Concrete surface treatment techniques
– part 1 –

green tech solutions

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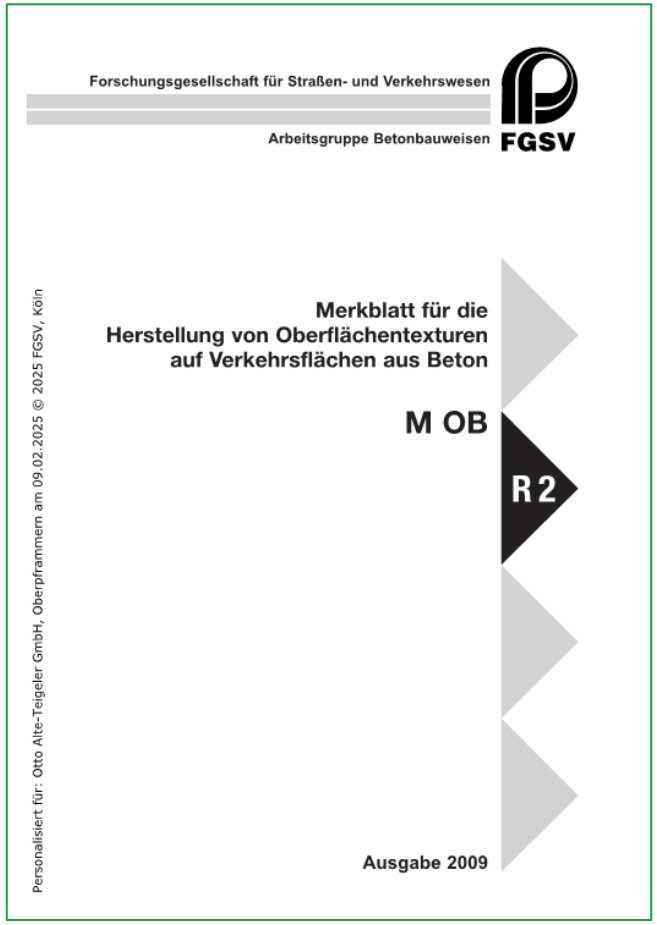
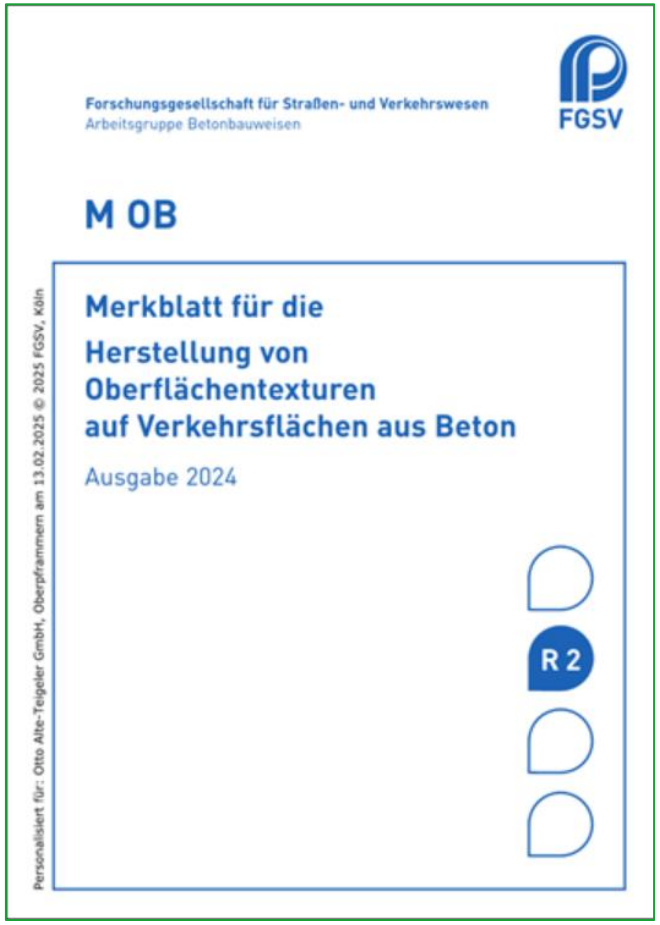
Agenda

- German standard M OB
- Texturing methods
- Grinding
- Grooving
- Grinding A+ / NGCS
- High-pressure water jetting
- Horizontal grinding of exposed aggregate concrete surface
- Conclusions

M OB – Further developments from 15 years





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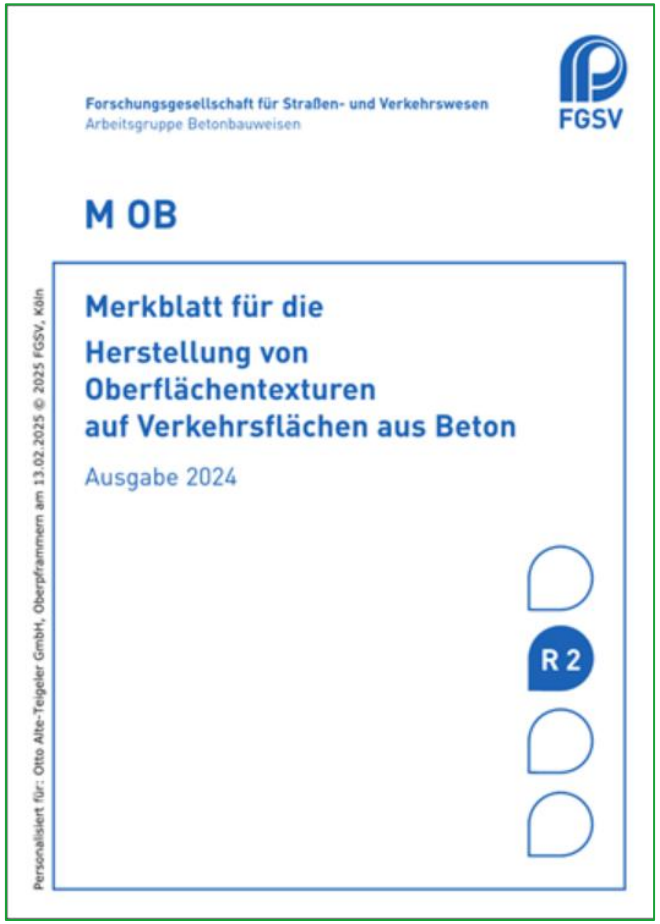
- 2 Definitions
- 3 Basics
- 4 Influence of texture on the performance charachteristics
- 5 Measurement methods
- 6 Scope
- 7 Texturing methods
- 8 Assessment of the performance properties
- Appendix

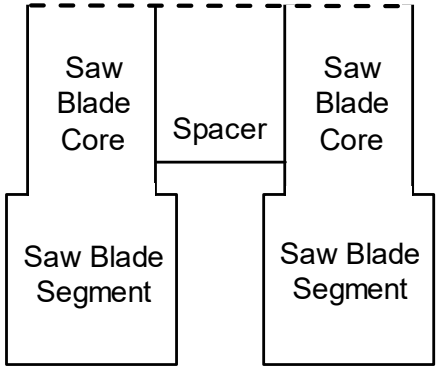


Texturing methods

- Removal of the surface mortar (exposed aggregate concrete)
- Texturegrinding
- Grooving
- Texturing of the fresh surface mortar
- Surface treatment with reactive resin (OB-RH)
- Other texturing variants
  - Texturgrinding A+
  - Horizontal ground exposed aggregate concrete
  - Porous concrete

Removing methods – grinding / grooving

- Grinding / texture grinding
- Grooving
- Combined grinding / grooving – NGCS



Texture Grinding

- Special grinding process for the controlled, defined production of a longitudinal texture in hardened concrete
- Version with or without grooving
- Achievement of homogeneous and permanently skid resistant, drainable and, depending on the grinding type, noise-reducing surfaces
- Types:
  - Type E, Type E+ (Structural Conservation)
  - Type S, Type S+ (standard texturing rinding, new construction)
  - Type A+ (acoustic texture grinding, new construction) – NGCS
- General reference to M TG

Texture grinding – Type S, Type S+

- Procedure for newly bult pavements and structural maintenance (renewal)
- Inclusion in the new ZTV Beton-StB
- Noise-reducing surface – official noise classification since 2025

Tabelle 1: Prinzipskizze der Texturgeometrien Typ S und Typ S+

Texturgrinding Typ S	Grinding
Texturgrinding Typ S+	Grinding + Grooving

Source: M OB 2024

Grooving

- Procedure for new construction and structural maintenance (renewal, repair and maintenance)
- Improvement of drainage capacity
- Reference to M BEB
- Information in particular for flight operations areas

Texture grinding type A+ / NGCS

- Texture grinding A+ to ensure water drainage, always in combination with grooving
- Noise reduction potential beyond texture grinding type S and S+
- Lasting performance properties only achievable with
  - Particularly polish-resistant aggregates that are permanently integrated into the concrete matrix
  - High matrix strength

Exposed aggregate concrete

- Standard construction method in Germany since 2006
- Exposing the coarse aggregate
- Non-directional texture
- Execution by:
  - Brushing (texturing in the uncured surface mortar)
  - High-pressure water jetting (texturing in hardened concrete)

Bild 11: Oberfläche nach dem Hochdruckwasser-strahlen

Source: M OB 2024

Exposed aggregate concrete – brushing

Exposed aggregate concrete – high-pressure water jetting

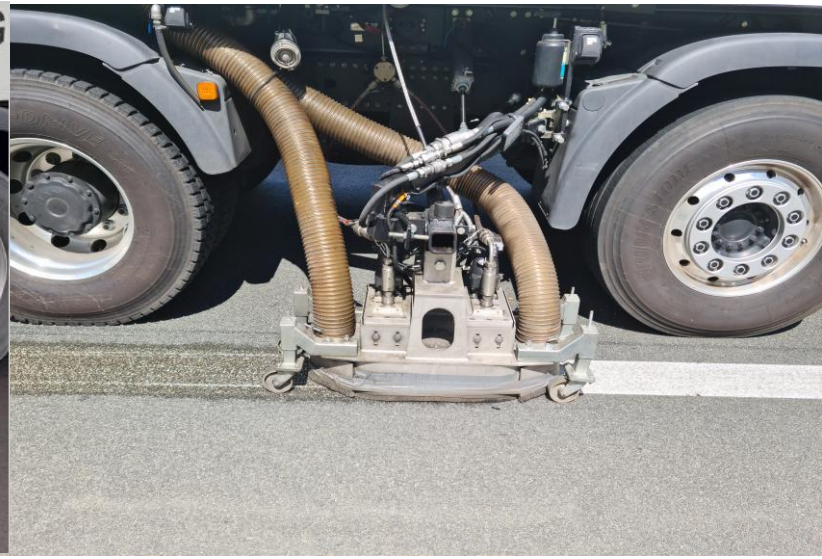
- Removal of the already hardened surface mortar
- for surfaces with exposed aggregate concrete composition in top layer concrete
- for surfaces with insufficient removal of the surface mortar by brushing
  - High air temperatures: very fast hardening, brushing too late
  - Low temperatures: very slow hardening, already decreasing deceleration effect
- no correction value for the noise emission according to RLS-19
- Determination of the D_{SD} value according to TP KoSD-19 is recommended

Brushing out at low temperature

Surface before and after HDW

Exposed aggregate concrete – high-pressure water jetting

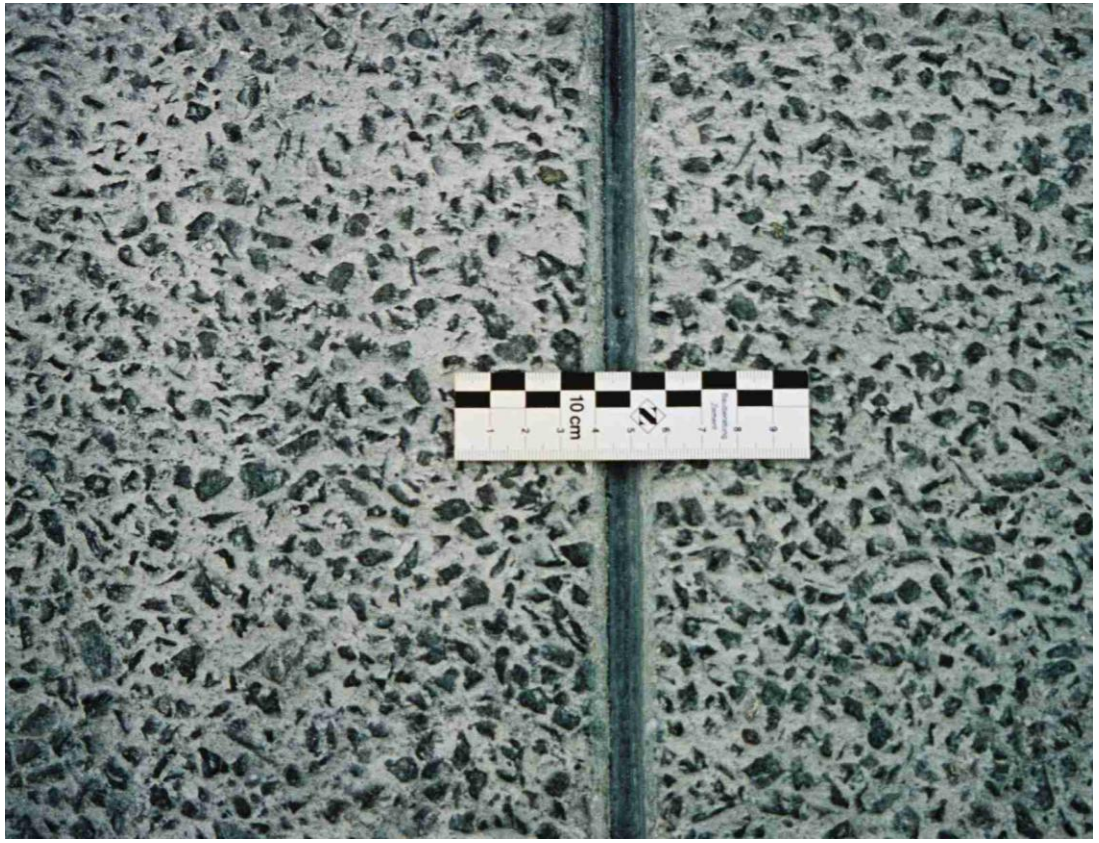
- Texturing by high pressure water jetting (controlled production of macro texture)
- Linear or planar high pressure water jetting (removal of road marking, surface cleaning)



Exposed aggregate concrete – high-pressure water jetting

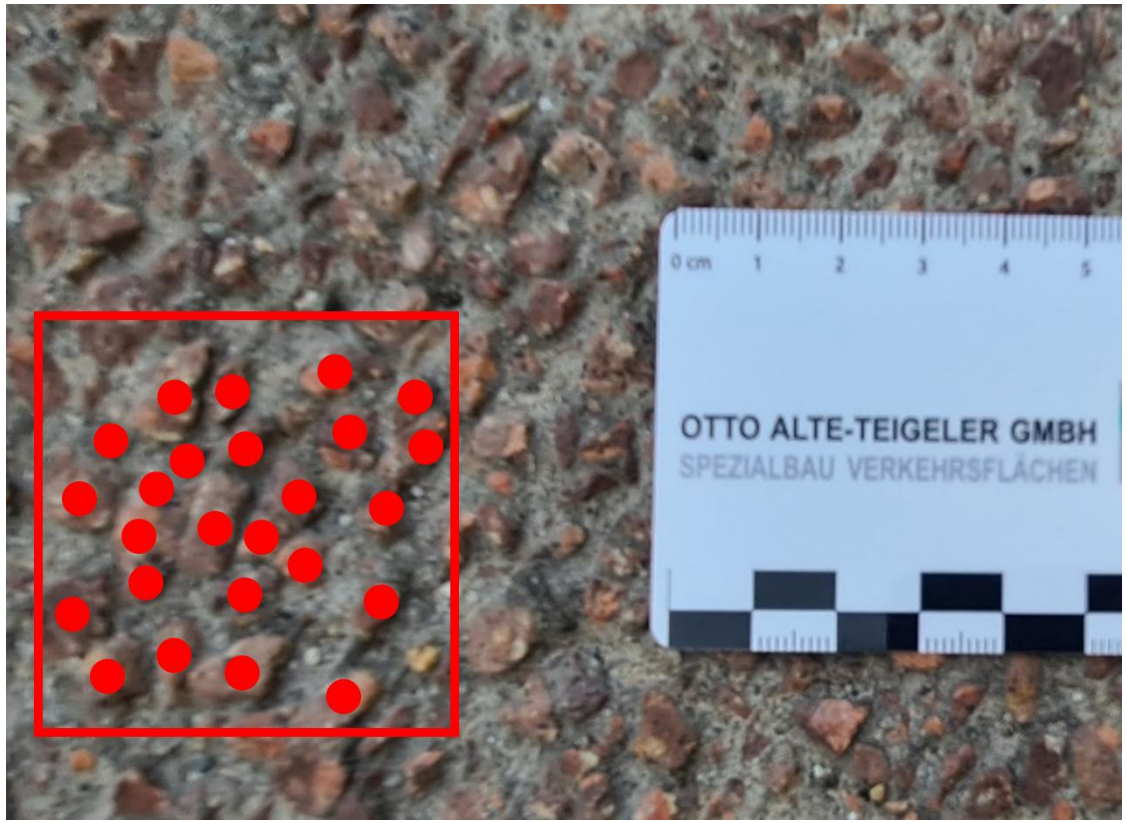
- Water pressure approx. 200 – 350 MPa
- Nozzle opening width approx. 0.15-0.20 mm
- Pressure and working speed depending on:
  - thickness of the surface mortar and
  - its hardening state at the time of processing

Exposed aggregate concrete



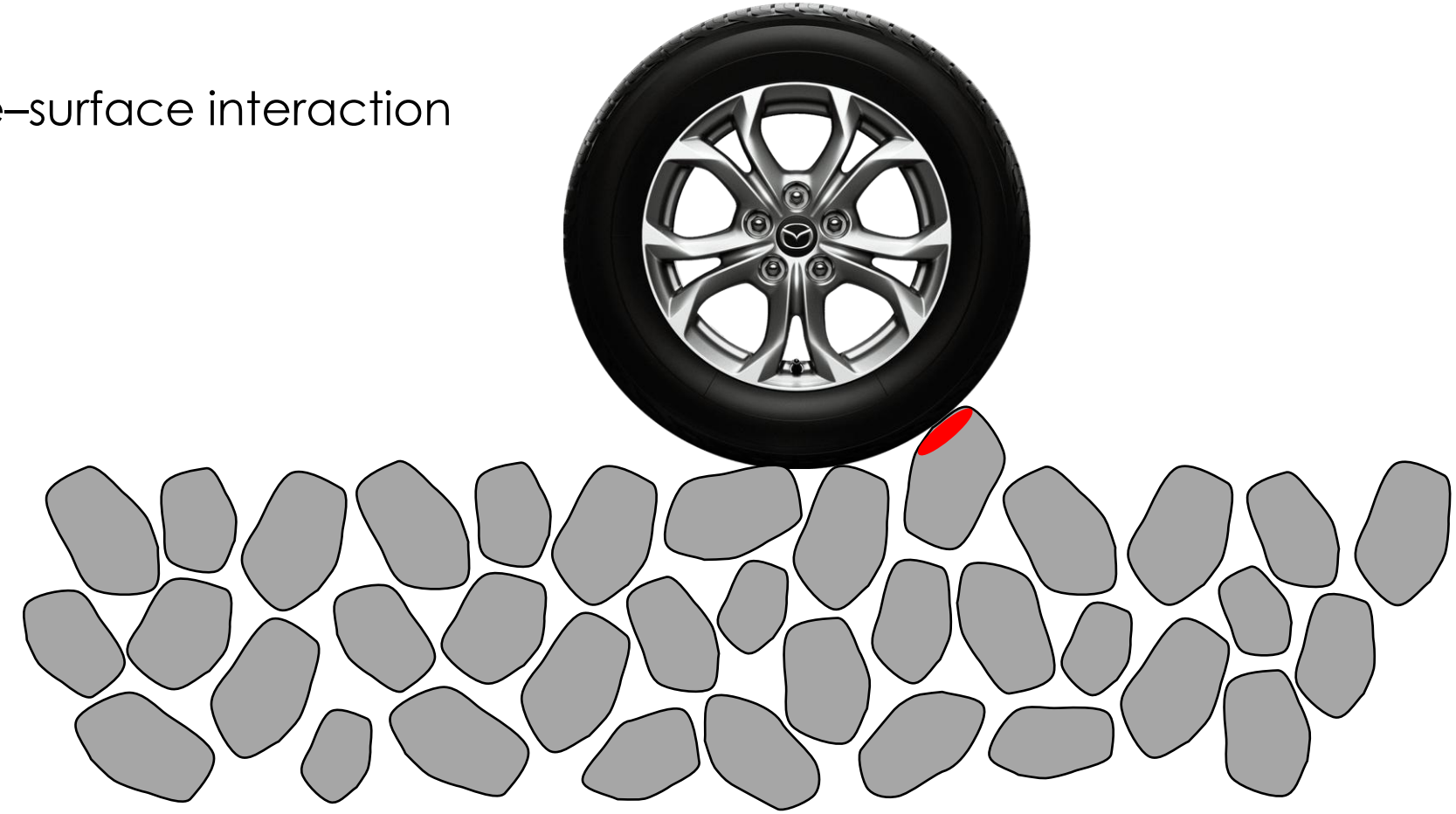
Horizontal ground exposed aggregate concrete

- Reduction of texture depth and tyre-road noise of exposed aggregate concrete surfaces
- Improving skid and rolling resistance
- Very quiet surface: plateau with gorges
- Preconditions
  - Sufficient number of homogeneously distributed grain tips
  - Good integration of the aggregate
  - Good longitudinal and transverse evenness
  - Texture depth (MPD value) of min. 0.8 mm



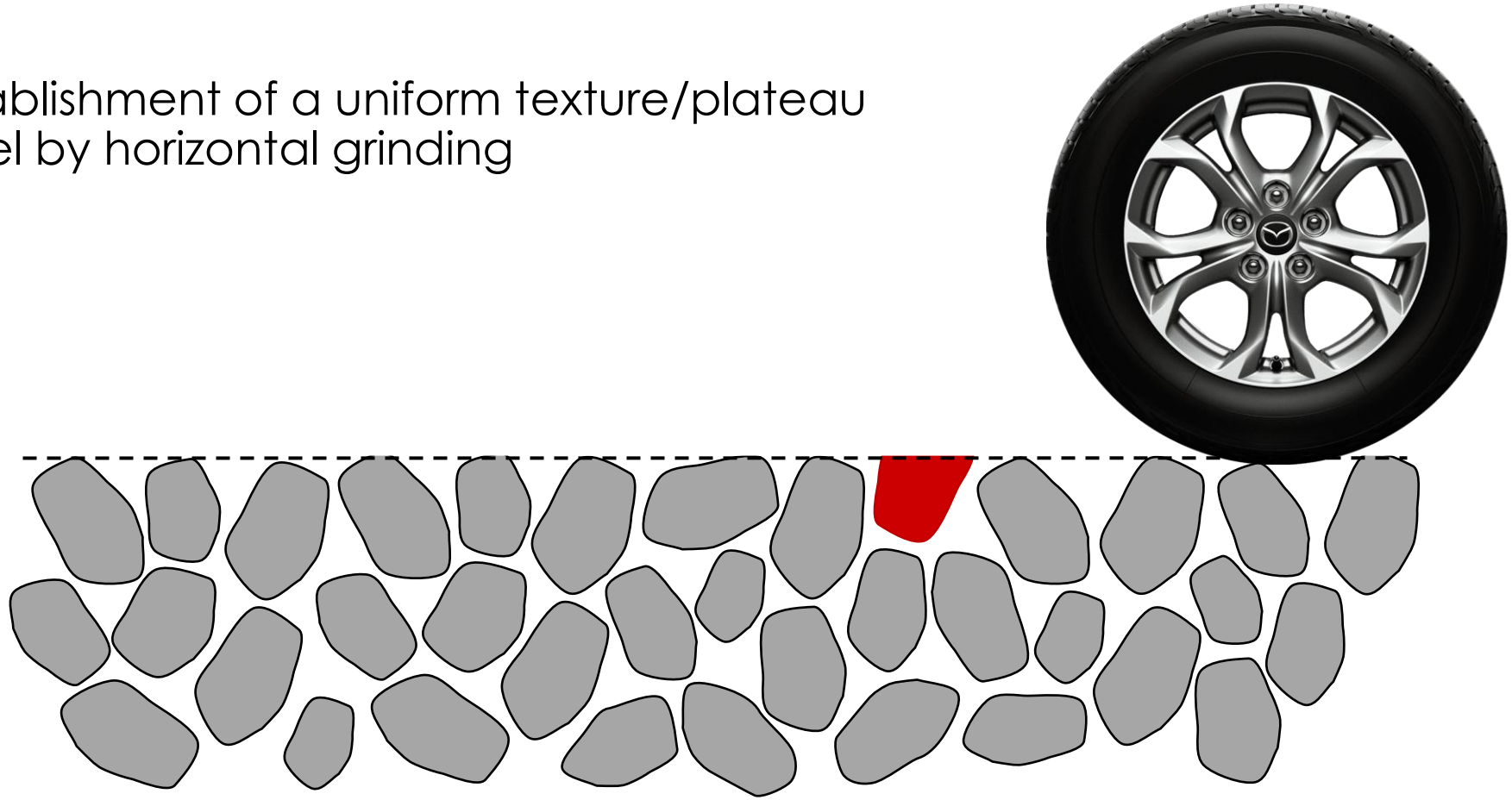
Horizontal ground exposed aggregate concrete

- Effect of tire–surface interaction



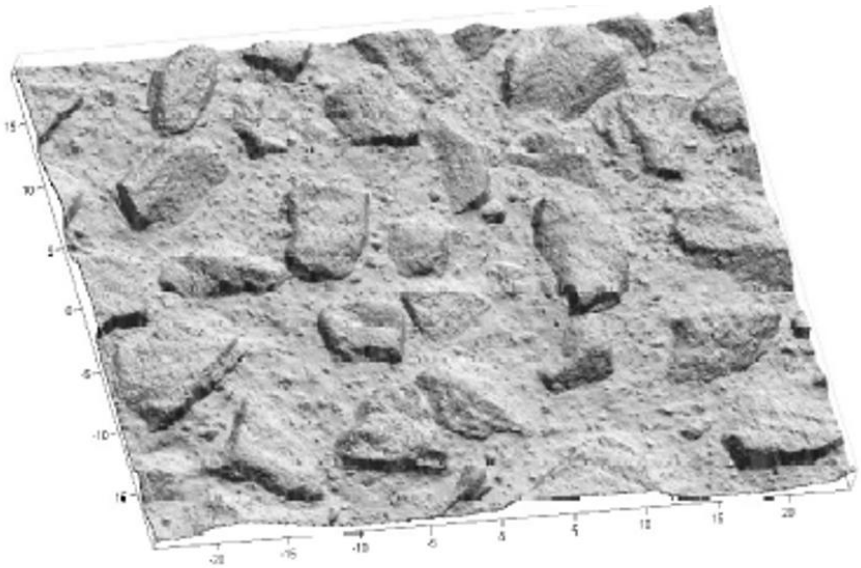
Horizontal ground exposed aggregate concrete

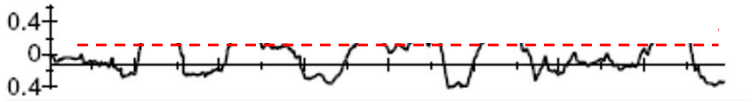
- Establishment of a uniform texture/plateau level by horizontal grinding



Horizontal ground exposed aggregate concrete

- What is the best grinding horizon?
- Touching area vs. texture depth





Horizontal ground exposed aggregate concrete

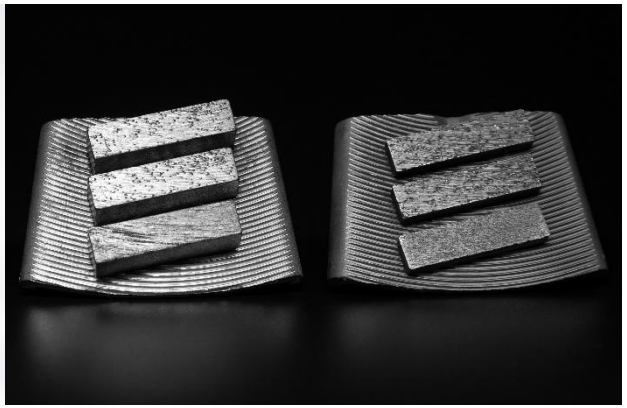
- High-performance heavy-duty equipment
- Working width up to 2.5 meter
- Multiple adjustment options to suit boundary conditions

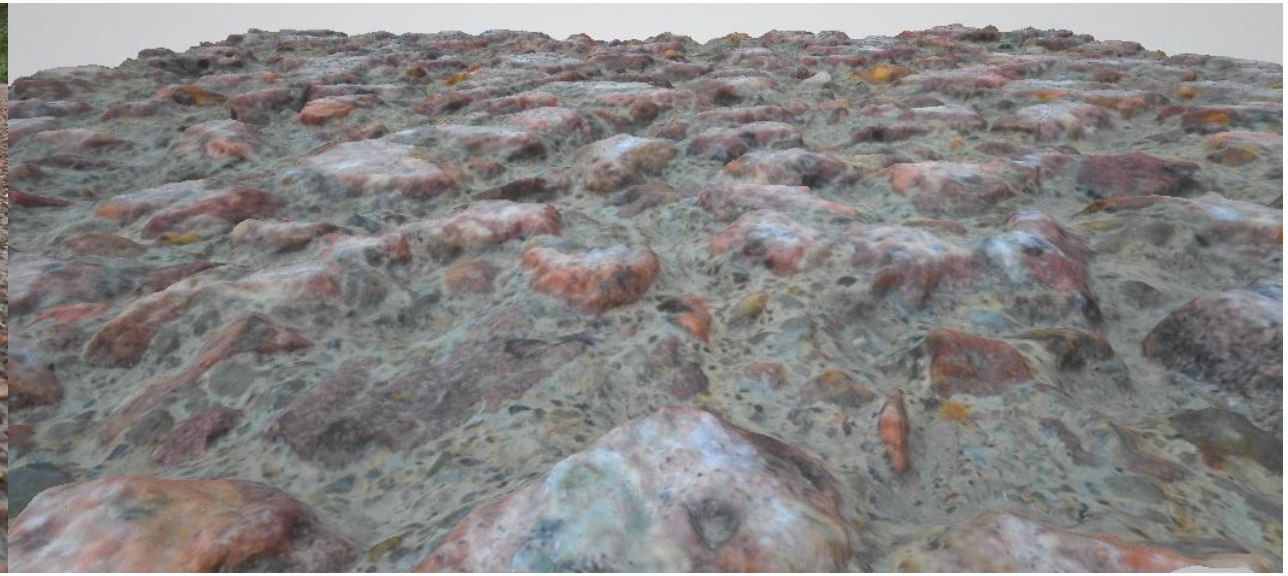
Horizontal ground exposed aggregate concrete

- Hand-held tools for finishing operations
- External dust extraction system

Horizontal ground exposed aggregate concrete

- Diamond tool selection tailored to the desired performance/results





Source: IWS

Conclusions

- Wide range of surface finishing methods
- A good surface needs a solid substance
- Renewal / improvement of textures possible
- New texturing methods are available
- M OB supports the selection and execution of suitable surface textures that are precisely tailored to the traffic area and its stress / functional properties
- Expertise in determining needs, selecting the process and executing it is indispensable
- We are happy to be at your side for advice and execution

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