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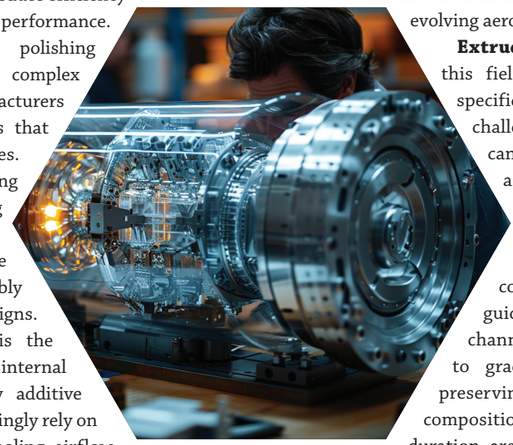
BUSINESS AND TECHNOLOGY SOLUTIONS THAT DRIVE A&D INDUSTRY

ADVANCING PRECISION IN AEROSPACE ABRASIVE FLOW MACHINING

Additive manufacturing has expanded design freedom in aerospace and defense engineering, yet that freedom often introduces a persistent manufacturing obstacle. Internal passages created by 3D printing often have rough surfaces that disrupt airflow or fluid flow within critical components. Rocket engines, propulsion assemblies and other performance-sensitive systems rely on carefully controlled internal geometry, and even small irregularities can reduce efficiency or compromise expected performance. Conventional machining and polishing techniques struggle to reach complex interior channels, leaving manufacturers searching for finishing methods that can address inaccessible geometries.



Aerospace executives evaluating specialized surface-finishing services focus on a small set of practical concerns that determine whether a solution can reliably support modern component designs. One important consideration is the ability to improve the quality of internal passages in parts produced by additive manufacturing. Designers increasingly rely on intricate channels that improve cooling, airflow or fluid circulation, yet these geometries introduce surfaces that cannot be polished through direct mechanical contact. A capable finishing service must therefore work inside enclosed or narrow passages while preserving dimensional accuracy and surface consistency.

Process control consistency also matters greatly. Aerospace programs often require extremely tight tolerances and documented results, especially when parts will operate in propulsion systems, turbine assemblies or other performance-critical environments. Finishing processes must allow engineers to tune results based on each part's geometry and the level of surface improvement required. A service provider that can adapt polishing intensity, evaluate progress during processing and confirm results through inspection creates far greater confidence for manufacturers responsible for mission-critical hardware.

Experience handling advanced aerospace components also influences supplier selection. Aerospace programs often move quickly from prototyping to production, particularly in the commercial space and defense sectors, where additive manufacturing continues to expand. Service providers must be capable of solving unusual finishing problems when new part geometries emerge. Longevity in the field and a demonstrated ability to support complex components provide reassurance that a finishing process will scale alongside evolving aerospace designs.

Extrude Hone AFM stands out in this field through a process designed specifically for interior polishing challenges that conventional tools cannot reach. The company uses a polymer-based media mixed with abrasive grains that is hydraulically pushed through targeted passages inside a component. Custom fixtures guide the media through internal channels, allowing the abrasive flow to gradually smooth surfaces while preserving the part's geometry. Media composition, abrasive size and processing duration are adjusted according to passage dimensions, starting surface roughness and the level of smoothness required for the final application. The service has become particularly relevant as aerospace manufacturers adopt additive manufacturing for propulsion and defense applications. Intricate internal designs that cannot be polished conventionally can be finished through abrasive flow machining, enabling improved airflow and fluid movement within complex parts. Industry experience also strengthens the company's credibility.

Executives evaluating aerospace abrasive flow machining services ultimately look for finishing methods capable of addressing internal geometries, adaptable process control and long experience solving difficult component challenges. **Extrude Hone AFM** demonstrates strength across these areas, making it a compelling choice for organizations requiring precision polishing of complex aerospace components. AD

Extrude Hone AFM

Abrasive Flow Machining for a Smooth Performance

Additive manufacturing has transformed aerospace design, enabling engineers to easily build complex internal parts that are far more intricate than before. This innovation, however, introduces a new challenge, rough passages that limit air or fluid flow and reduce efficiency. Extrude Hone AFM specializes in polishing these hard-to-reach pathways in both machined and additively manufactured parts for aerospace and defense companies, where high performance and efficiency are expected.

Sienna Rose, Manager and in charge of Quality Control

> **“We try new things and think outside the box to get the job done for our customers.**

Rocketry is the clearest example of where Extrude Hone AFM’s work matters most. It has been involved in streamlining parts on nearly every rocket launched in the last 15 years. Abrasive flow machining (AFM) is crucial in the aerospace and defense sector as additive parts tend to have rough passages inside. The job is often simple, but traditional machining and polishing cannot reach these areas. This is where Extrude Hone AFM’s expertise comes into play.

“We try new things and think outside the box to get the job done for our customers,” says Will Melendez, manager.

The process uses a polymer material, like Silly Putty, mixed with silicon carbide abrasives. For each tool or part, Extrude Hone AFM makes a custom fixture to guide the media through the targeted passage. A hydraulic machine holds the abrasive media, which changes depending on the passage and the finish the customer wants. Once everything is ready, the hydraulic setup clamps the part and pushes the media back and forth through the part to polish and deburr the internal walls.

Recognizing that repeatable results come from evaluation and step-by-step checks, Extrude Hone AFM’s team members constantly monitor the hole size, number of passages, starting roughness and the target finish of the part. These details help alter the abrasive size and the media for that part. Processing happens in small steps, with the part removed for measurement and inspection before the next run. More aggressive media can be used as the need arises.

Extrude Hone AFM’s impact extends beyond aerospace and into industries like medical and automotive. The main focus is always performance. The company helps when a part isn’t meeting expectations or isn’t as efficient as planned. Over time, the AFM process has moved earlier in the manufacturing pipeline. More clients now plan for AFM and include it in blueprints and specifications, making it part of the design instead of a last-minute fix.

Early planning shows the trust built through steady results. Extrude Hone AFM stands out by solving problems that others cannot. This ties to its strong, long-standing experience since the 1960s, supported by its out-of-the-box thinking and a willingness to try new approaches to meet customer needs. AD

Certificate

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CERTIFICATE OF RECOGNITION

Extrude Hone AFM

This is to certify that **Extrude Hone AFM** has been recognized by the Editorial Board of **Aerospace and Defense Review** as

TOP AEROSPACE ABRASIVE FLOW MACHINING SERVICE 2026

EDITORIAL ATTESTATION:

This recognition is determined through a bona fide editorial process based on the Aerospace and Defense Value Assessment Model and its defined methodology. It draws on independent editorial research, subscriber nominations and industry input, assessing impact on mission readiness, engineering performance, system reliability and execution in highly regulated, security-sensitive environments.

Jonathan Allred
Managing Editor
Aerospace and Defense Review

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