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Is that all there is?

Special Edition Three

real QUESTIONS real ANSWERS

BRIDGESTONE

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Is that all there is

So far, we've looked at tire manufacturing all the way through the curing process. But to paraphrase Yogi Berra, even though it ain't over until it's over, it sometimes seems like it's ***never*** *over.*

Testing, which began with the raw materials coming into the plant, continues through "final finish," and verifies the quality of the tires shipped to you.

We'll take a look at some of this "post-manufacturing testing," and see how vital it is to the process.

When does tire manufacturing quality control end?

Basically, never. Even after all the testing that goes into every step of the process, it's still important to look at the "finished goods" to make sure they meet quality standards.

What sorts of tests are done?

There are two main types, that might be called "non-destructive" and "destructive." Non-destructive testing relies on tests that when all done, leave the tire in saleable condition, while destructive testing, as the name implies, destroys the product.

A Bridgestone truck radial is x-rayed to check its internal steel cord structure.

What are some of the non-destructive tests?

Statistically random samples of each Bridgestone tire are automatically x-rayed, to make sure their inner steel cord architecture meets specifications. If a tire appears to be off-spec in any way, the tire will be x-rayed a second time, by a skilled operator, who can determine whether the tire is OK to sell.

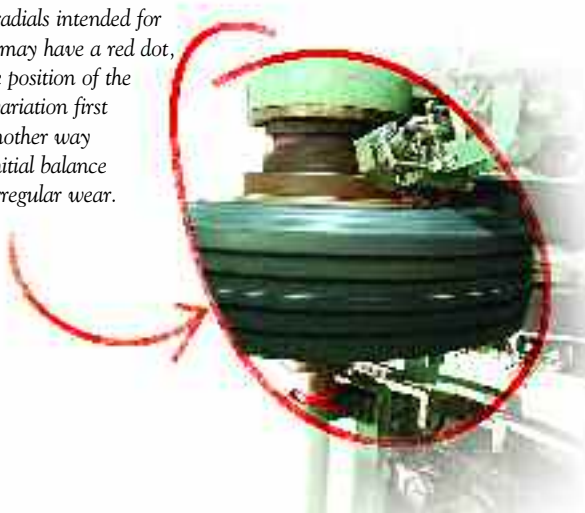
In addition, every tire is carefully weighed, and the light static balance point is marked automatically.

All Bridgestone truck radials have a yellow static balance mark to aid in initial tire balance and mounting.

What is that?

You'll see a yellow dot on the sidewall of Bridgestone tires. This indicates the light point of the tire. Typically, when mounting tires, you would match this point with the valve stem on both aluminum and steel wheels, which corresponds to the heavy point of the wheel.

Bridgestone radials intended for OE use also may have a red dot, indicating the position of the radial force variation first harmonic, another way to improve initial balance and reduce irregular wear.



We've also seen red dots.

Red dots indicate the location of the "radial force variation first harmonic," and provide an indication of the place where runout-like forces are concentrated when the tire turns.

Typically, you'll only find red dots on tires that were designated for original equipment on vehicles. Again, these marks help you mount tires for lowest vibration and best wear characteristics.

If a tire has both red dots and yellow dots, usually your best move is to match the red dots against the valve stem on aluminum wheels or the dimple (instead of the valve) on steel wheels.

Skilled inspectors check every tire, relying on their experience of how a new tire should look and feel.

Are those the only tests done?

In addition to those sorts of "objective" tests, mostly done by machines, skilled human inspectors look at every tire, inside and out, both with their eyes and with their hands, looking – and feeling – for any irregularities.

When you've looked at and handled tires every day for a while, the slightest difference from one tire to the next becomes very obvious to you. These skilled human inspectors are the last stage of inspection before tires are released to your dealer.

Some tires are cut into pieces so that their internal structure can be precisely examined.

What about the destructive testing?

A tire consists of so many components that are assembled together and then pressed and cured in a mold that it is essential to regularly cut up tires and check them.

Tires are sliced in powerful guillotine-like devices, beads are cut with bandsaws, and slices of tires are ground and polished so that they can be examined, with microscopic precision, to make sure every component is the right size, the right shape and in the right position within the tire.

A certain amount of performance testing is done as well.

Often, tires are run against rotating drums under varying loads, to see how they are likely to hold up under extreme service conditions.

How is that done?

In some cases, tires are mounted on wheels, much like the ones you use, and spun against giant drums, hour after hour, mile after mile, to determine heat-withstanding capabilities of casings and overall bead durability.

Tires are also deliberately punctured by large hydraulic rams, to determine their resistance to that kind of damage and to confirm load capacity ratings.

There's a whole host of specialized machinery, the equivalent of a torture chamber for truck tires, which is used to see what tires can withstand.

Tires are also deliberately punctured using a hydraulic ram, to determine their resistance to damage.

How often are these tests done?

Every day. It's not enough to do the tests just once and say, "Everything's OK." Things change. Raw materials and processes can change, almost imperceptibly over time, so Bridgestone engineers are constantly pulling samples of every kind of tire and testing them to make sure quality is maintained.

What happens to a tire that doesn't pass the tests?

There are different degrees of "not passing." In some cases, a tire may be functionally just fine, but may have some cosmetic issues.

In most cases, those tires can be "repaired," restoring their good looks, and since they never did have any problems that would have made them unusable, they can be sent to customers. Bridgestone does not sell "blems."

But in others, a tire may have a characteristic that renders it unsuitable for use. It may be possible to recycle its components, and when possible that's done.

Nothing leaves the plant that hasn't been rigorously inspected.

Only after a tire has passed all its tests can it be released for your use.

Do a lot of tires fail inspection?

Fewer and fewer all the time. Modern methods of statistical quality control and total quality management have greatly improved the quality and productivity of tire manufacturing.

Once, the idea behind quality control was "Don't ship junk." The final part of the process involved inspection after inspection – and rejection after rejection – to keep "junk" from getting through.

Now the idea is more "Don't make junk." That is, if everyone and every process in the plant is continually fine-tuned, the result is that the tires that show up at the end of the process are better and better. There are fewer tires to reject.

And the benefit to you is that you get a higher quality product at a better price. Once upon a time, the quality of a manufactured product was a function of the size of the scrap pile. Now, with today's truck tires and today's quality control methods, it's possible to have low manufacturing cost and high quality at the same time. TA