



Noise pollution

Millbrook Proving Ground recently re-opened its noise test track, with an upgraded noise surface to meet the new ISO 10844:2011 specification. Brian Tinham talks to principal engineer Darren Carter

OEMs, tyre manufacturers and commercial vehicle engineers will be aware of ISO 10844, the standard governing the specification of test tracks designed to measure noise emitted by vehicles and their tyres. But what many may not know is that, in 2014, new surface specifications will be included in type approval requirements for ECE Regulation 51 (which governs noise from category 'M' and 'N' vehicles), under the updated ISO 10844:2011.

It's that development that has forced all test facilities in Europe that measure vehicle noise to instigate a programme of upgrading their tracks. And hence the recently upgraded noise track at Millbrook Proving Ground, in Bedfordshire.

ISO 10844 is the mandatory specification for test tracks used for evaluating pass-by noise. Its purpose is to ensure reproducibility between test tracks, ensuring that noise measurements are not unduly affected by the surface, and so minimising the variability of recorded tyre-to-surface noise generation. The 2011 version of the specification aims to more accurately achieve this objective.

Composition and geometry

So what's new? The most significant amendments from the 1994 version can be grouped into three categories: composition of the test track surface; its geometry; and the surface properties. "Surface composition relates to specifications that span surface texture, smoothness and noise," explains Millbrook principal engineer Darren Carter (pictured). "The new ISO specification mandates very stringent requirements for the quality and composition of the top surface, while allowing a degree of flexibility in the construction of the track's substrate."

As for geometry, the new standard covers more than the size and shape of the site. "Proximity of large reflecting objects, gradients and cross-falls [slopes], and surface irregularities all

matter, and have been tightened up in the new standard."

And it's a similar story with the surface properties, which, under the new standard, are now measured in terms of mean profile depth (MPD), instead of the old mean texture depth (MTD). "The significance of this is that there are now lower and upper bounds placed on the MPD. Sound absorption now has a requirement for each one-third octave band from 315 to 1,600Hz, and separate requirements for the drive lane and propagation area."

Beyond that, legislation on vehicle pass-by noise levels means that future noise testing will be driven equally by the need to understand the contribution from tyres and the powertrain. For Carter, that's where Millbrook now scores, with the new track enabling engineers to isolate tyre-generated noise from the overall pass-by noise of test vehicles, and so help manufacturers to understand aspects of their vehicles that are contributing to total noise.

With the new Millbrook noise facility now open, it is the only commercially available facility in the UK to offer a fully-compliant noise surface. What's more, Carter says the new track is equally capable of running tests on vans, trucks, coaches and buses. Indeed, even the heaviest of road-legal vehicles can be tested, because Millbrook took advantage of the new standard's flexibility around track substrate in its construction.

And there's more. "Importantly, the physical changes to the effective length of Millbrook's noise site will enable engineers to extend testing capabilities, and so help manufacturers to conduct the newly introduced 'off-cycle' higher-speed testing requirements," explains Carter.

"The composition and quality of the new test track surface mean that manufacturers benefit from the most consistent and repeatable test surface in the UK," he insists. "Millbrook's new noise testing site will provide an excellent development tool, as well as helping with type approval of vehicles." 

