DYNABRADE®

CASE STUDY

INNOVATIVE SYSTEM SOLUTION FOR FIBERGLASS SANDING

WE LISTEN. WE OBSERVE. WE INNOVATE.

MADE IN USA

Fiberglass sanding is performed with the purpose of leveling or shaping a workpiece, or for scuffing a surface to ensure paints and clear coats adhere properly. The most common problem presented with this process, especially in an indoor workspace, is dust from sanding becoming suspended in the air and settling on worksurfaces. The problem manifests itself in two ways. First, airborne dust is a detriment to the health & safety of people in the sanding environment and second, dust is a leading cause of escalating operational & labor costs in the form of scrap and rework. Dynabrade has the complete solution to improve the work environment and control production costs.

METHODOLOGY AND CHALLENGES

Across the Recreational Vehicle (RV) manufacturing industry, most sanding for new production is performed with palm style random orbital sanders in conjunction with coated abrasives on fiberglass parts. Although production levels vary between manufacturers, the desired result from sanding is always the same: create an even, clean surface to work with in subsequent production steps. Accomplishing this result typically involves several sanding steps known as a grit sequence. The process generates large amounts of excess dust but creates an abraded work surface that is critical to ensuring sprayed coatings adhere and coat evenly with fewer imperfections. The dust this essential step creates challenges the overall manufacturing process in terms of cost, efficiency, health and safety.

Some challenges dust presents in terms of cost are clear and some are not often considered or identified. Added labor cost from cleaning or general "housekeeping" is a common cost that is accepted to a degree, while added PPE or the cost of spraying a panel a second time (materials and labor) can be difficult to quantify. Unfortunate and real worst-case scenarios such as an employee's health being adversely affected can seriously impact a manufacturer's costs, from lost time to care for the impacted employee.

The sanding process can become inefficient if uncaptured dust is present throughout the sanding progression. Uncaptured dust covering the work surface forms a layer preventing the abrasive from reaching peak performance and clogs the abrasive disc itself, known as "loading". When abrasives load, they must be changed frequently or wild scratches (commonly known as "pig tails") will appear in the final finish. In some instances, additional production steps are necessary, like increased parts rinsing before painting, as preventative measures. Inefficient abrasive use and added steps because of dust lead to poor productivity, additional cost, and more labor time. Health of employees and safety within the work environment are critical considerations related to fiberglass dust. Without the aid of a suitable source capture system, it is inevitable that dust will become airborne. If inhaled, serious respiratory problems have been known to occur, and contact with the skin or eyes can cause irritation, itching and rashes. To mitigate health concerns, manufacturers incur great expense purchasing personal protection equipment (PPE), such as respirators. Additional operational costs become necessary to maintain HVAC and air filtration systems, as well as other facility assets. With certain dusts or environments specialized electrical wiring may be required for light switches, outlets and even lighting to work against the possibility of fire or explosion.

PROCESS PROBLEMS

A leading manufacturer of Recreational Vehicles invited Dynabrade to visit their facility, and recommend potential process improvements and implement system solutions. Dynabrade was asked to evaluate the RV cap sanding production line specifically. Fiberglass front and rear end caps improve overall RV durability and are an integral component of the final product. The production and paint lines were alongside each other, but separated with a large plastic curtain in the middle of the room to help reduce sanding dust from migrating to the paint booths. The sanding portion of the production line produces 200 caps per day, with 8 operators working on the line. The end caps travel down the line in sets of 4, with 2 operators working on each cap. The scale of the operation and proximity of operators to each other and the paint line presented a challenging dust problem for the manufacturer.

In this process, caps were being sanded with palm style self-generated vacuum random orbital sanders connected to a collection bag at the back of the tool. The process created large buildups of fiberglass dust on the RV caps, and plumes of airborne dust required operators to wear several forms of PPE. It was clear that the dust collection measures were insufficient and were a hinderance to productivity.

To make matters worse, operators were not able to clearly see the workpiece as they were sanding. Consequently, more time was spent sanding and more abrasive discs were utilized per piece adding to labor and materials cost. Collection bags on tools were filling quickly and had to be changed two to three times daily, further adding to labor, material cost and to the amount of dust in the air from changing bags. Additional time and attention to detail was needed during the part rinsing step that had to take place prior to paint, and dust nibs were a common problem for the adjacent paint line, which could send parts through the sanding process a second time.

Beyond production challenges airborne fiberglass dust also presented the manufacturer with the challenge of protecting the health and safety of operators. Employees were covered in the dust and wore respirator masks that helped protect them from inhaling fine dust. Masks would be replaced at a minimum of once a day and represented a huge cost annually. The production line was equipped with six overhead draw fan units to help reduce the air contamination, but the fans required filter maintenance up to three times daily. Each time filters were changed production came to a halt. Explosion proof lighting upgrades were mandated by the manufacturer's insurance carrier because they recognized the potential hazard. Despite safety measures, the manufacturer and operators were uncomfortable and wanted to pursue a complete solution.

This was the perfect opportunity to show the Dynabrade difference by listening, observing, and optimizing!

INNOVATIVE SYSTEM SOLUTION

The recommendation from Dynabrade specialists was to adopt the use of sanders directly connected to a vacuum in order to prevent altogether or at least mitigate the dust problem at the source. The Dynorbital® Extreme sander (X61V) and Raptor Vac® clean air solution (61440) were recommended for the trial. The combination boasts the greatest dust collection rate available in part because of specialized sanding pad design, and multi-stage vacuum filtration. As an additional benefit each vacuum would service two operators if the trial proved successful.

The recommendation was agreed upon and Dynabrade specialists arranged for tools and vacuums to be delivered (without obligation to purchase) for the trial. Onsite for installation and startup; initial feedback from operators was encouraging. Operator reports of noticing a significant difference minutes into use was just the start of the value Dynabrade delivered to this manufacturer. Operators and managers remarked:

> *"We are now able to easily see where we have just sanded, and this is speeding us up."*
>
> *~ Production Line Operator*

Fiberglass dust no longer had the opportunity to buildup on worksurfaces or become airborne. Clear sightlines allowed operators to work quickly and ultimately improve production. The total sanding time per set of 4 caps was reduced from 12 minutes, to 10 minutes and 30 seconds. A savings of 10%, or $45,000 when equated to annual labor costs. The savings spread to the paint line where rinse time was reduced, and less rework reported. The cleaner, more efficient sanding process drastically lowered abrasive usage. Usage decreased from 1,700 discs to 1,250 discs daily which equated to $74,250 in annual abrasive savings, a 30% reduction!

> *"Since the introduction of the Dynabrade system, we have noticed reduced time spent in parts rinse down and noticeably less dust nib repair work."*
>
> *~ Repair/Inspection Department Manager*

With the solutions Dynabrade put in place on the production line, the annual tooling cost documented a savings of $8,404. The Dynorbital® Extreme (X61V) proved to be more durable, was able to be repaired, and the need for replacement was infrequent which meant less tool down time. The Raptor Vac® clean air solution (61440) eliminated the need for tool mounted dust collection bags and employee respirators completely. The overhead fan maintenance that was needed multiple times daily, was reduced to only once every 3 to 4 days.

> *"Before the Dynabrade system we were changing our draw fan service filter media in the sanding prep area up to three times daily. We are now changing them every third or fourth day."*
>
> *~ Maintenance Manager*

The dramatic improvement to air quality and visibility provided enormous benefits to operators on the sanding line and provided an immediate boost to morale. Health and safety benefits continue to be realized each day Dynabrade clean air solutions are in service, while savings also continue without the need to purchase and replace personal protective equipment.

> *"I like that I can now breathe easier while doing my work."*
>
> *~ Production Line Operator*

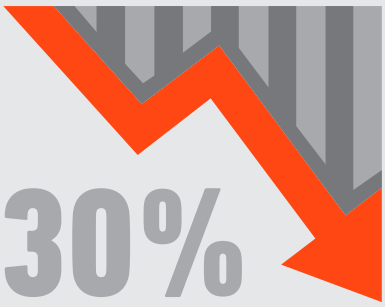
Dynabrade was able to document a reduction in labor, abrasives, tooling, and consumables which totaled $127,654 in annualized cost savings. Dynabrade strives to offer high quality tools and innovative solutions to help improve safety, productivity, and final finishes resulting in reduced overall production costs for manufacturers.

Unlike other manufacturers, Dynabrade has a team of seasoned, field professionals that offer hands on cost savings assessments, bringing value measured in dollars and cent, minutes and hours and more. By listening to the challengers our partners face, and observing existing methodology, we work together with manufacturers to implement a strategy on how to optimize the process, and ultimately provide a cost savings to improve the bottom line. That is the Dynabrade difference we provide every day.

$45,000

in Annual Labor Savings

Decreased Annual Abrasive Costs



30%

Eliminated

the need for tool mounted dust collection bags and employee respirators completely

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ABOUT DYNABRADE

Dynabrade has earned a reputation for excellence and a position of leadership in the innovative design and manufacturing of unique portable pneumatic abrasive power tools, related accessories, and dust collection. With our total systems solutions offerings, we are able to meet the specific needs of many industries. Our products are used in a variety of applications on nearly any material that requires surface preparation and finishing. We are easy-to-do business with and supply these products quickly to customers through a worldwide network of professional distributors. For more information on Dynabrade products & process solutions, please contact your local distributor or territory manager today. Or for more information, go to Dynabrade.com

PERFORMANCE ASSURANCE CASE

For Optimal Dynabrade Tool Performance

The "All-in-One" case to improve your efficiency. Audit and increase your performance with this complete kit by Dynabrade.

FIBERGLASS CASE STUDY **D20-07**