



## What is Puncture Proof?

**Puncture Proof** is a *Propylene Glycol* water soluble tyre sealant which when installed in a tyre will give full protection against punctures and pressure loss for the entire legal life of a tyre and will eradicate the following:

- Tread punctures
- Bead leaks
- Rim leaks
- Porosity
- Tube tyre or wheel-related leaks

**Puncture Proof** has a revolutionary water and chemical formula that enables the product to remain fluid at all times, thus enabling the product to immediately seal a puncture wound made by a puncturing object in the main tread area of the tyre. Up to 6mm penetration in a light vehicle (up to 8 ply rating) and a penetration up to 12mm in a heavy vehicle tyre (10+ ply rating), without loss of air pressure. As a result, **Puncture Proof** gives the advantage of longer tyre life together with lower downtime and maintenance costs.

**Puncture Proof** is designed to keep the product in constant suspension. The product adheres to the tread area and as the product remains fluid at all times, **Puncture Proof** gives constant protection.

**This does 2 things:**

- (i) It seals punctures as they occur.
- (ii) It eliminates under-inflation by sealing all leaks.

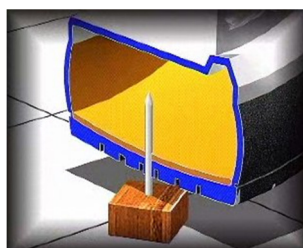
**Puncture Proof** is classified as non-toxic, non-hazardous. It does not require (EPA) – Environmental Protection Agency classification and complies with all (TSCA) – Toxic Substance Control Authority requirements.

### How Puncture Proof Works:

**(a) Puncture Proof** is injected through the tyre valve and forms a protective coat on the inside tread area of the tyre.

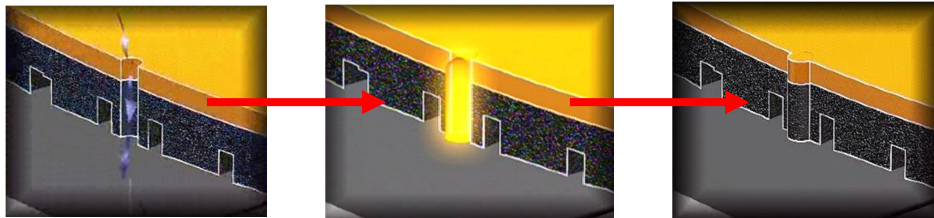


**(b) A puncturing object, (such as a nail) penetrates the tyre, which now has an even and permanent layer of Puncture Proof on its inner surface.**





(c) **Puncture Proof** is forced into the hole by internal air pressure forming a permanent rubber seal.



## About Tyre Sealants.

**Tyre sealants are manufactured to seal punctures from within.** It is installed through the valve after the removal of the valve core. The tyre does not have to be deflated to complete the operation.

**Products on the market today are as listed:**

### Rubber Based

This is a get-you-home product and comes in a pressurised aerosol can and is injected when the tyre has been punctured. It inflates the tyre at the same time. This material solidifies inside the tyre.

### Water Based

These are normally sold in plastic bottles and the contents squeezed into the tyre when the tyre has been deflated and before a puncture occurs. The sealant remains liquid but may freeze and/or separate at low temperatures.

### Glycol Based

This product will come in a 25-litre container and will require the use of a pump for installation. It is a very consistent sealant and will not freeze, separate or dry out under adverse conditions.

**Such a product is Puncture Proof, with more than 20 ingredients accommodated within the formula, making Puncture Proof the most advanced tyre sealant on the market.**

### Tyre Sealants... Good or Bad?

All tyres are porous and lose air. Porosity is one of the leading causes of under inflation. To eliminate porosity, the use of **Puncture Proof** is strongly advised. Tread separation and heat build-up caused by under inflation can occur and will in turn precipitate tyre failure and blowouts.

Tyre sealants have been around for a long time, but the industry could not produce a sealant which could withstand the pressure and stresses in tyres at speeds over 30 miles per hour.

However, in the 1990's, by applying new technology, a breakthrough came about. A tyre sealant, which could tolerate heat, cold and the centrifugal forces imposed upon it, was created – **Puncture Proof is that product!**

#### FACT:

A tyre sealant was featured on BBC TV on Tomorrows World as a potential life saving device for motorists. (May 2001)

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Environmentally Responsible Products



The unparalleled ability of **Puncture Proof** to perform well at almost any temperature and at speeds of up to 150mph is an exceptional technological advance. Its compatibility with any type of tyre construction is guaranteed. **Puncture Proof** will prevent rust and corrosion and will last for the legal life of the tyre.

### ***Puncture Proof Enhances Tyre Life***

Fleet owners have major problems with tyres and would do virtually anything to keep air in the tyres and keep vehicles moving. This is where **Puncture Proof** comes in; it is in a class of its own.

### ***Major Factors in Obtaining a Good Tyre Sealant:***

#### **Safety**

Today, a tyre sealant must be chemically benign. That is non-toxic, non-hazardous, non-flammable and biodegradable. **Puncture Proof** is all of these and totally environmentally safe.

#### **Compatibility**

**Puncture Proof** is in total harmony with all elements present in tyres. It is a requirement that a sealant be tested before use and then after 25,000 miles use. This affirms that the sealant will not cause problems later. **Puncture Proof** has been tested and meets all the specifications required. Rust inhibitors and anti-bacteriostats are present in **Puncture Proof** to ensure its compatibility with all tyre components.

#### **Dependability**

A tyre sealant manufacturer who is honest will have no hesitation in guaranteeing the integrity of his/her product by producing genuine documentation as proof that their product meets or exceeds the specifications laid down to any fleet operator for their general inspection.

## **Tyre Inflation.**

### **How Does Tyre Inflation Affect Maintenance Costs?**

If a tyre is correctly inflated it will have less rolling resistance, which will result in longer tyre life and better fuel mileage.

A good example is the wheelbarrow. If you have a barrow loaded with sand and it has an under inflated tyre, you will find it very difficult to push around.

Inflate the tyre to the correct pressure and you can push it anywhere. The same applies to a vehicle; the only difference being the engine is using more costly fuel than necessary.

Poorly inflated tyres resist rolling and cause poor fuel mileage. They also heat up quicker and run hotter, wearing out 10% to 40% faster than they should. Heat is the number one tyre killer and under-inflation also is its main cause. So you pay the penalty twice, as this chart<sup>1</sup> shows.

<b>Pounds Under-inflated</b>	<b>% Tyre Tread Loss</b>	<b>Lost Fuel Economy</b>
5lb (15%)	22%	3.1%
7lb (20%)	28%	4.4%
10lb (27%)	37%	6.25%

<sup>1</sup> Tested and road proven by Shell Research Laboratories.



If an average truck tyre is under-inflated by 5lb, this represents an;

**Increase in tyre wear – 20%**

**Increase in fuel use – 3%**

With under-inflated tyres, you not only pay more for fuel and maintenance, but you also lose your current tyre investment faster and have to pay for new tyres or re-tread sooner.

### ***Correct Inflation***

A tyre is an envelope consisting of materials forming a long chain of macromolecules. The tyre itself does not carry the load, rather it is the air within the tyre that carries the load and provides the only support between the vehicle and the road. The workings of a tyre are dependent on correct air pressure and manufacturers agree that under or over inflation will restrict tyre life considerably.

**According to Goodyear** – "Correct inflation is the most important fact in tyre life. Neglect of tyre maintenance, and especially tyre pressure maintenance, has cost fleets thousands of pounds. Under inflation should never be permitted."

**FACT:**

A tyre, under-inflated by 15% will wear 20% faster and waste 3% more fuel.  
*Shell Research Laboratories*

### ***Under Inflation***

The results of under inflation are;

- Increased rolling resistance, resulting in higher fuel consumption;
- Poor pavement grip, decreasing safety;
- Blow out risk, due to overheating;
- Reduction in resistance of punctures and cuts;
- Destruction of casing carcass, making re-treading impossible;
- Ply separation;
- Uneven tread wear.



## **Puncture Proof increases driving economy in so many ways!**

### **Eliminates under-inflation**

- extends tyre life
- improves fuel mileage efficiency and saves \$\$\$\$

### **Maintains the right air pressure**

- eliminates slow leaks
- protects against tread separation
- cuts down need to constantly check tyres

### **Reduces tyre wear**

- improves safety and economy
- improves drivability and load factors

### **Guards against punctures, flats and blowouts**

- improves fleet dependability
- reduces the need for backup vehicles and saves on manpower

### **Improves safety**

- will not mask or hide dangerous wounds
- operates over any terrain
- effective at high speeds

### **Reliable for entire tread life of tyre**

- **Puncture Proof** comes with a full factory warranty

### **Puncture Proof manufacture two grades**

- Domestic / Commercial Grade for use on high speed vehicles
- Extreme Heavy Duty Grade for use on off-the-road (OTR) equipment, combat and slow moving vehicles

### **Quick and easy to use**

- no need to completely deflate tyres to add **Puncture Proof**
- manual and automatic pumps, and valve core remover available

### **Permanently seals leaks**

- reduces downtimes and need for on-road service calls

### **Protects tyre casing and keeps it supple**

- extends life of casing and tread

*"Protecting the air we breathe..."*

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## **PUNCTURE PROOF**

- conditions casing, retarding ageing and dry rot

### **Fully compatible with tyre components**

- does not void manufacturer's tyre warranties
- does not damage tubes or tyre compounds

### **Provides all-weather protection**

- operates from  $-40^{\circ}\text{F}$  to  $300^{\circ}\text{F}$
- won't freeze or evaporate inside tyre

### **Inhibits rust and corrosion**

- protects steel belts, wheels and rims

### **OK in re-treaded tyres**

- actually increases retread-ability
- helps eliminate tread separation

## **Most Commonly Asked Questions.**

### **What is Puncture Proof?**

**Puncture Proof** is a unique blend of many chemicals in a viscous state. It coats and clings to the inner walls of the tyre and wheel. **Puncture Proof** is water-soluble and leaves no residue when rinsed out of a tyre or washed off any surface with water. It does not adhere like glue. **Puncture Proof** is non-flammable, non-volatile, non-toxic and not a hydrocarbon.

### **How does Puncture Proof work?**

**Puncture Proof** is injected through the valve and remains liquid inside the tyre for the entire life of the tyre. By coating the entire inner surface of the tyre and wheel, **Puncture Proof** conditions the casing, seals porosity, seals leaks and protects against most blowouts and air loss from punctures. The first time the vehicle is driven approximately 30 to 50 miles or more, **Puncture Proof** disperses throughout the entire air cavity. Normal flexing of the tyre and centrifugal forces enable **Puncture Proof** to seal the tyre so the correct air pressure will be maintained.

### **How much Puncture Proof do I require?**

Starting from as little as 340mls per tyre for passenger cars, to many litres for the largest trucks and off-road heavy plant or construction vehicle tyres. Our **Puncture Proof** 'Installation Manual' lists every tyre size available on the market and the required grade and quantity per tyre.

### **Is Puncture Proof cost effective?**

Yes! **Puncture Proof** will cut annual tyre repair and maintenance costs, service calls and downtime losses by an average of over 75%. Saving most fleet companies approximately 20% to 25% from their annual tyre and fuel budget. After a physical tyre puncture demonstration has been performed, **Puncture Proof** will accurately produce a detailed '**cost analysis report**' for a fleet manager utilising state of the art computerised software and highlighting the areas where **Puncture Proof** can assist in effective savings based on the fleets annual tyre expenditure.



## **PUNCTURE PROOF**

### **Is it difficult to install Puncture Proof?**

No! **Puncture Proof's** installation equipment has been designed for ease of use. From litre calibrated manual pumps to multi-litre dispensing air and electronic pumps for larger fleets along with specially designed state of the art dual application equipment make it simple to install. The average passenger car or light truck takes approximately 2 minutes per tyre to install, while a large truck averages approximately 10 to 15 minutes per tyre, including visual tyre damage inspection time.

### **Does Puncture Proof cause imbalance problems?**

No! **Puncture Proof** cannot create an imbalance situation. If the tyre and rim are properly balanced prior to installing **Puncture Proof** and neither is out of round, then there will be no change in performance. **Puncture Proof** does not balance tyres or rims. If a problem does exist then **Puncture Proof** may aggravate the situation, which alerts the driver that there is definitely a tyre, rim or suspension problem.

### **How long Puncture Proof will last once installed?**

**Puncture Proof** International Ltd warrants **Puncture Proof** for the legal tread life of the tyre. **Puncture Proof** does not cease to function or break down over time.

### **Will Puncture Proof freeze or evaporate during extreme weather?**

No! **Puncture Proof** propylene-glycol base (similar to anti-freeze) protects against heat and cold from  $-40^{\circ}\text{F}$  to over  $365^{\circ}\text{F}$ . In extreme cold weather below  $-40^{\circ}\text{F}$  **Puncture Proof** can slightly thicken, but as the tyre heats up from normal friction, **Puncture Proof** quickly returns to its normal viscosity.

### **What is the shelf life of Puncture Proof?**

**Puncture Proof** International Ltd. Certifies that when stored in factory sealed original containers, **Puncture Proof** may be stored for at least 60 months, out of direct sunlight and in a temperature range of  $-7^{\circ}\text{C}$  ( $+20^{\circ}\text{F}$ ) to  $+35^{\circ}\text{C}$  ( $95^{\circ}\text{F}$ ), a shelf life of 7 years.

### **Does Puncture Proof collect at the bottom of the tyre or ball up?**

No! **Puncture Proof's** thixotropic properties prevent this from happening. The Thixotropic-gel formulation seems to defy gravity and is capable of clinging to the entire inner surface of the tyre and rim. There are no adhesives in **Puncture Proof** and it will not cause any chemical changes to the tyre that would void the warranty. This ability to coat the inner tyre and rim is one of **Puncture Proof** International's most closely guarded secrets. The Thixotropic-gel also protects against separation and formulation breakdown. A tyre's highest and lowest operational temperatures and the centrifugal force generated in the tyre at any speed will not cause **Puncture Proof** to break down.

### **Can a tyre that has been treated with Puncture Proof be repaired?**

Yes! **Puncture Proof** is totally water soluble in its liquid state and even when **Puncture Proof** has cured, **Puncture Proof** does not contain adhesives, therefore, it is easily removed from any tyre. All major repairs can be performed without any additional preparation.

### **How big a puncture will Puncture Proof repair?**

Up to 6mm penetration is instantly sealed in light vehicles (up to 8 ply rating) and a 12mm penetration in heavy vehicles (10+ ply rating), through the tread area of the tyre.



## **PUNCTURE PROOF**

### **How does Puncture Proof repair a tyre when a puncture occurs?**

When a puncture occurs, the **Puncture Proof** coating encapsulates the puncturing object, sealing around it. When the puncturing object is ejected or removed, **Puncture Proof** is drawn into the wound by the capillary action of the escaping air. The tyre construction around the wound recovers or closes-up from the removal of the puncturing object thereby trapping the **Puncture Proof** repair clot. The repair clot cures and becomes non-water soluble to protect the inner structure from outside contaminants.

### **Will Puncture Proof hide or mask a dangerous puncture?**

No! In fact **Puncture Proof's** unique formulation is designed to purposely release air from unsafe punctures or weakened tyre casings at a controlled rate. This is a safety factor that has been designed into the formulation where a puncturing object has extensively damaged the tyre's inner-structure. The **Puncture Proof** repair is only as strong as the tyre and will not hide or mask a dangerous tyre wound.

### **Can Puncture Proof be used in tyres with tubes?**

Yes! But a good many of breakdowns are as a result of tubes being used when the tyre should have remained tubeless. We at **Puncture Proof** International advise against the use of tubes at all costs. They are unnecessary and are prone to punctures all the time. While we will install **Puncture Proof** in tube tyres, we make certain adjustments to it, to make it 'tubeless'. However, it has certain limitations and because of this, it is company policy to personally fix any flats that occur on vehicles treated with **Puncture Proof**. To do this, we will have in place, trained representatives in all areas to tend to any breakdowns.

### **Does Puncture Proof create a mess when a tyre is dismantled?**

No! **Puncture Proof** is viscous liquid and when installing the product with **Puncture Proof's** installation equipment there is no mess or waste. **Puncture Proof** does not flow like water, therefore a **Puncture Proof** treated tyre that is dismantled normally, and will not splash sealant around because there is only a small amount of reserve that has settled (approximately 20% of the installed amount). If the mechanic breaks the bead prior to releasing all of the air from the tyre, the **Puncture Proof** around the bead and rim tries to seal the escaping air, resulting in a mess usually around the mechanic's mid-section. If, after the tyre has been dismantled, it is thrown across the room, there is a good chance that the reserve will splash out. Once a mechanic understands the simple basics on handling **Puncture Proof**, there is never a problem.

### **Will Puncture Proof attack or corrode steel belts?**

No! **Puncture Proof's** advanced proprietary repair clot and curing attributes have proven that the specialised rust inhibiting system protects against rust and corrosion. This unique ability to cure within a wound also protects the steel belts from outside contaminants. These particular attributes do not exist in any other known tyre sealant.

### **Will Puncture Proof rust or corrode rims?**

NO! Puncture proof's rust and corrosion inhibit system continuously works to prevent rust or corrosion. **Puncture Proof** cannot eliminate existing rust or corrosion, but will neutralise it and prevent additional damage.

### **How effective is Puncture Proof?**



**Puncture Proof** has been successfully tested by R.A.P.R.A (Europe's leading Rubber and Plastics Research Association). **Tested to ECE regulation 30 Standard.**

Tested to speeds of up to 150 mph (240Kph) and can withstand 4 times maximum pressure loading after the puncture has been made.