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## Inventors

**Carlos Javier Obando Gamboa**

**Kamil Kaloush**

## Contact

Shen Yan  
shen.yan@skysonginnovations.  
com

## Method to Measure Thermal Conductivity of Bituminous Materials

-Background In road infrastructure, one of the important properties of addressing the environmental and urban heat island aspects of pavements is the determination of the thermal conductivity. Asphalt concrete represents the third most widely used resource in the world, with asphalt-paved roads being its principal usage. One of the most important components of asphalt concrete is bitumen. Bitumen is a viscoelastic material susceptible to temperature changes. The determination of thermal conductivity of the bitumen is critical for understanding and improving its thermal performance. Various analytical models can be used to calculate the thermal conductivity of bitumen; however, the accuracy of each model and technique used are constricted by the bitumen physical properties among other factors, for example modification, for each material. Invention Description Researchers at Arizona State University have developed a method for assessing thermal conductivity of viscoelastic materials such as asphalt bitumen. This steady-state-based test estimates the thermal conductivity of asphalt binders using cylindrical samples poured into a silicon mold. Unlike many current techniques, the proposed method is simple, does not require advanced equipment, and has been validated on materials with known thermal conductivity. In addition, eighteen samples of different binder grades were tested using this method, yielding test results that were repeatable and within known thermal conductivity ranges. The coefficient of variation between various samples were in the 7-8% range, supporting its value as an affordable alternative test procedure with good accuracy. Related Publication: [Estimating the Thermal Conductivity of Asphalt Binders](#)[Faculty Profile of Professor Kamil Kaloush](#)

