Rutgers Asphalt Analysis Tool Pack

Technology #2019-018

Modern asphalt pavement performance testing has quickly evolved into simple physical testing procedures with intensive and complex analyses of collected data.

To facilitate larger adoption of the testing protocols and associated data analysis by both the private industry and DOTs, engineers in the Rutgers Center for Advanced Infrastructure and Transportation (CAIT) Pavement Resources Program (PRP) have created the Rutgers Asphalt Analysis Tool Pack (RAAT-Pack). The software can provide analysis for several asphalt performance testing specifications by uploading an input file and clicking “Run”. The software alleviates errors and decreases the time required for data analysis.

Tests performed:
• **Intermediate Temperature Semi-Circular Bend (SCB)** testing is an innovative crack resistance test for asphalt pavements. It uses a semi-circular (half-moon) shaped asphalt sample with an initiated crack to determine further resistance to cracking analyzing the load and displacement data.

• **Cold Temperature Semi-Circular Bend** is utilized to determine the low temperature crack resistance of asphalt pavements using a semi-circular shaped asphalt sample. Low temperature crack resistance is calculated based on the load and displacement data collected throughout the test.

• **Ideal-CT** testing is a crack resistance test that utilizes a full size Superpave Gyratory Compacted sample and line loading. Crack resistance is calculated using the load and displacement data from the test.

• The **Asphalt Pavement Analyzer (APA) Rutting** is a wheel track test that utilizes a steel wheel tracking over a rubber hose to simulate traffic loading. This test is used to determine early life rutting in asphalt pavements.

• **Direct Compact Tension (DCT)** is a low temperature crack resistance test. This test method utilizes a circular specimen with a single edge notch loaded in tension to determine the fracture energy which can be used to help determine fracture resistance.

• **High Temperature Indirect Tensile Strength (HT-IDT)** is a modified version of standard IDT testing using a higher conditioning and testing temperature. This test method utilizes a cylindrical sample loaded across its vertical diametral plane, to determine the peak load at failure to calculate the IDT strength.

**Potential Users:**

Many Department of Transportation’s (DOTs) across the country require the tests performed by the RAAT-Pack software before an asphalt mixture can be used for paving. This means that all industry partners involved with or requiring asphalt pavement performance testing can benefit from use of the software.

**Advantages:**

This software was developed to perform analyses on several different asphalt performance tests. Other solutions analyze a single testing procedure.

**Rutgers Center for Advanced Infrastructure and Transportation**
Rutgers CAIT is an University Transportation Center, an elite group of academic research institutions that are sanctioned and supported by the U.S. Department of Transportation. The PRP is an infrastructure area within CAIT that leads innovations in pavement technology, engineering, and pavement management systems (PMS). PRP experts provide guidance and technical support to NJDOT and municipalities regarding PMS and is one of the largest and most active independent pavement labs in the New York/New Jersey metro region.

*RAAT-Pack requires Matlab software to operate.*

**Inventors**

**Edwin Haas**

Edwin Haas is a Senior Laboratory Engineer and the lead performance tester at the Rutgers Asphalt Pavement Laboratory at Rutgers University. He has a decade of asphalt material experience and is an invited member of the National Academy of Sciences-Transportation Research Board for his work.

**Benjamin Berger**

Benjamin Berger is a graduate student at Rutgers University working at the Rutgers Asphalt Pavement Laboratory and studying Geotechnical Engineering. In 2018 he received the Elaine & Robert Lang Foundation Scholarship in recognition of his academic achievement in the field of asphalt.

**Marissa Berger**

Marissa Berger is a graduate assistant at the Rutgers Asphalt Pavement Laboratory currently pursuing a Master's in Biomedical Engineering.