THE APPLIED ADDITIVE MANUFACTURING LEADER FOR AEROSPACE & DEFENSE

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Sintavia is the global leader in applied additive manufacturing for the Aerospace & Defense industry as well as for other critical end markets. We are experts at using the raw AM technology, supplied by our powder, gas, machine, and software partners, to design and manufacture components that meet the strict quality standards of these industries.

This is no mean feat; at Sintavia, our biggest investment has always been in our aerospace quality management system—a system that forms the backbone of our company’s operations. AM has the potential not only to completely displace the traditional supply chain for critical industries, but also to improve performance via optimized design. However, it can only do these things if it can conform to existing and exacting quality requirements.

This is our strength at Sintavia, and one in which we take the lead within the AM industry. Thank you for your interest in Sintavia, and welcome to the future of manufacturing.

Brian Neff
Founder and Chief Executive Officer
Sintavia, LLC
Sintavia is the first independent manufacturer of its kind to offer a vertically integrated, end-to-end metal additive manufacturing process that meets aerospace production quality standards. Sintavia's precision metal components are produced more efficiently than traditional casting and forging technologies, with a greatly reduced environmental impact.

**The Vertically Integrated Solution**

From an accredited, in-house laboratory, which verifies powder quality, to post-processing and non-destructive testing of final components, Sintavia is the vertically integrated solution for Aerospace & Defense OEMs. Sintavia is uniquely positioned to supply serially manufactured components with guaranteed quality and repeatability as part of the global supply chain.

The ability to serially manufacture precision metal parts via additive manufacturing depends on successfully Designing for Additive Manufacturing (DIAM).

Optimizing for the AM process is a difficult task given the numerous parameters involved throughout the entire metal additive manufacturing life cycle.

Optimized Performance

Sintavia is a leader in the re-design and optimization, via AM, of components for the Aerospace & Defense industry, in particular heat exchangers and fluid control components. By understanding how to additively manufacture aerospace-level quality, Sintavia is able to partner with its OEM customers and design the next generation of components that are more efficient, less pollutive, and less expensive.
Sintavia is the leader in AM production and certification of fluid control components including high pressure ducts, flow control valves, heat exchangers, and chassis for customers worldwide. As the implementation rate of AM accelerates through the Aerospace & Defense industry, Sintavia has emerged as the leader for AM production of key product categories relating to fluid control componentry, among other key product categories.

**Chassis**

Chassis, particularly those with internal conformal cooling holes, are natural applications for AM, combining traditionally difficult manufacturing aspects. These include thin walls, internal passageways, and unique geometries.

**Heat Exchangers**

AM has long been recognized as a natural production process for heat exchangers, given AM’s ability to create internal passageways in geometries that cannot be manufactured by traditional methods. Sintavia manufactures heat exchangers for several end industries, and can manufacture wall thicknesses of 150 microns or less.

**High Pressure Ducts**

Sintavia additively manufactures precision high pressure ducts and duct assemblies for Aerospace & Defense applications. AM is uniquely suited to meet the difficult design geometries and tolerances of high pressure ducts, and can manufacture assemblies that require fewer component piece parts.

**Flow Control Valves**

Production of flow control valve assemblies is greatly simplified via AM, with shorter lead times and fewer piece part assemblies. Sintavia manufactures flow control valves for commercial aerospace and other key critical industries.

**Other Part Families**

As AM continues to be adopted, Sintavia will continue to work with its customers to develop successful manufacturing strategies for new part families.

**Advantages of AM**

- These designs can offer substantial weight savings and performance in modern aerospace advanced component and assembly design. Each design is manufactured from electronic data generated from CAD files, making it a fully direct digital manufacturing process.
- Since the design is controlled directly from a CAD file, AM can produce parts that were at one time impossible to manufacture by conventional processes such as casting, forging, and machining.
- The design is only limited by a designer’s creative abilities. Features such as conformal cooling inserts, functional integration, complex geometries, lattice networks, and hollow members are now produced with considerable ease via the AM process.
Printing

On its fleet of high-speed industrial printers, Sintavia currently manufactures with Nickel, Titanium, Stainless Steel, and Aluminum alloys and other proprietary powders. Sintavia’s 55,000 ft² production facility was built around lean production principles – one of the very first AM factories of its kind to be so.

Surface Finishing

Sintavia is a global leader in the development and implementation of AM surface finish techniques and processes that conform to aerospace quality standards. Sintavia’s surface finishing equipment includes wet and dry blasters, multi-vibrating systems, disk finishers, and exude hones.

Machining

Although powder bed fusion parts come out of the machines with a remarkable near net shape, post-processing is often involved to meet critical dimensions and/or surface finishes.

Sintavia utilizes a wide array of final machining methods to meet or exceed customers’ expectations. The company uses multi-axis vertical machine centers, lathes, and traditional mills – all on site – to machine final tolerances.

Furnacing

For most critical applications, particularly those in the aerospace industry, hot isostatic pressing (HIP) and vacuum heat treatment are required to remove porosity of the finished part, increase ductility, and reduce fatigue damage.

Sintavia operates both a hot isostatic press and multiple vacuum heat treat furnaces in-house. After stress relief, all parts must be removed from the build plate after production, and Sintavia uses wire electric discharge machines and bandsaws for this task.
**Metallurgical Testing**

Sintavia’s metallurgical services for AM include:

- Metallography
- Knoop Hardness Testing
- SEM
- Vickers Hardness Testing
- Hardness Testing
- ICP Testing
- Rockwell Testing
- Failure Analysis Testing

**Mechanical Testing**

As part of its material characterization lab, Sintavia offers comprehensive mechanical testing capabilities using some of the most advanced equipment available. Sintavia’s mechanical laboratory performs the following tests:

- Fatigue Testing
- Tensile Testing
- Creep/Stress Rupture
- Crack Propagation
- Failure Analysis
- Fracture Toughness

**Non-Destructive Testing**

Through its wholly-owned subsidiary, QC Laboratories, Inc., Sintavia offers certified NDT services to its customers worldwide including:

- Fluorescent Penetrant Inspection
- Ultrasonic X-Ray
- Radiography
- Magnetic Particle
- Shop X-Ray
- Welding Inspection
- Eddy Current
- Magnaflux

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By applying the inherent benefits of metal additive manufacturing, Sintavia is taking a leadership role in improving the industrial ecology of precision metal manufacturing.

Not only do the components manufactured by Sintavia perform better mechanically than traditionally manufactured parts, but they are less expensive and possess a better environmental profile.

It is well documented that traditional casting and forging technologies are highly pollutive. Not only can Sintavia’s products reduce weight, thereby saving fuel, but the manufacturing process itself is much less pollutive. AM represents the next step in industrial ecology, and Sintavia is proud to take a market driven leadership role in this exciting development.

Sintavia is proud to take an early leadership role in a technology that can produce parts that not only are less expensive and faster than traditional manufacturing, but also result in a greatly improved environmental footprint.

Sintavia is proud to participate in green initiatives.