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|---|---|
| Name of Test<br>**N$_{flex}$ Factor** | Developer(s)<br>West and co-workers (NCAT) |
| Test Method(s)<br>AASHTO TP 141-20 | Adoption by Agencies<br>None |
| Description<br>The N$_{flex}$ test is similar to the traditional indirect tensile strength test. The test applies a vertical monotonic load on a cylinder specimen at a constant rate of 50 mm/min. During the test, the cross-head displacement is continuously monitored and recorded. Data analysis is conducted based on the load versus displacement curve. The N$_{flex}$ factor is calculated by dividing the material Toughness (area under the load displacement curve) by the slope of the curve at the post-peak inflection point. | Photographs/Illustrations<br> |
| Test Results<br>N$_{flex}$ factor | Test Temperature(s)<br>$25 \pm 0.5°C$ |
| Equipment & Approximate Cost<br>Load Frame | $10,000 to $20,000 |
| Specimen Fabrication<br>Gyratory specimen | Number of Replicate Specimens<br>At least 3 specimens per mixture |
| Specimen Conditioning<br>Conditioning for 2 hours at the test temperature | Testing Time<br>1 minute per specimen |
| Data Analysis Complexity<br>Simple | Test Variability<br>Medium (10-25% COV) |
| Field Validations<br>Fair (Correlation to cracking at FHWA ALF) | Overall Practicality for Mix Design and QA<br>Good for Mix Design<br>Good for QA |

Key References
- West, R. C., Van Winkle, C., Maghsoodloo, S., & Dixon, S. (2017). Relationships between Simple Asphalt Mixture Cracking Tests Using Ndes Specimens and Fatigue Cracking at FHWA's Accelerated Loading Facility. Journal of the Association of Asphalt Paving Technologists, 579-602.
- Yin, F., Garita, J., Taylor, A., and West, R. (2018). Refining the Indirect Tensile (IDT) Nflex Factor Test to Evaluate Cracking Resistance of Asphalt Mixtures for Mix Design and Quality Assurance. Construction and Building Materials, 172, 396-405.
- Yin, F., West, R. C., Xie, Z., Taylor, A., & Julian, G. (2019). Effects of Loading Rate and Mix Reheating on Indirect Tensile Nflex Factor and Semi-Circular Bend J-Integral Test Results to Assess the Cracking Resistance of Asphalt Mixtures. Auburn, AL: NCAT Report 17-09.