



**Maycast-Nokes**  
Precision Engineering Limited

2016

[www.maycast.co.uk](http://www.maycast.co.uk)



# ABOUT US

Maycast-Nokes is a precision engineering company based in Halstead, Essex.

We manufacture precision sand, investment/lost wax and gravity die castings in aluminium and steel.

We supply fully finished castings for aerospace, defence, automotive and general engineering applications.

In addition to our two foundries we operate a simultaneous 5-axis equipped machine shop and our extensive in-house facilities include heat treatment, metallurgy labs, Non-Destructive Testing (PFD, X-Ray) and pattern shops.

Because of our wide range of in-house services Maycast-Nokes customers are able to source fully-machined and finished castings from a single order. If required, castings can be assembled into complete assemblies or sub-assemblies, ready for the production line.

Maycast-Nokes holds quality certifications for ISO9001:2008, AS9100 REV C and NADCAP (NDT, X-Ray).



# HISTORY

**1950's** Evans Foundry was a tied foundry making shell and sand moulded aluminium castings exclusively for Evans Electroselenium, manufacturers of laboratory and scientific equipment.

**1971** Mr Charles Nokes (Foundry Manager) and Mr Roy Tanner (a local businessman) purchase the foundry from Evans Electroselenium and Nokes foundry is created.

**1982** Colin Richer (our current Chairman) invests into Nokes Foundry, starting of a long and successful partnership with Roy Tanner. The first CNC machine is purchased in 1985

**1993** First quality manual is written and BS5750 accreditation gained. The largest and most significant acquisition is made of Maycast Precision Products; a well established, family run business, founded in 1967 and one of the forerunners in the UK investment casting industry.

**1998** Nokes Foundry and Maycast Precision Products are amalgamated, forming the company we know today; Maycast-Nokes Precision Engineering. Manufacture of investment castings is moved from Hitchin in Hertfordshire to Halstead in Essex.

**2006** November 2006: NADCAP accreditation for Non Destructive Testing is awarded by PRI.

**2009** NADCAP accreditation for Heat Treatment & Mechanical testing is awarded by PRI.

**2016** Today Maycast-Nokes employs 150 people with an annual turnover of £6.5 million. Still family owned, the company continues to reinvest in state of the art technology including simultaneous 5-axis milling machines, the latest CNC lathes and ultra-fast X-ray technology.





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# CASTINGS

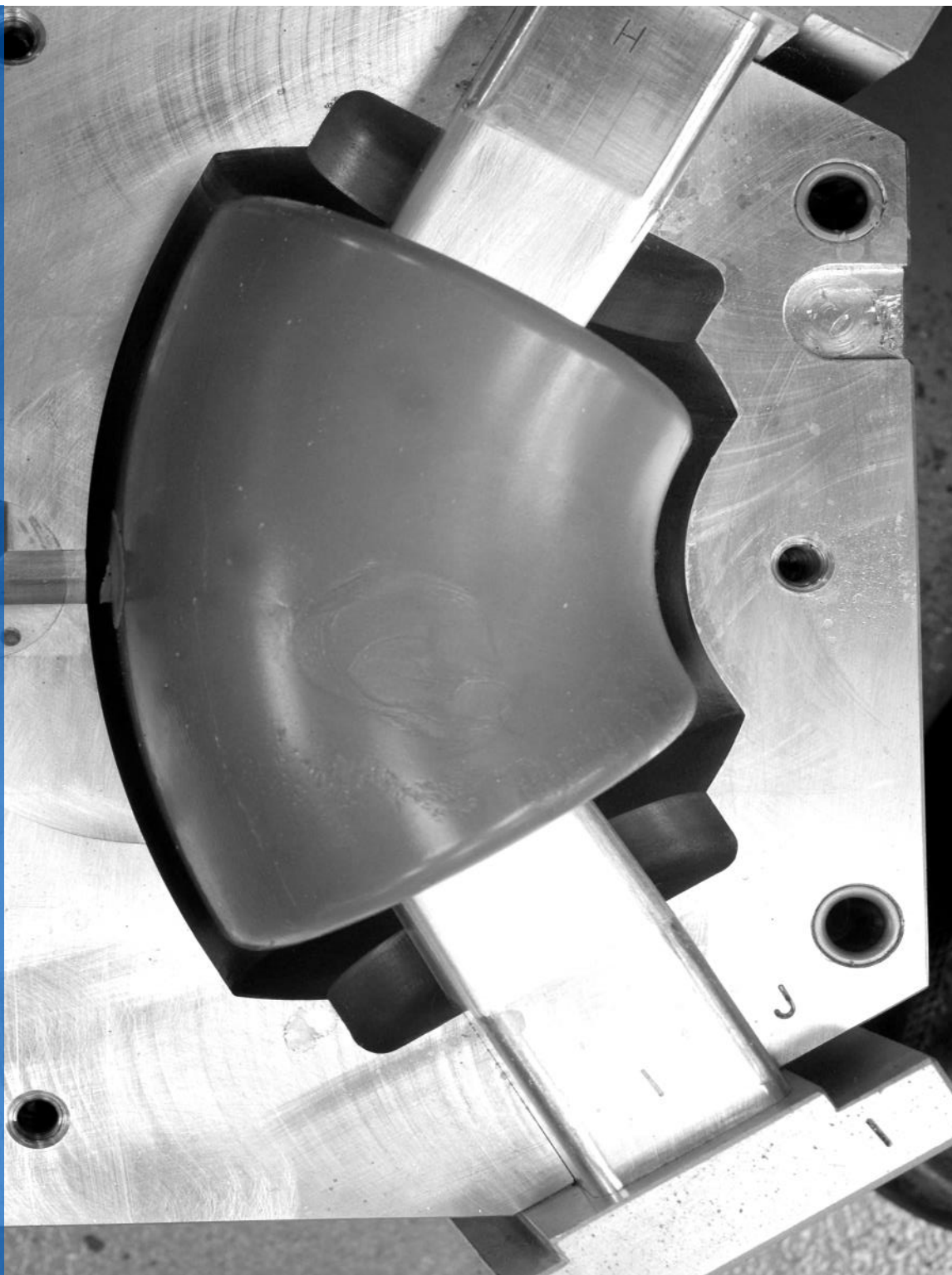
## INVESTMENT/ LOST WAX

Maycast-Nokes manufactures precision investment castings in an extensive range of metals to cover most applications. Our skills, experience and investment in the latest technology and methodology allows us to successfully deliver even the most demanding and challenging projects on time and in budget.

Precision investment castings enable the production of components that offer a high level of accuracy, integrity and reliability, whilst reducing the need for expensive secondary machining.

Using the latest in materials technology, complex internal features can be achieved using sacrificial wax or ceramic cores. Steel inserts within an aluminium alloy casting offer the designer the elevated mechanical properties of steel in localised areas but without the weight penalties.

Typical applications for precision investment castings include Aerospace, Defence, Communications, Medical and Motorsport.





# CASTINGS

## PRECISION SAND

Maycast-Nokes' precision sand casting facility consists of two separate casting processes, each of which has its own distinct characteristics.

Our **block moulding** process is used for the production of sand castings weighing 0.1kg to 30kg. Often multi-impression pattern equipment can be used. This technique can be highly cost effective whilst also giving an excellent surface finish. Using either wood or resin pattern equipment, this method offers excellent repeatability whilst achieving extremely tight tolerances. This can result in the reduction of costly machining operations.

All **floor moulding** activities are carried out by highly experienced, fully skilled craftsmen and can be used to either make sand castings from inexpensive loose pattern equipment, ideal for prototypes, or conversely very large parts which are too big for the block casting section.



# CASTINGS

## GRAVITY DIE

Gravity die casting is used to produce a wide range of aluminium products of various sizes and complexities.

A major advantage of gravity die casting is its repeatability and cost effectiveness, particularly where higher quantities are required.

In addition to our extensive knowledge of die casting, Maycast-Nokes can offer a 'one-stop-shop'; supplying fully-machined and finished castings, production-line ready.





# MACHINE SHOP

We have nine 4/5-axis CNC milling machines, three CNC lathes as well as a range of conventional machines. Our machine shop operates on a 3 shift system, 24 hours per day which allows us to offer a highly flexible approach on both small and large volume batch work.

As our machine shop is specifically set up for machining the castings we produce, so, all machines benefit from having probing facilities.

Due to our wealth of experience in manufacturing and machining castings, we are able to engineer customer's requirements from the start. Close working partnerships with our customers from the initial stages of design improves efficiency, saves costs and avoids over-engineering. This ultimately leads to reductions in lead-times from prototypes to full production.

The machine shop is supported by a temperature controlled inspection department with two Coordinate Measuring Machines (CMM's) and a range of conventional measuring apparatus.

We recognise that at the early stages of design a flexible approach is advantageous; as such we are able to work from 2D drawings or 3D models.

We can supply fully machined and finished castings made by rapid prototyping for fit, form and function trials or pre-production runs.





# PLANT LIST

## **Maho MH 1600S 4-axis CNC machining centre with three pallets.**

Working capacity: 1.6 x 0.8 x 0.8m (X, Y, Z).

## **Maho MH 1200S 5-axis CNC machining centre with two pallets.**

Working capacity: 1.2 x 0.6 x 0.6m (X,Y,Z).

## **Maho MH 1200S 4-axis CNC machining centre.**

Working capacity: 1.2 x 0.6 x 0.6m (X,Y,Z).

## **Maho MH 700S 4-axis CNC machining centre with two pallets (2 off).**

Working capacity: 0.7 x 0.5 x 0.6m (X,Y,Z).

## **Maho MH 600C 4-axis CNC machining centre.**

Working capacity: 0.6 x 0.45 x 0.45m (X,Y,Z).

## **Maho MC 50 4-axis CNC machining centre with two pallets & rotary table.**

Working capacity: 1.2 x 0.6 x 0.6m (X,Y,Z).

## **HAAS UMC-750 5 Axis High speed machining centre.**

630 x 500mm Dual-Axis trunnion table. 40+1 Side-mount tool changer. Coordinate rotating & scaling.

## **HAAS VF4SS 5 Axis High speed machining centre.**

Working capacity 1.3 x 0.5 x 0.6 (X,Y,Z)

## **HAAS VF2SS 5 Axis High speed machining centre.**

Working capacity 0.8 x 0.4 x 0.5m (X,Y,Z).

## **XYZ eMill 2000 Turret milling machine with ProTrack control system.**

Working capacity: 0.71 x 0.406 x 0.406m (X,Y,Z).

## **Doosan Puma 3100L CNC lathe.**

Working capacity: max. swing 0.85m, max. Distance between centres 0.79m, X-axis 0.3, Z-axis 0.8m.

## **Daewoo Puma 300B CNC lathe.**

Working capacity: max. swing 0.57, max. Distance between centres 0.648m, machine  $\varnothing$  0.4, Z-axis 0.680m.

## **Doosan Lynx 220B CNC lathe with twelve position turret.**

Working capacity: max. swing 0.29m, max. distance between centres 0.3m, machine  $\varnothing$  0.32.

## **LK 990C 3-axis CMM.**

Fully programmable with QCT software & offline CAD facility. Bed size under probe 1.3x 0.9m. Height under probe 0.7m.

## **Tesa 3-axis CMM with QCT software. Bed size 30" x 24".**

## **Inspecta 2600 3D portable measuring arm with QCT software**

In addition to the machines listed here, we also have a range of conventional horizontal & vertical mills, lathes and drills for supplementary manual machining operations. Please email [sales@maycast.co.uk](mailto:sales@maycast.co.uk) for further information.

# HEAT TREATMENT

Maycast-Nokes' NADCAP approved heat treatment department is equipped to perform a range of processes on a wide range of aluminium alloy castings.

All heat treatment processes can be tailored to the needs of a specific customer or part and are carried out by qualified technicians in accordance with AMS and British Standards.

The Maycast-Nokes heat treatment facility is available for independent sub-contract work.

Our heat treatment facilities include:

**2 x Solution ovens:**

**Working capacity: 900 x 900 x 600**

**Weight: up to 140 kg**

**4 x Precipitation ovens:**

**Working capacity: Up to 1000 x 1000 x 1000**

**Weight: Up to 200 kg**

All computer controlled, fully traceable and monitored by our Materials Laboratory.





# NDT

## RADIOGRAPHY

The radiographic inspection process makes use of X-rays to produce an internal image of a casting, or part of a casting, on film, seeking out any internal defects.

The X-ray facility incorporates two X-ray cells (200 kv + 320 kv) for use on both aluminium and steel castings. Using an automatic processor, images are produced on film and inspected against customer and industry standards for compliance.

We employ multi-disciplined NDT inspectors who are able to work in both NDT departments (Radiography and PFD). All are qualified to MAS 410 / EN4179 + PCN level two. In addition to our Level II members of staff we also have an on-site Level III, meaning that we can write and sanction all of our own process techniques without any assistance from an external source.

Both departments are fully NADCAP approved and are currently on the PRI Merit program (18 month audits) following three previous successful audits.

### Sub-contract testing service

In addition to carrying out NDT inspections of our own castings Maycast-Nokes is also able to offer a sub-contract NDT service, inspecting components manufactured by other companies to their required standards - For further information please contact [enquiries@maycast.co.uk](mailto:enquiries@maycast.co.uk).

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# NDT

## LIQUID PENETRANT

Maycast-Nokes offers two main non-destructive testing (NDT) procedures, Radiographic inspection and Liquid Penetrant inspection.

Fully qualified Maycast-Nokes technicians carry out complete surface inspection of the castings. The process is designed to identify any surface breaking defects such as cracks, laps or porosity.

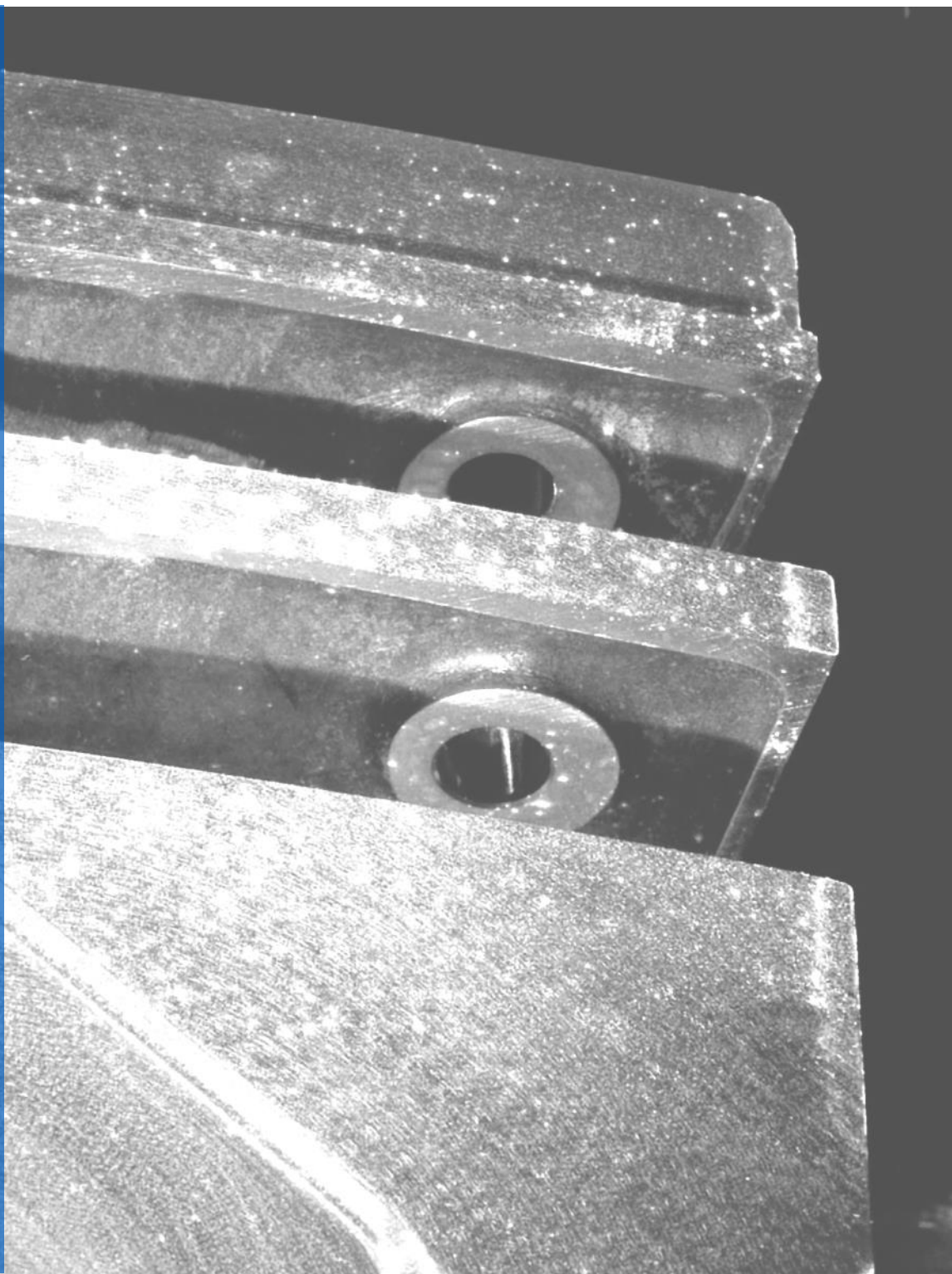
The principle of the testing method is that the dye/penetrant is drawn into any surface breaking defect by a process of capillary action. After a period of time soaking in the dye the castings are removed and water washed. When viewed under ultra violet light any defect will bleed with dye indicating a possible defect. Castings are inspected against customer/national specifications and sentenced accordingly.

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# METALLURGY

## Metallurgy

Outlined below are some of the tests performed at Maycast-Nokes. Tensile testing, metallography and hardness testing are all qualified under the stringent requirements of our NADCAP Heat Treatment approval.

## Tensile Testing

Maycast-Nokes performs tensile testing up to 100KN capacity at ambient temperature. Tests can be performed in accordance with:

BS EN 10002

BS EN 2002

ASTM E8

The test bars used may be as cast, turned to size or machined directly from a casting depending on the customers' requirements.

## Chemical Analysis

Chemical analysis is performed using optical emission spectroscopy (OES) on a state of the art "spectrolab" machine.

Current capabilities allow the testing of aluminium, steel and copper based alloys. For more information on alloys analysed please email us at [enquiries@maycast.co.uk](mailto:enquiries@maycast.co.uk)

## Metallography

Samples are prepared using manual and semi-automatic polishing procedures. They are analysed using a light microscope ranging from 50x to 600x magnification.

### Analysis includes:

#### General microstructure

IGA/IGO

Porosity

Grain size

#### Hardness Testing

Rockwell hardness testing is carried out per ASTM E18 and BS EN ISO 6508. Tests are performed using the Rockwell scales: HRA, HRB, HRC and HRE. The limits are often set by the material specification, but the frequency is usually set by the customers' requirements.

#### Other Testing

Other tests performed by Maycast-Nokes include:

Intercrystalline

Bend

Fracture

# QUALITY

Quality is the foundation upon which Maycast-Nokes Precision Engineering Ltd has built its reputation.

Our technical and commercial departments work closely together to ensure that every project conforms to strict quality management procedures. Our quality procedures are supported by a climate controlled Inspection department, equipped with the latest inspect2CAD software. We are able to measure components on our Coordinate Measuring Machines against an IGES surface model. This speeds up the inspection process and ensures greater control over component verification.

Maycast-Nokes holds NADCAP approvals for PFD, Heat treatment and X-Ray along with industry required approvals BS EN ISO9001:2008 and AS9100 Rev C

Maycast-Nokes also holds the coveted 'merit' status for all three NADCAP accredited process approvals.

At Maycast-Nokes we understand that quality does not start and end with the inspection of a product or with the approvals we hold.

We embrace all areas of customer support within the quality function, from first contact to post-delivery support.

Customers Approvals: BAE Systems, UTC, Aircelle, Liebherr Aerospace, MBDA, Thales, Zodiac Aerospace, GKN.



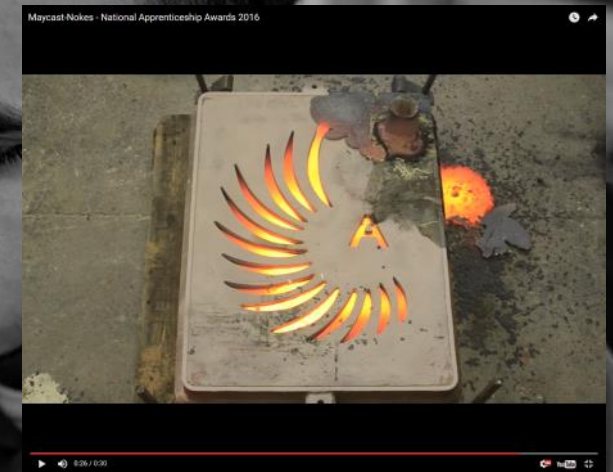


# APPRENTICES

## ENGINEERS OF THE FUTURE

Offering lifelong career opportunities is something which is rare in today's industrial and progressive world. However, Maycast-Nokes offers real life job opportunities and training schemes which develop into long term employment.

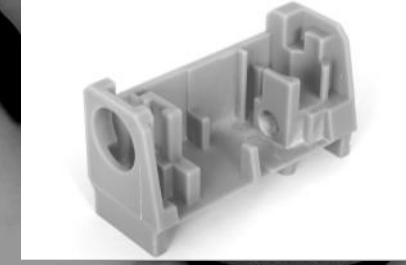
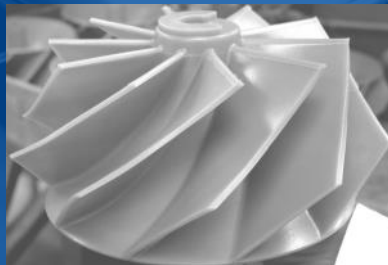
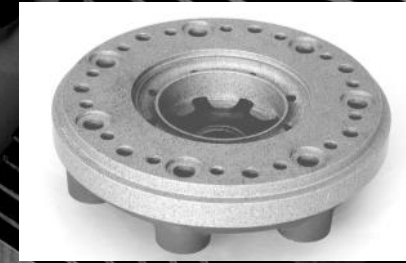
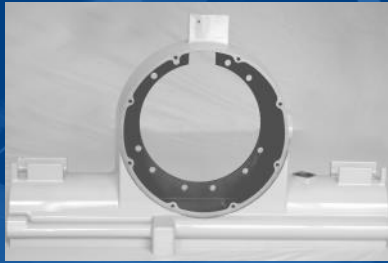
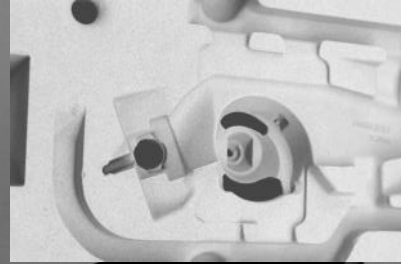
More than 60% of the current workforce has been with Maycast-Nokes for 10 years or more, resulting in a loyal, dedicated and productive team. The company also has a strong ethos of investing in the future with 10% of its workforce being trainees or apprentices. Training programmes at the company are designed to provide workers with industry recognised skills and qualifications. For example; over a three-year foundry apprenticeship, trainees will spend time in all areas of the business enabling them to become a skilled and knowledgeable employee. The Maycast-Nokes approach to training sets young people on the path to meaningful and lengthy careers.



### Elvium group given permission



# GALLERY





# CONTACT

## Maycast-Nokes Precision Engineering Ltd

Factory Lane West  
Halstead  
Essex  
CO9 1EX  
INGHILTERRA

**Telephone:** +44 (0) 1787-477021

**Facsimile:** +44 (0) 1787-474264

**Email:** [enquiries@maycast.co.uk](mailto:enquiries@maycast.co.uk)

[dblowner@maycast.co.uk](mailto:dblowner@maycast.co.uk)

[sgill@maycast.co.uk](mailto:sgill@maycast.co.uk)

[rsexton@maycast.co.uk](mailto:rsexton@maycast.co.uk)

VAT Registration: 651 1199 51

Company Registration: 3113620

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