

technically speaking

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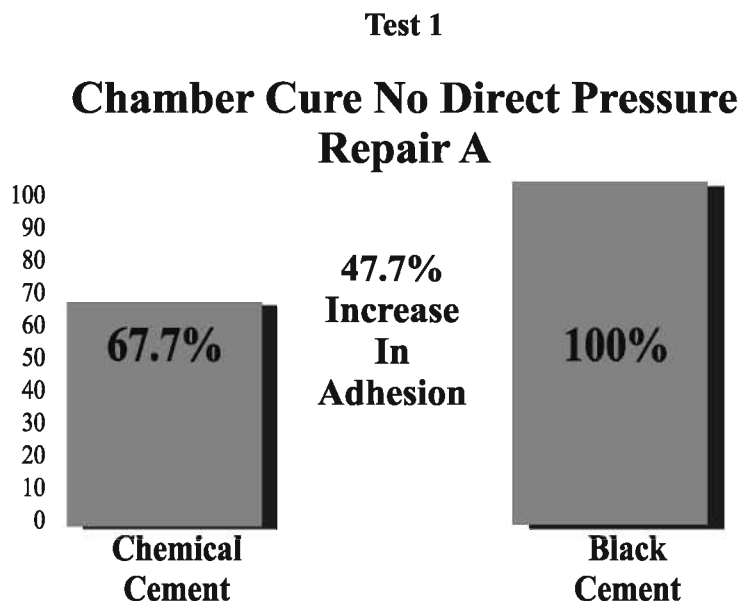
March 24, 2000

HOW DIFFERENT CEMENTS AFFECT TIRE REPAIR UNIT ADHESION THROUGH THE RETREADING PROCESS

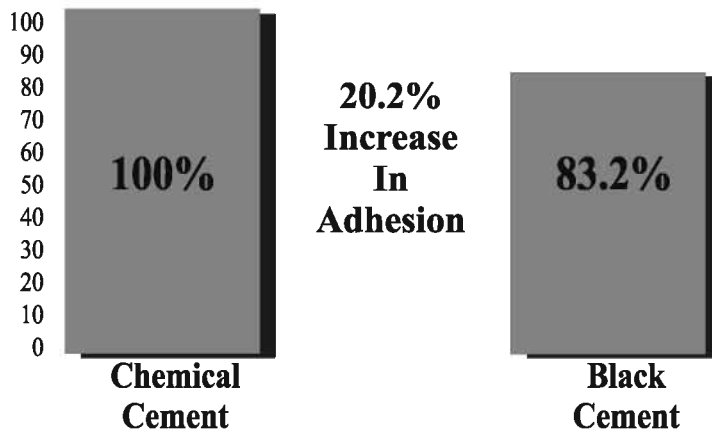
This is the second in a series of Tech's Technically Speaking issues that highlight conditions that affect repair unit adhesion. The focus of this test was to chart the average adhesion when using the proper chemical cement versus using black cement through the retread process. As explained in Technically Speaking Volume 23/Issue 2, adhesion is measured on a tensile tester that electronically records the adhesion of several repairs and then average them. For these tests, we took an average of six (6) separate repair unit adhesion pull tests to collect the data for each category.

All repairs in test 1 through 4 were cured in a retread chamber at 260°F (127°C) for 2.5 hours using the rimless/bagless system with no direct pressure.

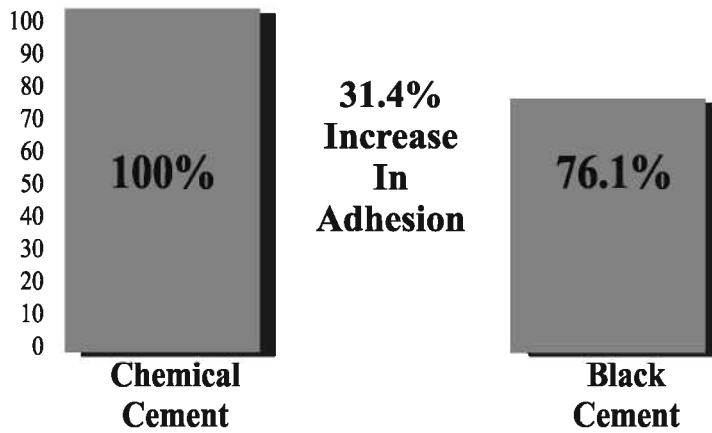
The results are as follows:



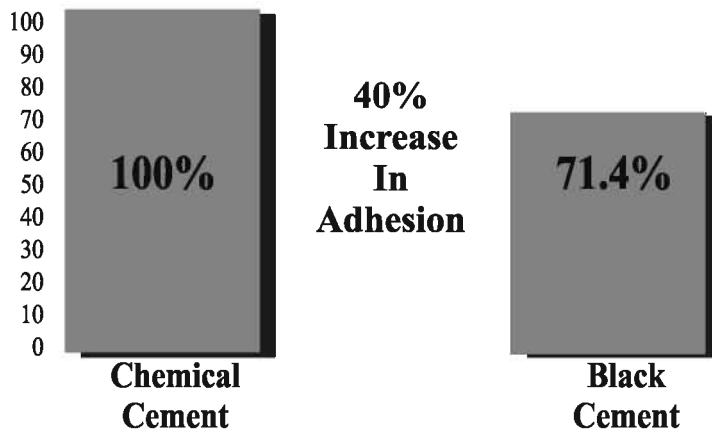
Test 2
Chamber Cure No Direct Pressure
Repair B



Test 3
Chamber Cure No Direct Pressure
Repair C



Test 4
Chamber Cure No Direct Pressure
Repair D



ANALYSIS:

Test 1 produced better repair unit adhesion using black cement versus chemical cement with Repair A.

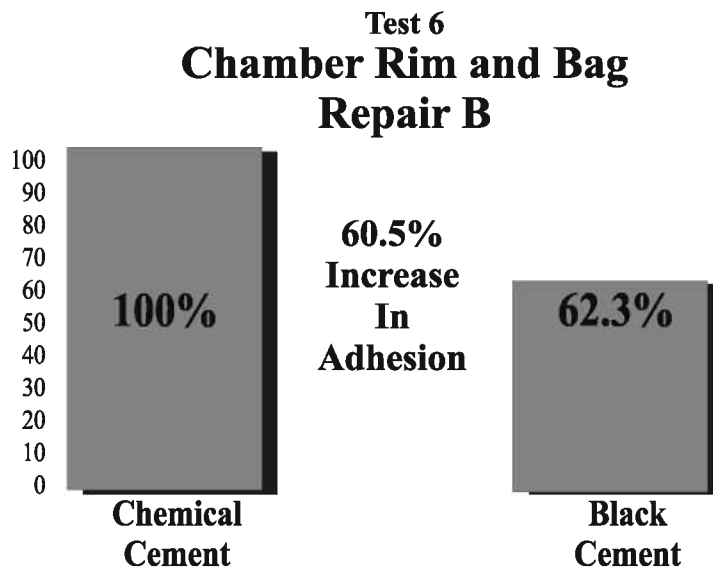
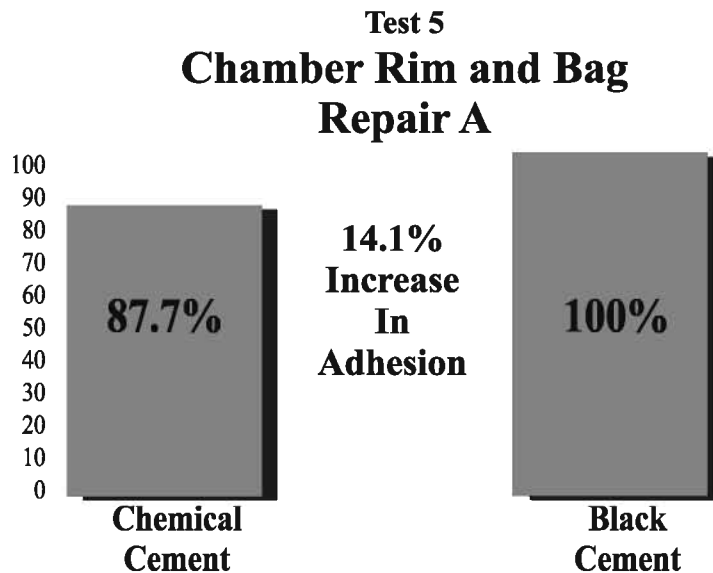
Tests 2, 3, and 4 illustrate that repair unit adhesion can be increased by up to 40% using the appropriate chemical cement with repair B, C, and D, versus black cement.

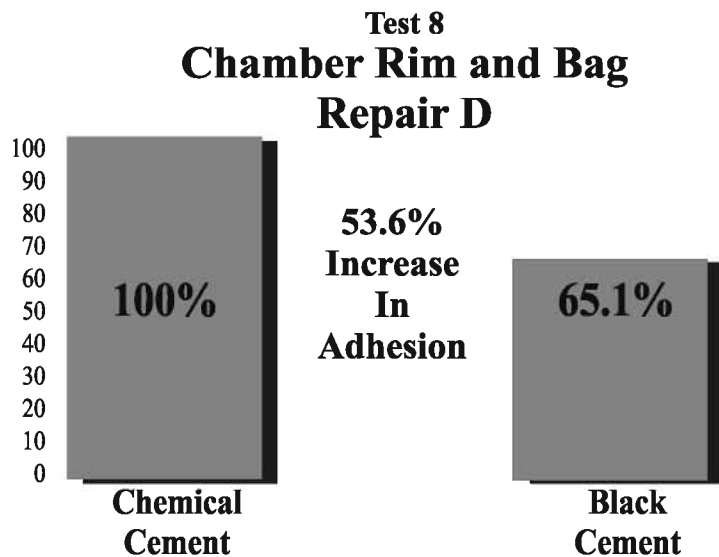
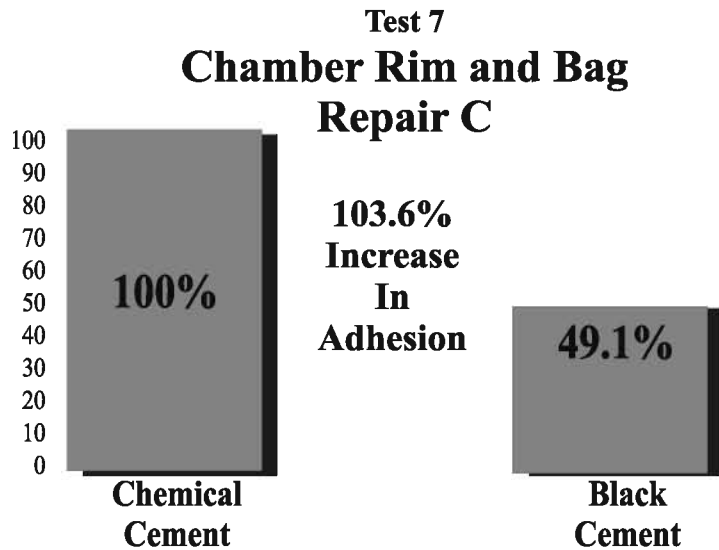
With all samples, the bonding gum layer appeared fully cured, however, improved adhesion was obtained with most repairs when using chemical cement. This is caused by the chemical activator creating a better cross linking of the repair's bonding gum to the tire.

In all cases, you must use the cement recommended by the repair unit manufacturer.

All repairs in tests 5 through 8 were cured in a retread chamber at 260°F (127°C) for 3 hours using the rim and bag system.

Results are as follows:





ANALYSIS:

Test 5 again produced better repair unit adhesion using black cement versus chemical cement with Repair Unit A in the rim and bag system. However, chemical cement performed much better with Repair Unit A in Test 5 versus Test 1.

Tests 6, 7 and 8 show dramatic differences in adhesions using chemical cement in the bag and rim system versus black cement with Repairs B, C, and D.

Remember, with the bag and rim system, direct heat is applied only to the outside of the assembled retread, thus producing reduced curing temperatures at the inner liner surface.

Although all of the samples indicated a complete cure of the bonding gum layer, the increase in adhesion with repair units B, C and D would seem to mandate the use of chemical cement.

Again, it is extremely important to use the cement recommended by the repair unit manufacturer to obtain the best performing tire repair adhesion.

Tech International would like to thank the participating repair material manufactures for donating their materials for these tests.