

## Case Study: Emerald Acid Clean #1

# Environmentally friendly aluminum cleaner outperforms the competition

## The Challenge

Hubbard-Hall was contacted by an international manufacturer that specializes in deep-drawn aluminum extrusion. Their products are used in the aerospace, automotive, and military industries, and have very demanding application specifications.

Mandated to transition away from toxic chlorinated solvents to an aqueous degreaser for health and environmental reasons, the company wanted to test products from several vendors.

## The Approach

After a full briefing on the company's needs, our experts recommended Emerald Acid Clean #1 (EMAC1). EMAC1 is a citric acid-based solution which can be applied as a soak, ultrasonic or spray cleaner. It contains a high percentage of EPA's designed to meet the environment (DfE) acceptable surfactants and solubilizer standards.

Emerald Acid Clean is engineered to remove a variety of soils and oxides from aluminum, standard and stainless steel, cast iron, copper, brass, Monel, and other high nickel alloys. It excels at removing forming lubricants, machining oils, light rust and scale from these substrates. It is also effective for lime scale removal.



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## Executive Summary

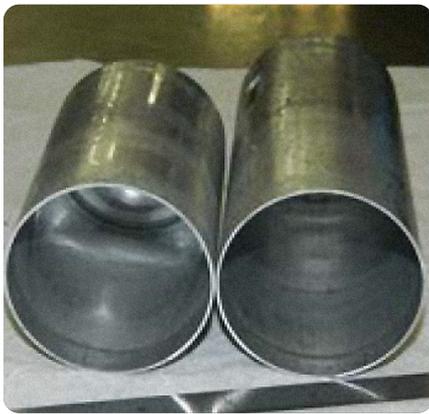
### Key features of Emerald Acid Clean #1

- Highly concentrated
- High detergency
- DfE approved wetting and solvent system
- Can be used as a burnishing compound
- Removes light rust and scales
- Contains no mineral acids
- Non-fuming
- Safe for employees

## The Outcome

The competitive trials were clear and consistently favored the Emerald Acid Clean #1. EMAC1 so thoroughly cleaned and removed any traces of the stearate lubricants without etching the aluminum. The high degree of cleanliness also contributed to an easier anodizing further into the manufacturing process

In addition to exceptional cleaning results, there was also a significant reduction in the overall cleaning process while at the same time increasing manufacturing line productivity. The manufacturer felt that Emerald Acid Clean #1 proved easier to control than previous chemistries they had used.



**LEFT IMAGE:** Deep drawn aluminum extrusions before cleaning and brightening

**RIGHT IMAGE:** Aluminum extrusions after washing with EMAC1 at 9.13% for 6 minutes with a 2-minute factory water rinse and a 5-minute heated dry.

“The success of Hubbard-Hall’s Emerald line of industrial cleaners has proven that safer, environmentally benign cleaners are a viable option in the industrial parts cleaning market.”

**Bob Farrell Sr.**  
Technical Director  
Hubbard-Hall

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