

ABSTRACT

Assembly Line Kitting: Foam Mold Material Substitute

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Kitting is considered an incredibly innovative and effective solution intended to aid operators within a mixed model assembly line. However, it is a non-value added procedure and one that customers may not be willing to pay for. With this project, the goal is to examine opportunities to employ lean principles and provide a solution that further eliminates non-value added procedures, while also producing the potential for a flexible, mixed model assembly line.

To achieve the aforementioned purpose, the production of foam molds, located within industrial totes and sent to the assembly line, was found to be a major waste within the kitting process. Foam molds are crucial to the creation of a kit as they provide clear presentation of components to assemblers line side, allow components to be held securely and easily, and enable facilitated access and standardized organization when picking parts. A foam mold material substitute is a potential solution to this problem as it allows for the elimination of the separate production loop and a streamlined, in-house process intended to present assembly components for consumption line side. Of the material prototypes ranked using Analytic Hierarchy Process, Beaded Foam (an uncompressed molding foam) provides the best alternative as it does not dry, does not crumble, can be formed infinitely, abides by the three R's, and holds its shape before and after pressure.

Included within the report is a description of the material demonstration (concerning metal assembly components), a comparison between the current-state and design of the future-state for kitting stations, and an economic analysis comparison between the new material, Beaded Foam, and the current material, polyurethane/polyethylene. The economic justification for Beaded Foam leads to projected savings, to the total annual cost, of about \$66,000 for a single kitting station. As there may be as many as sixty or more kitting stations in a full-scale, mixed model assembly line, these savings may be multiplied.