Unicure

Tomorrow's Technology Today's Choice

- Segmented Bead-to-Bead Radial Retread Process
- Tires Look and Perform Like New
- Maximize Casing Life
- Substantial Cost Savings

Radial OTR

Bead to Bead Retreading

As the number of units running radial off-the-road tires continued to rise throughout the 1980s and into the 1990s, we set out to find the most effective system for retreading radial OTR tires. Rather than attempting to adapt existing systems to fit the special demands of these tires, as our competitors do, we spent nearly two years of research and development time to find the optimal method. To date, over six million dollars has been invested bringing the Unicure line of bead to bead radial retreads to the industry. Using the latest in European technology, our retreads, in addition to looking like new tires, offer distinctive performance and longevity advantages over competitive methods. We currently offer 13 sizes, from 1400R-24 to 2700R-49, in 11 popular tread designs.

Why the Segmented Bead to Bead (Unicure) Retread Process?

The radialization of OTR tires began with the desire of operators to carry greater loads at higher speeds and obtain longer hours of service from their tires. One of the leading causes of failure in OTR tires has been sidewall cuts penetrating into the steel cables of the radial casing. Left unattended, these cuts will grow with every revolution of the tire, allowing moisture and dirt to work into the steel cables, eventually causing premature failure of the casing.

With these thoughts in mind, we developed the Unicure system to maximize casing life and generate new tire performance. With our process all cuts, from bead to bead, are removed and a new sidewall veneer is applied to restore the tire to like-new form.

The Process

Inspection

Until now, the only form of inspection available for OTR tires has been visual. Currently, we have the only non-destructive testing device in production to inspect OTR tires for retreading or repair. The technology, called shearography, has been used effectively in aircraft tire retreading for many years. This machine allows us to look beneath the surface of the tread and sidewalls and find separations along with other defects that are otherwise undetectable.

During the test cycle, a tire is placed in a vacuum chamber. Using laser imaging, cameras in the chamber photograph the tread and both sidewalls while the tire is in a relaxed state. A vacuum is then drawn in the chamber, and a second series of photographs is taken. At the end of the cycle, the two series of photographs are superimposed one on top of the other. Any movement in the structure of the tire, between the relaxed and vacuum state, is displayed in the form of anomalies on the computer screen. It is possible to locate and measure the exact size of these defects.

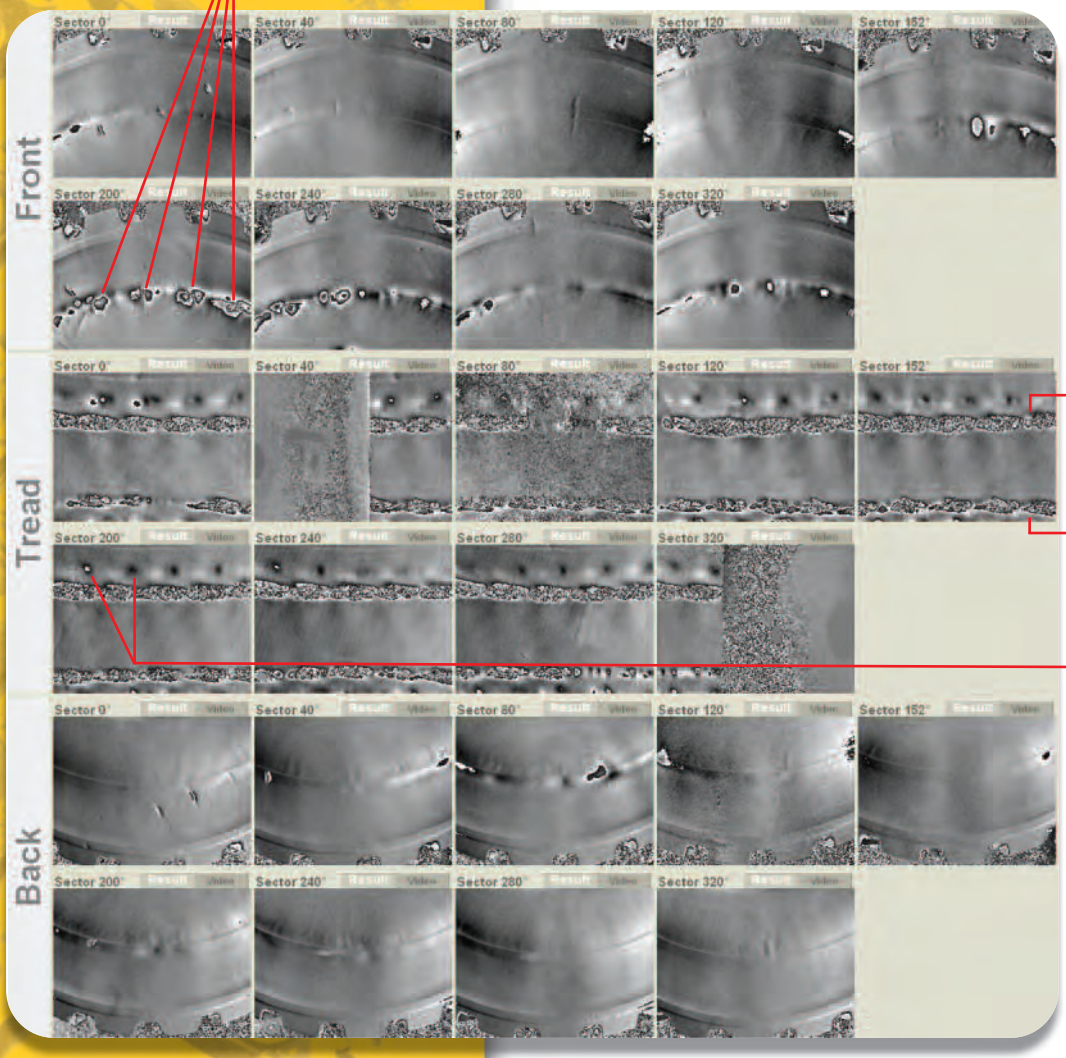
The goal of this inspection technique is to find non-repairable defects in OTR tires without having to buff off the remaining tread depth. A tire that is not a suitable candidate for retreading can often be remounted and the end user can safely run out the remaining tread life.

The Process

Inspection, con't.

The image below is of a 29.5R-25 sent in for retreading. The tire showed no signs of damage on visual inspection. While one sidewall is clean, the other sidewall shows long areas of separation in the turn-up area. The tread indicates large separations in the first and second belt, and minor separation into the third belt.

We determined that the damage was too severe for the tire to be retreaded. It had approximately 30% of the tread remaining, and was returned to the customer to be safely used as a spare, or simply run out.



Areas of turn-up separation

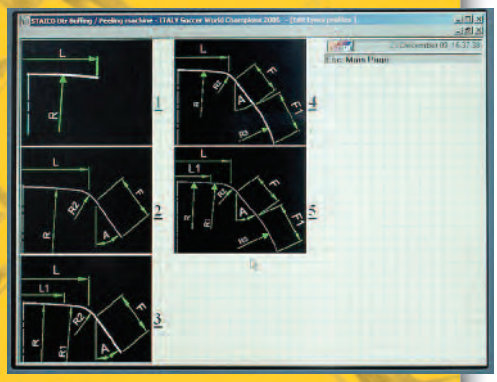
Large area of separation in top two tread belts

Minor separations into third tread belt

Buffing

With our system, all tires are buffed inflated on a computer-controlled buffer. CNC technology allows us to buff each tire to an exact diameter and profile to ensure uniformity.

The worn tire is buffed following the profile of the original tire casing. This is integral to producing a finished product with the optimal amount of undertread in the tread and shoulder, which will help keep heat build up to a minimum.



Operator can select from a variety of profiles to match specific tire size and design.

Typical Damage

Examples of Sidewall and Bead Area Damage

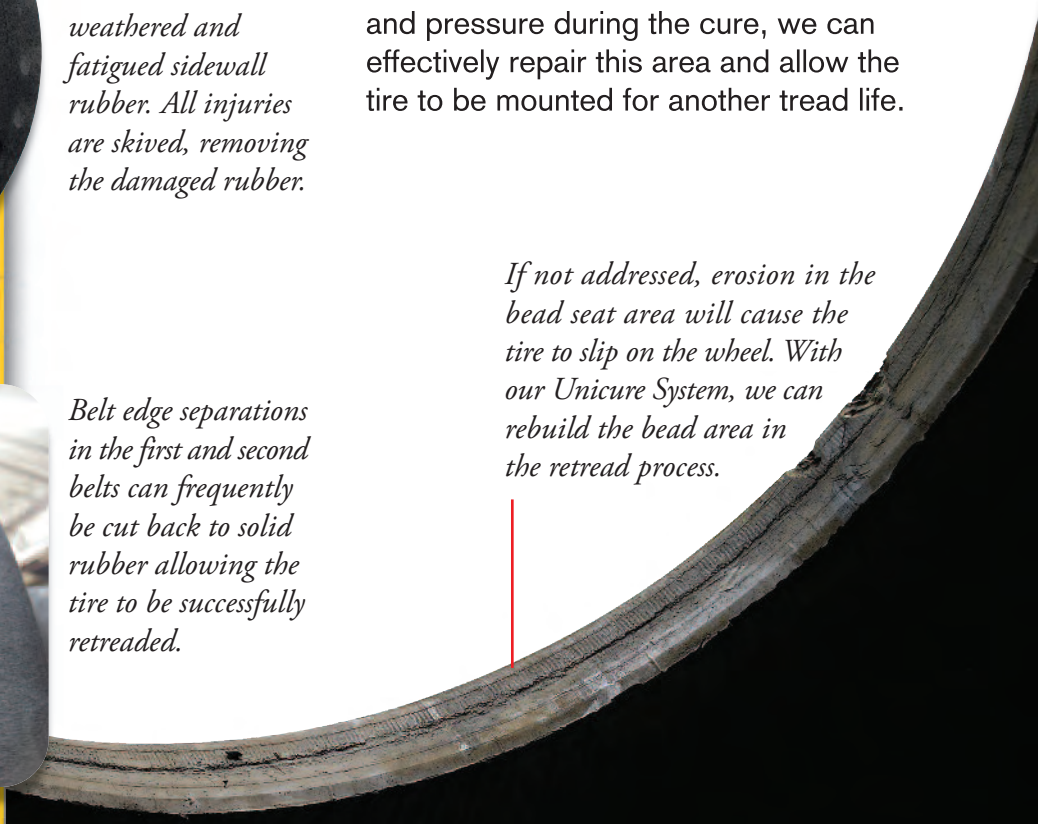
The majority of radial tires sent in for retreading have some degree of sidewall damage.

The tire shown has damage to the sidewall. In our system, every cut is skived out and the damaged area is removed. Uncured rubber is used to fill the void, and is cured in with the tire at the time of retreading. We do not simply cover over the damaged area with veneer, as has been stated by our competition. These repairs are done at no additional charge.

We buff every radial tire from bead to bead to remove the weathered and fatigued sidewall rubber. All injuries are skived, removing the damaged rubber.

In service, the beads of radial OTR tires are highly stressed. Whether from underinflation or high levels of torque, the bead band will wear on the bead seat area and cause the tire to slip on the wheel. Because we have both heat and pressure during the cure, we can effectively repair this area and allow the tire to be mounted for another tread life.

Belt edge separations in the first and second belts can frequently be cut back to solid rubber allowing the tire to be successfully retreaded.



If not addressed, erosion in the bead seat area will cause the tire to slip on the wheel. With our Unicure System, we can rebuild the bead area in the retread process.

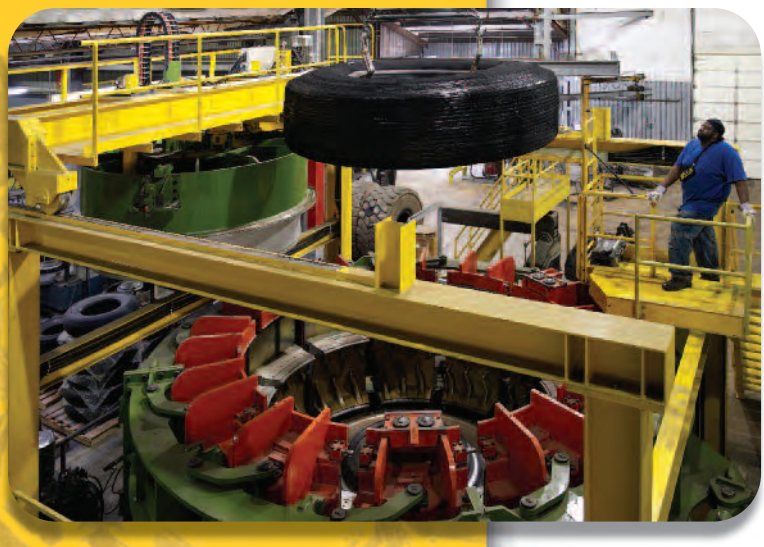
Building

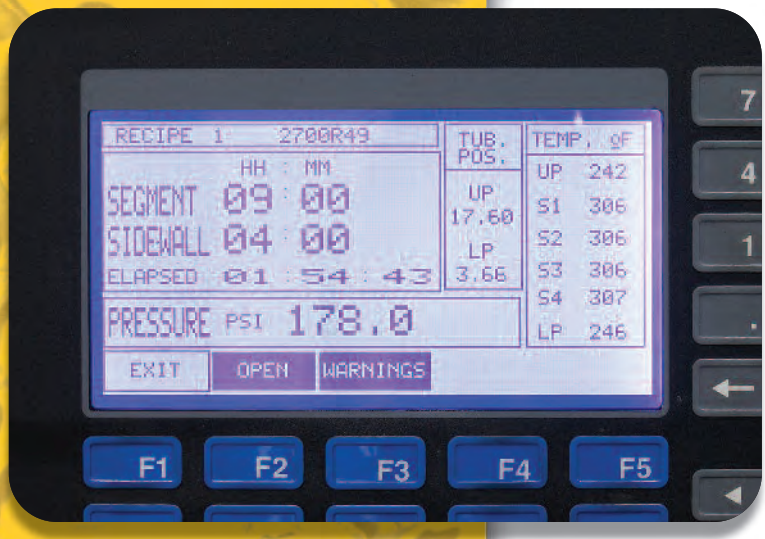
Radial tire retreading requires that the tire be built to precise dimensions. In order to achieve this, we utilize computer-controlled building machines which wind a continuous ribbon of rubber around the buffed tire. As in the buffing process, the operator chooses from a variety of programs for each tire size and design.

We utilize two different rubber compounds. First, a special sidewall/underbase compound which helps resist cut growth and cracking in the sidewall area is applied. A cut-resistant compound is then used to finish building the tread area to its final dimension.

The last step in the building process is the hand application of a 1/8" sidewall veneer. In addition to providing new tire looks, the new veneer restores the tire's anti-aging properties.

Curing





Just as in new tire production, our tires are cured in a segmented mold. PLC logistics control time, pressure and separate temperature zones for the bead/sidewall area and tread area.

In autoclave curing, every part of the tire, inside and out, is exposed to the full temperature for the entire length of cure. With our Unicure System, no direct heat is applied to the inside of the tire. The sidewalls are heated to a lower temperature, for a much shorter period of time, than the tread area.

The precure method for OTR retreading is often mistakenly referred to as the cold process. With this method, typical curing temperatures are 260 F. As the tire is also cured in an autoclave, every part of the tire is exposed to this temperature for the entire length of the cure.

Unicure CL3

SIZE	32NDS
1400R-24	36
17.5R-25	36
20.5R-25	44
23.5R-25	48
26.5R-25	52
29.5R-25	55

An L-3 design with a wide footprint. For use on loaders, dozers and graders. Not recommended for scrapers or articulated trucks where speed or length of haul is a factor.

Unicure AP3

SIZE	32NDS
17.5R-25	31
20.5R-25	34
23.5R-25	34
26.5R-25	42
29.5R-25	48

A directional all-purpose design with a good balance between traction and wear. Excellent speed capability on scrapers and articulated trucks.

Unicure CH4

SIZE	32NDS
1800R-33	54
2100R-35	60

A non-directional E-4 design for use on medium size end dump trucks. Wide center lug offers long, even wear and resists cutting and chipping.

Unicure CH4

SIZE	32NDS
2400R-35	72

A newer version of an E-4 design for use on large size haul trucks. Provides excellent traction and long wear in severe conditions.

Unicure CV4

SIZE	32NDS
2700R-49	84

A proven E-4 design for large size haul trucks. The rugged tread design and sidewall protectors offer excellent resistance to cutting, chipping and sidewall damage in abrasive or rocky conditions.

Unicure CL5

SIZE	32NDS
65-35R-33	120

An extra deep non-directional design for loader dozer applications. The wide tread offers excellent traction and the sidewall buttresses at the base of the lugs help protect against sidewall cutting.

Unicure CS3

SIZE	32NDS
33.25R-29	55

A high traction design for medium size scrapers. The wide tread provides extra sidewall protection and gives long hours of service.

Unicure CG2

SIZE	32NDS
1400R-24	33

An aggressive non-directional radial road grader design. Provides maximum traction in soft soil conditions. Greatly reduces flats compared to bias ply tires. For graders operating in rocky conditions on hard surfaces, our CL3 design will give longer hours of service.

Unicure CSG

SIZE	32NDS
1400R-24	30
17.5R-25	35
20.5R-25	40

A radial loader grader design best suited for northern climates where maximum traction on snow and ice is required. Greatly reduces the need for chains.

Unicure CL4

SIZE	32NDS
23.5R-25	48

A directional L-4 loader grader design. Provides long wear and high levels of traction.

Unicure CML4

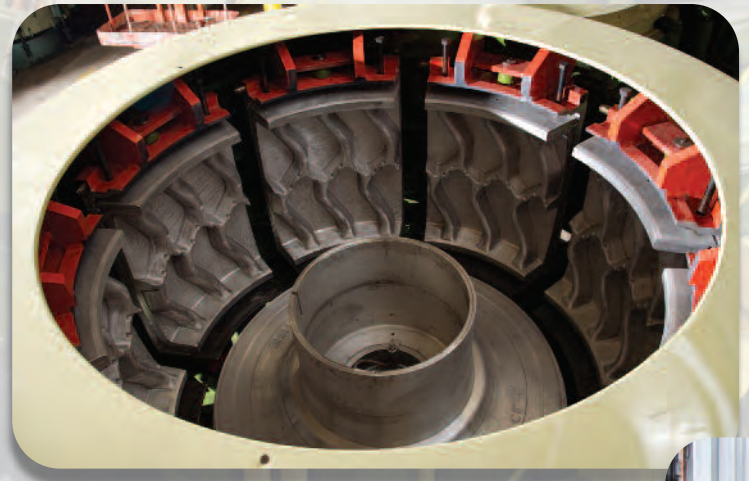
SIZE	32NDS
1200R-20	54

An ideal lower cost alternative for severe service on forklifts, mining equipment and yard trucks. Sidewall buttresses offer added protection against sidewall damage. Can be applied to commercial truck casings, Michelin and Goodyear only.

The challenge in retreading radial OTR tires has always been to make the casing last as long as the second tread life. This challenge is met with our Unicure System of radial OTR tires. From the state-of-the-art inspection, buffing, building and curing equipment, to our staff of experienced personnel, we produce a finished product that will look and perform with results that will compete with new tires. Add in a comprehensive, industry best warranty (prorated for up to four years) and there really is no other choice for your OTR retreading needs.

Should you have an interest and would like to see our process, we would welcome the chance to give you a tour of our facility.

For an online copy of this brochure, please visit UnicureOTR.com




DANGER