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Conspectus's Tech Tips received the national Communications Award from the Construction Specifications Institute.

ABSTRACT:

Is your definition of plywood and the woodworker's definition the same? The term plywood does not define a panel construction and performance. It is critical to understand the available cores and specify the right one to achieve your design intent.

FILING:

UniFormat™
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KEYWORDS:

Plywood, lumber, sheet product, woodwork, particleboard, MDF, veneer, core, paneling, cabinet, shelving

REFERENCES:

Architectural Woodwork Standards (AWS) 2009

WDMA - A Specifier's Guide to Door Face Veneers

Architectural Woodwork Plywood

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I Want Plywood!

Is this your reaction when you see cabinets or paneling constructed with particleboard or MDF panels? Do you know what you are demanding?

Architectural woodwork relies on two basic wood components: lumber and sheet products.

Lumber is easy to understand. Fell the tree, strip the bark, and saw the tree to create lumber. That's it right? Well not exactly. Lumber can also be veneered construction (one type of engineered wood) to create wide and thick members.

Sheet products are defined by AWS in Section 4, paragraph 1.2.1 as a "panel composed of a crossbanded assembly of layers or plies of veneer, or veneers in combination with a lumber core, composite core (MDF or particleboard), or combination core." The common definition and general perception of what plywood is stops at "plies of veneer." In other words, AWS considers a sheet product composed of 2 layers of wood veneer separated by a particleboard or MDF core to be plywood!

Lumber Veneered Construction

Many tree species do not grow large enough to allow large members to be created by sawing. Even if large members can be sawn, they may not be the best for fine architectural woodwork. Furthermore, larger lumber members are difficult to dry without twisting and checking.

For most architectural woodwork, the visible surfaces must be perfect, or nearly so. Checks (slits along the grain from drying stresses) are considered defects. Allowable defects are specified by AWS by Grade and by species.

Considering architects and designer will want a nearly perfect surface, veneered construction is an option for large lumber members. The member is built up by applying thin lumber or veneer faces and lumber edges to a core. The core creates the required lumber dimension. The lumber or veneer creates the finished appearance. This seems to be plywood, but not under AWS definitions.

The typical cores are:

- Lumber
- Structural Composite Lumber
- MDF (Medium-Density Fiberboard)

MDF cores will provide bulk but no strength. The other cores will provide some structural capacity for the veneered member.

Sheet Products

For architectural woodwork, sheet products are manufactured with a minimum of 3 layers: a core and two faces. Sheet products are



Is this what you mean?

Sheet Products

For architectural woodwork, sheet products are manufactured with a minimum of 3 layers: a core and two faces. Sheet products are available in many different constructions that affect the panel performance and appearance. AWS recognizes nine different core materials. The most common cores for architectural woodwork are veneer, particleboard, and MDF.

Regardless of the core used, all sheet products are plywood as defined by AWS. Always rely on the specified reference standard for the product definition. Internet sources such as Wikipedia actually conflict with AWS by limiting the definition to veneer cores only. Caution should always be taken when researching information from sources other than a recognized construction industry standard.

All plywood has veneer faces providing the desired appearance. Likewise all plywood has a core providing the panel performance. Consider these performance characteristics when selecting a plywood core:

Performance	Best Panel Core
Flatness	MDF, Particleboard
Visual Edge Quality	MDF
Surface Uniformity	MDF, Particleboard
Dimensional Stability	Veneer
Screw Holding	Veneer
Bending Strength	Veneer

See 1.2.31.5.3 COMPARISON TABLE in AWS Section 4 for a more detailed comparison.

If a particular performance is required, the core must be specified. Simply requiring plywood is not enough. The construction will be left to the discretion of the fabricator. And the fabricator will select the core that produces the best result for him, not necessarily meeting the design intent for the particular application. Fabricators prefer MDF cores because the panels are very flat with

excellent surface uniformity. This makes controlling the visual appearance of the completed construction much easier than with other cores.

Owners may prefer veneer cores because the panels have the best screw holding and bending strength. Veneer cores may provide the most durable woodwork, especially in abusive applications.

Designers may want thermoset decorative overlay (melamine) finishes for cabinet interiors to minimize shop finishing. These overlays are applied by the panel manufacturer to MDF and particleboard cores, only. The performance will be the same as for MDF and particleboard core panels.

Woodwork Construction

Just where are sheet products used in architectural wood work, and what performance may be important?

Wall Paneling: Excellent surface appearance is the primary concern. Structural capacity is not required since the panels are simply hung from the substrate.

Cabinets: Consider the use. Is it the corporate board room or the mail room? Select the cores for appearance or durability to suit the application. The doors and drawer fronts may be different construction than the cabinet and drawer bodies for different performance.

Shelving and Countertops: Structural capacity to resist bending and sagging may be important, particularly where there are longer spans and where there are heavier loads. Dimensional stability in wet or damp areas may be important for countertops in restrooms and locker rooms.

Conclusion

Consider the use and the required performance. Select the appropriate

plywood core to produce the intended result. And finally, specify the selected core. Do not leave it to the fabricator to make the selection for you. You may have no recourse when you try to enforce your definition of plywood.



If this is not what you mean, make sure to correctly specify the plywood (sheet product) you really want.

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