

Aerospace Industry Use Case for Xebec Deburring Technologies

Aerospace manufacturers must attain precise edge breaks and quality surface finishes to meet specs for machined workpieces. This is critical to proper aerodynamics for workpieces like rotating engine parts, ensuring the finish reduces drag and achieves the necessary balance. If the part doesn't meet requirements, a manufacturer could end up scrapping a part that costs hundreds of thousands of dollars.

Unfortunately, this worst-case-scenario is a common occurrence in the industry. Most manufacturers still remove parts from the CNC machine to deburr them by hand with tools like files, grindstones and belt sanders. Despite the expertise of the technician, this results in inconsistent quality and increases the risk of scrap and rework.

Aerospace manufacturers can solve their most pressing issues, such as the high cost of scrapping parts, by introducing Xebec deburring solutions into their processes. This includes integration of automated deburring and finishing solutions to replace less efficient hand-deburring operations.

What can aerospace companies expect when updating their deburring and finishing processes?

- Improve surface finish
- Increase consistency and quality
- Reduce setup and cycle times
- Increase throughput and capacity
- Meet tight dimensional tolerances
- Obtain clean, minimal edge breaks

Automated deburring with Xebec ceramic fiber tools reduces cycle time, results in consistent quality and accomplishes both deburring and finishing at once. The ceramic fiber technology performs markedly better than nylon impregnated brushes, making it ideal for the aerospace industry and its tight precision demands.

These tools can help aerospace manufacturers address their immediate issues with deburring and finishing, as well as related issues like optimizing employees' time, taking on more jobs and enhancing the company's reputation for quality.



Xebec Deburring Solutions and Applications in the Aerospace Industry

Aerospace manufacturers can use Xebec deburring solutions on a range of aerospace parts, including:

- Wing and structural parts
- Internal engine parts and engine housings
- Entire housing and framework rockets
- Manifolds and hydraulic parts
- Heavy structural mounts for engines
- Any metal component that goes into airplanes, fighter jets and rockets

Here are a few specific examples of ways Xebec deburring technologies can be used on aerospace parts:

Xebec Surface Brush

Aircraft Body: Manually deburring this large workpiece with conventional abrasives takes time. Automate deburring with Xebec ceramic fiber brushes to achieve a consistent finish and cut down machining time.

Wing Rib: This workpiece is also large and takes time to deburr manually with a belt sander. Automate deburring to achieve uniform quality and realize a shorter cycle time.

Landing Gear Parts: Manually deburring these parts typically involves using a file. This leads to unstable quality and a long processing time. Automate deburring with ceramic fiber brushes for a consistent quality finish.



Turbine Blade: Operators typically use files to deburr this part as well. This causes unstable edge quality, and a recovering process is required. Automate the process for a precise, consistent edge quality and to achieve an even edge shape.

Blisk: Using a grindstone to deburr this part takes time due to its complicated design, often resulting in unstable edge quality. With automated deburring, a constant edge quality can be achieved and one operator can operate multiple machining centers.

Turbine Disk: This is another part operators use grindstones to manually deburr. This often leaves remaining burrs and results in inconsistent edge quality. With full automation, no burrs remain and quality is stabilized.





Xebec Stone Flexible Shaft

Cylindrical Aircraft Parts: Cross hole deburring these parts typically involves a rubber grindstone in a rotating tool. With this method, finish quality varies depending on the worker and their skill level. Each hole takes 150 seconds to deburr on average, equating to 40 minutes to deburr 16 holds. With the Xebec Stone Flexible Shaft, quality is stable and deburring time can be reduced to 30 seconds per hole, helping manufacturers realize a shorter cycle time.

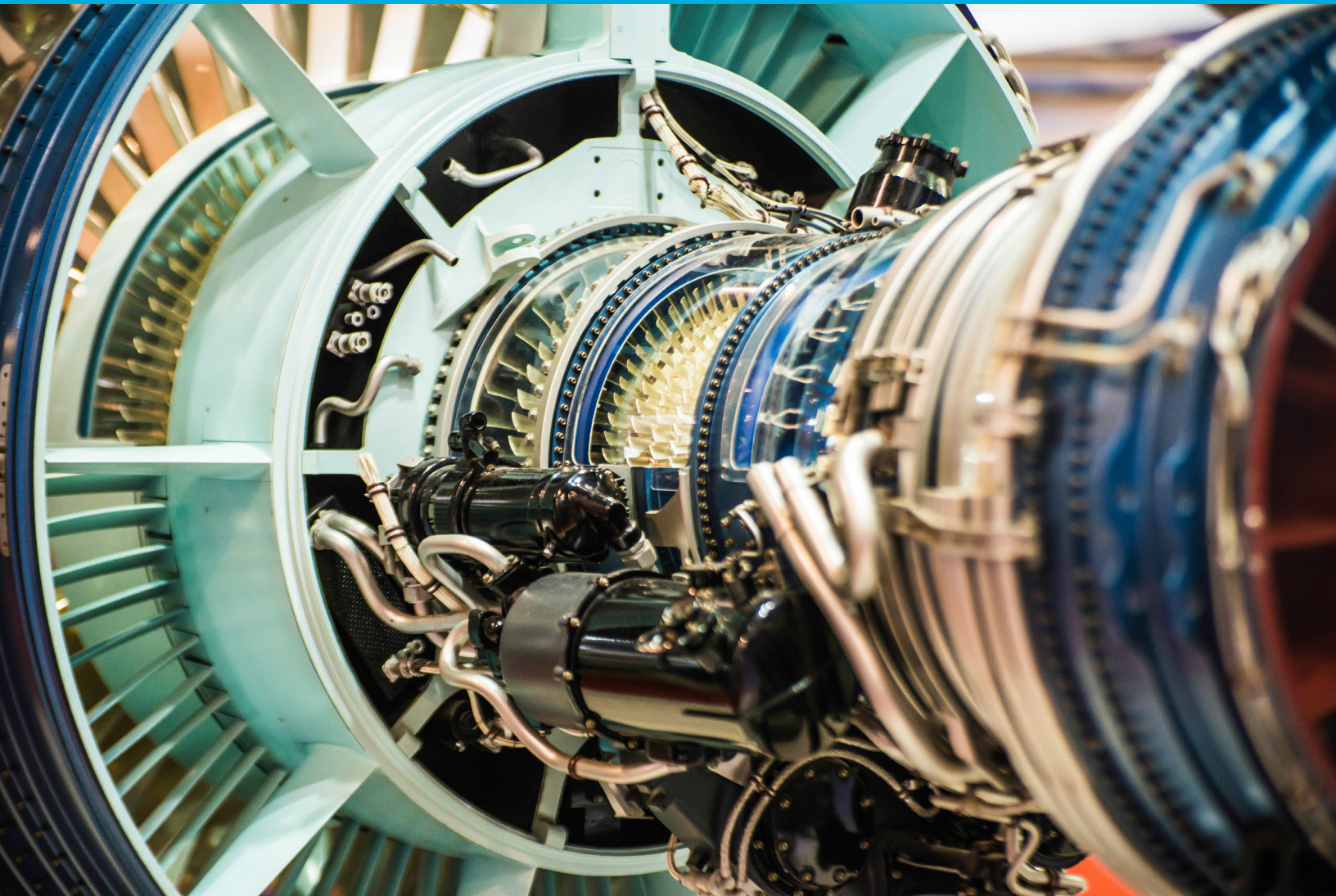
Xebec Deburring Solutions and Applications in the Aerospace Industry

Deburring and finishing aerospace parts is no small aspect of the process, and the resulting work can either add fuel to some of manufacturers’ biggest challenges or solve for them.

What issues do aerospace manufacturers have to manage with manual deburring?

- Time and resources to move large parts for each phase of manual deburring and finishing process, which adds to setup time.
- Time and resources to conduct extensive, precise hand-deburring and -finishing on high-precision and complex parts.
- Limited ability to optimize machine and operator time to increase capacity.
- Challenge of attaining consistent quality and precision that meets spec with each part.
- High cost of scrapping expensive aerospace parts if they don’t meet specs.
- Worker strain and injury due to hand-deburring, which often involves contorting and balancing to reach areas on large parts.
- High cost of skilled labor to hand-deburr and -finish parts.





With automated deburring and finishing using Xebec ceramic fiber brushes and tools, aerospace manufacturers will see immediate results that solve for these issues. Results include:

Save time and resources

Automated deburring helps manufacturers optimize the time of both their machines and their workforce. They often save substantial setup time by automating the deburring and finishing process on the CNC machine and accomplishing these two tasks at once. To add to that, the automated process is faster and more efficient than hand deburring, reducing cycle time and allowing

for increased throughput. It also allows operators and employees to operate multiple machines at once or shift their duties to other more profitable tasks.

Reduce scrap and rework

Xebec ceramic fiber brushes help manufacturers achieve necessary precision on aerospace parts. This reduces the chance of scrapping expensive parts and wasting the time and resources already invested in the part. It also reduces the likelihood of added setup time and further resource allocation should a part need to be reworked to meet precision requirements.

Increase throughput and capacity

Automating deburring and finishing shortens the cycle time for a part, freeing up machining time to add jobs and/or increase throughput. It also reduces setup time because large parts don't need to be moved as often, which frees up several hours for many parts and enables employees to conduct other tasks instead or optimize throughput. Manufacturers can increase their capacity for work. Additionally, a shorter cycle time on a part often means a faster payment cycle from customers.

Improve employee safety

Deburring and finishing large aerospace parts by hand often involves straining and contorting to reach difficult places and achieve precision. The aerospace manufacturing industry has a high rate of worker injuries and any opportunity to support better safety and comfort in their daily responsibilities is worth considering to lower employee turnover. Automated deburring and finishing greatly reduces the amount of manual work employees must dedicate to these tasks, improving safety and reducing risk of injury.

Realize cost savings and added revenue

When you calculate the savings you'll realize from each of the above results, you'll notice that each one of them comes with its own cost benefit. Reducing scrap is one of the most obvious savings categories if you work with parts that cost in the hundreds of thousands. Employee safety might seem less obvious, as those costs aren't easy to know unless an incident occurs. Being able to increase your capacity can help you do more than save – it can help you grow and increase profits and revenue. And you can easily measure how optimizing your time and resources contributes to savings over a one- to three-year period after implementing Xebec deburring and finishing solutions.



Achieve Notable Process Improvement with Xebec's Help

"Xebec reps have over thirty years of experience engineering automated deburring and finishing solutions in aerospace and other industries. We know how to help companies obtain the precise finished product they need. We can help engineers redesign the process to reduce bottlenecks, improve consistency and quality, and speed up cycle times."

– Dave Sawicki, Sales Director and Senior Applications Specialist

