

# Impregnation How and why ...

# Porosity? No problem – we use Maldaner!

## Porosity

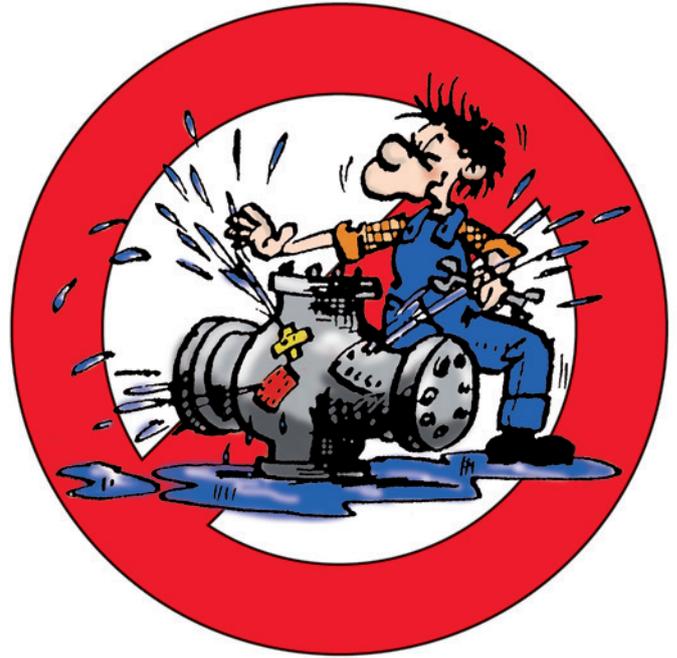
In spite of careful production techniques, castings made of grey iron, copper, aluminium and magnesium alloys often turn out porous and thus unsuitable for their intended use, e.g. as motor parts, oil pans, brake cylinders, pump casings, filter parts or valves. Furthermore, cast parts that were originally pressure tight may start leaking after post impregnation machining as enclosed pores are cut.

## How does porosity appear?

Porosity mainly appears because the outer contours solidify first when cooling after casting. When further cooling of the castings takes place, the metal shrinks and porosity can form inside the castings. In spite of advances in processing, porosity cannot always be avoided. Other factors like melting temperature, alloy composition and mould design additionally influence casting quality.

## Our solution: Impregnation

Expensive porous work pieces do not need to be scrapped. The products are actually enhanced with our metal impregnation process.



The impregnation costs are only a fraction of the part value. It would be costly and time consuming to replace these parts. The risk of replacement parts leaking is also avoided.

## Advantages of the Maldaner Impregnation System

### Pressure-tight parts

Impregnation by the Maldaner process makes porous work pieces pressure-tight. They can then be confidently used in most applications including hydraulic and pneumatic systems.

### Better surfaces when painting and coating

Impregnation by the Maldaner process prevents air or moisture inclusions when painting. No bubbles will form in the paint or coating anymore when the parts are heated.

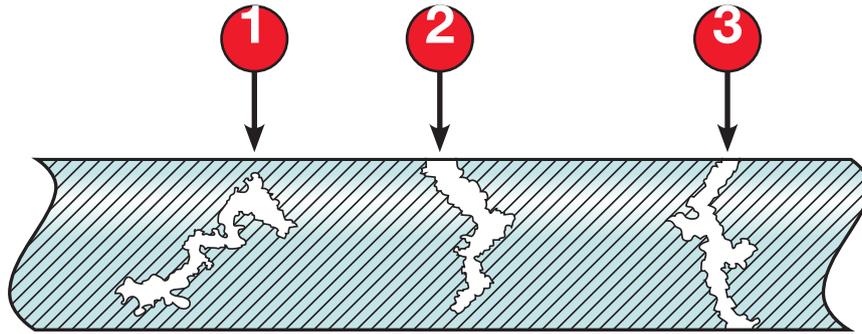
### No blooming after galvanisation

Impregnation by the Maldaner process fills the porosity in the parts with synthetic resin. In this way, acid is prevented from penetrating the parts and causing blooming after galvanisation.

### Prevention of inner corrosion

Impregnation by the Maldaner process can also prevent formation of corrosion by moisture in the porosity.

# Three forms of porosity in the casting

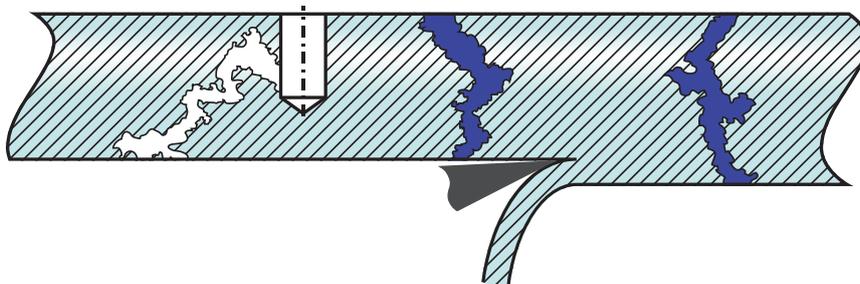


- 1 The encapsulated or enclosed pore:**  
It is only a problem if opened by a machining process.
- 2 One side open or blind porosity:**  
Leads to blooming after galvanic treatment, bubbles or craters form in the paint after stove enamelling. This type of porosity also poses the risk of inner corrosion.
- 3 Through porosity:**  
Liquids and gases penetrate the cast wall. A single pore is sufficient to make the part leak and thus useless.

▶ Impregnation according to the Maldaner process fills the open pores.



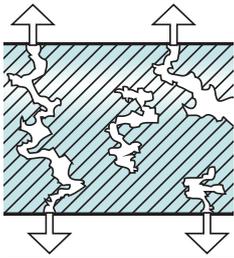
▶ Cast parts that are machined after impregnation can leak again if unfilled porosities are cut open.



▶ Therefore, we recommend impregnation after the final machining.

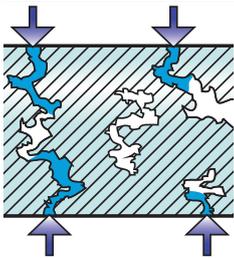
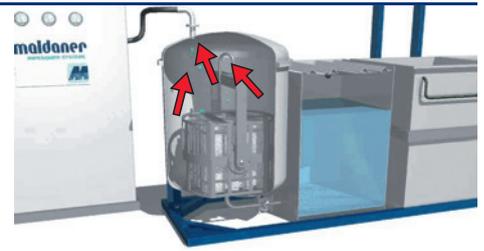
# Action of the Maldaner Impregnation System

The following schematic shows how the sealant fills the pores and thus warrants permanent sealing.

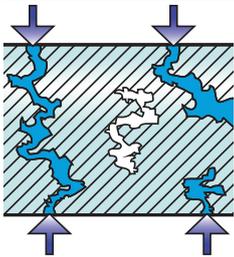


**Note:** The prerequisite for best impregnation results is that the work pieces are free of grease and the internal porosity is clean and completely dry.

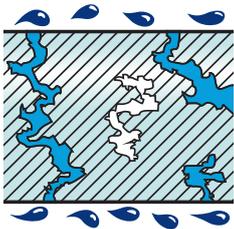
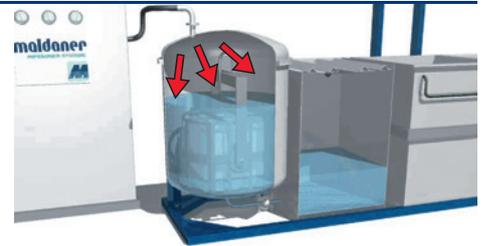
By applying a vacuum of less than 10 mbar the air trapped in the porosity is evacuated.



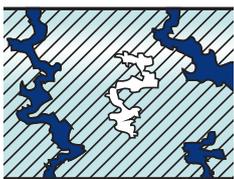
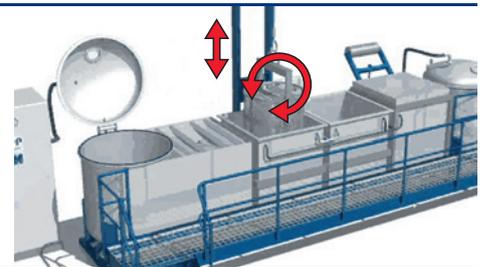
Impregnation sealant can penetrate into the porosity due to the vacuum removing all of the air.



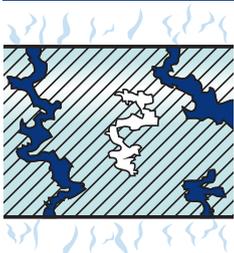
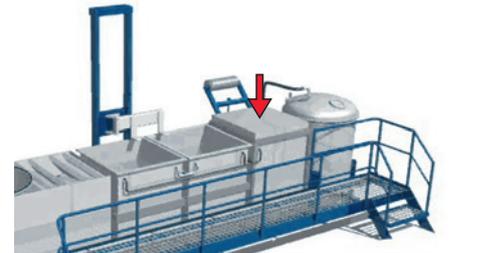
After the vacuum has been released, the impregnation sealant is forced into the porosity by atmospheric pressure and thus penetrates even the finest porosity.



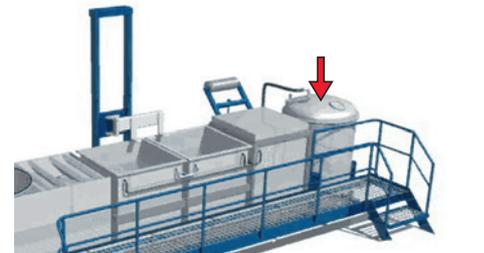
In a water bath the components surface is washed so no surface film remains. No additional washing is necessary afterwards.



Curing of the sealant takes place in the polymerisation bath at 90 °C. Rapid initial curing at the surface prevents bleeding out of the sealant from the porosity.



Vacuum drying of the hot components ensures dry work pieces and prevents corrosion by residual moisture.



## Maldaner GmbH

Max-Planck-Ring 3  
40764 Langenfeld  
Germany

Tel.: +49 21 73 9 84 99 0

Fax: +49 21 73 7 40 12

E-Mail: [mail@maldaner.de](mailto:mail@maldaner.de)

Internet: [www.maldaner.de](http://www.maldaner.de)