

Change in Tire Making Process Saves Energy

Using Nitrogen Gas for Curing Tires Is No Laughing Matter



Conversion from Hot Water to Nitrogen for Truck and Bus Tire Curing

The Bridgestone Firestone North American Tire, LLC - LaVergne Plant (BFNT-LV) located in LaVergne, Tennessee makes tires for passenger vehicles, trucks and busses. The LaVergne plant is:

- **ISO 14001 certified**, (First U.S. tire plant to achieve this certification)
- **EPA National Environmental Performance Track member**,
- **Pledge level in the Tennessee Pollution Prevention Partnership**, (a program of the Tennessee Department of Environment and Conservation)

Process Overview:

The original LaVergne tire plant was built in the early 1970's, when the tire curing process used hot water and steam to heat and expand a bladder which pressed the tires into their molds. Hot water and steam requires a large amount of heat to keep the curing process at the right temperature for vulcanizing, or curing the tires. Using hot nitrogen gas to inflate the bladder requires much less heat input.

Why We Implemented This Program:

The project was initiated to conserve energy. The engineering analysis showed that converting the curing process would provide these key environmental benefits:

- **Electricity Consumption Reduced** by eliminating hot water pumps. This will save approximately 4,960,000 kwh/yr, the equivalent usage of over 550 houses per year (based on an average usage of 9,000 kwh/yr/home).
- **Boiler Fuel Consumption Reduced** by minimizing steam load. This will save approximately 162,600 mcf/yr of natural gas.
- **NOx Emissions Reduced**: this will save approximately 4 tons per year.
- **CO2 Emissions Reduced**: this will save approximately 9,800 tons per year.

Cost of Implementation and Return on Investment:

The total capital investment cost for this project was approximately \$1,200,000 which will yield a **total annual savings of \$2,900,000**. The project was started in January 2005 with the last press converted in November 2005. This project was featured in the December 1, 2005 issue of the Tennessee Department of Environment and Conservation's P2 Alert newsletter.

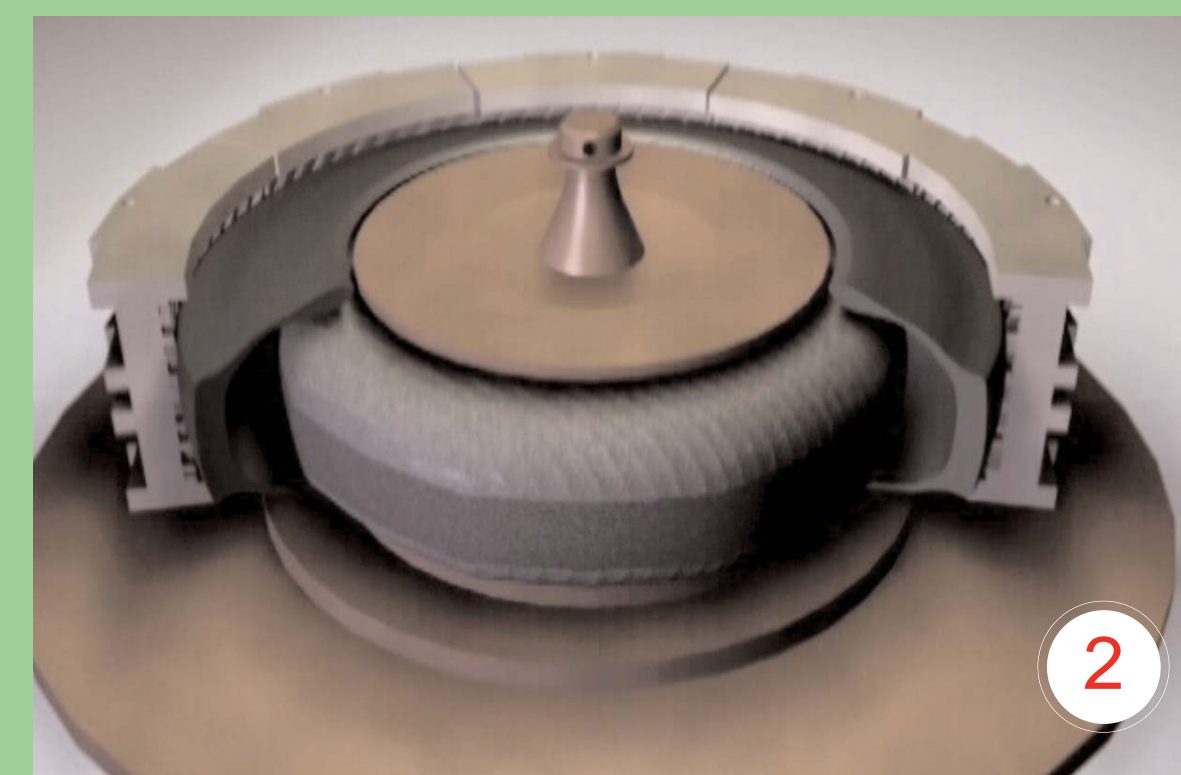
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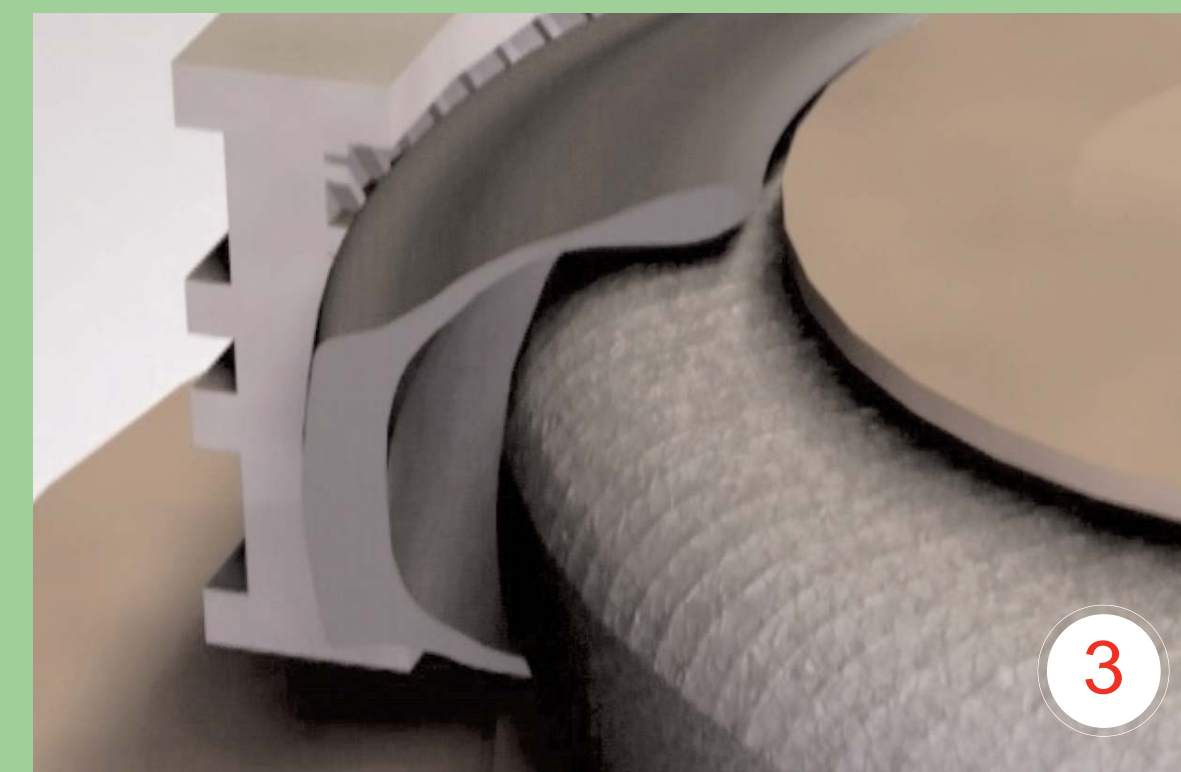
Tire Curing



1
Tires are cured by placing an uncured (green) tire into a tire mold.



2
A rubber bladder inside the mold expands, forcing the uncured tire against the mold.



3
The tread pattern and lettering on the sidewall of the tire are created.



4
The mold is heated with steam in order to provide the heat necessary to cure the tire.



5
When the press opens the cured tire is revealed.