AGILE MANUFACTURING IN A CUSTOM SMALL-LOT ENVIRONMENT

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ABSTRACT

Market demand for product variations and improved services requires flexibility in the production system by its personnel, production methods, scheduling and changeover management. Thus the production system must become an agile factory. Companies in the large-scale upholstered furniture industry; to meet the challenges of lean and agile production are following approaches similar to the automotive industry. These companies daily encounter a multitude of interactions with suppliers of the hundreds of fabrics and other components, skilled workers, severe quality constraints and many wholesalers and retailers. They must manage the numerous activities involved in production changeovers to meet customer demands in spite of severe space, scheduling and material handling restrictions. The companies must service growing customer expectations and improve inventory management in this complex environment. Critical to their operations is the lot or batch size. Through discrete item simulation of a typical manufacturer in this industry, the impact of lot size on space, work-in-progress, material handling, operation time variances, changeover frequency, lost time and other factors have been studied. The production process is one of synchronizing the flow of separate subassembly operations toward final assembly. The simulation allows testing of lot sizes toward the goal of "pulling" each sub-assembly batch through to final assembly. Each batch represents a collection of fabrics and wood frames for a particular style, pattern and color to meet the demand.