

MÜLLER-BBM



Acoustic consulting and measurements during planning, construction and operation

Low noise road surfaces

Low-noise road surfaces

Noise-reducing road surfaces are an effective measure to reduce traffic noise. Müller-BBM supports you when planning, constructing and operating noise-reducing road surfaces. With our long term experience, we can help you to implement these measures effectively and monitor noise-reducing road surfaces over the entire lifetime.



CPX measurement



Texture measurement system surface drone

In many situations, noise-reducing road surfaces can complement or even replace other noise control measures without affecting the cityscape and without additional space requirements as is the case e. g. with noise barriers.

However, not every type of low-noise road surface can be applied anywhere. The effect is optimal only when surface type and dimensioning are adapted to the local situation and to the traffic mix.

Here, Müller-BBM can support you: with our interdisciplinary experience and the profound understanding of tyre-road noise generation, we can assist you in choosing a suitable road surface type. We support you with acoustic acceptance tests of the new road surfaces, too. Finally, we take care of the acoustic monitoring during operation, when the surfaces are regularly examined for their acoustic effectiveness.

For this purpose, we have a variety of highly sophisticated measuring devices at our disposal, which enable us to determine the relevant parameters fast

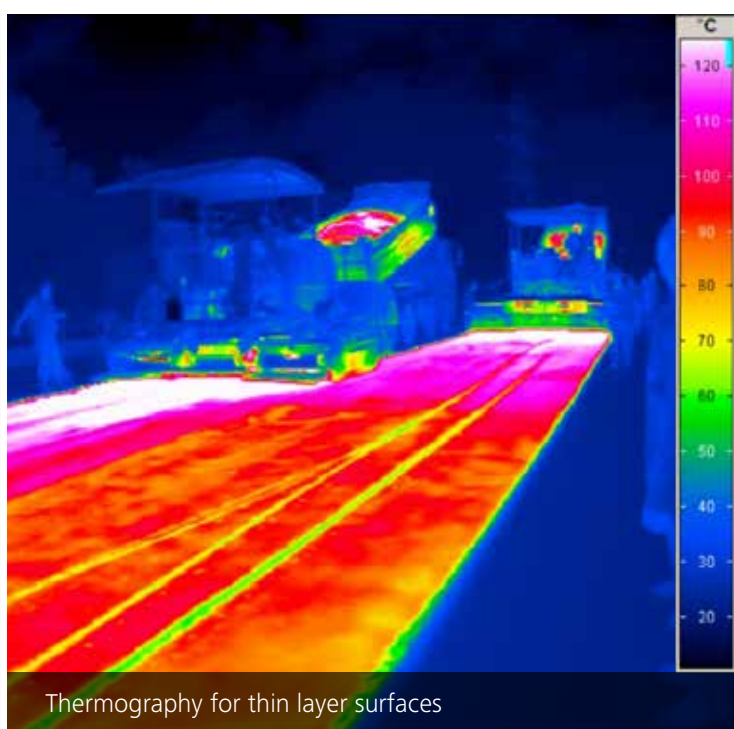
and effectively in every situation – in the laboratory, on test fields as well as on the road during its construction and operation.

Please feel free to contact us! We are looking forward to working with you!

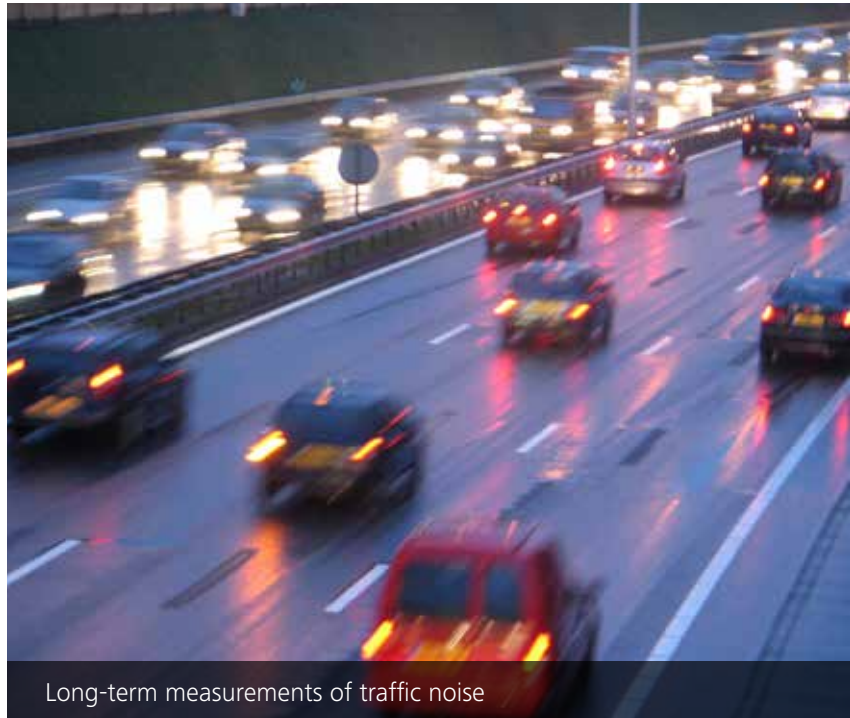
Our services for you

The testing and calibration laboratories of Müller-BBM GmbH are accredited in accordance with ISO/IEC 17025 by DAkkS, Germany's national accreditation body. Our accreditation includes all relevant procedures in the field of tyre-road noise.

DAkkS is signatory to the multilateral agreements for mutual recognition of the European co-operation for Accreditation (EA), the International Accreditation Forum (IAF) and the International Laboratory Accreditation Cooperation (ILAC). The signatories to these agreements mutually recognise each other's accreditations.



Thermography for thin layer surfaces



Long-term measurements of traffic noise

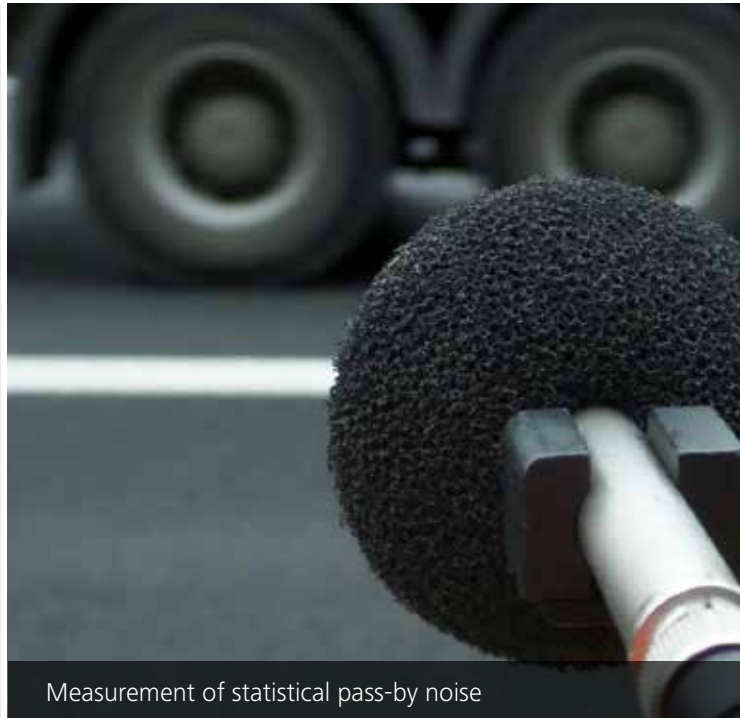
We can support you in all phases of your low-noise road project:

- Planning phase: Consulting on the selection of a suitable low noise-road surface type and, if necessary, dimensioning of the chosen surface type
- Tender procedure: Support with the tender procedure for the construction of low-noise road surfaces
- Laboratory tests for acoustic suitability tests, such as measurements of the sound absorption coefficient, flow resistance and texture in the laboratory
- Acoustic supervision of the installation: texture measurements during construction of the road surface (macro-texture and megatexture), measurements of longitudinal evenness as well as thermographic measurements
- Non-destructive measurements on test fields or on the installed road surface: sound absorption, air flow resistance, texture
- Acoustic acceptance and acoustic monitoring: pass-by measurements according to ISO 11819-1 (SPB measurement) and close proximity measurements of the tyre-road noise according to ISO 11819-2 (CPX measurement)
- Simulation-based development and optimisation of noise-reducing road surfaces with our calculation model SPERoN®

References

Müller-BBM has been active with research projects, consulting services and measurements in the field of tyre-road noise for over 20 years.

Please find here a selection of interesting projects Müller-BBM was involved in.



Measurement of statistical pass-by noise



Texture measurement with surface drone

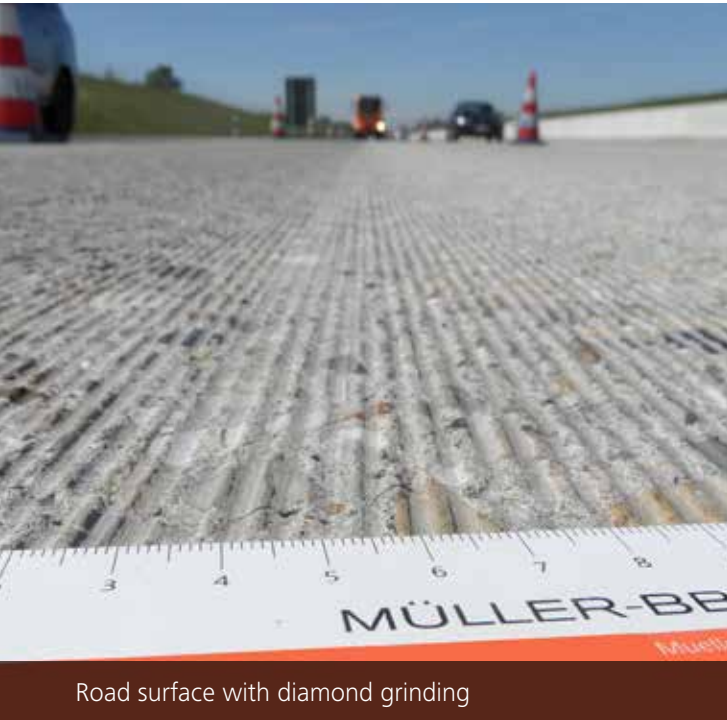
Annually recurring acoustic monitoring of low-noise road surfaces:

- Several highways in the area of the Highway Administration for Southern Bavaria (Autobahndirektion Südbayern), up to 21 road sections, since 2008
- Several motorways in the area of the Highway Administration for Northern Bavaria (Autobahndirektion Nordbayern), up to 7 road sections, since 2014
- Several motorways and trunk roads in the area of the Highway Administration for Lower Saxony (Landesstraßenverwaltung Niedersachsen), up to 21 road sections, 2011–2016
- Several highways and trunk roads in the area of the Highway Administration for North Rhine-Westphalia (Straßen. NRW), up to 24 road sections, since 2015
- Acoustic monitoring of a porous asphalt road surface on a PPP-section of Highway A6, since 2011

Consultation and support during construction

- Radolfzell: Installation of a porous road surface on an urban road: acoustic laboratory tests, measurements on a test field and acoustic monitoring
- BAB A6 near Roth: Laboratory tests of porous asphalt mixes for optimising the acoustic performance and durability
- Ludwigshafen: Selection of suitable concepts of low-noise road surfaces considering the traffic mix and routing; support with the tender procedure
- Berlin: Several road sections in Berlin – measurement of surface texture on laboratory samples, test fields and finished road sections with thin layer asphalt surfaces

References



Road surface with diamond grinding



Impedance measurement on a tyre

Research projects

- Collaborative research: “Acoustic durability of dense or semi-dense low-noise asphalt surfaces”, Research cooperation “road infrastructure”, Germany-Austria-Switzerland, since 2017
- Collaborative research: “Sustainable high tech asphalt – pollutant and noise-reducing with new material processing and monitoring”, Work package: Optimising acoustic properties of road surfaces considering a long-term concept; project funding by German Federal Ministry of Research (BMBF, funding code no. 13N13315), since 2015
- Collaborative research: “Multi-functional road made from nanooptimised ultra-high-performance concrete”, Work package VI: Elaboration of a low-noise texture design adapted to material and process; project funding by German Federal Ministry of Research (BMBF) within the framework NanoTECTURE, funding code no. 13N10496, 2009–2013
- Collaborative research: “Low-noise road surfaces from precast slabs in UHPC”; project funding by German Federal Ministry of Infrastructure (BMVI, funding code no. FE88.0114/2011), 2011–2014
- Collaborative research: “Low-noise block pavements”; project funding by German Federal Ministry of Infrastructure (BMVI, funding code no. FE 88.0115/2011), 2011–2014
- Collaborative research: “Quiet road traffic” parts 1 to 3, supervised by the German Federal Highway Research Institute (Bundesanstalt für Straßenwesen), funded by the German Federal Ministry of Economy (BMWi), 2000–2014

Environment

Noise control
Air pollution control
Vibration control
Light and electromagnetic fields
Environmental compatibility
Plant safety
Legally compliant business organization
Risk assessment
Chemical analysis

Technology

Automotive acoustics
Ship acoustics
Rail acoustics
Industrial acoustics
Machine acoustics and machine dynamics
Psychoacoustics
Mobile communication

Comprehensive solutions from a single source

Consulting · Planning · Measuring Expert Opinion · Research

Müller-BBM Industry Solutions GmbH is a subsidiary of Müller-BBM AG, with headquarters in Planegg near Munich. Since 1962 Müller-BBM has been advising clients nationally and internationally and is now one of the world's leading engineering firms. More than 300 highly qualified employees form an interdisciplinary team of scientists and engineers in the most diverse specialist fields. The company currently has twelve offices in Germany as well as a branch office in Austria.

Notifications

Müller-BBM Industry Solutions GmbH is notified as an expert authority in accordance with § 29 b of the German Federal Pollution Control Act (BImSchG). The notification comprises

- determining emissions and immissions of air pollutants, noise and vibration
- verifying the correct installation and function in addition to the calibration of continuous emission measurement systems (CEMS)
- checking combustion conditions

Accreditations

Our testing and calibration laboratories are accredited according to ISO/IEC 17025:

- Test laboratory for sound and vibration, electromagnetic fields and light, air pollution control, measurement of hazardous substances
- Calibration laboratory for acceleration and acoustical quantities

Müller-BBM Industry Solutions GmbH has a significant number of employees with competency certificates that were awarded to them on an individual basis. They include publicly appointed and sworn experts, state-recognised experts and otherwise appointed and notified experts.

Detailed information on the scope of our accreditation, its international validity and the corresponding certificates can be found on <http://www.muellerbbm.com/quality/>.

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