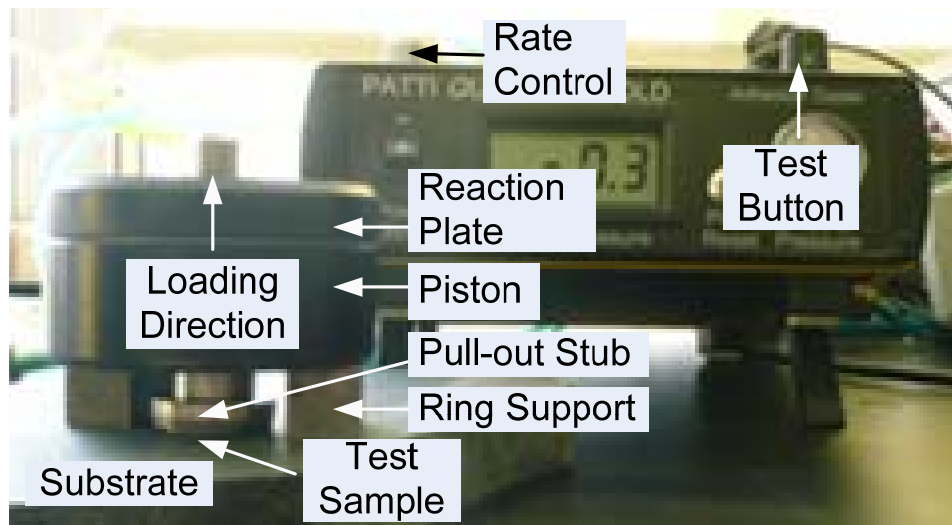


Bitumen Bond Strength (BBS) Test

Quantifying adhesion between bitumen binders and aggregates demands simple, inexpensive test methods as the road building industry moves toward performance-based specifications. The Pneumatic Adhesion Tensile Testing Instrument, commonly known as PATTI and originally developed for use in the painting industry, is identified as an appropriate test device for the newly proposed Bitumen Bond Strength (BBS) test.

The BBS test procedure recently developed at the University of Wisconsin–Madison in collaboration with the University of Ancona in Italy and the University of Stellenbosch in South Africa has been used successfully on hot bitumen to characterize the effects of moisture damage and on bitumen emulsions to characterize the development of bond strength.

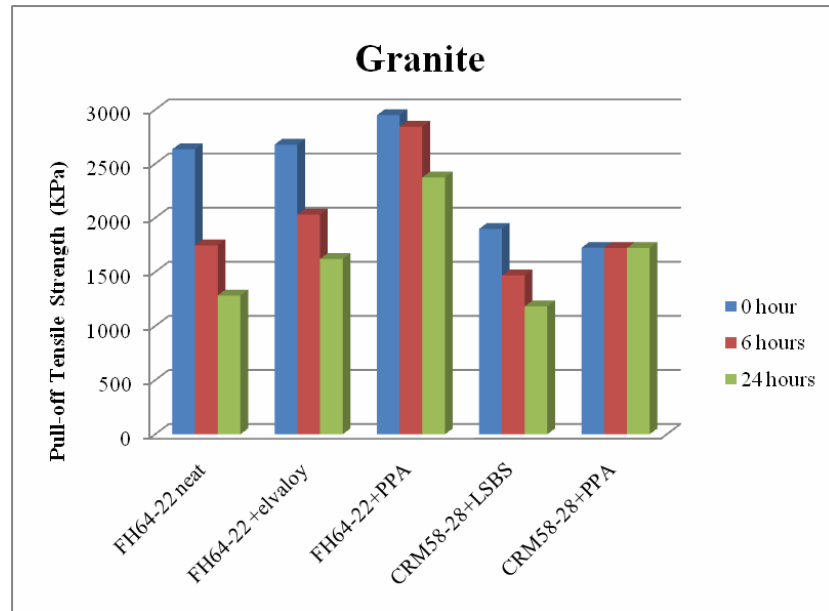
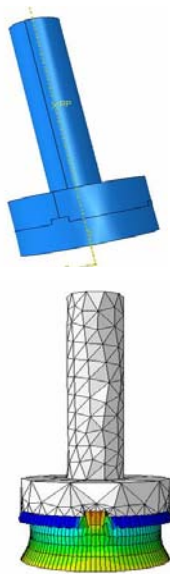
The test method shows great promise for measuring the development of bond strength in emulsified asphalt binders. The BBS test method is able to quantify the effects of emulsion type, binder modification, aggregate mineralogy, and curing conditions on bond strength development. In addition, it characterizes bonding between aggregates and hot-applied bituminous binders and quantifies the effects of conditioning time, conditioning solution, and binder modification.



The BBS test assembly.



Pull-out stubs control film thickness with circumferential feet (left). The stub's threaded shaft screws into the PATTI reaction plate and is affixed to the substrate with emulsion (center). Polishing modifications to the surface diminish failure at the stub-binder interface (right).



Effect of modification and conditioning time on the pull-off tensile strength obtained with BBS. It can be seen that polyphosphoric (PPA) modification significantly reduces the moisture susceptibility of the PG 58-28 binder.