Is Nitrogen Better in Your Tires then Natural Air???

OK, nitrogen has LARGER MOLECULES then oxygen, but is bigger always better? I have heard that filling one's tires with nitrogen; improves handling, reduces tire wear, improves the vehicles MPG and even the green colored valve caps makes you attractive to the opposite sex. How much of this is true?

In the first place natural air is 78% nitrogen, so what is the benefit of having the other 22% of nitrogen in your tires? For each month of service 1 psi of pressure may escape your tire. Since the kinetic diameter of a nitrogen atom is actually just a bit bigger than an oxygen atom, the bigger molecules are less able to permeate the tire's rubber and seep out. It is so minuscule that daily drivers would not even notice.

The biggest advantage of using nitrogen is that it is a dry gas and will not support moisture. Moisture in a tire makes it more susceptible to pressure change. The moisture causes the tire to expand when hot and contracts when cold, and changes the tire's PSI. This can cause problems for precision track and racing cars with handling tuned to very specific tire pressures. Nitrogen filled tires maintain a more consistent pressure, even as the tire heats up during laps.

To get the full benefits of nitrogen, the tire has to be filled with 93% to 95% purity. To achieve this in a tire that has already been filled with natural compressed air. The tire needs to be filled and purged at least three or four times with nitrogen to get the percentage of nitrogen high enough to get the full benefits. There is no way to get 100% percent of nitrogen in a tire because there is still a whole atmosphere of damp, oxygen tainted air pushing its way into the tires. While tires appear solid, the microscopic structure looks like strands that continuous stretch and relaxes which allows permeation or diffusion of air.

The other advantage of a dry gas (nitrogen) is that there is less moisture to corrode the wheel or tire pressure sensor, That has never been reported as a major problem before the tire wears out or the battery in the sensor goes bad. Also you must remember that atmospheric pressure is constantly pushing oxygen and moisture into the rubber from the outside of the tire.

In conclusion; nitrogen will not improve braking, ride or handling, but let say one is running a track day and the tire temperature starts out at 60°F and goes up to, say 90°F; in a few laps. In that case the water vapor pressure would more than double. The handling of the car is completely different in the way it corners. So if a ½ to 1 pound of pressure can make a ½ to 1 second faster lap times by all means fill your tires with nitrogen.
For daily drivers, I don't think anyone will notice a 1 psi less in one of their tires or have the casing fail on a tire before the tread wears out. Most drivers would benefit more from purchasing an accurate tire gauge and checking their tire pressure more often when they are cold and adjusting.

You can always put some red valve stem caps on your tires and tell everyone you are running a 78% special nitrogen mix in your tires.

KJ