VALUE ANALYSIS LEADS TO BETTER AIRCRAFT SEAT PRODUCTION AT LESS COST

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In the aerospace industry, there is no place for metal components that do not meet the very highest standards of quality. Flight crews and passengers depend on the integrity, reliability and safety of metal parts that go into a plane.

With over seventy years of experience servicing this demanding industry, it's not uncommon for others to turn to us for evaluation of an aerospace part they are having difficulty with – especially parts that are made off-shore.

CASE STUDY

Application: Aerospace

Part Description: Aircraft Seat Backrest (for flight attendants)

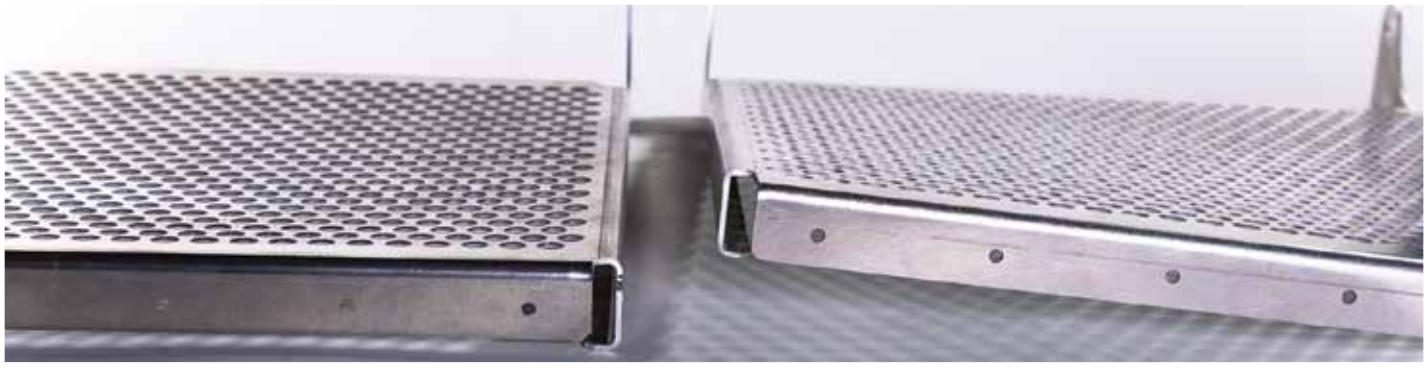
This particular aircraft part made by a low cost off-shore supplier, had a surface flatness requirement of .100" max.

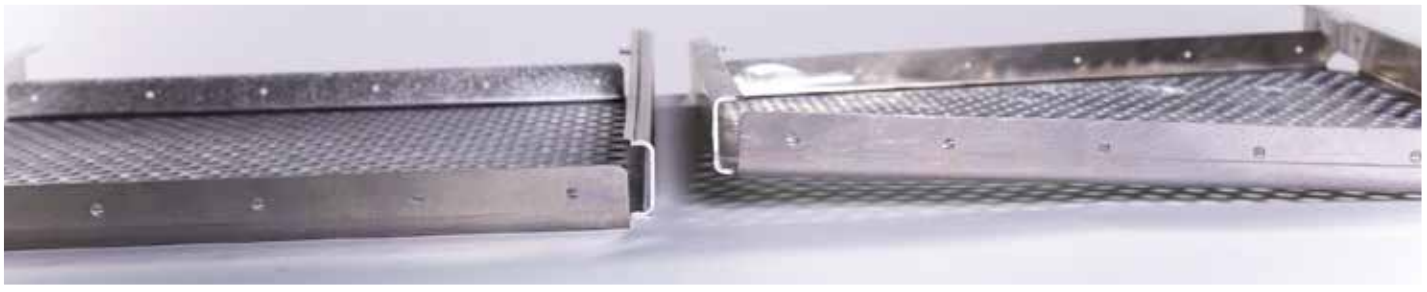
As with all projects, we rely on Value Analysis/Value Engineering (VA/VE) as one of our most important tools to systemically analyze existing parts. VA/VE helps us to identify substitute materials and methods with less expensive alternatives, without sacrificing quality or functionality. VA/VE focuses entirely on the functional aspects of components and materials, and not their physical characteristics.

VA/VE was successfully employed to overhaul the production process of this aerospace part. VA/VE completely changed how the lightening holes were being made, which exceeded all specifications for surface flatness while greatly reducing scrap.

LEFT PHOTOS: Improved part with gang stamping of lightening holes

RIGHT PHOTOS: Original part resulted in extreme warpage and oil canning





ORIGINAL PROCESS:

- Laser machine to cut the outside profile, attachment holes and the 793 lightening holes.
- Bend into final shape with a bending machine

Challenge:

The laser process generated excessive heat which caused extreme warpage and "oil-canning" which exceeded flatness requirement up to .500". Additionally, the aerospace customer was experiencing a 50% scrap rate and non-value added inventory.

After a thorough VA/VE process and testing, it was determined that warpage would be eliminated with gang stamping of the lightening holes versus laser cutting. Additionally, this method would produce a part that would exceed the surface flatness specification of .100" max.

PROCESS AFTER VA/VE:

- Laser machine to cut the outside profile and attachment holes
- Gang Stamp the 793 lightening holes.
- Bend into final shape with a bending machine

VA/VE Improvement:

Gang stamping lightening holes eliminated distortion and kept the surface flat to .040" max, exceeding this important .100" requirement. The process of stamping holes eliminated heat-related distortion on the seating surface that was caused during the laser cutting process. This solution made a better part while eliminating all costly scrap. Additionally, the stamping process is more efficient and yielded a time savings which helped reduce the cost of this operation by 20%.

Banner then applied this process to two other similar backrests for even more savings and improved part quality.

CONCLUSION

It has never been a more exciting time for evaluating how existing parts are being made. The tools to enhance and reduce the costs of existing parts are improving all of the time. Adopting old adages such as 'if it ain't broke don't fix it' have no place in today's world of technology and continuous improvement requirements.

VA/VE uses a step-by-step methodology to reduce costs, improve product functionality or both. The outcomes can reduce costs, improve function, and reduce waste. It can also help to improve a parts manufacturability and assembly.

It is also common to use VA/VE in conjunction with the principles of Lean Manufacturing to take a broader view beyond reducing costs in both product development as well as production. Partnering with suppliers that are actively pursuing better ways of inspecting, evaluating and manufacturing will be in a better position to offer better ways of producing parts with higher quality and reduced waste.

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