

# What Is a Solid Core Door, and What Type Is Best for My Installation?

By Theresa Nuqui

**S**OLID CORE DOORS ARE USED FOR various applications, ranging from architectural, to commercial, to even residential. Not all residential solid core doors are exterior or entry doors. In many cases, people prefer to have solid core interior doors due to the sound dampening and insulating qualities that a normal interior hollow core door does not provide.

The term *solid core* is just what it states: a solid core, but it is a generic statement in itself, as *solid core* can refer to many different types of cores. Usually a solid core door is defined as any door that does not have a hollow core. Further, hollow core doors are actually not hollow but have a cardboard-type core laid out in a honeycomb or grid-type configuration. Some may even have a foam core that can also be found in hollow metal doors.

All manufacturers construct a typical door in the same manner, with the core being the base that is framed with rails at the top and bottom and two or more vertical stiles that make up the standard sub-door. Included in this standard sub-door configuration may be additional rails and stiles or other interior blocking for hardware or other surface-applied products.

There are two typical methods for building this sub-door:

- A loose lay method, in which the core, stiles and rails are run through a glue spreader so that the glue is applied only to the surface that is to receive the door skin. Each component is placed in its prospective location, and the door skins are laid on the glued surface with the backer side down on both sides. This can be repeated to produce up to 40 doors at a time before being pressed.
- The other method actually bonds or glues the stiles and rails to the core, and the core is cured in a machine before it is sanded and/or planed. After

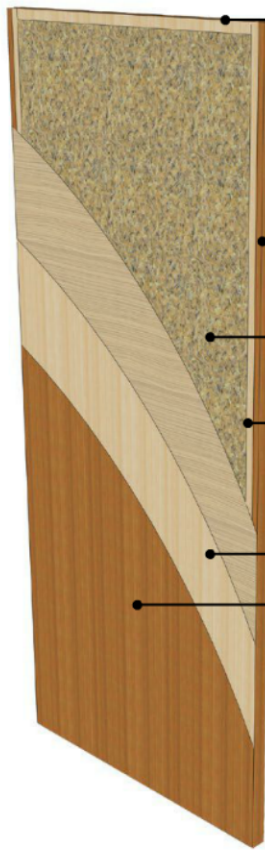
sanding the bonded core to the correct thickness, the sub-door is run through a spreader. The door skins are glued to the core, then placed in the press in the same method as the loose lay, or individually, depending on the manufacturer's method.

The latter of the two is the preferred method for most architectural-grade doors and provides a durable product for heavy and extra-heavy usage. Most commercial and architectural-grade doors are required by the specifications to meet the minimum industry standards as set by associations dedicated to assuring that all products meet those minimum specifications, such as the Window and Door Manufacturers Association (WDMA).

## Core Types for Solid Core Doors

**Particle Core (PC)** – The particle core is the most common type of solid core product, which is produced from a coarse sawdust material that is denser at the surface than at the center. This type of construction creates a better surface for sanding and bonding the door skin without telegraphing. Telegraphing is a defect caused by the outline and/or surface irregularities such as frame parts, core laps, voids, etc., that is visible through the face veneers. It also provides a better screw-holding capability than does the less dense inner part of the core. Particle core has many uses in several industries, but for the sake of door usage, the two most commonly specified are LD-1 and LD-2 cores.

Both LD-1 and LD-2 particle cores must comply with the American National Standards Institute (ANSI) a208.1 standard. LD-1 is the most common and widely used of the two and has a density factor of 28 lbs/ft. LD-2 particle core has a density factor of 32 lbs/ft and is specified for extreme heavy usage applications or for eliminating the need for hardware blocking that is recommended for most LD-1 particle core doors. LD-2 particle core must be



**Top and Bottom Horizontal Edge:** 1/8" minimum solid wood or structural composite lumber, one piece, laminated or LVL

## Inside a Solid Core Door

**Vertical Edge:** 3/4" minimum matching hardwood outer stile; 7/8" minimum finger-jointed, composite or LVL inner stile

**Core:** Particle board, ANSI A208, 1, grade LD-1 or LD-2 (LD-2 requires no additional blocking.)

**Core/Edge Interface:** Stiles and rails are high-frequency bonded to core, and core assembly is sanded prior to application of cross band and veneer.

**Crossband:** 2-ply edge-glued hardwood or one-piece HDF

**Faces:** Selected hardwoods minimum 1/50", grades A, AA, and high-pressure laminate, medium density overlay or hardboard. High-pressure laminate 0.050" direct to core, 0.050" with cross band or 0.125".

Illustration courtesy of Vancouver Door Company

specified, or most door manufacturers will supply LD-1 by default when particle core can be provided to meet other criteria for door construction.

For example, LEED (Leadership in Energy and Environmental Design) is currently in high demand. Particle core can be specified to meet some of the requirements for certain types of LEED credits. Both pre- and post-consumer recycled content are covered, as well as No Added Formaldehyde (NAF) or No Added Urea Formaldehyde (NAUF). Certified forest (FSC) products are also available for LEED credits if specified—but with an added cost, of course.

**Staved Lumber Core (SLC)** – Sometimes referred to as Wood Core (WC), this type of core has been available to the industry for several years and is produced from small blocks of wood (typically pine) that are butt-jointed and glued together so that each row and column are offset to the adjacent row and column. Each block of wood must maintain a specific dimen-

sional tolerance before it can be constructed into a solid core. This core is used more for an exterior-type application and can also meet some of the same LEED criteria as the particle core if specified, with the exception of recycled content. This type of core does not require additional blocking due to the density factor.

### **Structural Composite Lumber Core (SCLC)** –

This type of core was introduced to the market just a few years ago. It is produced from flakes or large chips of wood layered in a random orientation from one to the next. It is then pressed together to achieve a strong and stable finished product. These cores are used in several applications, including but not limited to exterior doors and doors that require a full vision lite or glazed panel or where a high usage application is specified. Most manufacturers will substitute a particle core for this type of core to maintain the warranty for any one of the issues mentioned previously. This core can be specified to meet some of the LEED requirements and does not require any interior blocking.

**Agri-Fiber Core (AC)** – This kind of core is similar to particle cores in appearance. The base material for this core is wheat or rice that can be combined with other fiber-type materials. These are typically specified for their environmental or “green” qualities for LEED projects. They are a Rapidly Renewable material, not a forest product.


**Mineral Core (MC)** – Mineral cores are produced by a limited number of manufacturers, and the materials used to make them are proprietary to those manufacturers. They are used in wood doors requiring a fire rating of 45 to 90 minutes. Blocking with a denser material similar to the core for attaching hardware is highly recommended for this type of product.

**Sound Transmission Loss Core (STC)** – STC cores are engineered specific to the ratings for which they are specified. Each STC-rated core may be constructed differently to achieve the rating it is tested for and is also proprietary to each manufacturer.

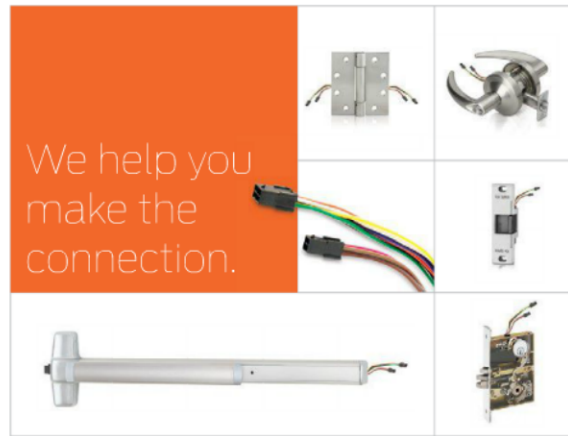
**Bullet-Resistant Core (BR)** – This type of core can vary in thickness, which gives it a particular ballistic rating, and is usually sandwiched between two thinner pieces of different core types (usually particle core) to get the overall door thickness specified—i.e., 1¾ inch.

**Lead-Lined or X-Ray** – There are variable construction types that can use the cores outlined in this article to provide certain qualities such as lead-lined or x-ray doors and electro-shielding, but just about all doors produced will use one of these cores.

Regardless of the type of door—single or pair, sliding door, pivot door, dutch door, wicket door, etc.—the door construction or configuration type must be specified so that it can be constructed in one of the methods discussed in this article with the proper core and framing system for the type of door that is required.

As you can see, there are several cores to choose from. This information is a general guide to help you choose the correct door core for your upcoming projects or door replacement. 

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