



Punctureseal Tyre Sealant

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Overview

The Punctureseal product is a unique blend of chemicals which includes fibres, polymers and Thixogel™. Once installed into a tyre through the valve, Punctureseal changes any ordinary pneumatic tyre into a "Puncture-Proof" tyre capable of,

- Sealing punctures caused by objects up to 6.3mm (¼ inch) on road vehicles.
- Up to 12mm (½ inch) on heavy duty off road vehicles.
- Maintaining CORRECT air pressure.
- Sealing all porosity leaks.
- Sealing minor rim leaks.

Punctureseal Usage

Punctureseal is the only true **"Seal Punctures – Extend Tyre Life"** product available on the market today.

- **"Seal Punctures"**, is vitally important to vehicle operators who rely on the integrity of their tyres to contain their costs with little or no downtime due to tyre related problems.
- **"Extended Tyre Life"**, saves hundreds of thousands of world-wide customers, millions of pounds a year in increased tyre life (up to 40%), and reduced fuel costs (up to 9%).



The Punctureseal product is sold world-wide in over 140 countries, has some 45 years of research and development behind it, and is manufactured in America. Punctureseal has earned the reputation as the obvious answer to vehicle operators' greatest inconvenience – the puncture. We offer the highest level of quality, ease of installation and an economic proven solution to this everyday occurrence.

Current users include city councils, police forces, armed forces, large and small transport operators, waste management companies, taxi and private hire firms, agricultural vehicle owners, farmers, van-based businesses, plant hire operators, motorcyclists, and many thousands of the motoring public.

Punctureseal Product line

Commercial Grade



Designed for use in domestic and commercial vehicles (bicycles, motorbikes, cars, SUV's and vans) operating at highway speeds.

Provides enhanced puncture protection over the Road product. Seals punctures up to 6 mm ($\frac{1}{4}$ "). Also a popular choice for dirt bikes and recreational vehicles of all types. Not recommended for heavy duty off-road (OTR) vehicles, lorries or heavy plant equipment.

Extreme Heavy Duty Grade



For use in road vehicles with 4 or more wheels, off road vehicles of any type, and heavy slow-moving vehicles and equipment operating off the road. Extreme Heavy Duty Grade provides maximum tyre protection and air retention, sealing punctures up to 12mm ($\frac{1}{2}$ ").

Punctureseal Facts and Attributes

- **Extends Tyre Life**

Punctureseal has been tested and proven to maintain air pressure, retard aging within the casing, reduce heat build-up and increase tyre life on an average of 25% and higher in many cases.

- **Protects Against Under Inflation**

Punctureseal has the ability to eliminate porosity, air migration and seepage, thereby allowing the tyre to maintain optimum air pressure, preventing tread separation & zipper ruptures.



- **Increases Re-Treadability**

Punctureseal has the ability to protect against the inception of tread and ply separations caused by air migration between the plies of new and retread tyres, thereby resulting in additional retread cycles and extended casing life.

- **Retards Dry-Rot & Casing Degradation**

Punctureseal has the ability to retard dry rot and aging from within the tyre, which increases the life of any tubeless tyre casing.

- **Heat Reduction (Number 1 killer of Tyres)**

Punctureseal assists in protecting tyres from devastating heat build-up which is associated with friction caused by under inflation and/or overloading. Punctureseal contains specific ingredients that aid in the conduction of heat away from the tread area, by transmitting additional heat to the rim (which is the tyre's natural heat sink), resulting in a cooler running tyre for any type of equipment or vehicle, regardless of mission profile.

- **Safety Factor**

Punctureseal provides safety factors that are not found in any tyre. Punctureseal will not mask or hide damage that has breached the integrity of the tyre. Punctureseal is specially formulated to allow any serious puncture (potentially dangerous) to slowly bleed air and Punctureseal out of the wound, thereby allowing the tyre to deflate in a controlled manner. This attribute provides safety and aids in alleviating the hazards associated with blowouts.

- **Lasts The Life Of The Tyre**

Punctureseal contains a number of additives that protect the rubber from deterioration and can easily outlast the tyre's service life. Punctureseal's performance is not diminished by speed, distance or time.

- **Protects The Entire Inner Surface Of The Tyre**

Punctureseal's Thixogel™ provides a 2-3mm thick jelly coating that clings to the entire tread area surface of the tyre. The sidewalls and rim areas are protected by the saturated air solution within the inner air-cavity, thereby providing protection for the tyre at all times.

- **Positive Sealing Capabilities**

Punctureseal repairs are positive and secure, thereby transforming any tyre into a self-sealing tyre. Punctureseal Commercial Grade is capable of sealing tread area punctures caused by puncturing objects up to

- Up to 6.3mm in diameter with the Commercial Grade
- Up to 12mm with the Extreme Heavy Duty Grade

as long as the puncturing object has not severely damaged and/or weakened the tyre's structural integrity (and). Punctureseal can not create a secure repair in any tyre that has major internal damage, regardless of the puncturing object's diameter.

- **Water-Soluble (for easy clean up)**

Punctureseal is completely water-soluble in its liquid state, and leaves no residue when rinsed with plain water. Yet it will not dissolve within a wound after it has cured. Standard repairing procedures can be utilized without additional effort.

- **Protection Against Rust & Corrosion**

Punctureseal contains a complete rust and corrosion inhibiting system that not only protects steel and alloy wheels, but in a wound, Punctureseal's proprietary process will also protect the tyre's steel belts. Outside contaminants are prevented from leaching back into the wound which would cause the steel belts to rust and the plies to separate. Without Punctureseal's protection, the contaminants would quickly destroy valuable casings.



- **Cannot Create A Balance Problem**

Punctureseal can not create an imbalance due to its fluidity and ability to evenly coat the entire inner surface of the tread area of the tyre caused by the centrifugal force generated by the revolving wheel. If, however the vehicle's suspension is worn beyond normal tolerances or a tyre/rim assembly is not balanced and/or trued correctly, the abnormal centrifugal force generated may have enough gravitational force to cause some Punctureseal to collect in the apogee or "high spot" area thereby increasing the "existing" imbalance problem. If the problem becomes severe the driver may feel a vibration from the front axel or rear axel or both. **The vibration indicates that a problem pre-existed in the tyre assembly or suspension prior to installing Punctureseal and to avoid this it is recommended that the balance and trueness of a tyre assembly and/or the worthiness of the front suspension be verified, prior to the installation of Punctureseal.**

- **Eliminates Most Flats & Blowouts**

The majority of flats and blowouts are a result of driver negligence with the number one cause being excessive heat generated from under-inflation. The overheated, under inflated tyre becomes soft and can be penetrated very easily, however, under inflation creates additional problems such as tread separations, ply separations and zipper ruptures. All of the above is primarily caused by porosity (natural air migration) which exists in all tyres to some degree. Punctureseal eliminates air migration and prevents the majority of damage created by under inflation, thereby preventing most related blowouts.

Punctureseal Return on Investment

Punctures, caused by debris left on (and off) our roads, are an irritating and expensive – yet mostly avoidable – fact of life for every person or company, who owns or operates a car, truck, motorcycle, caravan, horsebox, trailer, bicycle, van, wheelchair, tractor, plant, in fact any vehicle with pneumatic tyres. As long as this debris exists, and tyres remain under-inflated due to poor maintenance and the natural porosity caused by their manufacturing process, this will continue to happen.

Dangerous blow-outs can occur, when tyres are run too hot, caused by incorrect pressures and the impact damage caused by road debris. This can result in a worst case scenario having a catastrophic effect on peoples' lives, can seriously reduce a company's profitability, and at best can disrupt personal freedom.

***The average vehicle with a puncture takes 3 hours to replace the tyre.
How much will this impact your supply chain, your logistics, your operations?***

Incorrect tyre maintenance can also be a major contributor to higher fuel costs and can increase your fuel consumption by up to 6.25%.

SHELL RESEARCH LABORATORIES

Under Inflation %	Reduced Tyre Life %	Lower Fuel Usage %
10%	5%	2.00%
15%	20%	3.00%
20%	28%	4.50%
30%	37%	6.25%

Under inflation may not only be reducing your profit margin by increasing tyre wear therefore increasing tyre purchase costs, it will be lowering your profit margin by reducing fuel economy and increasing tyre maintenance costs.

Add to this calculation the **cost of the time** your people spend checking tyre pressures. You have a duty of care to ensure this work is done.

Duty of Care to your employees

Do you have a legal duty of care towards your employees?

Your average life expectancy if you are parked on the hard shoulder of a UK motorway is 28 minutes. This is a UK Government statistic.

Punctureseal will reduce your fuel costs, extend the life of your tyres, and give you a return on investment in under five months.

But if Punctureseal prevents a puncture on one of your vehicles travelling on a motorway, it could save more than money; it could save a life.

And in this world of litigation, can your organisation afford the cost of a lawsuit claiming lack of duty of care for not installing tyre sealant in your vehicle fleet?

Military applications

In the endeavour to achieve recognition for the Punctureseal product and in conjunction with numerous ballistics experts, it achieved the seemingly impossible and made an ordinary pneumatic tyre bullet resistant. The result of the testing programme was an amazing achievement which conforms to the requirements of the BS5051 'Ballistic' Standard - **a world first for a tyre safety product!**



This exacting Standard maintained that the Punctureseal Military product had to be effective in the control of air pressure loss from a tyre, whilst allowing the vehicle to be driveable for a sufficient distance to remove the vehicle from the immediate threat.

The threat in question was being shot at from a distance of 10-metres with 7.62 and 5.56 NATO rounds, a 9mm round, and finally a 12g (1oz) solid 15mm diameter shotgun slug, all of which the Punctureseal product coped admirably with - much to the amazement of those in attendance, **most of the damage inflicted by the ammunition was sealed with very little air loss at all!**

In addition to the powerful version developed for use by the military and other heavy duty off-road users, such as the Construction and Haulage industry, Punctureseal is also available in other grades for Domestic and Fleet vehicles, including cars, 4 x 4's, motorcycles, caravans and trailers, providing the safe alternative to dangerous blow outs, improved tyre wear and saving money by enhancing the tyre's all round performance.

Punctureseal Military Grade is a restricted item and is not available to the general public in the U.K., however certain categories of business customers may qualify for military grade but would need to write us a "**letter of requirement**" and sign an undertaking not to use the product in any vehicle that travels along a public highway. (This absolves Punctureseal and its agents from legal responsibility for any clients' misuse of the product. Military Grade is only available by special pre-paid order and is subject to a minimum quantity of 12 drums.)

The reason for this is the MOT Inspectorate that allows by law "**a maximum tyre repair of 12.5mm in the tread area of the tyre**". Punctureseal military grade may provide a repair in excess of this figure or in some cases the sidewall, without the driver even knowing of the damage done. The continued use of that tyre in the UK could then be considered illegal.

Military grade product is in regular general use on public highways all over the world where there are no legal restrictions upon its use - only the purchase costs determine its widespread use.

Testing



We recognise that any product manufacturer will make claims for the benefits of the product offered.

Punctureseal has taken a different approach. We commissioned an independent test report undertaken by Millbrook Proving Ground. www.millbrook.co.uk

Our product was tested in a controlled environment, and the test report is available for download at <http://bit.ly/s202IV>.



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