

## CASE STUDY

# Evaluation of Vacuum Cycle Nucleation as an Environmentally Preferable Cleaning Process

### Challenge

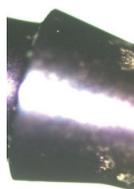
Vacuum Cycle Nucleation is a new technology that could potentially replace the multi-stage ultrasonic system (VCN device shown on right). Making this switch has the potential to greatly reduce toxic chemical usage, and therefore save the company money and increase environmental sustainability. The purpose of this project was to determine if VCN is an environmentally preferable and economically feasible alternative to ultrasonic cleaning. In order for VCN to prove effective, it must be able to clean all types of precision parts at lower cost and with minimal usage of chemicals.

### Solution

NYSP2I began by obtaining a set of baseline parameters for the ultrasonic cleaning; particulate on cleaned devices was examined, and used as a reference point to determine relative effectiveness of other cleaning methods. Next, a test program was developed for cleaning; multiple combinations of cleaning chemicals, drying methods, and vacuum pressures were tested. Finally, NYSP2I calculated the annual cost of running the current ultrasonic cleaning system, and compared that to the cost of cleaning with VCN.

### Results

Based on the results of the cleaning tests and cost calculation, the VCN machine was proven to be an effective replacement for the ultrasonic cleaning system. Comparison of the baseline annual chemical cost model with the worst case VCN scenario indicates a cost savings of \$61,557 a year.



Before Cleaning



After Cleaning

### CHALLENGE

- Determine if Vacuum Cycle Nucleation (VCN) is the environmental & economic alternative to cleaning precision devices with Ultrasonic Cleaning

### SOLUTION

- NYSP2I developed VCN program to clean devices, and compared costs to Ultrasonic Cleaning System

### RESULTS

- VCN machine proven to be an effective replacement
- Baseline cost savings indicate \$61,557 a year

## NYSP2I PARTNERS



10 Regional Technology Development Centers

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