and in particular their stiffness, to control each of these problems is discussed. This often requires compromise - for example, reduction of the noise emitted from the rail may suggest a high stiffness, while reduction of noise from the supporting structure may require a low stiffness. These considerations lead to different solutions to different problems. Some general conclusions are drawn as to how, and to what extent, each of the different types of railway noise and vibration problem may be addressed by modifications to the track fastening system.