

COLORCORE®2 LAMINATE BY FORMICA GROUP



TECHNICAL BRIEF FABRICATION GUIDE

ColorCore®2 surfacing material is a unique laminate that features the high-performance characteristics of standard laminate combined with the added feature of being the same color throughout. ColorCore®2 laminate does not have the dark edge line often associated with laminate applications because the solid color on the surface continues throughout the entire thickness of the laminate.

STORAGE AND HANDLING

STORAGE

ColorCore®2 surfacing material sheets should be stored horizontally with the top sheet turned down and a caul board placed on top to protect the material from possible damage and to reduce the chance of warpage of the top sheets. ColorCore®2 surfacing materials should be protected from moisture and should never be stored in contact with the floor or an outside wall. The optimum conditions for storage are approximately 75°F (24°C) and at a relative humidity of 45 to 55%.

HANDLING

Always carry ColorCore®2 laminate sheets vertically. Handle full-size sheets carefully to avoid breakage or injury. It is recommended that two people carry full-size sheets.

Be careful when moving ColorCore®2 surfacing material so as not to strike it against anything which would damage the decorative surface or the edges.

Always lift a ColorCore®2 laminate assembly from one point to another. Never slide the panel on its decorative surface. Leave the protective film in place during fabrication.

STRESS CRACKING

CAUSES OF STRESS CRACKING

Stress cracking of ColorCore®2 surfacing material is caused by the concentration of stresses greater than the ColorCore®2 surfacing material can withstand.

These stresses can be caused by external forces such as loading or impacts, but are generally created by the normal dimensional movements of the ColorCore®2 laminate assembly as it reacts to the surrounding environment. As with all wood-based products, ColorCore®2 surfacing material reacts to the ambient conditions. ColorCore®2 laminate sheets and substrates gain moisture and expand under moist conditions (high relative humidity) and lose moisture and shrink under dry conditions (low relative humidity). When drying occurs, stress cracking can result. Also, when improperly fabricated ColorCore®2 laminate assemblies are exposed to low humidity conditions, stress cracking may result.

ColorCore®2 laminate moves about twice as much across the grain (sheet width) as it moves along the grain (sheet length/sanding direction). Whenever possible, minimize the dimension of the cross-grain direction.

CONTROLLING STRESS CRACKING

Controlling stress cracking can be easily accomplished by using fabricating techniques which recognize and moderate the

dimensional movement and associated stresses in a ColorCore®2 laminate assembly.

PRECONDITIONING

Allow the ColorCore®2 surfacing material and substrate to acclimate for at least 48 hours to the same ambient condition prior to fabrication. Optimum conditions are 75°F (24°C) and 45 to 55% relative humidity. Provisions should be made for the circulation of air around the components.

SUBSTRATE SELECTION

The recommended cores for ColorCore®2 surfacing material fabrication are 45# density, industrial-grade particle board or medium density fiberboard (MDF). DO NOT USE DRYWALL (GYPSUM), PLASTER, CONCRETE, SOLID LAMINATE OR UNDERLAYMENT.

INSIDE CORNER FABRICATION

Radius inside corners as large as possible ($\frac{1}{8}$ " (3.2mm) minimum). Inside corners required for sinks, grills, electrical outlets, etc., must contain the stresses generated by the normal movement of the ColorCore®2 surfacing material. Radiusing the cutouts greatly reduces these stresses. The radiused corner created by a $\frac{1}{4}$ " (6.4mm) diameter router bit is sufficient.

ADHESIVE BOND

The strength of the bond between the ColorCore®2 surfacing material and the substrate determines the amount of stress that may be transmitted to the substrate. Contact adhesives are the weakest of all recommended adhesives because of their elastomeric nature. PVAc (white or yellow glue), urea and resorcinol adhesives distribute much more of the stress to the substrate, making these assemblies more crack resistant.

When using contact adhesive, stress crack performance will be greatly improved if PVAc (white or yellow glue) is used at all inside corners (see below). Note: Waterproof PVAc adhesives (yellow glue) are available for assemblies which require water resistance.

- A. Mask the ColorCore®2 surfacing material and substrate area around the cutout prior to applying the contact adhesive.
- B. Apply a PVAc adhesive to the masked area just before the ColorCore®2 surfacing material and substrate are joined and nip rolled to fuse the contact adhesive.
- C. Clamp the area bonded with PVAc until the adhesive has set (usually one hour).

STRATEGIC SEAM PLACEMENT

Plan the placement of seams to minimize inside corners.

Arranging seams to avoid unnecessary cutouts is also an effective means of controlling stress cracking.

INSTALLATION

Install the assembly clearance at sinks, electrical boxes, the panel edges, etc. to allow for normal dimensional movement.

Do not install a ColorCore®2 laminate assembly by forcing or

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binding the assembly in a manner which will not allow normal dimensional movement. Panels should be installed with clearance around electrical boxes, piping, ductwork, etc. Sinks or louvers should fit easily into openings without binding. Panels should be installed in a flat plane by shimming or furring to avoid unnecessary bending.

CUTTING

Many of the same tools used to fabricate items surfaced with Formica® Brand laminate are also used with ColorCore®2 surfacing material.

When using a table saw to cut ColorCore®2 laminate sheets to rough sizes we recommend using a triple-chip grind (10" carbide-tip blade with 60 teeth).

When cutting double sided panels on table or panel saw, a 5° negative hook angle blade is recommended. This will produce a smooth cut and minimize chipping.

The blade should be raised approximately 1/2" (12.7mm) above the ColorCore®2 surface. By further raising the blade, surface chipping is reduced. By lowering the blade, bottom side chipping is reduced.

The ColorCore®2 laminate sheet, face side up, should rest flat on the saw table as it passes the saw blade. The saw fence should be in proper alignment with the saw blade. A board may be clamped to the saw fence to prevent flutter while cutting.

When using a radial arm saw, materials should be supported with a piece of scrap lumber. A 5° negative hook angle blade is also recommended.

Some electric shears can be used, with care, to cut ColorCore®2 laminate sheets. Never use laminate slitters to cut ColorCore®2 laminate sheets.

ROUTING

A router, along with a selection of carbide cutters, will be the will be an indispensable tool when working with ColorCore®2 surfacing material. There are a variety of routers on the market which differ in style, size, price and optional attachments. A basic 1/4" collet router with at least a 23,000 RPM rating can perform the majority of the machining requirements of ColorCore®2 surfacing material.

The two most commonly used router bits are:

- Carbide-tipped 2 flute flush cutter with ball bearing guide
- Carbide-tipped 2 flute bevel trimmer with ball bearing guide (available with various bevel angles from 10° to 22°)

Some other bits (specialized uses discussed on pages 4):

- 45° chamfer carbide-tipped router with ball bearing guide
- 1/8" or 5/32" rounding over carbide cutters with ball bearing guides

Another tool that should be kept on hand is a fine-ribbed flat steel file. Always file towards the center of the substrate with the file against the substrate.

A belt sander should not be used because it can leave an uneven seam and result in an unattractive glue line in the final assembly.

In accordance with good safety and hygiene practices, the use of standard safety equipment, dust collection techniques and devices on production equipment, and the use of protective equipment such as safety glasses, dust masks, etc. normally used during woodworking operations are recommended. Make certain that all applicable safety standards are observed during all handling and fabrication operations.

SUBSTRATES

ColorCore®2 surfacing material should be bonded to a suitable substrate such as medium density fiberboard (MDF) or a 45 lb. density industrial grade particleboard (CS 236-66: Type 1, Grade B, Class 2). The substrate should be clean, free of oil or grease and uniform in thickness.

Do not apply ColorCore®2 surfacing material to drywall (gypsum), plaster, concrete, solid lumber or underlayment grade particleboard.

BALANCING

Many applications, such as large, thin sectioned panels, cabinet doors, etc., will require a balancing sheet. Optimum balancing is obtained by bonding the grade of ColorCore®2 surfacing material on both sides of the assembly with the same adhesive treatment. Always align the sanding marks in the same direction.

For less critical applications, the selection of an appropriate backer depends upon the specification application. The following table is offered only as a general rating of the effectiveness of several materials. These are listed in descending order of balancing capability. The final decision concerning the selection of a proper backer must be made by the fabricator, based on the particular application.

BACKER SELECTION GUIDE

BALANCING MATERIAL	DEGREE OF BALANCE	TYPICAL APPLICATIONS
CC/HGP	Best	All Applications
12/HGP		Cabinet Doors
C9/CLS		Cabinet Cases
10/HGS		Cabinet Cases
99/BKH		Countertops
91/BKL	Least	Countertops

Note: The high-gloss version of ColorCore®2 surfacing material, Grade SS/HCS, should only be balanced with itself when used in applications requiring a balanced assembly. In this case, the same adhesive treatment should be used on both sides.

ADHESIVES

Two types of adhesives are used for bonding ColorCore®2 surfacing material to substrates: PVAc (white glue) and contact adhesive.

Of the two, PVAc is preferred. It dries clear and strong and results in thinner glue lines than contact adhesive, but it does require maintaining uniform pressure over the entire area until the glue is

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dry. PVAc is available in catalyzed and non-catalyzed form.

Contact adhesive or waterproof PVAc (yellow glue) is recommended where water resistance is required, however contact adhesive generally results in a more obvious glue line. Non-pigmented contact adhesive, such as Formica® brand #151 natural spray grade, or Formica® Brand #100M or #140 brushable grades is recommended.

There are three basic methods for applying contact adhesive: roller, brush and spray. Although rolling and brushing are acceptable, spraying will assure a more uniform application of adhesive and is the preferred method.

A combination of PVAc and contact adhesive may also be used for applications on large surfaces to achieve the least apparent glue line. To do this:

- First, bond the edge of the substrate with PVAc and trim flush.
- Second, mask off approximately a 1-½" (3.81cm) wide strip of the substrate face and corresponding ColorCore®2 material. Then coat both surfaces with contact adhesive.
- Peel off masking tape and allow contact adhesive to dry.
- Spread a light coat of PVAc onto the previously masked substrate. Waterproof PVAc is recommended for applications, such as countertops, that require water resistance.
- Position ColorCore®2 sheets on the substrate and "J" roll areas bonded with contact adhesive.
- Clamp the areas glued with PVAc.
- Use caul boards to protect the surface and distribute the pressure. Wipe away the glue squeeze-out.
- If using this method on door panels where flatness is critical, use the same procedure on both sides.

Remember, ColorCore®2 surfacing material has no dark edge to hide the adhesive line. The wrong glue will give you an unattractive glue line. Resorcinol, pigmented contact, and standard dark colored urea adhesives tend to leave a noticeable and objectionable adhesive line when used with the lighter colors of ColorCore®2 surfacing material.

SURFACE PREPARATION & ASSEMBLY

A tight mechanical fit of surface to edge is required to minimize glue line visibility.

A basic rule in fabricating ColorCore®2 surfacing material is to always apply edges before the surface sheet.

To avoid cracking the edges, edgebanding should be cut to allow for ¼" (6.35mm) overhang. Edgebanding should be free of chips and dirt on the faces and backs.

Veneered edgebanding should be trimmed with a sharp, flush cutting router bit. Always slow down at the end of the cut and corners to allow the cutter to do the job and avoid chipping.

A flat substrate is essential for good fabrication. File the edges with a smooth file held flat against the substrate surface. ColorCore2 material must be filed in one direction only – toward

the substrate. Do not use a belt sander. To check for flatness, use a piece of ColorCore®2 surfacing material as shown.

Apply the ColorCore®2 laminate sheet, allowing a ¼" (6.35mm) overhang. Now the assembly is ready for shaping the edge.

SHAPING THE EDGE

SELF EDGE

To achieve the "self-edge", a basic 10° bevel trim router bit is used. The depth of this router bit should be adjusted to trim the ColorCore®2 surface and a small amount of the ColorCore®2 edge during the final trimming operation, thus eliminating the need to hand file.

ROUNDED EDGE

A soft-looking radiused edge is achieved by using a ⅛" or ⅝³²" rounding over bit. The ⅝³²" rounding over bit is the maximum radius that can be used with ColorCore®2 surfacing material without exposing the substrate. Rubbing the machined edges with lemon oil, boiled linseed oil, tung oil, high quality acrylic car wax, or clear Danish oil will restore the original surface luster.

PINSTRIP EDGE

A striped or multi-colored effect can be achieved by combining two or more colors of ColorCore®2 surfacing material on the edge. A number of different bits can be used to expose the multi-colored layers.

To achieve the pinstripe edge, cut the desired colors of ColorCore2 strips and glue together to form the edge strip. Sand the face of the ColorCore®2 strips to permit adhesion. We suggest 100-grit abrasive paper. When gluing the strips together, use a solvent-based contact adhesive for any number of layers. A clear epoxy adhesive can be used for three or few layers with superior results. Since the performance of epoxy adhesives varies widely, it is recommended you test any epoxy for suitability for your intended application. Do not use PVAc adhesives.

Remember, the color of the selected adhesive is important. Alternating light with dark colors of ColorCore®2 surfacing material will also help conceal the glue lines.

Align the sanding marks, and combine the ColorCore®2 laminate pieces face to back. Apply the edge strips to the substrate.

To achieve the pinstripe edge, use two layers for the edge strip. Then, using a 45° chamfer bit, rout the edge to expose a pinstripe.

For three or more layers, pre-assemble strips and apply as molding with miter cuts or apply to the substrate one band at a time.

For additional finishing of the machined edge, sand with progressively finer papers (180-600). Do not use dark colored abrasive papers. Polish with a soft buffing wheel and white polishing compound.

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WOOD EDGES

The wood edge is the most forgiving of all edge treatments with respect to adhesive lines. There are several different treatments possible with the wood edge. Two examples are the Chamfer (45°) and the Ogee edge.

For either of these edges a decorative wood is glued to the outer edge of the substrate with suitable PVAc glue. The wood is then exposed by routing to create a beautiful and unique effect.

WOOD CHAMFER EDGE

The wood chamfer edge is achieved by routing into the decorative wood using a 45° chamfer bit.

WOOD Ogee EDGE

Similar to the wood chamfer edge, this effect is created by routing into the decorative strip using an ogee bit.

Wood edges should be properly sealed according to the requirements of the particular application. Acceptable finishes are those commonly used in woodworking and may include: lemon oil, tung oil, bar top varnishes, polyurethanes and others. If prolonged exposure to moisture is anticipated, special consideration to further sealing of the wood should be given.

SURFACE TREATMENTS

ColorCore®2 surfacing material can be engraved, face-routed and sandblasted to achieve beautiful and unique looks.

Multiple layers of ColorCore®2 material can be used for the surface just like an engraving stock to achieve striking accents.

ColorCore®2 surfacing material can be face-routed using carbide-tipped, single flute veining bits. This will create a unique surface detail. Face routing on single layers of ColorCore®2 surfacing material should be limited to a maximum depth of 0.02" (0.5mm).

Sandblasting can also create an interesting effect. This effect is realized by gloss change, not by depth. You may want to experiment with garnet abrasive and an inexpensive sand blaster. Your only limit is your imagination. Sandblasting masks can be fabricated from laminate, cardboard, masking tape, rubber, metal and vinyl materials. Masks can also be purchased from a local sign maker.

SUMMARY

- Use caution when handling ColorCore®2 surfacing material.
- To avoid breakage and injury, carry ColorCore®2 laminate sheet vertically with two people to a sheet.
- Store horizontally.
- Select the proper substrate – 45# density particle board or MDF.
- Precondition substrates and ColorCore®2 laminate sheets for a minimum of 48 hours prior to fabrication. Optimum conditions are 75°F (24°C) and 45 to 55% relative humidity.
- PVAc adhesive is preferred. Waterproof PVAc or contact adhesive should be used when water resistance is required. If you use contact adhesive, use a non-pigmented adhesive. Spraying gives the best results.
- Apply edges first, machine as smooth as possible and follow with a smooth file to eliminate unevenness. Do not use a belt sander.
- Before applying adhesive, check for a smooth flat plane with a small piece of ColorCore®2 surfacing material placed flat down on the surface.
- All cutting tools and saw blades should be kept sharp. Use carbide-tipped tools.
- Elevate the saw blade to ensure a clean cut both top and bottom. Eliminate ColorCore®2 laminate sheet flutter when sawing by properly supporting the material. Do not use a laminate splitter.
- To avoid cracked edges, minimize ColorCore®2 material overhang to approximately ¼" (6.4mm).
- Set routers to clean edges entirely – this eliminates filing and sanding.
- When finishing the edge, use an acrylic car wax or boiled linseed oil, lemon oil or clear Danish oil to rejuvenate the color. These may also be used to rejuvenate routed surfaces.
- Radius inside corners as large as possible, ⅛" (3.2mm) minimum.
- Plan the placement of seams to minimize inside corners.
- Provide clearance at sinks, electrical boxes, range cutouts, etc. to allow for dimensional movement.

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MANUFACTURER

Formica® Brand Laminate sheets are manufactured by Formica Group.

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