

CO-OP WORK REPORT

SCHOOL OF AERONAUTICAL AND ASTRONAUTICAL ENGINEERING
PURDUE UNIVERSITY

WORK PERIOD
5
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AT
Ball Aerospace & Technologies Corp.
P.O. Box 1062
Boulder, CO 80301

SUBMITTED BY
Phillip Spindler

During my fifth work session at Ball Aerospace & Technologies Corp., I worked in production on the unclassified section of a classified project. My assignment consisted mostly of making build documents from engineering drawings for mechanical ground support equipment. Build documents describe the processes that must be taken to manufacture a part or assembly from raw material through machining, finishing, cleaning, and final quality control inspection. Along with the miscellaneous mechanical ground support equipment I was in charge of having fabricated, I also worked on lifting fixtures, non-flight instrument covers, and small flight hardware.

The process of having a part or assembly made starts with receiving a drawing from the design engineer. After checking the drawing for errors and inconsistencies, the raw material and hardware have to be ordered and the shop order must be written. The shop order normally starts a part at the general machine shop then moves it onto metal finish. After the part is finished, it is cleaned and assembled if so required. Then the part gets a final quality control check to make sure the part was fabricated and assembled as the drawing says it should be. While most of the processes in this flow take less than one 8-hour shift to complete, the machining step can take much longer depending on the complexity of the part.

In addition to my assigned work, I helped the Materials and Processes Engineering group in testing gloves, personal protection equipment, and plastic sheets for non-volatile residue. The non-volatile residue test is a common way of quantifying how dirty a product is. The basic theory is to use a solvent to extract residue (which commonly includes hydrocarbons, soaps or silicone) from a product. After being extracted, the residue is weighed and reported with respect to the surface area of the sample tested. An infrared spectrum of the residue is also taken to help identify its composition.

I also designed and had fabricated two different shipping inserts for the Materials and Processes Engineering group. The sheet aluminum shipping inserts set inside of a paint can and are secured in place with set screws around the perimeter. The shipping inserts have holes in them to hold various sized glass jars. The inserts were required to meet COT, EPA, and OSHA shipping requirements for transport between two of Ball's Colorado locations.