Pollution Prevention Institute

DUCOMMUN AEROSTRUCTURES

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Company background



Ducommun was founded in 1849 in Santa Ana, California, as a hardware supply store and has evolved into a global supplier of manufacturing solutions for the aerospace, defense and industrial markets. The company specializes in electronic and structural systems for commercial aircraft, mission-critical military and space programs, and sophisticated industrial applications. Ducommun has 2,500 employees across eight states and two countries. The Parsons facility is part of Ducommun's structural division and uses chemical-processing and hot-forming processes. The facility employs 140 people and has the capacity to produce more than 4,000 different parts, almost all of which are made from titanium, with a few aluminum exceptions.

Project background

Ducommun has an interest in reducing and even eliminating waste by refining their chemical usage and implementing a new wastewater monitoring system to inform decisions that can lead to reduced water usage.

Incentives to change

At the corporate level, Ducommun is "committed to environmental protection through leadership, investment and involvement," and prioritizes specific environmental, social and governance principles to avoid adverse impacts to the environments in which their facilities are located. The Parsons facility has acted to further these goals by recurrently hiring P2 interns to investigate and implement sustainability projects and practices. This year, the projects provided opportunities to reduce chemical use and waste generation, resulting in cost savings and improved process efficiency. Additionally, wastewater monitoring allowed for the recording of more accurate environmental data.

PROJECTS REVIEWED FOR P2 POTENTIAL

Wastewater monitoring system

Ducommun's Parsons facility uses three outfalls to discharge wastewater produced throughout the different processes they use. One of the outfalls has no accurate system to determine the amount of wastewater produced. Ducommun established a goal of quantifying the amount of wastewater discharged daily as well as actively monitoring and logging its pH.

Because the system had to be resistant to an industrial environment as well as precise, a programmable-logic-controller (PLC)-governed system was on the best option. PLCs are rugged, industrial computers adapted for controlling manufacturing processes, often using sensors for input. A parts list was picked and assembled to accomplish this. Although there is no payback period for this project, the investment is necessary to establish a baseline and understand the impact any process has on water usage. Once the hardware was assembled, an accompanying program was written to totalize the amount of flow that the sensors detect, and to record its pH.

Chemical mill chemical reduction

Ducommun specializes in the formation of titanium parts for commercial airplanes, which are formed using some of the largest hot presses in the country. A biproduct of this process is the formation of alpha case, an oxidation reaction that occurs on the surface of titanium parts when put under high temperatures for an extended period. This oxidation affects the strength and performance of titanium parts and is regulated by Ducommun's customers. The alpha case must be removed to specification by milling the parts with a chemical milling tank. Parts are currently milled for a set amount of time to remove a fixed, over-estimated amount of the part's surface, because the actual depth of accumulated alpha case is unknown and Ducommun wants to ensure the alpha case is removed to specification. Currently, the testing of alpha case depth is done by a third-party company, despite having the proper testing equipment in house.

The chemical reduction project involved establishing a study to determine actual alpha case accumulation on parts. This information could then be used to remove the alpha case layer on parts based on actual accumulation versus the current set milling times.

A test plan was written to accomplish this, including creating a time-study table and monitoring different parameters and their effect on the depth of the accumulated alpha case layer. The study found that the amount of material currently being removed could be reduced. This change resulted in a 10% reduction in chemical usage and waste production from the two milling tanks in use at the facility.

SUMMARY OF 2026 P2 INTERN RECOMMENDATIONS

Project	Annual estimated environmental impact	Estimated cost savings ($/year)	Status
Wastewater monitoring system	N/A	N/A	Implemented 95% Complete
Chemical mill chemical reduction	393 gallons of hot form acid reduced 365 gallons of nitric acid reduced 1,346 gallons of hazardous waste reduced	$13,805	Recommended
Total[1]	**393 gallons of hot form acid reduced 365 gallons of nitric acid reduced 1,346 gallons of hazardous waste reduced**	**$13,805**	
GHG reductions[1,2]	**10.22 metric tons CO_2e**		

[1]Does not include projects "not recommended" or where "more research needed."

[2]EPA P2 GHG Calculator with Cost, 29 November 2022 & EPA WARM Tool- Version 16, December, 2023