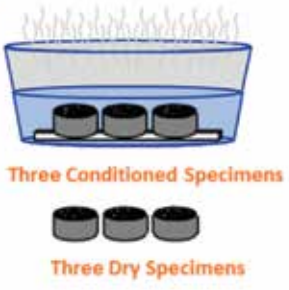
Name of Test **Tensile Strength Ratio**	Developer(s) Developed by Lottman Modified by Tunnicliff and Root
Test Method(s) AASHTO T 283-14 (2018)	Adoption by Agencies Alabama, California, Colorado, Connecticut, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Virginia, Vermont, Wisconsin, Wyoming
Description The indirect tensile (IDT) strength is determined for one set of dry specimens and another set of wet specimens conditioned according to the modified Lottman procedure. The procedure consists of partial vacuum saturation, one freeze/thaw cycle, and soaking in warm water. Tensile strength ratio (TSR) is then determined as the ratio of the average wet IDT strength over the average dry IDT strength. Several modifications to the moisture conditioning procedure have been adopted by state highway agencies.	Photographs/Illustrations  
Test Results IDT strength, TSR	Test Temperature(s) 25 ± 0.5°C

Equipment & Cost	
Vacuum container	$3,000
Water bath	$650
Freezer	$300
Mechanical testing machine	$4,000
Lottman breaking head	$500

Specimen Fabrication Gyratory specimens	Number of Replicate Specimens 6 specimens
Specimen Conditioning Conditioning for 2 hours at 25°C in water bath	Testing Time 3 days
Data Analysis Complexity Simple	Test Variability IDT strength: Low (10% COV) TSR: Low (9.3% d2s)
Field Validations N/A	Overall Practicality for Mix Design and QA Good for Mix Design Poor for QA

Key References

- Lottman, R.P. (1982). "Predicting Moisture-Induced Damage to Asphalt Concrete Field Evaluation," NCHRP Report 246, Transportation Research Board, Washington, D.C.
- Tunnicliff, D.G. and Root. R.E. (1984) "Use of Antistripping Additives in Asphaltic Concrete Mixture Laboratory Phase," NCHRP Report 274, Transportation Research Board, Washington, D.C.
- Azari, H. (2010). "Precision Estimates of AASHTO T283: Resistance of Compacted Hot Mix Asphalt to Moisture-Induced Damage," NCHRP Web-Only Document 166, Washington, D.C.