

technically speaking

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THE IMPORTANCE OF PROPER BUFFING SPEED, PROPER CLEANING AND BUFFED TEXTURES

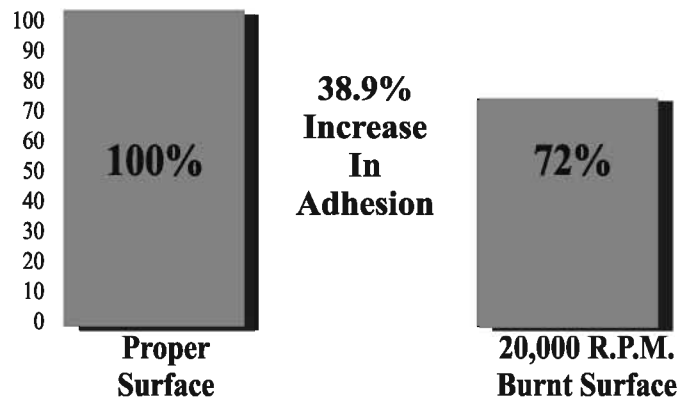
This is the third in a series of Technically Speaking Issues on Conditions that effect tire repairs. Our goal is to support many of the statements that are often made during repair seminars. This issue deals with the use of proper speed used for inner liner preparation and the proper buffed texture needed for maximum adhesion of radial tire repairs. The repairs used for these tests were CT-22 Radial Repair Units. Each test consists of an average adhesion of six repairs of each condition. As explained in the past, an adhesion pull test is performed on a tensile tester, which measures the force required to pull the repair unit from the tire. To prepare the substrate, the surface is buffed, cleaned and chemical Vulcanizing Fluid is applied to the substrate. Once the Vulcanizing Fluid has thoroughly dried, the repair is stitched onto the prepared surface. Repairs can be vulcanized at room temperature or by applying heat in a press or retread chamber. 72-hour room temperature or Chemical Vulcanization was used for this test. Once the prepared samples are completely vulcanized, they are cut into a one-inch wide strip. These samples are then pulled apart on a tensile tester where the average adhesion is recorded.

5,000 RPM VERSES 20,000 RPM BUFFING SPEEDS

Many years ago the RMA (Rubber Manufacturers' Association) established proper speeds for buffing rubber and preparation of steel cables for the retread and repair industry. It was established through testing that a maximum speed of 5,000 rpm should be used when buffing rubber. Higher speeds proved to burn or scorch rubber, thus reducing adhesion. Yet today many of our customers are still preparing inner liners with lower cost, high rpm air tools. Tech believes it is extremely important for all of our customers to be aware of the loss in adhesion when using a high speed air tool for inner liner preparation. In this test six samples were prepared with a low rpm air tool and six with a high speed air tool. After proper cleaning and cementing of the substrates, the repairs were applied to the surfaces. After 72 hours, the samples were pulled on a tensile tester. The results showed that the burnt surfaces pulled to only 72% adhesion levels compared to adhesion levels obtained on a proper unscorched surface. In other words when using proper buffing speed, an increase of 38.9% in adhesion can be achieved.

The use of the proper speed air buffer will increase the adhesion of repairs. Not only does a low rpm buffer assure better adhesion, it will also improve the control of the buffing wheel. This will lessen the change of buffing through the inner or creating an irregular surface.

RMA-2 Texture @ 5,000 R.P.M. vs. 20,000 R.P.M.

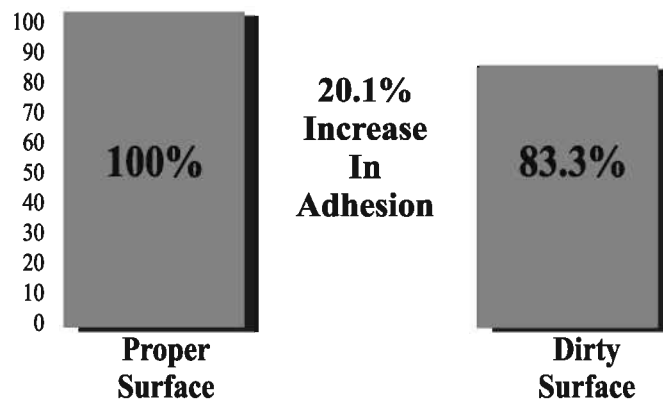


PROPER CLEANING

A clean, properly prepared surface will also provide an increase in repair unit adhesion. We compared this to an improperly cleaned surface where the buffing dust was not completely removed. Another thing that will cause contamination is when a technician uses a dirty rag to clean the buffed surface. Cleaning the liner can be accomplished by using one of two cleaning methods. One method is using a vacuum and Rub-O-Matic applied to a clean, lint free cloth. The second method is using a soft wire brush to remove debris from the buffed surface, followed by vacuuming.

Tech's testing showed a 20.1% increase in adhesion when the buffed surface was cleaned properly versus an improperly cleaned surface.

Proper Surface vs. Dirty Surface

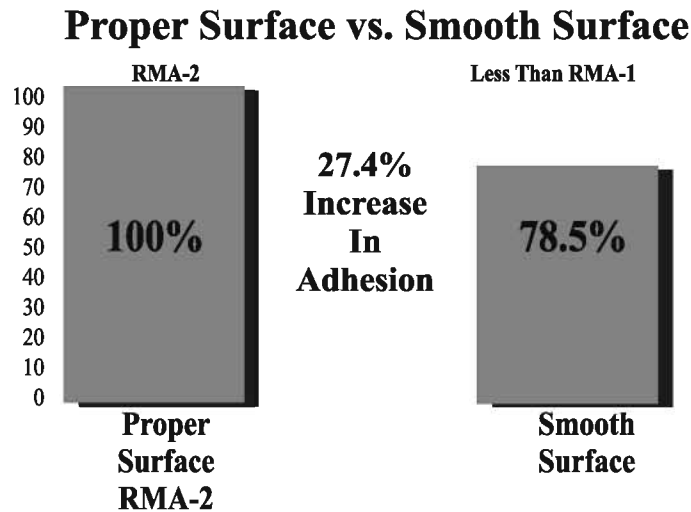


RMA#2 BUFFED TEXTURE vs. SMOOTH SURFACE

Many times we see technicians using a worn out buffing wheel to prepare the inner liner. It is extremely important to create a proper surface to maximize the adhesion of the repair to the tire.

A smooth surface texture does not create the mountains and valleys in the rubber that are necessary for maximum adhesion. In addition, a worn out buffing wheel will not thoroughly remove the oxidation from the inner liner. For this test we prepared the surfaces with an RH-106 Rubber Hog inner liner wheel and a worn-out RH-106.

Tech's testing showed an increase of 27.4% when the proper buffing wheel was used to prepare the inner liner.



RMA#2 TEXTURE vs. RMA#4 BUFFED TEXTURE

Many technicians feel that a rough textured surface will provide excellent adhesion. When applying retread rubber, uncured repair or cloth backed repair, this statement is true because of the thickness of the cushion gum. When using a chemical repair, this is not a true statement due to the thin layer of the cushion gum. The cushion gum on most chemical repairs runs between .0012" (.031mm) and .0022" (.056mm) in thickness. These cushion gums are too thin to be stitched into a deep texture. A deep texture can cause the repair to bridge across the top of the texture and will not make complete contact with the prepared surface. The optimum textures for chemical repairs is an RMA #1 or RMA #2 buffed textures. For this test we prepared the surfaces with an RH-106 for an RMA #2 texture and a 16 grit buffing wheel for the RMA #4 texture. Testing showed an increase of 11.8% increase in adhesion when a properly textured surface is achieved. A rough textured surface can be more detrimental to adhesion when using repairs with semi-cured cushion gums. Soft cushion gums are more forgiving than the chemical gums that have already been exposed to heat.

