ALPHACASTING

alphacasting.com

WORLDWIDE LEADERS

# IN PRECISION INVESTMENT CASTING

March 11, 2024

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# WE ARE **CASTING**

We are focused on **aerospace, defense, transport, and medical OEM** support with **aluminum, titanium, and stainless steel.**

***30+ years experience*** in investment casting, using air melt and vacuum cast alloys.

Located in ***Montreal,*** Canada.

Over ***74,000 ft²*** of office and manufacturing space.

***$20+ millions*** sales per year with ***180+ employees.***

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# WE ARE **EXPERTS**

Sustained AS9100 and NADCAP qualification in **aerospace quality** systems

History of high-volume automated manufacturing ***(cost competitive)***

Able to use **same tooling for multiple alloys** ideal for part development

Integrated manufacturing ***(rapid prototyping, tooling, machining, heat treat)***

Strong focus on high mechanical property **aluminum** and **titanium**

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# WAX PATTERN **INJECTION**

The process starts with the injection of wax in modular aluminum molds.

Each mold has been configured to guarantee the design requirements of our clients.

The manufacture of wax pieces requires the greatest accuracy and neatness, and in our department, we make sure that each process has 0 errors, with the greatest attention to detail and cleanliness.

# MOUNTING

We manufacture the best pieces and it all starts with the creation of an assembly of runners and gates mounted to the wax pattern in ways to provide the best metal dispersion during the casting process.

After mounting, the molds are sent to the next process; where they are covered with a series of layers (shell) that adhere to maintain the original shape with the greatest fidelity.

# **SHELL MOLD** & PRODUCTION

Automated mold production lines have increased capacity and reliability of mold performance.

Our rigor in the creation of the shells of each piece is developed together through automation and human work, generating greater performance and effectiveness of the process.

We have dedicated lines for steel, aluminum and titanium alloy castings.

# **FOUNDRY** OPERATIONS

***THE ALUMINUM FOUNDRY***
Alphacasting has developed a rapid controlled solidification process, used for the production of high property aluminum casting. Pressure-assisted, air-melt and koolcast aluminum alloy processes are used for high density castings.

***THE TITANIUM FOUNDRY***
Vacuum Arc and Induction melting furnaces for titanium and super-alloy castings.

***THE STEEL FOUNDRY***
Air-melt induction melting for steel, stainless steel and bronze alloys.

# KOOLCAST

Alphacasting has developed a rapid controlled solidification process, used for the production of high property aluminum castings. The process is adaptable to existing parts and molds. A fluid extracts heat from the casting, resulting in rapid solidification and fine casting microstructure. Once heat-treated, the casting has superior static and dynamic mechanical properties.

US Patent - 2014
# 8,631,852 B2

Canadian Patent
S/N 2,707,317

# CLEANING

The pieces resulting from casting require the removal of material that is not part of the design and its functionality.

Our specialized technicians clean and remove excess material to obtain a piece that can be ready for subsequent treatments and evaluations.

We use tools that guarantee effective and high-quality work, in accordance with the requested specifications.

# MACHINING, PROTOTYPING & TOOLMAKING

In our integrated engineering and design department we manage:

- Part machining
- Fixture
- Tooling
- Anodizing
- Chemical milling
- Insert installation
- Rapid prototyping design and production.
- Final part inspection

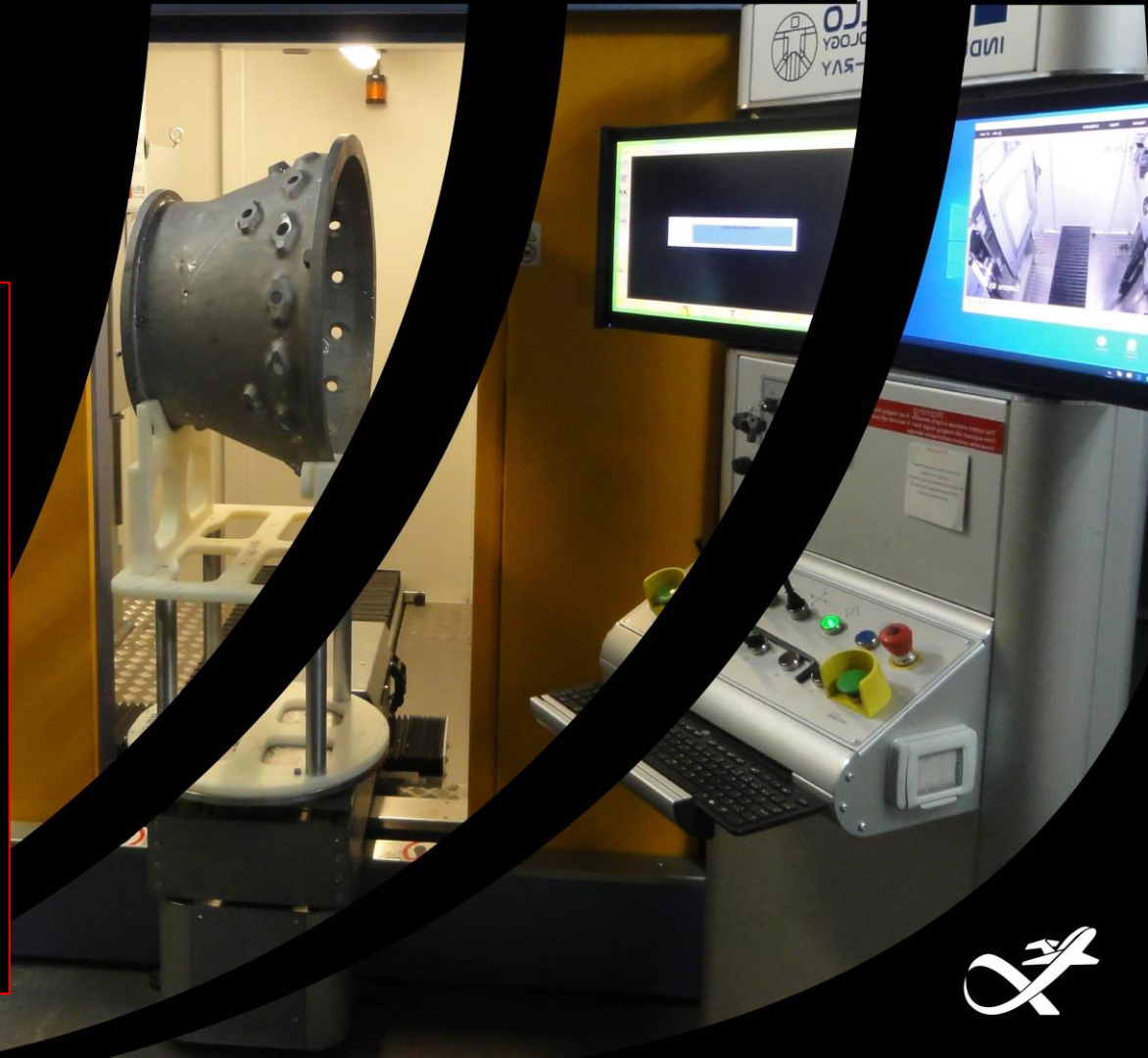
# Non-Destructive Testing (NDT)

Florescent penetrant inspection (FPI) or Magnetic Particle techniques are used to verify castings for absence of surface discontinuities.

Digital and film radiography are used to inspect castings for final part certification and foundry control.

Visual inspection is used to detect larger surface discontinuities.

Dimensional inspection is used to ensure the parts respect the tolerances of the technical drawings.



# HEAT TREATMENT

Steels, stainless steels and alloys are vacuum heat treated and gas quenched.

Aluminum alloys are solution treated in drop bottom quench furnaces and aged in forced convection furnaces.

Heat-treating and hipping on titanium parts performed by approved outside sources.

Experienced fixturing techniques in heat treatment to reduce distortion of parts during quenching.

# STRAIGHTENING

Aluminum castings are either hand straightened or pressed in compression straightening dies, followed by QC checks in modular fixtures.

Hot straightening is used for steel and titanium.

**Functional Go/No-Go Fixturing**

Alphacasting employs functional inspection fixtures in both the straightening department and for final inspection  verification.

Fixtures are calibrated before use and reflect drawing requirements for profile, flatness, circularity and other dimensional requirements.

# WE ARE **SUPPLY CHAIN**

**ERP System** (GUARDIAN FOUNDRY SOFTWARE) is managed by a team of specialists

A large, flexible and competitive **Supplier network** for tooling, treatment and machining

**Load/Capacity** analysis on regular basis

On Going **Projects** :

**"CMMC" project** to secure the complete data information system

**MRPII final Training** to secure all competencies

**Full S&OP process** in development

**LEAN/5S** development to secure/improve efficiency and global competitiveness

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# SOME OF OUR CLIENTS

SAFRAN
Parker Aerospace
AMETEK AEROSPACE & DEFENSE
Triumph Group, Inc.
Raytheon
ThalesAlenia Space
HEROUX DEVTEK
United Technologies
PALL Pall Corporation
DRS TECHNOLOGIES
Multimatic MOTORSPORTS
Savage Arms
Honeywell
BELL
BRP
THALES
TELEDYNE TECHNOLOGIES INCORPORATED
BOMBARDIER
MITSUBISHI HEAVY INDUSTRIES, LTD.
EMBRAER
SPACEX
Elbit Systems
NHBB New Hampshire Ball Bearings, Inc. A Minebea Company
MOOG
ELCAN Optical Technologies
Esterline CMC Electronics
CAE
BOEING
ENDOTEC INNOVATOR FOR A BETTER FUTURE
GE
VERATHON
L3 communications
MDA
Parker
CORONÉO
GENERAL DYNAMICS Ordnance and Tactical Systems
ATERMES
CUBIC

# AEROSPACE

From CAD file to castings, we deliver innovation, **quality and precision.**

ALUMINUM CASTING - PRESSURE VESSEL

CABIN PRESSURIZATION SYSTEM

LUBE & SCAVENGE PUMP

LUBE AND SCAVENGE PUMP – LEAP

LARGE COMBUSTION CHAMBER

APU

HIGH PRESSURE FUEL PUMP

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# AEROSPACE

Alphacasting has developed the **expertise** to deliver the **best castings** in the industry.

STRUCTURAL ALUMINUM PARTS

RINGS 17-4PH CAST RINGS FOR TURBOFAN ENGINE

SAFRAN DEVELOPMENT TITANIUM PARTS ON LEAP 1A & 1B

AIRCRAFT HEAT SHIELD TI6242 HEAT SHIELD ON ENGINE PYLON.

BALL AND YOKE

TURBOFAN SERVICE PANEL (17-4), LUBE & SCAVENGE PUMP (F357) AND TRANSFER GEARBOX (E357+CU) FOR LEAP.

TITANIUM TORQUE-TUBE

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# TRANSPORT

## High strength Aluminum Suspension Structure

Hight strength aluminum suspension part, for resistance and protection from failure.

## High strength Aluminum body structure

The future cars will be lighter - but just strong, forcing manufacturers to seek new alloys to reduce vehicle weight without sacrificing strength.

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# TRANSPORT

Alphacasting meets these requirements through new advances in the casting processes that use super lightweight aluminum alloys.

## High strength Aluminum body structure

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# MILITARY - DEFENSE

We proudly serve the worldwide and rapid changing defense industry.

LARGE ALUMINUM CASTING

MILITARY OPTICAL

MISSILE BODY CASTINGS

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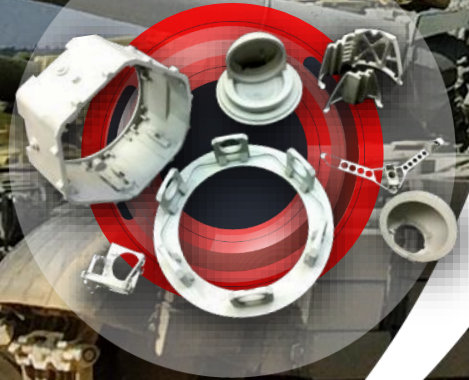
# MILITARY - DEFENSE

We provide multiple parts for transforming complexity into resistance, light weigth, and the best performance and properties.

**MINIATURE POINTER TRACKER FOR THE INFRARED COUNTER MEASURES SYSTEM**



**COMPACT THERMAL IMAGER CHASSIS**

**GAS OPERATED SEMI-AUTOMATIC BULL PUP RIFLE**

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# MEDICAL

Titanium surgical tools combine a sterile light weight, integrated camera, light, suction and gas tube for the surgeon.

Titanium surgical tools are casted, machined and assembled with electronics.

Precision titanium alloy tools have high strength and stiffness yet are lightweight and can be sterilized and reused.

Titanium endoscopes are machined and polished ready for camera assembly.

**PRECISION SURGICAL TOOL APPLICATIONS**

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# TELECOM

## Titanium Castings - Satellite Structures

Titanium **Yoke** and **Hinge** assemblies are ***hollow, lightweight*** and exhibit ***high stiffness*** to support the solar panels during positioning.

Primary and Secondary Yoke castings employ welded core plugs and assembly to form lightweight torque tubes.

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# COMMERCIAL

Alphacasting is primarily recognized for its expertise in developing multiple precision parts for the aerospace, military, and medical industry.

Nevertheless, there is much more to discover about us. We also deliver quality to the transport, energy, agricultural, technology, and communications industries, who rely on us for 30+ years.

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¡THANK YOU!

!WE'D BE HAPPY TO SERVE
**YOUR BUSINESS¡**

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