

Concept to finish

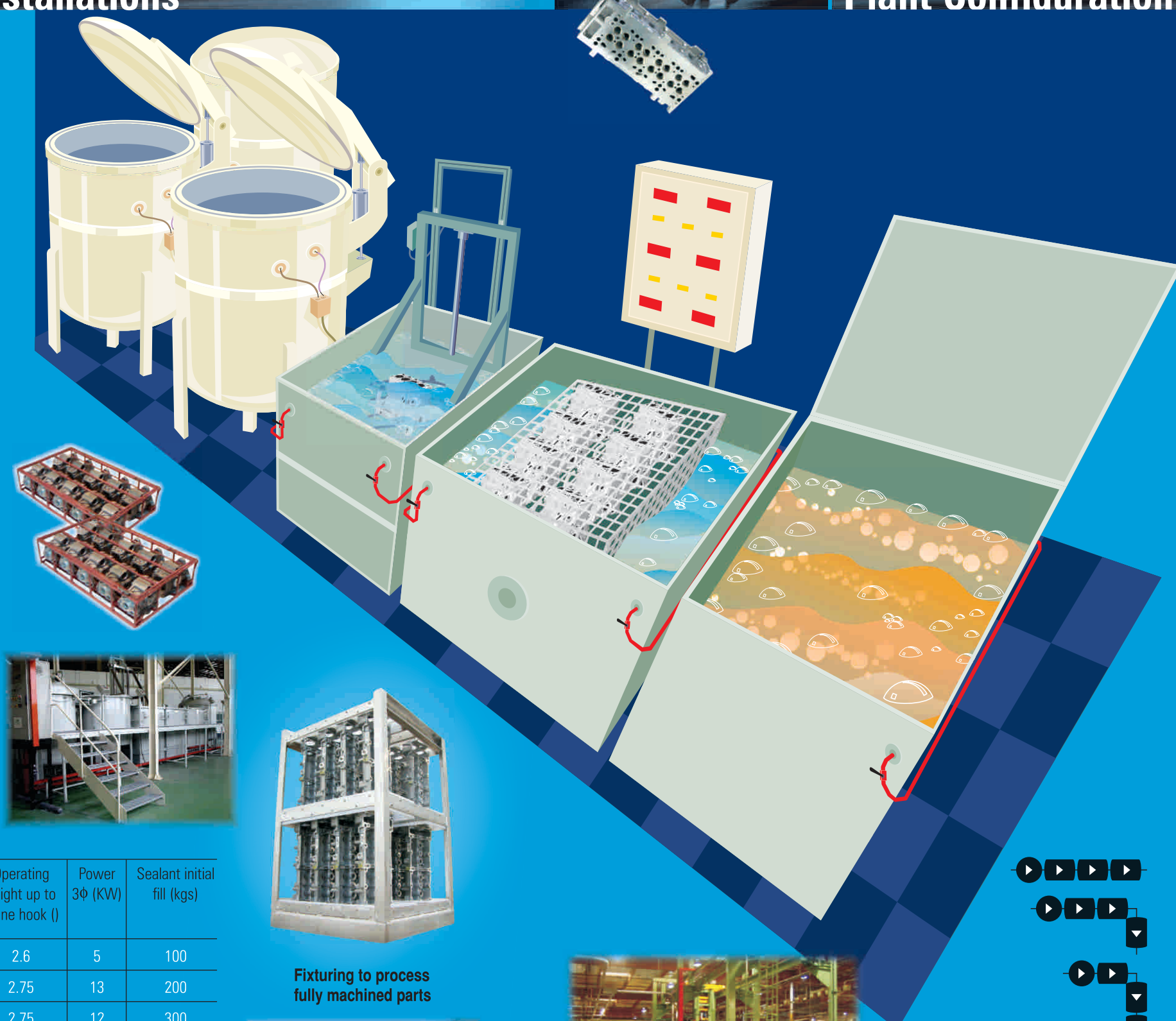
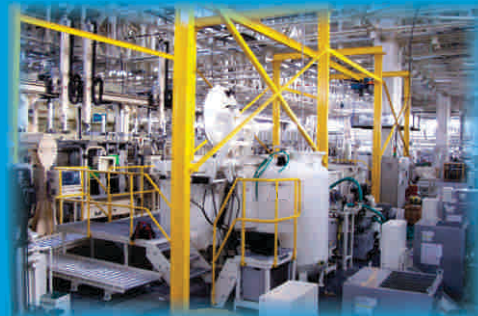
We provide turnkey solutions to our clients' specific requirements for impregnation. From conceiving the project, to manufacturing the solution, to implementing it at our clients' end - ImpregSeal is present at each stage.

At our job shops you can leverage our experience that spans over 20 years to ensure optimally efficient impregnation of your components. However, if you acquire your own impregnation unit you will save on time, money and complicated logistics, when

your scale of operations is very large. To this end we offer clients the option to choose from either a semi-automatic or a fully automatic impregnating line.

In our factory situated in Pune, India, we build complete Metal Impregnation Units. In addition to standard designs we manufacture units that are customized to meet specific clients' requirements. We also learn from the experience of our job shop activities to up grade our assembled impregnation lines. Modifications in our products are only made after they have been tested and their efficiency

proven on the shop floor. Sometimes clients need additional equipment for conversion of existing installations. We also supply the technology and the equipment needed for such conversions.



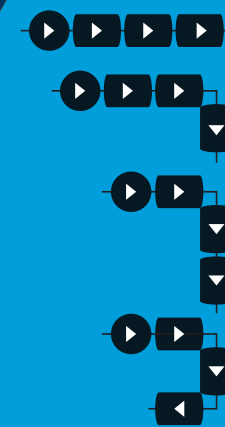
Semi automatic impregnation plants:

For sturdy components, and in industry verticals where complete automation is not the need of the hour, we have a semi automatic impregnating line. It provides a perfect balance of operator intervention and process automation to ensure that clients receive cost-efficient, time-efficient and well-impregnated components.



Operator-free, flexible, fully automatic impregnating plants

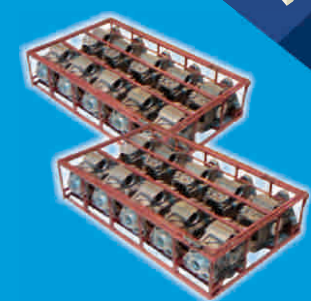
For impregnation of intricately machined and fully finished components for an inline mass production facility we recommend our revolutionary fully programmable robotic impregnation system. This system, with international standards for quality, safety and reliability, ensures a completely operator independent impregnation cycle and automated process control with complete peace of mind for the user. Also with the provision of optional X, Y, Z, W axis movements for each component this system provides for complete flexibility on process specifications.



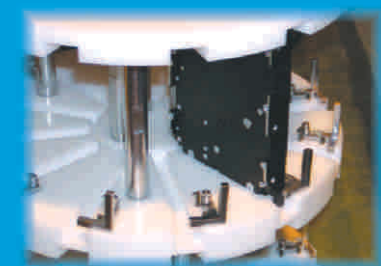
Typical plant layouts for batch type operations

SPECIFICATION SHEET

Model	Dimensions of charge Basket (mm)	Maximum Charge Weight (kgs) Ferrous	Floor space L x W (m)	Operating height up to crane hook (l)	Power 3Φ (KW)	Sealant initial fill (kgs)
MI 450	φ325 x 400 ht.	300	5.5 x 2.50	2.6	5	100
MI 600	φ520 x 550 ht.	400	6.60 x 3.00	2.75	13	200
MI 750	φ700 x 700 ht.	500	8.1 x 3.25	2.75	12	300
MI 950	φ850 x 700 ht.	600	9.25 x 3.75	3.25	22	600
MI 1100	φ1000 x 900 ht.	1000	10.0 x 4.1	4.0	28	1000
MI 1200	φ1100 x 1100 ht.	1100	10.5 x 5.10	3.60	32	1200
MI 1500	φ1300 x 1300 ht.	1600	11.8 x 5.65	4.60	50	2000
MI 1600	φ1450 x 1450 ht.	1700	12.5 x 6.00	5.0	50	2400



Fixturing to process fully machined parts

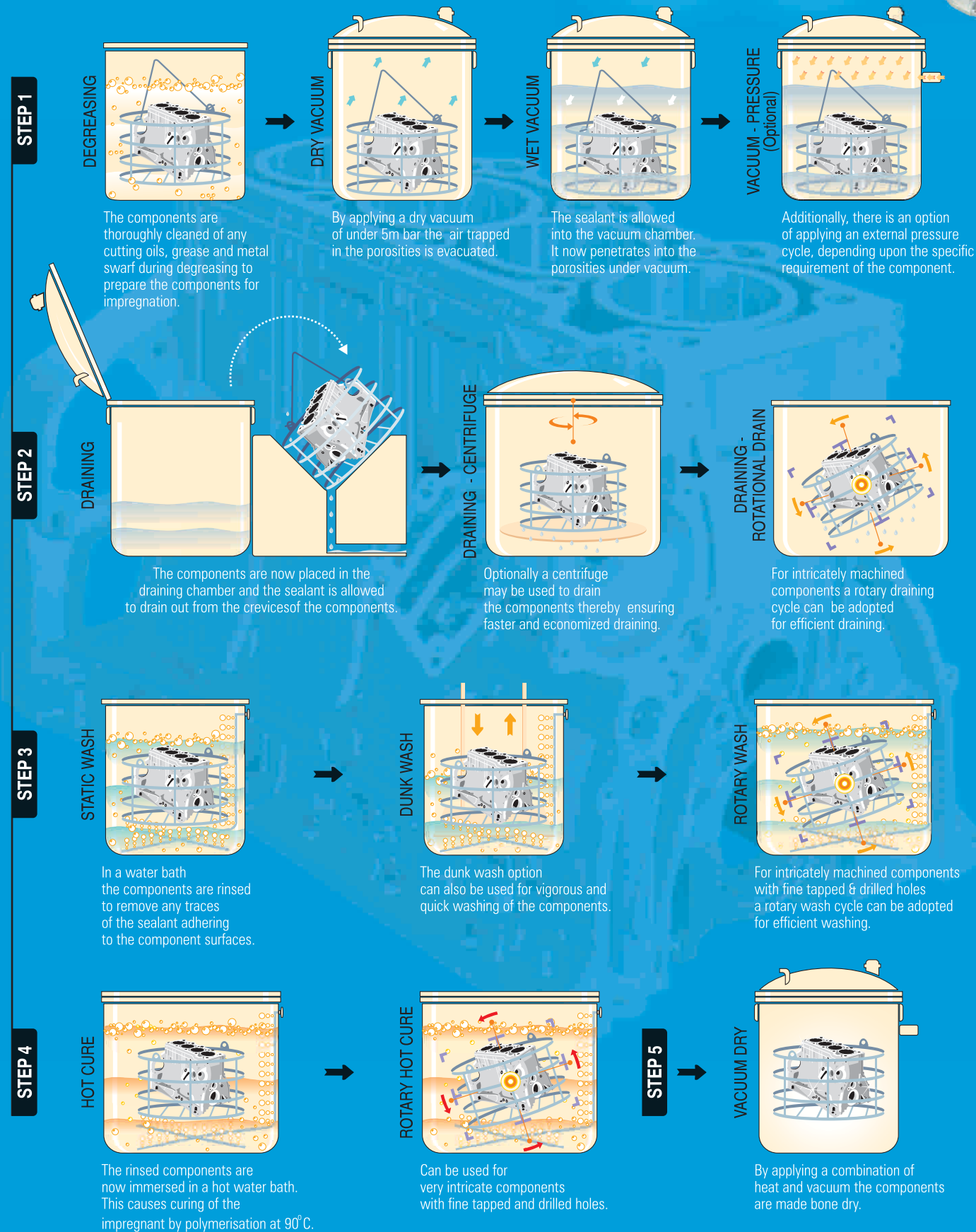


Process Options

ImpregSeal

Applications

ImpregSeal



SAFEGUARD YOUR ASSETS

Even minor leakage of gases, air or liquid can cause entire batches of production to be rejected. Impregnation as a de rigueur procedure, therefore, has received easy and complete acceptance among the people who are primarily responsible for the quality of products. Industries all over the world

have experienced huge machining losses because leakages have been discovered after a casting has been machined. In such cases there is no choice but to scrap the casting. And if a casting is scrapped after it has undergone an expensive machine process, there is no way in which that cost

can be recovered. The solution - mandatory, pre-emptive impregnation of all castings so that QCD considerations may be well taken care of. It is, in contemporary business, the smartest way of ensuring a healthy, consistent bottom line for all users of leak tight castings.

A WIDE RANGE OF COMPONENTS TYPICALLY IMPREGNATED

Impregnation systems find application in today's world driven by qcd consideration in all industry segments that use castings, plastics, sintered metal parts, powder coated and chrome plated parts. The most obvious examples of such industries are :

Aerospace components	Filtration equipment	Air compressors
Fuel supply systems	Hydraulic pumps/valves	Pneumatic Components
Transmission housings	Fire Fighting equipment	Automotive Cylinder heads, Manifolds and blocks

APPLICATIONS

TSP Impregnation Sealant range can be performed on castings before or after machining. If porosity is accessible before machining, as in the case of powdered metal parts and some castings, it may be of benefit to impregnate at that time. For some cases it may also be done after full machining.

It has been proven to be more cost effective to impregnate rather than to scrap castings. If a casting has had expensive machining processes there is no way to recover that cost if the casting is scrapped. It has been calculated by engineers that impregnation is a small cost when recovering expensive components.



- The primary application for impregnation is to seal castings against leakage of air, gases and fluids.
- Impregnation is also used to seal porosity for surface finishing. Finishes such as conversion coating, plating, wet paint and powder coatings can be applied after impregnation. Impregnating prior to these applications will alleviate blistering, spotting and bleeding of pre-plating solutions through plated parts. It will also eliminate "fish eyes" and pin holing in painted and powder coated components.
- If powdered metal parts are to be machined, impregnation prior to machining with MI 3000 sealant will eliminate tool chatter and reduce tool wear. Powdered metal parts are also impregnated for pressure tightness and electroplating applications.
- Sealing Inserts into assemblies
- Brazed and Welded Assemblies
- Entrapping contaminants
- The trend to create lighter alloys of Aluminium and Magnesium has increased the incidence of microporosity. This has made effective impregnation techniques an accepted word to the Foundryman and a word specified by Design Engineers.





NOW SUPPLYING TO OVER 15 COUNTRIES

Our Customers include...

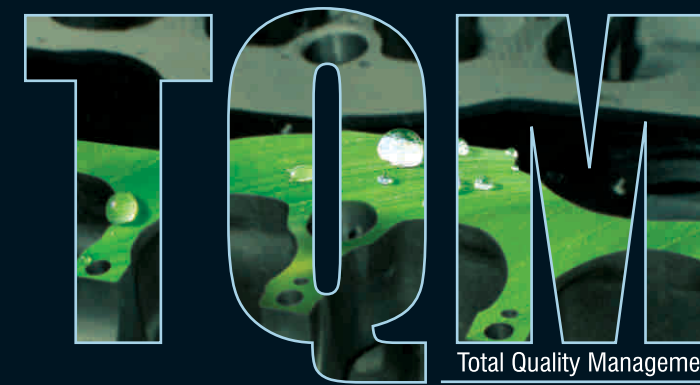
DAIMLER - CHRYSLER AG	VISTEON	DAI MITSUBISHI	MARUTI UDYOG	BAJAJ AUTO
VOLKSWAGEN AG - AUDI	WABCO	ABB	FORCE MOTORS	AUTOLEC INDUSTRIES
PORSCHE	BOSCH - MICO	HONDA	KALYANI BRAKES	ASHOK LEYLAND
GENERAL MOTORS - OPEL	ZF GETRIEBE GmbH	YAMAHA	TATA MOTORS	ENNORE FOUNDRIES
FORD MOTOR COMPANY	DAIHATSU	SUBARU	PREMIER	LML MOTORCYCLES
BMW - ROVER	LEMMEZ	KAWASAKI	GREAVES GROUP	DELPHI TVS
JAGUAR	TRW	UCAL - MIKUNI	KSB PUMPS	SUZUKI METALS
K H D, AG	NISSAN	MAHINDRA GROUP	TVS GROUPand many more
KNORR BREMSE AG	SUZUKI	KIRLOSKAR GROUP	ENDURANCE SYSTEMS	
PEUGEOT - CITROEN	CUMMINS	HINDUSTAN MOTORS	ANURANG ENGINEERING	

CUSTOMER SATISFACTION IS OUR MAIN GOAL

When you buy on price alone you can never be sure. It's unwise to pay too much, but it's worse to pay too little. When you pay too much you lose a little money - that's all; but when you pay too little you sometimes lose everything - Because the thing you bought is incapable of doing the thing it was bought to do. The common law of business balance prohibits paying a little and getting a lot. It can't be done! If you deal with the lowest bidder it is well to add something for the risk you run, and if you do that, you will have enough to buy quality.

-John Ruskin 1819 - 1900

Over 500 satisfied customers worldwide !



Washing ■ Impregnation ■ Leak Testing

We are the only single window to comprehensive Impregnation solutions



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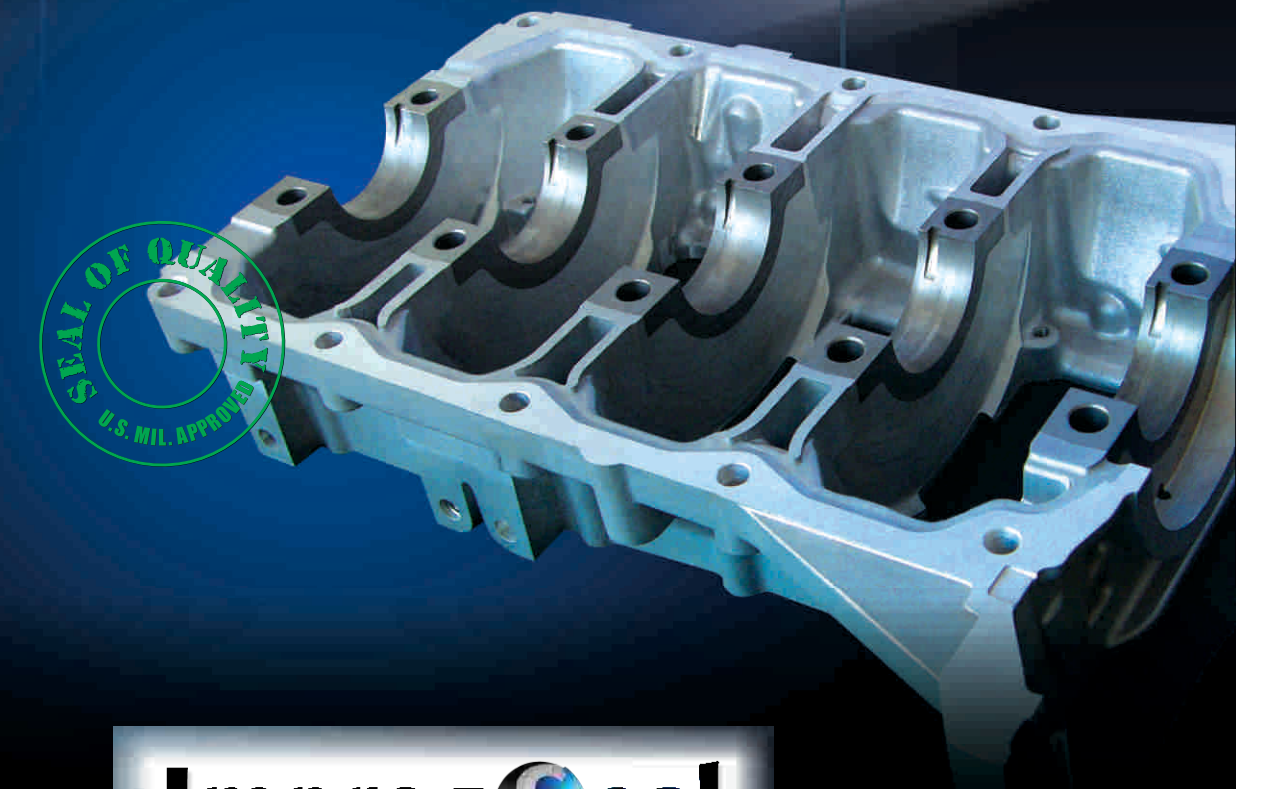
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The Formula 1... for the ultimate seal of Quality



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Always Ahead

ImpregSeal

Leak Testing / Assembly

ImpregSeal

Knowledge with teamwork

ImpregSeal

Founded in India in 1989, Metal Impregnations (India) Pvt. Ltd. has emerged as Asia's leading provider of turnkey porosity sealing solutions. At the foundation of our global success lie three important factors -

- Our team, which comprises India's top technical experts in the field of impregnation technology.
- A rich heritage of experienced knowledge of the process of vacuum impregnation, leak testing and component washing technology.
- Our world famous TSP Impregnation Sealant range which is approved by most automotive majors worldwide and also conforms to all leading specifications and approvals

World-class infrastructure and facilities at the Metal Impregnations (India) Pvt. Ltd. premises, strong technical skills, a commitment to R&D, and the team's unwavering dedication to providing world-class service - these factors combine synergistically to make us race leaders!

End-to-end solutions

We provide a complete, comprehensive, range of end-to-end solutions and services in the field of impregnation. Our work is characterized by professional and technical expertise delivered in a personalized manner. Quick decisions, correct decisions, taken by the people that know all there is to know in impregnation technology - that is what our customers all over the world receive when they work with us.

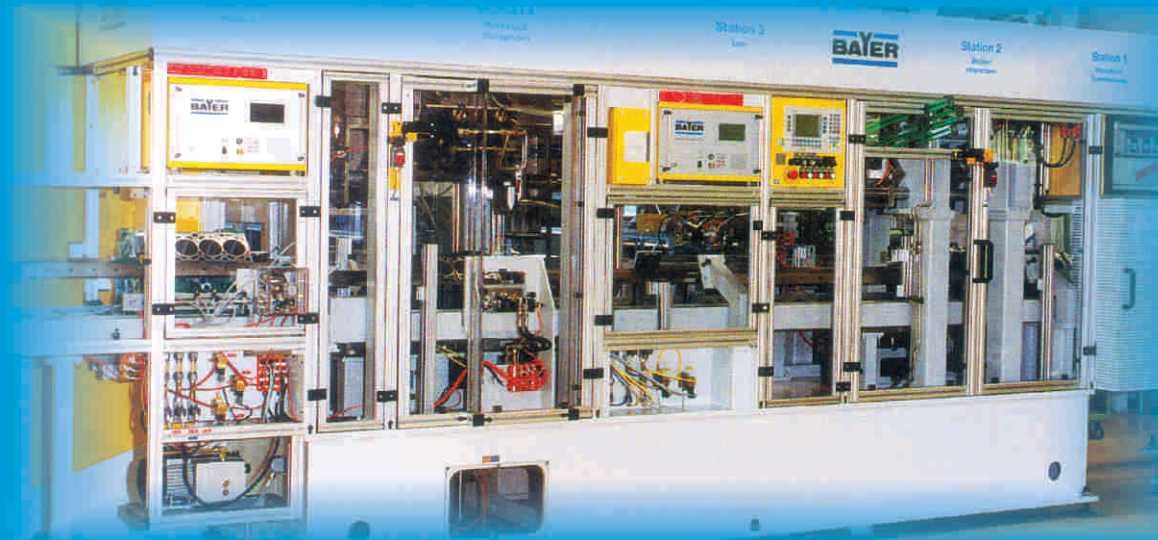
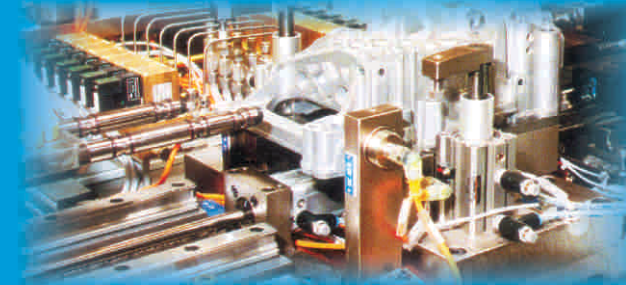
Global acceptance

We provide cutting-edge solutions to some of the world's most competitive and demanding markets, like Japan, New Zealand, Malaysia, Australia, Thailand, USA and more. We are part of the supply chain that services global giants in the automotive industry. Our customer profile stands testimony to our commitment to stringent global requirements of quality, reliability and safety.



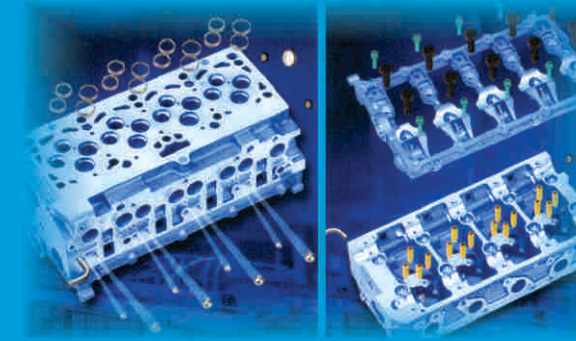
Transfer assembly and leak test units for cylinder crankcases and assorted housings

- Leak Test - Water jacket, Oil channel system, Pressure-free oil channel system
- Assembly - Sealing parts balls, Covers, Bolts
- Measurement - Camshaft bearing hole, Crankshaft bearing hole, Balancer shaft hole
- Test - Oil channels flow rate



Transfer assembly units for cylinder heads

- Assembling the valve seat rings
- Assembling the valve guides
- Cooling the valve seat rings and the valve guides in nitrogen (optional)
- Pressing in and hammering in at room temperature (patented process)
- Pressing in with "Force Distance" monitoring
- Oiling the parts
- Checking presence of all parts
- Assembly of camshaft bearing ladder frame
- Assembly of plugs and balls



The world of manufacturing is balanced today on a three-pointed axis - Quality, Cost, and Delivery. No matter what the product, no matter what the market conditions, these three parameters are the cornerstone of success in the hugely competitive manufacturing sector, globally.

These considerations are especially significant in the automotive industry, in the precision equipment manufacturing sector, and in other industries where vast scales of operations are involved. Today, impregnation of components is one of the industries' most important mantras to produce leak tight castings and to create finished products that win on all counts - Quality, Cost and Delivery.

The world has awoken to the realization that impregnation significantly reduces machining losses, creates a reputation for reliability and positively impacts on the costs of the production life cycle. It also allows for on-time deliveries by reducing both production and assembly downtime. Quality is a major concern for manufacturers across the table. But this concern is paramount to all manufacturers of the automotive industry, of precision equipment like pressure and volume measurement equipment, computer hard disks, high voltage circuit breakers, etc. The process of impregnation ensures top quality assurance in all these fields

We are Metal Impregnations(India) Pvt. Ltd.. And we provide you, our clients, with the most advanced technology in impregnation systems and solutions.