



Sustainable manufacturing has led to an increase in the popularity of high-performance additives which have enhanced the lifespan of sealed aluminum parts, increased the productivity of hot sealing by over 20 percent with reduced maintenance and manufacturing sludge



### ➔ Market Situation

The manufacturing companies have been increasing spending on enhancing production efficiency along with limiting the cost. Furthermore, the shifting inclination towards sustainable manufacturing has paved the way for shop floor owners to prospect for engineering solutions that would not only limit the lead time but also reduce environmental waste. As a result, the inclusion of coatings solutions is expected to emerge as one of the key preventive maintenance tools that are projected to resolve the concerns of the manufacturers. Over the past few years, designers as well as engineers working in manufacturing firms have been striving every day to enhance product durability and improve productivity. Growing demand for lightweight and aesthetic aluminum parts has resulted the manufacturers incorporating cost-effective anodizing solutions to maximize both the productivity and sustainability of their processes.

### Client Challenges

- ✦ Increased time for hot sealing
- ✦ Large amount of generation of drag out and waste
- ✦ High spending on combating the foaming issue



### Our Approach

The research team connected with the buyers of aluminum metalworking segments who are actively using conventional metalworking fluids in their assembly lines. It has been revealed that the introduction of such solutions is helping to cut costs and limit the resource count during the application of coatings the metal parts such as steel and aluminum. These coating additives are capable of ensuring a long-life etching effect for outstanding finish and high productivity. Conventionally, aluminum metal reacts with oxygen in ambient air and other weathering influences, which results in an undesirable and unaesthetic oxide layer. The inclusion of effective coating additives results in converting the outermost aluminum layer into a controlled thin and smooth oxide skin. As a result, the inclusion of high-performance additives in the formulation of metalworking fluids induces the protection of the surface from further oxidation.

### Our Recommendations

Based upon the indicators obtained from our research study, we have proposed the inclusion of sealing additives for the companies who are manufacturing metalworking fluids to increase the performance in hot sealing along with limiting the toxicity in cold sealing. Such additive solutions are capable of serving the following purposes:-



**Helps in doubling the standard life span of sealed parts**



**Increasing the productivity of single-step hot sealing by a minimum 20%**



**Nickel-free cold seal coating formulation can work in a range of 35°C-40°C**

### Business Impact:-

The inclusion of high-performance additives in metalworking fluids has resulted in providing various benefits namely high etching and finishing levels, excellent bath stability, reduced drag-out, and no foaming issues. Metal processing companies also reveal that the inclusion of metalworking fluids has resulted in limiting the hot sealing by 3 min/μm. Furthermore, it has been also seen that the use of finished coatings solutions based on this additive chemistry has resulted in reducing the make-up of the bath by 50% and thus, inducing a low CO2 footprint. In terms of economic aspects, the aluminum processing companies benefitted from achieving substantial cost savings per square meter of hot-sealed materials.

### Conclusion

Manufacturing cost in developed nations of North America and Europe, where there is a high scope of use of advanced materials in the last two decades, has remained one of the key challenges as a result of increasing utility expenditure coupled with adherence to stringent regulations. However, the increasing acceptance of sustainability along with the shifting inclination to incorporate advanced materials to limit total operating costs (TOC) is projected to remain some of the key takeaways for the investors who are prospecting to enter the value chain of high-performance additives for the chemical industry.

Supporting government policies to promote investment in the manufacturing sector of India and the Middle East due to the implementation of Make-in India and Saudi Vision 2030. This is projected to upscale the production output on a domestic level. These favorable initiatives are expected to promote the scope of high-performance additives as cost-trimming solutions for aluminum processing companies in the near future.