

Trusted
to do

the
difficult
things

Sand Casting

Sand casting is a traditional, highly skilled casting method used to manufacture complex shaped parts with variable section thicknesses. So named due to the use of bonded sand to create a mould into which molten metal is poured.



The process is extremely versatile and allows for simple or intricate castings to be produced. Typically, sand moulds are produced using wooden pattern equipment, which can be reused, or polystyrene patterns for single use. Sand casting is a popular selection for pump and valve applications, where internal detailing and passageways can be achieved by adding cores during the moulding process.

- Sand castings from a few kg up to 12,000kg in all heat, wear and corrosion-resistant alloys
- Decades of experience and embedded processes, supported by casting simulation software engineers (MAGMA)
- Unique HPLT/durville casting process to control oxide formation and to manage shrinkage (no-weld technology)
- Proprietary running and feeding mechanisms
- In-house 3D pattern printing machines
- Routine provision of third-party witness inspection and radiographic examination
- Single unit to high volume manufacture
- Semi-automatic boxless carousel manufacturing
- Secondary reclaimed sand to reduce environmental footprint
- Shell castings with an envelope from 25mm to 300mm in all copper-based alloys up to 25kg
- Gravity die castings in aluminium up to 30kg
- All necessary approval and accreditations

Centrifugal Casting

The centrifugal casting process typically produces castings of symmetrical, round hollow shapes (e.g. rings and tubes).

The nature of this dynamic casting process produces castings with a fine grain structure and a high degree of structural uniformity and integrity.

- Centrifugal castings technology to manage production forces in excess of 60g
- Rings and tubes with shaped external features to a maximum diameter of 2750mm (vertical process) and maximum length of 5000mm (horizontal process)
- Materials experts in all non-ferrous and ferrous alloys, with particular specialisation in naval and complex alloy castings
- World-leading die range with centrifugal casting machine flexibility
- Centrifugal manufacturing ensures high-integrity and close grain structure for safety-critical applications
- Maximum cast weight of 16 tonnes
- Approved shaft liner manufacturer for UK, USA (NAVSEA), Canada, Italy, France, Spain and more
- All necessary approval and accreditation for other industries



Machining

Westley Group has two finish-machine shops, both offering a complete fitting and assembly service for all product types.



Machining everything that we cast is central to the Group’s strategy. This vertically-integrated manufacturing platform provides our customers with a complete product solution, as well as consistency and security of supply.

- Extensive facilities across two sites employing over 100 people, machining in excess of 6 million production minutes per year
- Very large spectrum of manual and CNC machines to accommodate machining of all materials at all sizes and tolerances
- Design and engineering services with 3D CAD solid and surface component modelling, including CAM facilities
- Metrology and surface finish measurement with fixed table and mobile capability
- Continuous multi-million pound strategic investment cycles including numerous new Haas and Doosan machining centres
- The joystick-controlled Zeiss and the Aberlink Axiom probe CNC, use temperature compensation methods with a hexagon SWIFT-CHECK system for consistent metrology confidence. The most intuitive CMM software available enables precise measurement of the smallest components, a level of precision which is further enhanced by Ideagen Q-Pulse FAIR reporting software
- Assembly and testing facilities for all requirements

Materials Expertise

Westley Group manufacture in all internationally recognised heat, wear and corrosion-resistant alloys.

Our standard materials include nickel aluminium bronze, cupronickel, cupronickel chrome, leaded gunmetal, aluminium silicon bronze, Monel, as well as all exotic steels and special irons.

Across our four businesses we have three metallurgical laboratories where we alloy our own material, with in-house metallurgists and furnacemen collaborating across a suite of over 25 electric induction furnaces. Every melt is analysed in real time in an on-site laboratory using a combination of Optical Emission spectrometry, X-ray spectrometry, LECO Carbon Sulphur analysis, ELTRA Oxygen and Nitrogen analysis, and Olympus in-depth microstructure analysis, to provide accurate metallic and non-metallic make up and equivalents. This is how we ensure every component is manufactured to our exacting in-house proprietary target chemistry.

We have led the development of no-weld nickel aluminium bronze and copper nickel chrome for naval defence standard applications. Furthermore, we offer an unrivalled, critical design for manufacture (DfM) interface to support component manufacturability and programme risk management. We are experts in the casting of over 400 complex alloys, supported by coded and approved welding expertise. Westley Group supports its metal expertise with the management of rigorous material testing procedures, including 100% radiographic inspection, dye penetrant examination, eddy current testing and third-party witness inspection.



Testing and Inspection

Our quality procedures are approved to minimum ISO 9001 standards and up to AS9100. We offer an extensive range of destructive and non-destructive tests to demonstrate casting integrity.



A technical team of fully trained and qualified metallurgists is responsible for material analysis, ensuring materials meet the chemical requirements of every order. We use certified high-quality ingots from reputable material suppliers, and on melting, a melt button is taken from every furnace charge to be checked in one of our on-site electron emission spectrometers.

- UK Primes and NAVSEA approved testing procedures
- All-encompassing range of destructive and non-destructive tests provide quality assurance in line with the most stringent supply parameters
- All quality procedures are approved to minimum ISO 9001 standards and up to AS9100, with approvals for numerous institutions, organisations and third-party assurance bodies
- Technical and laboratory teams including fully trained and qualified metallurgists
- Chemical analysis of all furnace melts with in-house X-ray and optical emission spectrographs (OES)
- Radiography (X-ray) testing both in-house with cobalt source, and externally with linear accelerators up to 600mm wall thickness
- In-house dye penetrant testing with trained Level 1, 2, 3 operators
- Mechanical testing, ultrasonic testing, impact testing, magnetic particle inspection, magnetic permeability testing, hardness testing and eddy current testing
- Validated and controlled CNC CMM inspection and assurance

Assembly

All Group Companies offer assembly as part of their overall service offering. Valves, firefighting equipment, column pipes, water lubricated ship propulsion bearings, architectural components, pressure reducing vessels, and many other examples see us use manufactured, free issued, and sourced parts to complete the assembly, testing and packing of complete customer product lines.

- Specialised FM-Approved assembly cells
- Assembly of in-house cast and machined product with bought-in or free-issued componentry
- Pressure testing, flow rating, serialisation identification and recording
- MRP system-led build and inventory
- Bespoke painting service
- Export packing service for safe sea and air transport



