

World Class Cleaning Solutions

Case Study

International Aerospace Component Supplier

CUSTOMER DETAILS

Product: AquaVantage® 815 GD
Parts Cleaned: Multiple types of tubes; titanium and aluminum alloys
Removing What: Processing and machining oils, Particulate and process debris, Corrosion inhibitor oils
Why: “In Process” cleaning and degreasing of parts at the end of the manufacturing process, prior to packaging

Equipment Used: Washing System – 3 Tank Ultrasonic Immersion

- Tank 1** – Washing tank, AquaVantage® 815 GD, 65°C, 5min. immersion and ultrasonic with circulating water;
 - Recirculation via solution “jets”, very near and parallel to liquid surface, for agitation and “blow-off” toward overflow skimmer; creates a lot of agitation at solution surface
 - Total wash liquid volume 2,430L, containing 55Gallon (208L) charge. Tank size 3,000L.
 - Concentration target ~10%, though initial 8.56% (i.e., 1 drum).
- Tank 2** – 3min. Rinsing, compressed air bubbling agitation
- Tank 3** – 3min. Rinsing, recirculating water, no compressed air agitation.

Original Equipment Design:

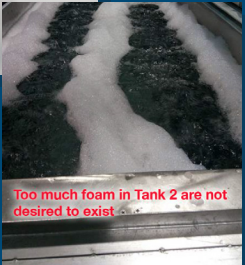
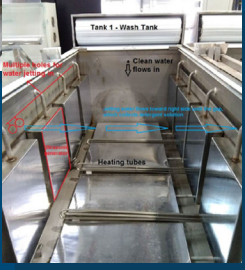
- Temp** – 65 degree Celsius
- Concentration** – initial 8.56%, tuned to 10%
- Wash time** – 5 min. in wash tank
- Rinse tank 1** – 3 min. by clean DI water; Compressed air agitation
- Rinse tank 2** – 3 min. rinsing by hot DI water (85°C), cycling water, no compressed air agitation

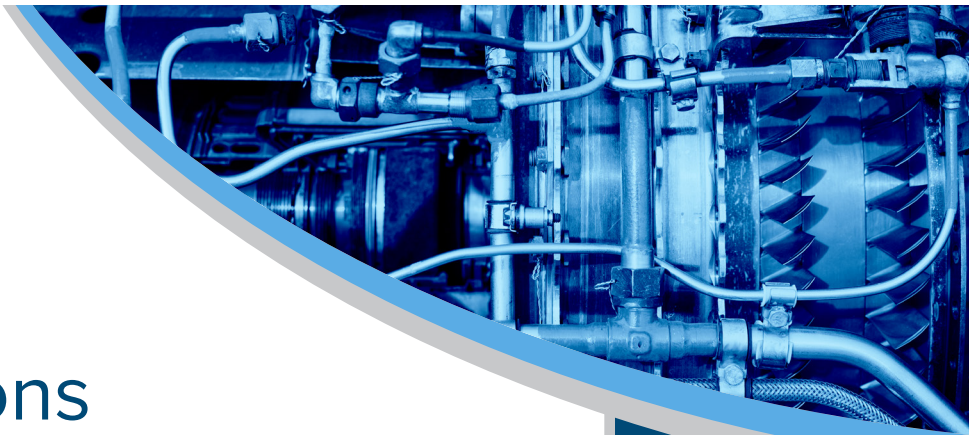
Test Results – Original Equipment Design

- Too much foam in tank 1 wash tank due to agitation of surface jets
- Foam in wash tank 1 drag-out to rinse, tank 2
- Detergent and foam dragged into tank 2 (rinse) further agitated by air agitation
- Customer complained about foaming, incomplete rinsing, spotting on parts

Process Adjustments – Brulin and partner’s process recommendations

- Upgraded Washing System Design to minimize sources of foaming
- Since AquaVantage® 815 GD is inherently high foaming, switch to a low-foaming detergent in the immersion system
- Customer chose recommendation to adjust the washing system to minimize sources of foaming
- Strong preference to continue using a product satisfying existing approval and testing requirement
- Maintain recirculation in tank 1, but return solution via washing eductors, beneath water surface, downward flow toward part basket; improve washing agitation, avoid surface foam
- Surface jets remain for skimmer/overflow, but turned off during wash operation
- Eliminate air bubbling agitation in tank 2
- **Procedural change:** Minimize detergent drag-out from wash tank with proper part basket draining: lower foaming, better tank life





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Upgraded Washing System: Jets down ~45°

Tests after upgrading Washing System

- Controlled foaming of AquaVantage® 815 GD in Wash Tank 1
- Controlled foaming in rinse, Tank 2 & 3

Procedural changes to minimize drag-out from tank 1 (wash tank)

- Adequate drain time
- Part positioning

Current Chemistry: AquaVantage® 815 GD

Concentration: 10%

Washer Type: 3-stage (1 wash, 2 rinse) modified

Specific Metals: Aluminum and Titanium

Temperature: 149°F/65°C

Wash Time: 5 minutes

Rinse Water Temp: 185°F/85°C

Rinse Water Number and Time: 2 rinse stages, 3 minutes each

Dry: Compressed air blow-off

Tank Life: Customer Improvement requested: Control Foaming in questionable equipment design

Other: Satisfy existing aerospace specification approval, testing requirements

Prior Processing Steps

- Surface treatment – Step 1: Henkel Turco Airlion T-4090
- Cleaning after Step 1 surface treatment
- Surface treatment – Step 2: Alodine 1200s, i.e. Cr+ ions for coating

RESULTS

Problems: Excess foam and excess drag out

Causes: High agitation equipment design, drag-out

Solution: Modified equipment and process based on Brulin and partner recommendations

- Customer is very satisfied with the cleaning performance and control using AquaVantage® 815 GD for degreasing their aircraft tubes
- Continue to Monitor Customer the customer and their process, support as needed.

