

Aggregate Image Measurement System (AIMS)

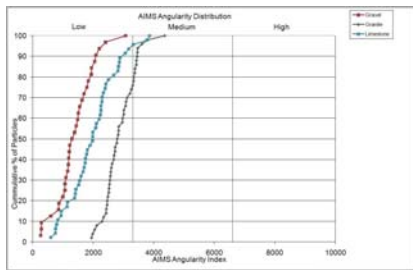
Highways for LIFE Partnerships 2008 Award \$200,000

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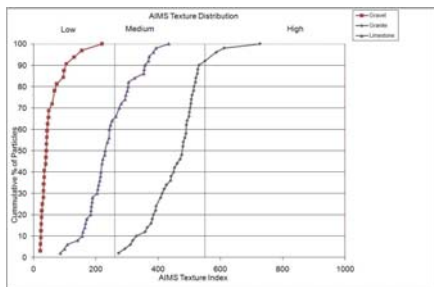
Project Status

The results of the interlaboratory study will be available in February 2010. Two proposed test methods for the procedures for testing materials with digital imagery were submitted for review by the AASHTO materials committee. The interlaboratory study will provide the precision information and potentially accelerate the adoption of the procedures should AASHTO deem adoption appropriate.



Angularity

The AIMS angularity chart provides objective characterization of the material edge characteristics. AIMS angularity characterizes the particle edge sharpness characteristics on a scale of 0-10000. The sample chart above reveals the angularity distribution characteristics of river gravel.



Micro-Texture

The AIMS also characterizes surface texture on a scale of 0-1000. The sample texture chart above reveals the smoother texture of a river gravel surface as compared to that of a limestone and crushed granite material.

Need for Innovation

The characteristics of aggregates used in hot-mix asphalt, hydraulic cement concrete, and aggregate pavement layers affect the structural integrity and durability of pavement systems and the skid resistance of pavement surfaces. Those characteristics include shape, (such as round or flat); angularity, (the sharpness of the corners of the aggregate particles); and texture, (the smoothness or roughness of the particle surface). Manual methods now used to measure aggregate characteristics can produce inconsistencies in measurement, quality assurance, and mix design.

Project Overview

Pine Instrument Company refined and developed the Aggregate Image Measurement System (AIMS) to analyze aggregate properties using digital imaging technology. The AIMS combines hardware that captures real-time digital images of paving material samples and the proprietary software that analyzes aggregate characteristics that affect pavement quality and improves the speed and accuracy of testing. In the interlaboratory study, 32 university, commercial, and highway agency laboratories evaluated the reproducibility of the AIMS equipment and procedures.



Angularity

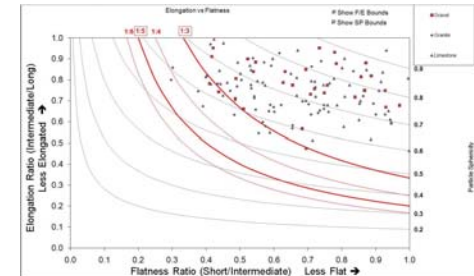
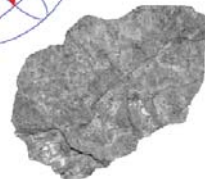


Form

The AIMS is capable of performing three tests on an aggregate sample size.

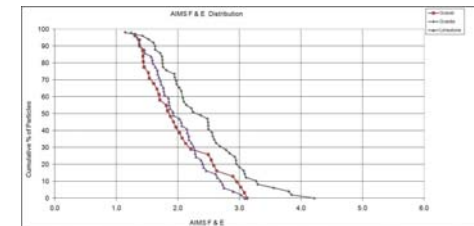


Texture



Particle Shape (Flat and Elongated)

Existing manual methods for "flat and elongated" analysis can be tedious, labor intensive, and groups particles to a specific range. The AIMS captures coarse particle 3D shape data and presents the information in multiple formats.



Aggregate Degradation

The AIMS also is used to characterize aggregate material performance in degradation tests, such as the Micro-Deval. The change in the properties from before to after degradation testing reveals information regarding the ability of the aggregate source to retain skid resistance in the field.

Project Team

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32 laboratories

Contact Information

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