



State of the art in testing hot mix asphalt

IBQ

- **Tests that are currently being carried out on asphalt granulate in Germany**
- **Challenges for asphalt granulate in the coming years**
- **Solutions currently used at IBQ GmbH**

Part 1

Tests that are currently being carried out on asphalt granulate in Germany

Tests that are currently being carried out on asphalt granulate in Germany

Usually tested in Laboratory

- binder content
- binder type
- grain size distribution
- ring and ball
- bulk density
- contaminant content
- grain shape

Usually determined by prior information

- resistance to fragmentation
- polished stone value
- water absorption of the aggregates
- resistance to freezing and thawing

Part 2

Challenges for asphalt granulate in the coming years

Low temperature asphalt, modified binders



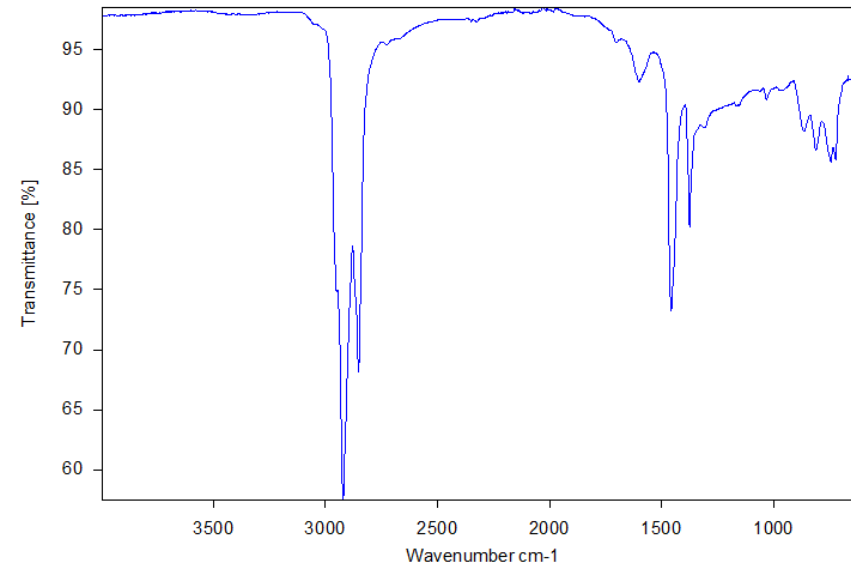
Gap describing binder properties

Part 3

Solutions currently used at IBQ GmbH

Fourier-transform infrared spectroscopy – ATR-FT-IR

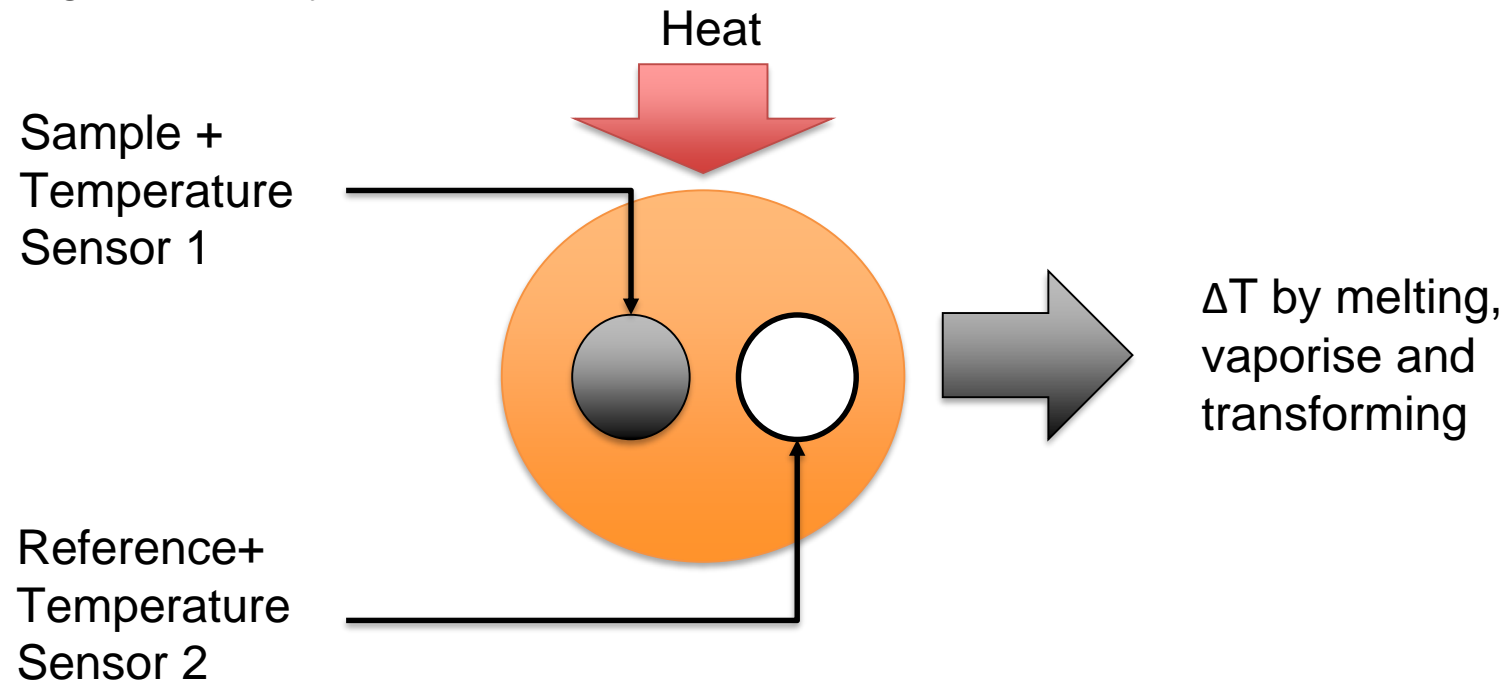
- 2,5 μm to 25 μm wavelength \rightarrow 4000 cm^{-1} to 400 cm^{-1} wavenumber
- Molecular movement and rotation
- Qualitative and quantitative analysis



Fourier-transform infrared spectroscopy – ATR-FT-IR

- Fast
- Versatile
- Small sample sizes
- Difficult to measure with similar chemical compositions
- Partly complex sample preparation

Dynamic scanning calorimetry- DSC



Dynamic scanning calorimetry - DSC

- Small sample sizes
- Quantitative detecting of very small amounts
- Versatile
- High accuracy scale ($\pm 0,01$ mg)
- Liquid nitrogen is needed



Thank you for listening

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