

Wood Manufacturing Technology Terms

Business Strategies

bidding – After the cost of producing a product or project has been accurately estimated, a bid is a document that is prepared and submitted to the hiring company or contractor. Multiple bids are generally solicited and turned in as sealed documents all at the same time. Often – but not always – the low dollar bid is the winner but other circumstances can influence the hiring company, such as reputation, ability to meet deadlines and other factors.

change orders – A common element of contracted projects, a change order is called for when there is a change in the scope of work originally agreed to. Change orders may be created if additional elements are added to or removed from a project, if the project was incorrectly estimated, or if the project team is not able to complete their work within the original budget or timeframe. Once a change order is approved, it becomes part of the contract.

estimating -- The process of determining the total costs of a product or project, including materials, labor including management, supplies, overhead (portion of rent and utilities, machine and tool wear and tear, office administration), marketing, installation if applicable and your profit on the job.

JIT –“Just in Time” refers to the production strategy of minimizing material inventory to a level where it is available only as needed and thereby reduces costs associated with storing and maintaining large stock supplies. It also aims to expose and reduce waste in the manufacturing process itself to further reduce inventory, such as having employees acknowledge a mistake immediately –even if it means shutting down the line – in order not to compound the mistake further along in the production. Employing JIT strategy requires a balance between all systems within a plant to maximize efficiency and employee time. The decision whether or not to operate with reduced inventory can be influenced by material pricing whereby purchasing volume stock at a lower price point might outweigh smaller, repeated shipments over time, as well as by one-time vs. repetitive shipping and transportation costs.

Lean Manufacturing –A manufacturing philosophy that challenges a business to operate as efficiently as possible and to reduce waste in all areas of operation. The concept was introduced in the automotive industry by Toyota (called the Toyota Production System) and centers around the elimination of waste. Key to Lean Manufacturing is the dedication to “continuous improvement,” acknowledging that to operate at maximum efficiency requires a constant and consistent investment in review systems by everyone in the company.

Outsource – When a company removes a manufacturing process from its own plant and purchases the process from another company; for example, a cabinet shop may outsource making the cabinet drawers because doing so is less costly than making them in-house. When the outsource company is outside the country it is referred to as “offshoring.” (Because of changing economics in doing business with China, a number of companies are returning their outsourced business to the U.S. which can be described as “insourcing.”)

Design Terms

architectural millwork –Refers to interior constructed components such as doors, window trim, mantels, moldings and baseboards. While most often created in wood, millwork can also be crafted from plastics and composites. Since the 1950s, the term has been expanded to “architectural woodwork” as the scope has expanded to commercial casework and fixtures, wall surfacing, ornamental work, stairwork and factory finishing.

aging in place –This is a relatively new term that describes homeowners’ desire to outfit their own homes with convenience and accessibility features necessary as they age, so they can live independently rather than move to a facility that incorporates these needs for seniors. The intent of the baby boomers to remain in their own homes has instigated a whole new level of creativity and customization within the interior design world in order to accommodate their needs and desires.

Ready to Assemble (RTA) –Furnishings that break down into parts for easy assembly by the consumer. RTA is an economical manufacturing strategy saving the manufacturer in assembly and shipping costs due to less bulk, saving the retailer in display space, and thus passing the savings on to the customer who carries the product home and puts it together. RTA is also referred to as “knock down” or “flat pack.”

green building –Employing strategies in the design and construction of buildings in a manner that has as little impact on the environment as possible. There are a number of considerations in addition to material choice such as site selection, sun orientation, energy and water efficiency, landscaping choices and more.

Industry Standards/Regulations

American National Standards Institute (ANSI) is an organization that approves or “accredits” standards that have been developed by representatives of standards-developing organizations, government agencies, consumer groups, companies, and others. These standards ensure that the characteristics and performance of products are consistent, that people use the same definitions and terms, and that products are tested the same way. ANSI standards exist for wood products, architectural millwork, and woodworking machinery safety requirements. www.ansi.org

Architectural Woodwork Institute (AWI) is the standards-setting body for advanced woodwork manufacturing in North America. For over 50 years AWI has published the Architectural Woodwork Standards for materials and workmanship. The AWI standards are referenced in most contract documents for commercial and high-end residential work. www.awinet.org

combustible dust is a volatile material created from very fine particles during manufacturing processes that, when suspended in air in the right concentration, become explosive. Such particles can come from wood or plastic, or even food products such as sugar. The force from such an explosion can cause deaths and destruction of entire buildings. Because in many instances, employers and employees were **Wood** unaware that a hazard even existed, standards have been created by OSHA to prevent these hazardous conditions and protect workers. www.osha.gov

Wood Manufacturing Technology Terms (Industry Standards/Regulations, cont.)

Occupational Safety and Health Administration (OSHA) is an agency of the United States Department of Labor. OSHA's mission is to "assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance." OSHA issues workplace health and safety regulations including limits on chemical exposure, employee access to information, requirements for the use of personal protective equipment, and requirements for safety procedures.

www.osha.gov

National Association of Manufacturers (NAM) is the nation's largest industrial trade association, representing 11,000 small and large manufacturing companies in every industrial sector and in all 50 states. NAM advocates on behalf of this sector in the areas of labor, employment, health care, energy, climate, corporate finance, tax, bilateral trade, multilateral trade, export controls, technology, regulatory and infrastructure policy.

www.nam.org

skill standards indicate what a worker needs to know and do on the job and how well he or she needs to perform to succeed in the workplace. Skill standards define both the work itself and the worker qualifications, specifically the skills and knowledge required to successfully perform the work.

Woodwork Career Alliance (WCA) is a non-profit industry responsible for the development, publication and assessment of the industry-approved *Woodwork Manufacturing Skill Standards*. These unified standards of tool skills and evaluations serve as a comprehensive, industry-accepted guideline of operational procedures by which to measure performance and results produced by woodworking professionals and students in training. The assessment program consists of skill and knowledge tests that allow participants to demonstrate their competency in wood technology skills.

www.woodworkcareer.org

Machining/Manufacturing Terms

32 mm system –A system of cabinet construction designed for high volume casework production based on the consistent drilling of 5mm holes in 32mm increments. Such an indexing system allows for a consistent relationship of product parts, ease in hardware mounting as well as assembly (and disassembly).

CAD/CAM (computer-aided design/computer-aided manufacturing) – Refers to using computer systems for the design, analysis and manufacturing of products. Once a design has been produced with the CAD component, the design itself can control the machines that construct the part. CAD/CAM can also describe the context of a software tool capable of a variety of functions.

CNC (computer numerical control) -- is the automation of machine tools in manufacturing which has revolutionized machining processes. CNC systems employ CAD/CAM programs to interpret a design into commands for the machines. Some machines combine multiple tools in one cell, or a manufacturer might use several machines which requires moving the product component from one machine to another. CNC works on solid wood as well as thicker composite panels.

Wood Manufacturing Technology Terms (Machining/Manufacturing, cont.)

edgebanding -- A process by which the edge of a panel is covered to enhance the appearance and hide the exposed edge. This is typically done with a machine but may also be done by hand. The edgebanding material could be PVC, HPL, solid wood or wood veneer and can range in thicknesses of .4mm – 25mm depending on the application.

face frame -- The frame on the front of a cabinet box which adds detail and hides the raw edges of the construction. Face frames lend strength to the front of the cabinet as well as add visual interest. Face frame is considered a traditional style of cabinetry and mimics a particular style of furniture.

frameless – Smooth and flat, unadorned cabinet faces (often called Euro style after the modular and portable cabinets of Europe). Frameless construction requires an edgebanding to hide the raw edges of the cabinet carcass.

machining center – Any CNC machine used for cutting or drilling.

manufacturing cell – A plant layout strategy that groups a set of machines required to produce a given product in close proximity. Ideally, a cell worker is versed in the operation and set up of all cell components and material supplies and tools are close at hand to achieve maximum efficiency. The goal is to reduce space, manufacturing time and set up time; and to be flexible enough to be responsive to changes in the market.

mass customization – The ability to create flexibility in CAM systems so that some customization can be incorporated into a mass-producing process—usually to meet customer demands for more personalization of products. Increasing appeal to consumers without increasing costs in the process is the advantage.

nested base manufacturing –Using a CNC router, nested base is the efficient utilization of sheet material by grouping, or nesting, pieces together with common toolpaths. Some CNC routers not only route, but also can shape, trim, bore and perform other operations required on each of the parts (these machines might more aptly be termed CNC machining centers). Nested base is used in the manufacture of cabinets, store fixtures, furniture and other products that are assembled from flat panel components.

optimization –The utilization of strategies and tools (such as software) that are designed to assess and maximize the efficiency and functionality of complex manufacturing processes. In panel processing, it allows for cutting parts from a sheet of material with the least amount of waste, maximizing the number of pieces that can be cut from any size panel.

panel processing -- Refers to a segment of the woodworking industry that deals with substrate material in the form of a panel. Typically these panels are either 4'x8' or 5'x10' and then cut into smaller sizes.

point to point –A boring machine that moves from one point on a part to another; it is able to drill multiple holes on a single stroke (which makes them ideal for 32mm operations). PtoPs drill about twice as fast as CNC routers; they work well on small, light and thin panels. Today's PtoPs can also perform other functions including routing.

Wood Manufacturing Technology Terms
(Machining/Manufacturing, cont.)

scoring -- Scoring consists of a lite scribe or saw cut in the surface of a Melamine panel followed by the main saw blade making the finish cut. It is used to insure a clean chip free cut when cutting Melamine panels.

work flow-- The efficient flow of work and materials in a shop to maximize production and minimize the labor used during production.

Materials Terminology

glulam, or “glued laminated timber,” is composed of individual wood laminations, or “lams,” specifically selected and positioned in the timber, based on their performance characteristics, and bonded together with durable, moisture-resistant adhesives. Glulam is a versatile construction material with great strength and durability, and is used in everything from beams to stadium arches. It is available in depths from 6 to 72 inches or greater and in lengths up to 100 feet and longer.

MDF (medium density fibreboard) is an engineered wood product formed by breaking down hardwood or softwood residuals into wood fibers, combining it with wax and a resin binder, and forming panels by applying high temperature and pressure. It is made up of separated fibers, but can be used as a building material similar in application to plywood.

OSB (oriented strand board) is manufactured from waterproof heat-cured adhesives and rectangular-shaped wood strands that are arranged in cross-oriented layers, similar to plywood. This results in a structural engineered wood panel that shares many of the strength and performance characteristics of plywood. Produced in huge, continuous mats, OSB is a solid panel product of consistent quality with no laps, gaps or voids.

particleboard is an engineered wood product made of wood chips, fibers and adhesive, forming panels under heat and pressure. Particleboard is available in various “grades” as set forth by the Composite Panel Association on ANSI A208.1.

substrate - A substrate is the material to which a veneer is bonded. In general, common veneer substrates are either MDF, particle board, or other less expensive pieces of wood such as poplar or pine. Technically, any smooth surface that can be glued to can be a substrate for a wood veneer.

veneer -- A thin layer of wood that is applied over another material (called a substrate), typically for the purpose of conserving more precious woods and reducing costs. Wood veneer is typically 1/16th of an inch thick, ranging all the way down to 1/64th of an inch thick. Any type of wood can be cut into veneers but woods such as oak, maple, birch and cherry are the most commonly cut veneers that are incorporated into commercially manufactured furniture.