

# MOOG NEWS AND VIEWS

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Moog News and Views is proudly published monthly for the employees of:  
**Moog Components Group  
Murphy, North Carolina**

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## **New MPAP Automated Assembly Line Coming Soon!**

*Article Submitted by David McClure, Manufacturing Engineering Manager*



Respironics Inc. approached Moog Components Group over two years ago with a project to improve their competitiveness and help them maintain the approximate 50% share of the obstructive sleep apnea (OSA) market. Facing stiff competition from competitors offering less robust low cost solutions to treat OSA, Respironics developed the new M-Series offering of products while simultaneously launching several continuous improvement efforts among their key suppliers. The heart and soul of M-Series is driven by the MPAP (Miniature Positive Airway Pressure) motor and blower assembly, produced at the BDC building. Our contribution to keeping Respironics Inc. competitive resulted in a three company partnership to automate the assembly and testing of the MPAP assembly line.

In September 2006, Respironics and Moog Components Group selected Automation Tool Company (ATC) as the automation intergrator. The project kicked off on October 12, 2006, and is scheduled to be fully implemented by September 25, 2007. ATC designed an automated production line that consists of four main cells:

1. Assembly Cell #1 is a Bosch palletized conveyor line, consisting of 31 stations, that produces units ready to be balanced.
2. Five cells with five Hofmann balancers in each cell will utilize robots to automatically load and unload the balancers.
3. Assembly Cell #2 is a dial indexer consisting of 10 stations that complete the final assembly readying units for run-in and test.
4. Three cells for run-in and test will utilize robots to automatically load and unload the run-in racks and test stations. Completed units are offloaded via a conveyor belt to a centralized packing area.

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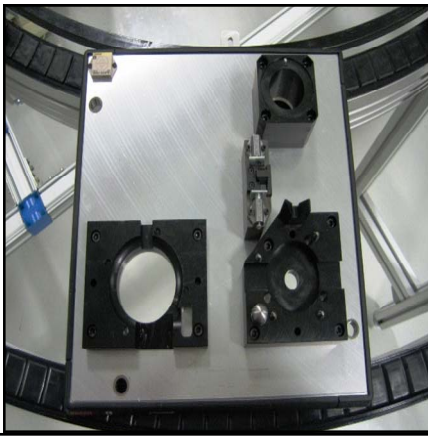
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The new automated line is capable of delivering 2,000,000 MPAP motor and blower assemblies per year while operating 80 hours per week. This equates to one completed blower assembly every 6.48 seconds.

This project is no small step — rather it is a giant leap into automation. The technical support required to operate and maintain a machine of this scope will be a challenge. Two engineers and one technician will support this installation while six material handlers on each shift will keep the parts loaded and perform station resets. Another technological feature of this machine is its data collection system. Blower assemblies traveling this line will have a 2D bar code label. Each pallet in assembly cell #1 is equipped with a RFID (radio frequency identification) tag that will track the status of each unit as it is assembled on the line. The data collection system will record the RFID tag and read serial numbers from bar codes to track each unit's progress around all four main cells. The data transferred to the Programmable Logic Controller will be stored by individual serial number on a server and eventually will become a part of each assembly's birth certificate as it leaves final test.

This project has already gained a lot of attention from Respiroics and Moog. Once this technology is installed in our new building addition, it will get a lot more attention. The new MPAP automated assembly line is an investment in the future of our company, as well as our community.

Article Photos: D. McClure



**Pallet on assembly cell #1.**



**Adept robot cell #1.**



**Balancer cell with Fanuc robot.**

## **Employees Meeting Addressed by Bob Brady**

Corporate Chairman and CEO, Bob Brady, visited MCG—Murphy on June 6th. He spoke to Murphy employees, reporting on the state of business throughout Moog Inc. He cited strong growth in sales and earnings in the '07 fiscal year across all segments, with anticipated sales reaching \$1.5 billion for the current fiscal year.

Mr. Brady's presentation included a NASA video on the topic of future space exploration. Accompanying Mr. Brady were Joe Green, Larry Ball, and Bob Sterrett, who answered employees' questions at the end of the session.



**Bob Brady (L) and MCG—Murphy employees.**

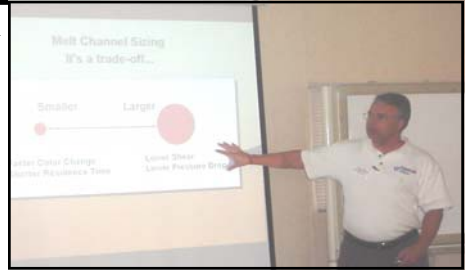
## Plastics Training at Murphy

*Article Submitted by Jon Leinbach, Engineering/Facilities Manager*

We recently were able to have two series of courses taught in Murphy on the selection and design of plastics and the process of injection molding. Instructor Joe Henz, of the Polymers Center of Excellence in Charlotte provided our in-house training of both sessions. The first session involved primarily the Design Engineering group and the classes were *Choosing the Right Plastic* and *How to Design a Plastic Part*. Two weeks later Joe came back to Murphy and taught *Injection Molding 101* and *102* to an expanded group of Design, Manufacturing, and Quality Engineers.

Some of the many topics covered were:

- Strengths, weaknesses, and applications of common plastics
- Designing for assembly, mold ability, and structural integrity
- How injection molding works and how unique characteristics of plastics affect molding
- Proper design of runners and gates
- Troubleshooting common molding defects



**Polymers Center's Joe Henz instructs Plastics Classes.**



**Plastic assembly parts**

Over the last 3 to 5 years our new product designs have incorporated an increasing amount of plastics in one form or another. The Respironics MPAP motor blower design is an example. This design relies on the blower housing to also serve as the motor housing. The impeller and shroud assembly is polycarbonate and ultrasonically welded. Also many of our BN Series brushless designs have already been converted to an injection molded insulation system allowing for mechanical features to control magnet wire placement and printed circuit board mounting while replacing the electrostatic coating with a more uniform insulation barrier from grounding to the lamination assembly or stack.

Along with all the plastic parts in our product today come the challenges of new designs and then understanding, communicating, and managing our plastic injection molding suppliers. Challenging can be an understatement, especially before these courses. Our goal is to be better educated and equipped to handle whatever comes our way involving plastics. A direct quote from the class was "We learned how to design plastic parts to lower cost and improve reliability".

Thanks go to the Polymer Center, expert instruction by Joe Henz, administrative assistance by Laura Gulizia, and the outstanding attendance and participation by all the students in Design, Manufacturing, and QA.



**Murphy MCG students receive in-house training on designing plastic parts and injection molding.**