HIGHLIGHTS

United Surface Solutions
Overview of installation and process implemented in RI Manufacturing Company.

Wet Technologies
Overview of recent installations replacing 4 operations with one unique process.

Processing of Complex Geometries
Additively manufactured post processing technology.

Innovative Finishing Technologies

IS002

Wet Blasting Medical Components

This New York company's installation was implemented specifically deburring and final finishing of medical device components. Innovative Finishing and Wet Technologies worked together to develop a process utilizing a tumbling barrel to process 200 workpieces in a 12 min process that eliminated 2 hand deburring operations, a centrifugal disk operation, (30 minutes), and a subsequent glass bead blast for final matte finish.

With a special media we were able to completely finish these components with a consistent, repeatable process that saved the manufacturer time, manpower and rejects.

Wet Technologies, WTSS-36

Tumble Barrel View Inside WTSS-36

Wet Technologies incorporates a unique system into their cabinets that allows for the good media to settle in the cabinet prior to purging the broken down media. This pause valve allows for a consistent, repeatable finish from batch to batch.

Inside:
Finishing Complex Geometries While maintaining delicate features.

Swissline Precision – High Energy Finishing

Swissline Precision, a machine shop located in RI, approached us with a couple of unique deburring applications.

The first application was for very fragile and long stainless steel tubes measuring .187 dia x 15" in length. They were having difficulty deburring the ends of these tubes and refining the surface in a consistent and timely manner. Their current method of hand deburring and polishing was inadequate in that there were great inconsistencies in the quality of the final product due to the very nature of hand work. An increase in production also required a faster way to finish the parts as the current method would not produce the quantities required without a significant increase in personnel and training.

United Surface Solutions CPC-1000

Inside view: United Surface Solutions CPC-1000

Our testing, in conjunction with United Surface Solutions of Santa Fe Springs, CA, provided a solution involving the use of a United CPC 4000 Centrifugal Barrel . This high-energy machine, with the adaptation of special custom fixtures now produces batches of 500 pc's per 20 minutes, requiring only one machine operator. The damage and scrap rate has been dramatically decreased and profits from this product line have increased as a result.

Cellular High Energy Application

Vertical Centrifugal Barrel

Swissline Precision's next application was for a machined part made of Beryllium Copper that had many details and required tedious hand deburring. Again, the current method of hand deburring provided inconsistent results with a high rejection rate. The solution was a United CPC250 Vertical Centrifugal Barrel Machine.

This machine produces 750 parts per 15 min cycle and has a very small footprint. The results have proven to be consistent and have also resulted in a less than .5% rejection rate. As this machine is placed in the manufacturing cell, the cell operator is able to process these parts in batches while the CNC machines are producing more parts. Since installation, the customer has also found an additional product to be processed in this machine.

United Surface Solutions CPC 250

Waste Water Treatment

Swissline Precisions installations both require water for operation and generate process effluent that must be treated or disposed of as hazardous waste. Of course, there are cost associated with disposal and treatment of this effluent. Our solution to this problem was solved using the United ARS 1000 closed-loop automated treatment system. This flocculant type treatment system can process 125 gallon batches of effluent and then store the treated water for reuse in the deburring machines via a built in pump system. This closed-loop system saves significant money in water usage and eliminated disposal costs.

Flocculation is a waste water treatment process that uses a clay polymer to coagulate the solids in the vibratory waste water stream. The mixing of this clay polymer to your wastewater encapsulates the contaminates, oils, grease, heavy metals and suspended solids. The sludge created can be filtered out and dried using various methods. The sludge may then be sent to your local land fill in accordance with local regulations. The remaining treated water can be sent back to your finishing equipment for re-use or disposed of.

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United Surface Solutions
ARS 1000

Processing of Complex Geometries

Post Processing Additively Manufactured Components

There has been a lot of discussion surrounding the use of traditional mass finishing for post processing of Additively Manufactured parts. Traditional mass finishing, (centrifugal barrel, disc, vibratory bowl, etc.), is not well suited for complex geometries. The gross material removal and loss of geometry to critical dimensions is pronounced on outside dimensions while in some cases leaving the inside dimensions virtually untouched. This is the case with subtractive manufactured components as well.

When considering finishing options, engineers have either allowed for dimensional changes from finishing or opted to hand finish, discriminately to avoid any changes in final dimensions.

We have developed processes utilizing new technology that excels in consistently producing highly homogeneous surface finishes on work pieces with complex geometries and, for example, thin, fragile vanes. As in the compressor impeller pictured on the next page or femoral components with a "box". Even difficult to reach corners receive a perfect finish.

Processing of Complex Geometries *(cont'd)*

Depending on where your starting Ra is, and if you are just refining the surface or looking to Super-Polish, There may be a two step process to reach your goal.

If this impeller were additively manufactured to a finished dimension, we could process utilizing the build plate. The components would be finished prior to removal. Should your components require post process machining, or are not additively manufactured, we could easily finish in the same equipment utilizing fixtures.

Benefits of this process:

- Consistent and absolutely repeatable grinding and polishing results
- Excellent finishes on difficult to reach surface areas
- Homogeneous, perfectly isotropic surface finish
- The work pieces never get damaged during the process
- Even the most intricate work piece contours are maintained
- 24-hour operation, without any operator intervention, possible

Please contact us for free sample processing or contract job shop finishing. Innovative Finishing Technologies looks forward to working with you in developing a process for your components with complex geometries.

Innovative Finishing Technologies, llc

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Karen Zaccaro

Karen began her career in Teflon coatings. Working for The Donwell Company, over the course of a decade, learned all aspects of coating applications and surface preparation. Finding her niche in surface preparation and mechanical finishing, Karen founded Innovative Finishing Technologies, llc in 2000.

Initially, IFT was strictly consulting. Today IFT offers service, support, equipment integration, spare parts, media and supplies, and most importantly, process development.