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The Ten Most Important Manufacturing Terms

With smart factories on the rise, it's more important than ever to keep up on the changing manufacturing jargon. Here's a handy list to keep around wherever you go.

Agile Manufacturing - The process of quickly responding to consumer needs, agile manufacturing incorporates tools and training to respond to changes in market demands thus reducing lead times across organizations. Agile manufacturing can include lean and flexible manufacturing as well as "mass customization" concepts.

Bill of Materials - **Bill of materials** (BOM) is the list of all raw materials that go into the final assembly of a product. This bill of materials includes all assemblies, subassemblies and the number of parts used in the production of the end product. The BOM is generally tied to the production order which reserves the exact quantity of raw materials for the completion of the product. The bill of materials is used in manufacturing to refer to the current production configuration or recipe rather than the actual bill defining the cost of production.

Contract Manufacturing - A Contract Manufacturer is a firm hired by a company to focus on the manufacturing or assembly of all or part of the final product.

By contracting a manufacturer, hiring firms generally can save money as the manufacturer will have experience in the manufacturing process as well as plant assets specific to the manufacturing of similar products. Additionally, through a CM, firms are able to focus energy on the sales and marketing of the products rather than the manufacturing and are thus more efficient for the firm.

Digital Manufacturing - Digital manufacturing refers to the process of improving product design and manufacturing through the integration of information systems across the supply chain. Digital manufacturing aims to reduce the time and cost of manufacturing by digitizing all processes including design, production and product use. In order to optimize manufacturing, digital manufacturing runs simulations analyzing operations, machine specifications and input materials for maximum efficiency within a product life cycle.

Digital manufacturing shares goals with flexible and lean manufacturing but evolved from the computerized world.

Engineering Change Order - The Engineering Change Order (ECO) is the documentation outlining the proposed change to the design, lists the product or parts affected and requests review and approval from the manufacturers. The ECO is used to make modifications to material, assemblies and subassemblies and other types of product information.

An engineering change order is also known as an engineering change notice, the document outlining the changes in production and product specifications to be used in the manufacturing process.

An ECO is issued when an error is found and corrective action is taken. It is also common for an ECO to be issued in technology manufacturing when an electronic component becomes obsolete or reaches the end of its life cycle.

An ECO may also be issued to reduce production costs when more affordable materials or components become available to be used in manufacturing after the initial production cycle.

Engineer-to-Order - Custom-engineered products are variable products that require additional customization to meet customer needs, usually identified in an initial proposal or in the order fulfillment process. Manufacturers often refer to their custom-engineered products as engineer-to-order (ETO) products.

Manufacturing custom-engineered solutions is a team sport. Sales, engineers, purchasing, operations and finance must all work in close collaboration to ensure the product meets exact specifications on the customer's timeline. The more the team understands and captures initial customer expectations, then meets those expectations, the more successful an engineer-to-order company will be.

Industry 4.0 - Industry 4.0 is commonly referred to as the fourth industrial revolution. It is characterized as the name for the current trend of automation and data exchange in manufacturing technologies. Industry 4.0 bridged the gap between physical production and manufacturing and digital manufacturing.

Product Lifecycle Management - **Product Lifecycle Management** is the management of product records, including bills of materials, specifications, CAD files, revisions and changes, from the initial design and prototype to the end-of-life delivery and service. Product lifecycle management integrates people, business systems, and processes into the core of a product.

Quality Management System - A **Quality Management System** documents the aspects of a company's design and operational controls. The system includes monitoring, issue reporting, improvements and changes, in order to ensure that product design and manufacturing are repeatable. Quality management systems help ensure that production is meeting consumer and regulatory requirements and improvements in the process are continuously being made.

Value Chain - The **value chain** is the process of turning an idea into a marketable product. In monitoring the value chain, engineers and managers can deliver the most valuable products to consumers at the lowest cost possible. The main goal of a value chain is to create a competitive advantage by increasing the value add of a product while keeping costs minimal.