

# Bridgestone on Nitrogen Inflation

## ***Is nitrogen inflation new?***

No, it's been used in off-highway tires, aircraft tires and racing car tires for years.

## ***Why did they switch?***

Air is about one-fifth oxygen and oxygen, especially at high temperatures and pressures is a very reactive element.

When oxygen reacts with other materials, the process is called oxidization. When oxidization is extremely rapid the process is called burning. Tires can run so hot they can actually catch on fire.

And nitrogen helps prevent slower forms of oxidization too.

## ***What are those?***

Oxygen corrodes aluminum and steel wheels. And, oxygen reacts with rubber, in a sense corroding it too.

Rust and dust from wheels can clog valve stems, causing them to leak. And rough surfaces on wheel flanges and tire beads may not seal properly, causing additional leaks.

Oxygen also ages the inner liner, that thin layer of rubber inside the tire whose function is keeping air away from the carcass. As the inner liner ages, more and more air molecules can pass through it, causing more pressure losses.

## ***How does that happen?***

Air migrates through rubber. Truck tires can lose 2 psi per month as a result of air passing through their sidewalls.

That's why regular inflation pressure checks are a must. Even if there's nothing "wrong" you can still be losing pressure.

And when oxygen passes through rubber, it can come into contact with steel cords, causing them to rust too.

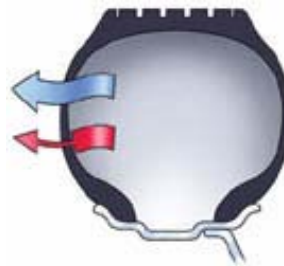
Between aging rubber and corroding steel cords, oxygen reduces retreadability.

## ***How does nitrogen help?***

Nitrogen permeates through rubber more slowly. It might take six months to lose 2 psi with nitrogen, compared to a month with air.

And nitrogen is far less reactive. It doesn't cause rust and corrosion on steel and aluminum and it doesn't degrade rubber.

Wheel surfaces stay smooth and clean, rubber remains supple and resilient. Inflation losses are minimized – and retreadability is enhanced.



Nitrogen permeates rubber more slowly.

## ***Are there other benefits to nitrogen?***

Air is full of water vapor called "humidity". And compressed air concentrates the water in it.

Draining water from your air lines helps, but unless you have an efficient air dryer, chances are there's still water in your compressed air.

## ***What's the harm in that?***

Water vapor in compressed air acts as a catalyst, accelerating rust and corrosion.

Water vapor also absorbs and holds heat. And, when it changes from liquid to vapor, water expands tremendously in volume.

So tires inflated with air tend to run hotter and fluctuate in pressure more. That's why racing tires, where fractions of a psi can radically change handling are inflated with dry nitrogen.

Reprinted from Bridgestone Real Answers, Volume 8, Issue 3.