

DESIGN ENGINEERS



“Lost Wax Casting Offers A Flexible & Cost-Effective Manufacturing Process”.

The ability to produce complex shapes and a high degree of surface finish offers endless opportunities for the Design Engineer. Supreme Precision Castings Limited is one of the foremost investment casters in Australasia and is a preferred supplier to customers in Australia, Asia, North America and of course New Zealand. Our dedicated team comprises specialists in investment casting, engineering, metallurgy and tool making.

What is the Lost Wax casting process?

Lost Wax Casting, (also known as Investment Casting), is a near-net-shape manufacturing process. This means that the as-cast components can have a high degree of detail, precision and accuracy, dramatically reducing the need for costly operations such as machining, welding and fabrication. The process consists of the production of detailed expendable patterns usually in wax, the building of a refractory mould around the pattern using a ceramic slurry, removal of the pattern usually by the application of heat, firing of the mould to develop a maximum ceramic bond, casting of molten metal into the mould, removal of the refractory and finishing of the cast product.

The process is commonly utilised for the manufacture of components for a wide range of industries including hand tools, medical and diagnostics equipment, oil exploration, mining, marine, road transport, architectural, food and beverage and fluid handling applications.

Advantage of the Process

Complex intricate shapes that embody curves and/or are associated with internal passageways (especially where changes in direction and size are involved) usually dictate a casting method. When it comes to Investment casting, the process delivers the following additional benefits:

The absence of the requirement to part the mould for pattern removal affords freedom of design not available in most common casting processes. Thin-walled configurations can be made.

A high degree of surface finish and dimensional accuracy can be obtained. Affords the opportunity to optimise materials usage and economics of component manufacture.

Lost Wax Casting Alloys

Investment casting is well suited to a wide range of engineering alloys such as carbon steels, low alloy steels, stainless steels, high alloy steels, tool steels, as well as nickel/cobalt/aluminium/copper-based alloys.

Dimensional Accuracy

Typically, ± 0.1 mm per 25 mm is a guideline for linear dimensional accuracy.

Surface Finish

The as-cast surface finish compares favourably with the finish obtained by milling or turning. The typical surface finish on steel castings is $R_a = 125 \mu$ ins, (roughness number N8).

Size and Weight Range

The majority of investment castings fall within a weight range of a few grams to approx. 15 Kg.

Quantities

The process merits consideration for all quantities from prototypes and numbers of as low as 50 to very large runs of thousands.

Design Considerations

The excellent as-cast surface finish and dimensional accuracy of the process present the Design Engineer with a unique ability to optimise material usage with a minimum of costly finishing operations together with virtually unlimited freedom of design.

In the attempt to provide cost reduction and valued engineering service, Supreme Precision Castings is frequently challenged by product designers. Following casting friendly design hints serve to optimise the product cost:

- Avoid abrupt changes in section.
- Use fillets or radii of appropriate size.
- Core out heavy bosses to equalise section thickness.
- Use tie bar, webs or brackets to minimise distortion.
- Maintain maximum length or depth of through-holes to less than 5 times the diameter of the hole and that of the blind holes to less than twice the diameter of the hole.
- Benefit from high definition cast lettering, serrations, keyways and thread on the cast products.

Supreme Precision Castings is one of the foremost investment casters in Australasia and has had ISO9000 accreditation for 15 years. Our dedicated team comprises specialists in investment casting, engineering, metallurgy, and tool making. If you are considering Investment Casting, we request that you "Make us part of your Design Team". Consultation at the earliest possible stage in the design process will ensure optimisation of product design by taking full advantage of the process capabilities.