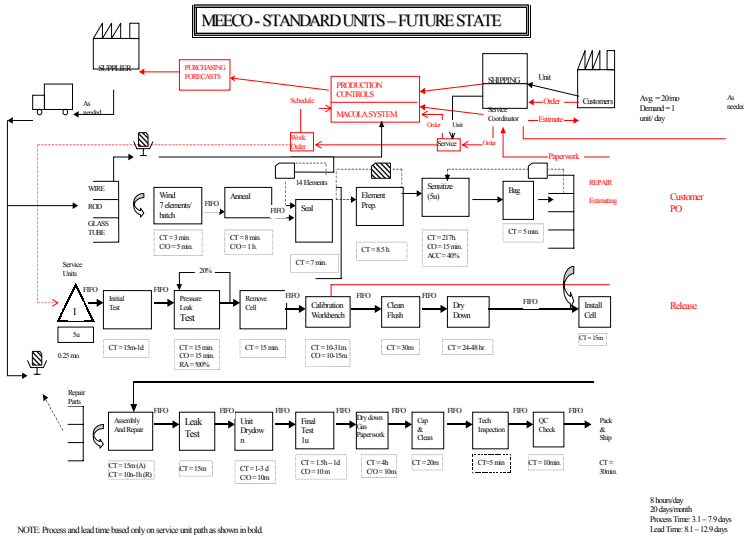


Manufacturing Process Improvement

Background

Advent Design was asked by a local manufacturer of moisture analyzers to review a manufacturing process for the analytical cell which was the central component of their analyzers. Process yields had been very low, falling into the single digits at times, and the material used in the cells was very expensive, high purity precious metal wire. As a result, scrap costs were very high, and the overall output and productivity were quite low resulting in long lead times for the analyzers.



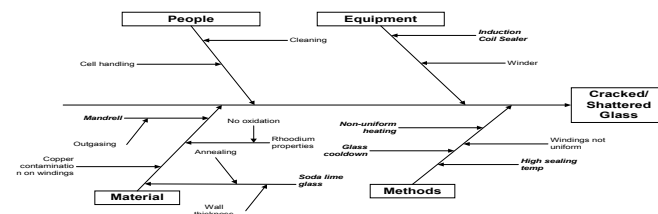
Project Description

Advent Design reviewed current process documentation, observed assembly operations, and analyzed production data in order to develop an overall picture of the cell manufacturing process and operation. The high failure rate was traced to two main areas, wire embrittlement and glass cracking.

The wire embrittlement prevented the sleeved and sealed cell element from having its wires peeled back to allow for connection to the electrical contact posts for the cell or from having the wires wound around the contact posts. This failure mode was traced to a combination of the processing and handling of the wire during the cell production process and the manufacturing of the wire. Meetings were held with the wire manufacturer to improve and stabilize the wire characteristics to better suit the client's manufacturing process. To assist in this matter, enhanced quality control measures were developed and put into place to provide the data necessary to check, evaluate, and improve the wire characteristics.

The glass cracking seemed to be the result of stress induced in the glass sleeve as it was sealed. For this problem, the corrective action focused on the development of an improved sealing method using a tube furnace where the glass sleeve for the cell element could be sealed all at once. The original method used a moving heater, which sealed the sleeve about 1/4" at a time and which seemed to induce great stress on the ends of the glass sleeves where the glass flowed the most. The results from initial work with the tube furnace was quite promising, and through some additional experimentation, a new method for the sealing process was developed.

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Impact

Once the wire characteristics were improved and the new sealing procedure in use, production yields rose above 80% on a consistent basis and frequently exceeds 90% now. Based on the remarkable results, Advent Design has worked with the customer to review other production areas and to start implementing lean manufacturing processes within their facility. Three value stream maps were developed by working with the company's manufacturing team.



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