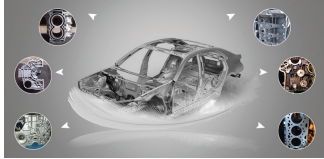


# THE IMPREGNATOR

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## Teknoseal TSP 99: One Sealant, Many Solutions!

Porosity is a universal problem in the manufacturing of castings, powdered metal components, and plastic components, etc designed to hold the pressure of liquids and gases. The finest of leaks can render components to be ineffective. Special Impregnation sealant TSP 99 is the solution to seal the micro-porosity leakages in such components.



Metal castings are a must to meet the requirements of manufacturing in several applications ranging from fine machines to heavy ones. With the growing trend of lightweighting technology, the incidence of porosity has also risen. As porosity wreaks havoc on the supply chain with reduced efficiency and increased downtime,

impregnation techniques with sealants have been widely accepted by manufacturers and foundries and recommended by design engineers globally.

Exhaustive trials in various demanding applications prove the effectiveness of impregnation in metal castings,

### Did You Know?

#### WHO COINED "JAI HIND"?

The slogan 'Jai Hind' was coined by Abid Hasan Safrani (born as, Zain-al-Abdin Hasan), a close associate of Netaji Subhash Chandra Bose.

Netaji allocated Abid the task of devising a method to greet soldiers. Initially, Abid thought about a simple 'Hello'. Netaji was dissatisfied. At the second instance, Abid came up with 'Jai Hindustan Ki'.

Further, he shortened it to 'Jai Hind'. Netaji appreciated this outcome. He greeted revolutionaries and INA members using this slogan.

In course of time, it was adopted as the official slogan of India.

Abid was an engineering student in Germany.



A batch of components being impregnated on a fully automatic IMPREGSEAL machine

plastic connectors, sintered parts, and other porous materials such as wood. Impregnation is suitable for use in both large batches and lean manufacturing applications, producing consistent quality performance, irrespective of the size or nature of the components being treated.

Teknoseal is a leader in offering its wide range of sealants for impregnation processes in various industries. The TSP 99 range is an innovative solution by Teknoseal, which is a one-stop solution for impregnation in many industries.

TSP 99 is a thermal, heat cure methacrylate impregnation sealant. It has excellent washability and requires no afterwork, even with complicated castings of intricate designs. It has very high-temperature stability with a working temperature range of -50 to +220 degree Celsius.

Castings that are impregnated with TSP 99 possess high-pressure resistance, which is equal to the strength of the parent metal. It has very good chemical resistance to petrol, motor oils, hydraulic fluids,

antifreeze, gases, and diluted acids and conforms to globally-accepted industrial norms and specifications.

#### Special impregnation sealants from the TSP 99 range:

- Are approved by major automobile manufacturers.
- Are chemically and physically durable.
- Have the perfect viscosity for effective porosity penetration for excellent sealing and optimized consumption patterns.
- Are resistant to high temperature, chemicals, and pressure.
- Are environment-friendly.
- Are suitable for a wide range of industries ranging from Automotive and Aerospace to High-critical apps in the Oil and Gas and also Food and Drinking Water grade.

The Teknoseal impregnation sealant is the best-selling product, which complements the Vacuum Impregnation technology. The sealant is a cross-linking mixture of mono and polyfunctional acrylates and methacrylates.

The sealant contains no halogens, solvents, or PCBs.

Teknoseal sealants are used by industries worldwide for impregnation of parts such as aerospace components, engine and transmission parts, air compressors, automotive cylinder heads and blocks, electrical/ electronic connectors, food processing equipment, filtration equipment, fuel supply systems, hydraulic pumps/ valves, process control equipment, transmission housings, wheels, power brakes, thin-walled die castings, powder metallurgy products, oil and gas industry, plastic molded components, instrumentation meters and valves, sanitary fittings, truck and railway brake parts, castings for hydraulic control, heat exchangers, ceramic parts, builder's hardware, and aircon compressor castings. ●

## IMPREGNATION TIPS

**Q.** Can we effectively seal inert gas leakages with TSP 99?

Yes. TSP 99 is being used to seal extremely fine porosities with leak rates up to  $7^{-10}$  cc/min. of inert gases like Helium, SF-6, or Nitrogen.



- Dr. Resin



# The race for light-weighting in automotive technology



Why are automakers in a frenzy to create lighter vehicles? Essentially, lightweight enhances value to the customers through fuel economy, increased safety, and improved handling. The momentum in meeting this goal is aided further by the laws that attempt to protect environment from harmful emissions (GHG or Green House Gas effect).

S Subramaniam

Battery-powered electric vehicles would be the next-gen revolution, which would bring in an avalanche of innovative products and processes, threatening present day automakers and their ancillaries who are glued to conventional technologies (Internal Combustion Engine).

Reducing a car's weight by 10 percent would boost its fuel economy by about 8 percent. Steel has always been the preferred material of construction, but substitutes are emerging in the race for lightweight. For more than two decades, Aluminum has dominated this transformation bringing in innovations in processing of Aluminum alloys. Die castings and hot/cold formed products made in Aluminum alloys are undergoing continuous upgrade in design and manufacture. Magnesium, the lighter substitute to Aluminum, is catching up finding ways to combat hazards in processing and costs involved. Materials and process innovations in steels

too have seen quantum leap in this transformation. Thinner and stronger sheets combined with uniquely-designed body structures have been ably supported by the evolution in micro-alloyed high-strength steels.

Critical loading points in a car are still made of high-strength steels or Titanium. The progress in substitution of metal by plastics and carbon/glass fiber composites has advanced quite rapidly. Product innovations have reduced metal content with help from improved bonding techniques and research in resins and adhesives manufacturing.

While in pursuit of lighter weight, the bumps that confront the Die Casting industry are many. Aluminum and Magnesium alloys have limited reach in matching special steels. Cast Aluminum components need to be manufactured thin and light and competitively stronger through creative design architecture. Capable machines and die designs that

meet these requirements have to evolve continually when newer product designs are aggressively gravitating to other materials and manufacturing methods. With the advent of battery-powered electric vehicles, the Die Casting industry should look for fresh opportunities to stay and excel in a competitive environment.

In the light weighting process and with the advent of thin walled, light weight castings in Aluminum and Magnesium, especially tested with inert gases like Helium, Nitrogen or SF6, Vacuum Impregnation of castings is an accepted process. Especially for components such as computer hard disc castings (to avoid corruption of data), oil and gas regulator bodies (for safety), Automotive brake components (for safety), Automotive aircon compressor castings (to prevent leakage of refrigerant gas), etc, it is rather a production tool and a Quality Assurance process specified by design engineers and accepted by foundrymen worldwide for safety as well as Quality Assurance. ●

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## Moresco VP shows profound appreciation on his Vacseal visit



In August 2017, Mr. Takashi Takeuchi, Vice President—Moresco Corporation, Japan visited Vacseal, Pune along with his team. Vacseal is a part of the Sen group of companies.

He praised Vacseal for its expertise, product supply, the range of products, and marketing of its die lubricants

and expressed interest in expanding Moresco's business in India.

The Vacseal team assured Mr. Takeuchi to promote the Moresco brand to the best of their abilities.

For more information, visit [www.vacseal.co](http://www.vacseal.co)

*Mr. Takashi Takeuchi, Moresco V.P addressing a meeting*

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**MORESCO**

## IMPREGSEAL inaugurates the Customer Excellence Program



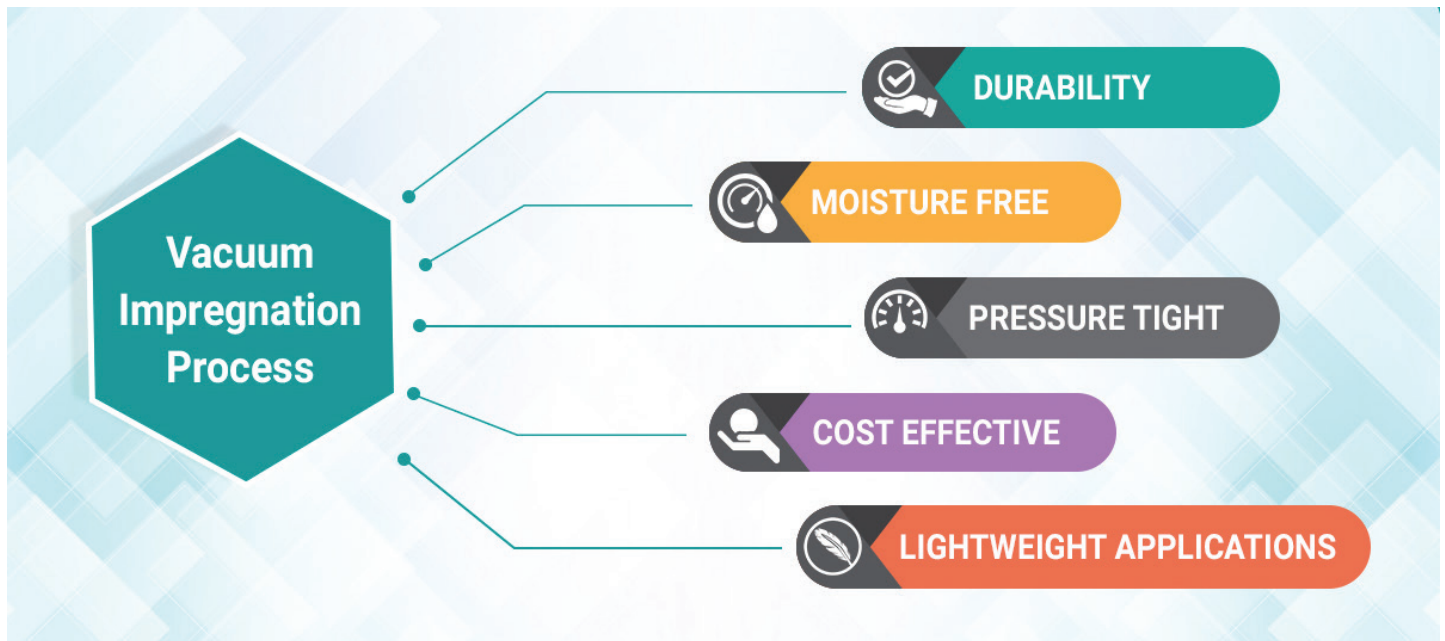
IMPREGSEAL, the vacuum impregnation company, inaugurated its Customer Excellence Program on January 2, 2018. This program will help customers to achieve excellence in impregnation technology. This customer-centric training will enhance the process quality of vacuum impregnation in

manufacturing. This program has been designed based upon the rich experience of three decades possessed by IMPREGSEAL. It has been formulated with complete focus on the customers' requirements of knowledge of the impregnation process technology.

For more information, visit [www.impregseal.com](http://www.impregseal.com)

*The inauguration ceremony of the Customer Excellence Program*

# Why impregseal it with TSP 99?



Be it metal castings, wood structure, or plastic moldings—porosity becomes a big problem in everything! Right from small components to heavy metal castings, porosity leaves the product prone to leakage and affecting the purpose of the product. The only solution of eliminating porosities is impregnation with the TSP 99 sealant, to enhance the quality and reliability of the products.

As early as in the 1940s, porosity was sealed with sodium silicate and styrene-based resins, and it was mainly used to mend metal castings that were found to have leakage in leak-test operations. Shortly after the commencement, the method was used for preventing corrosion in metal castings, powdered-metal parts, and other material components.

Now, the processes to prevent corrosion in various material components such as plastic composites and wood too were devised.

From the raw material to the finished component, the product goes through a value-addition of almost 300 percent, which is nullified if the porosity exists. Impregnating the product with TSP 99 helps in retaining this value-addition. It is the right solution for sealing macro and microporosities in the components.

With the increase in the usage of plastic in manufacturing industries, porosity elimination from components that used plastic and metal together (like connectors that have a plastic-metal interface) becomes an important process.

Impregnation of plastics using TSP 99 completely fills microfine gaps making them moisture and leak-proof. The sealant is a polymer that is flexible and durable; it would not crack due to thermal expansion; has the power to endure solvents such as glycol, oils, and caustics; and works well at operating temperatures up to 220 degrees Celsius.

Similarly, wood is also a porous material having naturally a lot of crevices. Unlike plastic components and metal castings, wood is prone to rot and decay as germs and bacteria appear inside these crevices. Thus,

exposure to water or humidity for an extended amount of time becomes a challenge to keep the wood safe. TSP 99 proves to be an effective solution to all such industries where the application of wood is inevitable such as ship building, marine applications, décor for domestic and commercial, palletization, and many more. It has also been observed that impregnation helps to improve machinability of wood.

TSP 99 is an effective sealant as the impregnation material is not harmful; it gives the required environmental resistance while preventing the probable hazards.

Teknoseal's TSP 99 meets the standards for producing porosity-free components. It is a low-viscosity sealant that penetrates deep and then completely polymerizes within the porosities with excellent adhesion properties.

IMPREGSEAL's impregnation services with TSP 99 are stable and do not introduce any health hazards and are environment-friendly. As a result, vacuum impregnation is preferred as a permanent solution to seal porosities. ●



# How to ensure reliable Impregnation?



*A fully automatic IMPREGSEAL line*

**Before impregnation, the component and the porosities must be clean and dry. We must wash and dry the component after machining.**

At this stage, the porosities might have cutting oil, water, or other contamination.

To overcome this, we must dehydrate/heat the component in a suitable oven at minimum 150 degrees Celsius. The thumb rule is to heat for 30 minutes for a cross-section of one millimeter. For extremely thin components, a lesser time is recommended.

Another alternative to ensure cleanliness of the component surfaces is a vapor degrease, which for minimum 30 minutes in perchlorethylene is effective. However, taking into account environmental hazards, it is not recommended.

In case of specific alloys that may get distorted due to heat, the remedy is to wash them clean in a hot industrial wash, rinse, and vacuum dry them while they are still hot. This method has high efficacy to effectively cleanse porosities despite the existence of high

volatile oil contamination. Now, both the components and the porosities are conducive for the sealant to penetrate into the porosities.

In some cases, where the porosities are not cleaned completely (partially filled with contaminants), the sealing is not complete

Now, the sealant near the component surface results in a good sealing performance. However, in the interiors, the blend with the contamination results in polymerization of the sealant resulting in field failure at the later date, even though the component had passed the initial pressure test.

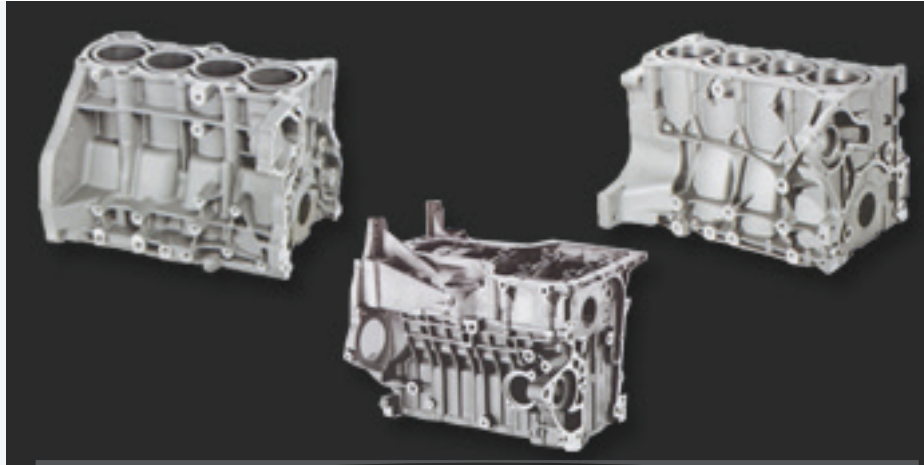
A polymer of a contaminant sealant is proportionally weaker than a polymer of a pure sealant.

It so happens that the components pass the initial pressure test, but might fail while in operation. Consequently, the customers opine that the sealant

has failed. The crux is that the sealant is not to blame but the pre-treatment of the components is. For further information, visit [www.impregseal.com](http://www.impregseal.com)



# Impregnation of Aluminum and Magnesium cylinder blocks



Modern day engines have to cater to demands of high-performance characteristics, both in technology and cost. Light-weighting has made it mandatory to use thin walled castings with metals like Aluminum and Magnesium for engine components, but these metals are highly prone to micro-porosities formed in the resulting castings.

*Engine cylinder blocks manufactured using Aluminum & Magnesium*

Impregnation using Teknoseal TSP99 is now a process, well accepted by foundrymen and specified by design engineers all over the world. Porosity is an unavoidable phenomenon, which seriously affects the metal automotive castings, causing them to leak. Hence the metal castings are impregnated with porosity sealants to enhance their quality and reliability.

Starting from molten metal to the finished and fully machined castings, the automotive component goes through a value- addition of over 200% to 300%. Impregnation helps in overcoming this value lost when the casting is rejected due to leakage.

During impregnation, the special impregnation sealant penetrates deep into the microporosities and effectively seals the leakage paths without changing the appearance or machined dimensions of automotive castings ensuring a robust seal.

The increasing trend of using the metals like Aluminum and Magnesium has led to the necessity of impregnating the automotive castings to improve the fuel efficiency and to meet the air quality norms of the cars. Castings typically impregnated by the sealants are a whole range of engine

components like engine cylinder blocks, cylinder heads, air intake manifolds, powertrain components, fuel supply system components, etc. Automotive OEMs worldwide have made impregnation a mandatory process to ensure that the engine is reliable for over 100,000 kilometers or more of running and to ensure no field failures.

With the special sealant TSP99, Teknoseal provides the complete turnkey solutions for microporosities in castings. It has been tested to the supreme quality standards for performance to meet global automotive norms as demanded by US MIL I17563 standards. It has also been tested to perform against the media like oil, hydrocarbon fluid, aviation gas, acids and alkalis and also examined for thermal stability.

Teknoseal's TSP 99 meets the mark of quality and suits the best for the purpose. The reliability offered makes TSP 99 the clear choice for performing the impregnation on automobile castings to improve efficiency, eliminating the rejection, rate of leakages and optimizing the cost of the castings. In order to avoid failures Teknoseal's special impregnation sealant, TSP 99 makes

the automotive castings durable, effective and consistent in their performance. ●

## IMPREGNATION TIPS

**Q.** What are the benefits of impregnation of powder metallurgy components?

The highly porous powder metallurgy components become pressure-tight, have enhanced machinability, and are resistant to internal corrosion.



- Dr. Impregnator

World's leading automobile manufacturers  
are trusting Teknoseal for sealing leakages.

**Do You?**



**Seal it with TSP 99**

World's Trusted Impregnation Sealant