FORMICA® LAMINATE BY FORMICA GROUP

SUBSTRATE TECH GUIDE

BACKGROUND OF HPL

When using Grade 20-90 gloss finish on a panel application there will be a degree of telegraphing on the surface. Formica recommends using Grade 10-90 or Grade 12-90 for gloss applications.

As HPL is a paper product comprised of about 70% wood fibers, it is susceptible to expansion and contraction due to moisture absorbency and thus will move in both width and length directions and dependent on ambient relative humidity. In most parts of the country winter time dry heat shrinks HPL and summertime expands HPL. HPL moves twice as much in the width as it does the length.

SUBSTRATE SELECTION

As HPL moves with humidity swings, it is important to choose a substrate which moves at similar rates. The industry uses Particleboard and MDF substrates in most applications as these are comprised of randomly oriented wood fibers which absorb moisture similarly to HPL.

Other marginal substrates include plywood, steel and aluminum but they will move at a different rate than HPL and in the case of metals will react to temperature and not humidity.

Substrates which are problematic include gypsum and similar inorganic materials due to poor bonding and variances in dimensional change and thus are not recommended.

MDF (GOOD)

MDF or Medium Density Fiberboard is also an engineered wood product made by breaking down hardwood and softwood into its fibers and combined with a wax and resin binder by applying high temperature and pressures. The surface is flat, smooth, and free of knots and is a better choice for Formica® Brand gloss-90 finishes. It is stronger and much denser than particleboard.

PARTICLEBOARD (GOOD)

Particleboard is an engineered wood product made from woodchips, shavings and sawdust and bonded together with a synthetic resin binder which is pressed and extruded. A density of 45lb/ft^3 is recommended. It is economical, lightweight with good screw holding strength.

Additives for various performance characteristics can be added such as fire and water resistance.

PLYWOOD (MARGINAL)

Plywood is an engineered wood made from thin sheets of wood or piles. Layers are glued together with each layer at right angles for better strength. The alteration of the grain reduces expansion and contraction and makes for consistent strength in all directions.

If you choose to use plywood, Formica Corporation recommends “A” faced, hardwood, veneer or multiply core plywood. The use of any plywood substrate will require Formica® Brand F200, F270 or PVA adhesive to ensure a proper bond..

MDF

PARTICLEBOARD

PLYWOOD

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STEEL/ALUMINUM (POOR)

Bonding HPL to any metal substrate which offers a structural strength has its challenges (see Metal Substrates Technical Brief). Since metals move with temperature but HPL moves with humidity these two conditions can counteract each other causing HPL bond failure. If you choose to use a metal substrate Formica Coporation recommends F155 contact cement for bonding to metals. Water based adhesives are a bad choice as water needs to dissipate thru the substrate and metal has an impenetrable barrier. Thicker HPL like Grade 10 are best as they have the least dimensional movement.

SUBSTRATES NOT RECOMMENDED

Gypsum, Concrete Surfaces, Plaster or TFM. These surfaces have inadequate bond strength due to irregular surface and moisture transfer issues.

	BOND STRENGTH	SURFACE IRREGULARITIES	DIMENSIONAL MOVEMENT SIMILAR TO HPL
MDF	Good	Good	Good
PARTICLEBOARD	Good	Marginal	Good
PLYWOOD	Good	Marginal	Marginal
METALS	Poor	Good	Poor
GYPSUM	Poor	Poor	Poor
CONCRETE	Poor	Poor	Poor
TFM/MELAMINE BOARD	Poor	Poor	Poor

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SUBSTRATE TECH GUIDE

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