When there’s no room for error, trust your vision to Advanced Forming Technologies.

We deliver more than just metal parts; we deliver accuracy.
At AFT we build confidence through unparalleled technology, quality and service.

Advanced Forming Technology: Where Vision Meets Precision

It’s your vision. It’s the part you’ve meticulously created for a very specific need. Would you trust this vision to anybody? Of course not. You want to be confident your part will be built exactly the way you designed it. This is a world that doesn’t tolerate error. No one understands that better than AFT. That’s why we’ve made a business of delivering accuracy-every time.

A global leader in Metal Injection Molding (MIM) and ThixoForming since 1987, AFT builds confidence through unparalleled technology, quality and service. We invest a tremendous amount of resources in every job. Working with our state-of-the-art design process, our engineers create a customized program for each new part. Our sales, engineering and customer service professionals work with you at every stage to ensure the highest level of quality. Everything is adaptable. Everything is catered specifically to your needs.
Technology: AFT’s commitment to technology is unequalled in the industry. Most years, we invest seven-figure sums back into our systems.

Process: Completely customizable and impeccably accurate, AFT’s process is a closely guarded trade secret that maximizes efficiency and minimizes error.

Customization: Customization is at the core of everything we do at AFT. As a vertically integrated operation, we have the independence to design programs to the most specific requirements.

People: Our team consists of the industry’s most qualified, forward-thinking professionals, including 12 black belts and more than 20 degreed engineers.

Quality: In a world that doesn’t tolerate error, AFT delivers the most exacting standards in the industry. Among other strict standards, we maintain Six Sigma Process Control.

Service: AFT doesn’t abandon you after the sale. Our highly trained staff is accessible throughout the manufacturing process.

Facilities: None of AFT’s competitors can offer fully automated capabilities to the same size and scale. Whether you’re looking for 5,000 parts a year or 100,000 a day, we have the resources to get it done.

Solutions: Ultimately, our business is providing solutions. You have an extremely complex, difficult-to-manufacture part; we have the means produce it for you.
If you can envision it, we can do it. At AFT, our next-generation technology exists to serve your needs.

Metal Injection Molding
AFT’s proprietary MIM technology represents the future of small, complex component manufacturing. It combines the shape-making capabilities of plastic injection molding with the material flexibility of powder metallurgy.

Strength in Detail: Through our unique processes, we can form multiple components into a single, complex geometry. The technology permits co-molding and bonding of dissimilar materials. This means we can create more intricate parts with higher densities and greater strength than conventional metal forming manufacturers.

Built-in Adaptability: Every bit of our technology works to ensure that we deliver exactly what you need. Mold design engineers customize each MIM program using the most advanced CAD/CAM technology, including mold flow analysis.

Varied Applications: AFT’s progressive MIM technology is ideal for building aerospace components, medical and surgical instruments, automotive parts, electronics, computers and peripherals, power tools, firearms and communications equipment. MIM parts can range in weight from 0.1 grams to around 150 grams. Construction materials vary from stainless steel to non-ferrous alloys such as titanium.

ThixoForming
Working in the thixotropic, or semi-solid state of heated materials, AFT’s ThixoForming technology merges the forming features of plastic injection molding with the strength produced by conventional die-casting.

Microstructure Refinement: The thixotropic technology provides a process for microstructure refinement and the enhancement of material properties.

Superior Material Qualities: As opposed to conventional die casting, where metals are heated to extreme temperatures, AFT’s ThixoForming technology allows us to work the materials at lower temperatures. This provides laminar material flow, which creates higher dimensional tolerances and superior material qualities.

Varied Applications: AFT’s ThixoForming works extremely well for larger metal alloy components that need to be produced in medium to high volume. It’s ideal for fields such as automotive, computer equipment, electronic packaging, power tools and telecommunication devices, among others. ThixoFormed components can range in weight from 50 grams to well over 4 kilograms.
AFT’s MIM process is the envy of the component manufacturing industry. Automated systems work with microprocessor controls to produce high levels of quality control in a completely customizable environment.

**Design:** Using cutting-edge design technology, engineers take a customer’s concept and outline a customized program for MIM.

**Mold Making:** With the help of CAD/CAM technology, engineers fabricate molds similar to those used in plastic injection molding.

**Compounding:** Technicians mix proprietary materials to form a palletized molding compound with a volume ratio of about 60/40 metal to binder.

**Molding:** Injection molding machines create “green parts,” which are typically 15-25 percent larger than the finished product.

**De-Binding:** The binder material is removed from the “green parts” to create de-bound, or “brown parts,” which are approximately the same size but very porous.

**Sintering:** “Brown parts” are sintered in vacuum-type furnaces where they shrink to almost complete density. Secondary machining is available to finalize parts.

With two state-of-the-art processes to choose from, AFT can provide a range of solutions for your component manufacturing needs.

**ThixoForming**

AFT’s ThixoForming process produces components with complex shapes, high-density, fine finished detail and light overall weight.

**Heating to Thixotropy:** Technicians feed chipped material (typically magnesium alloys) through precisely heated, multi-zoned barrels to create a thixotropic, or semi-solid, material.

**Molding:** The thixotropic material is injected into a customized mold.

**Robotic Handling:** Robotics aid in material handling for more consistent production quality.

**Trimming:** When the part solidifies in the mold, it is ejected, trimmed and finished to exact specifications.
Customization

AFT’s manufacturing process is the most efficient and refined in the world, but it’s also built on a platform of adaptability.

**Vertical Integration:** Much of AFT’s adaptability grows from our status as a vertically integrated company. Unlike many of our competitors, we don’t use pre-fabricated materials or pre-set processes. Instead...

- We employ customized materials and customized stock.
- We make our own robotics.
- We maintain our own machine shop.
- We do all our own tooling.
- We construct all our own molds.
- We execute our own compounding and can perform custom compounding to your specifications.

This means we aren’t at the mercy of other companies when it comes to producing our products. That gives us more flexibility, which we pass on to our customers in the form of a superior level of customization.

People

During each step of the process, AFT has people in place who are dedicated to quality assurance. Every project receives the full attention of an entire team of professionals, which includes a sales manager, customer service agents, design engineers, production engineers, quality engineers and manufacturing cell managers.

- AFT takes quality seriously with more than 12 black belts and 20 degreed engineers on staff.
- We have the highest engineer-to-sales ratio in the business, which underscores our commitment to innovative design and production processes.
- We are dedicated to ongoing training and continuing education, so our staff remains among the most qualified in the world, and accuracy is always delivered.
Quality

Quality is job one at AFT. If we take on a project, you know we’re going to get the job done right.

- AFT maintains a Six Sigma Process Control for the highest level of quality.
- We are certified by ISO 9001, QS 9000 and ISO/TS16949 quality management systems.
- Our Total Quality Management program dictates that all manufacturing and engineering personnel receive SPC/SQC training.
- AFT’s Quality Assurance system has been built to exceed the standards of Good Manufacturing Practice and Mil-0-9858A.
- AFT technicians constantly inspect products using the most advanced metrology equipment and automated optical inspection gear.
- We maintain a full metallurgy lab to ensure that everything we produce meets the most stringent metallurgical specifications.
- Every step of the manufacturing process is controlled by a sophisticated planning and control system.
- Using microprocessor controls and closed-loop injection systems, AFT can apply statistical process controls to guarantee that we get your job done exactly right.

Service

AFT is dedicated to the process, the entire process. Our sales and engineering staff are accessible throughout the construction of your part, giving you personal attention every step of the way.

AFT encourages open communication between customers and manufacturing work cell managers. With clear lines of communication, we can better ensure that quality and accuracy remain consistent. This communication also leads to improved manufacturing efficiency and a quicker delivery to market.
Facilities

At more than twice the size of our nearest competitor, AFT has volume and automation capabilities far beyond the rest of the industry.

• AFT has two large-scale manufacturing centers: one in Longmont, Colorado, and another in Retsag, Hungary.

• AFT powers more than 160,000 square feet of cutting-edge manufacturing space, giving us the facilities to support a global clientele.

• Between our two facilities, we run 37 molding machines, 14 sintering furnaces and 4 debinding units. No competitor even approaches this level of machinery.

• Equipped with 3- and 4-axis robotics, AFT molding machines ensure optimum precision.

• Mold injection machines are equipped with computerized vision technology that guarantees complete and proper filling of the molds.

• We maintain full, onsite machine shops to provide all the customizable construction and maintenance our customers require.

• Scalable production allows programs that can yield a few thousand pars a year, up to several million.
Solutions

If you have a job that requires the most stringent standards in the world, built with cutting edge technology and designed around an adaptable process, then AFT is your solution. AFT’s combination of resources, facilities and mindset has created a company that isn’t just ahead of the pack; it’s in a class all its own.

At AFT we thrive on innovation. We employ the most progressive-minded engineers on the planet. We invest enormous sums into research and internal process testing. We are committed to technology and constant advancement.

When you work with AFT, you aren’t limited to tried-and-true methods for component production. We are committed to creating a customized process just for you. If a methodology doesn’t exist, we will invent it. At AFT our imagination always pushes the limits of possibility.

Don’t trust your vision to anyone. Trust it to AFT, the definition of accuracy delivered.

The AFT MIM School

As an added service, AFT conducts regular seminars on our cutting-edge Metal Injection Molding process. The AFT MIM School seminars take place at our Longmont, Colorado, facility and cover all elements of the design and manufacturing process. Among other topics, attendees will learn about powders and compounding, the basic MIM process, how to design for MIM, the MIM manufacturing steps, quality control issues and secondary operations related to MIM. For more information, visit www.pcc-aft.com or call 303-833-6000.
Founded in 1987, AFT is a wholly owned division of Precision Castparts Corporation (PCC), a multi-billion-dollar international juggernaut in parts manufacturing. Our corporate headquarters sit just minutes from downtown Denver and the scenic Colorado Front Range. With world-class skiing, golf and mountain activities within easy reach, it’s easy to see why some of the world’s best MIM and ThixoForming professionals have come to work with us. Visit us and see for yourself. One look at our facilities – and one glance at the surrounding scenery – and you’ll understand why the center of the metal parts manufacturing universe is right here in Longmont, Colorado.

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