

# INTRODUCTION – What are 3D Laminates

**3D Laminate is known by a couple of names:**

- **3DL**
- **Rigid Thermo-Foil or RTF**
- **Membrane press foil**

**3D Lamination encapsulates a panel**

- **3DL covers the front, top, bottom and sides of a panel.**
- **3DL can form around routed contours.**



## INTRODUCTION – What are 3D Laminates

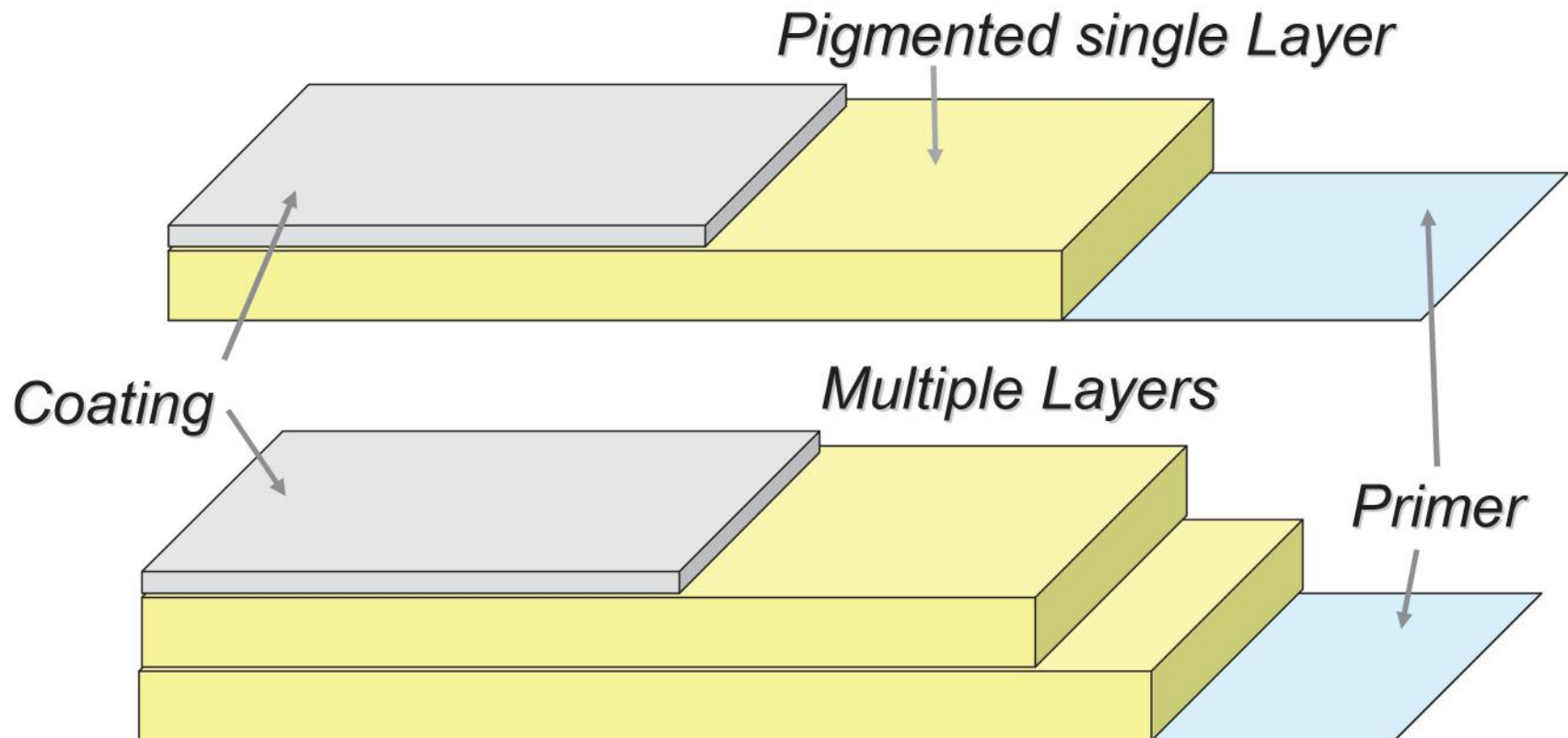
For Healthcare, 3DL has several advantages:

- continuous surfacing for sanitation
- rounded corners for safety
- free form shapes for spill containment, drip control.



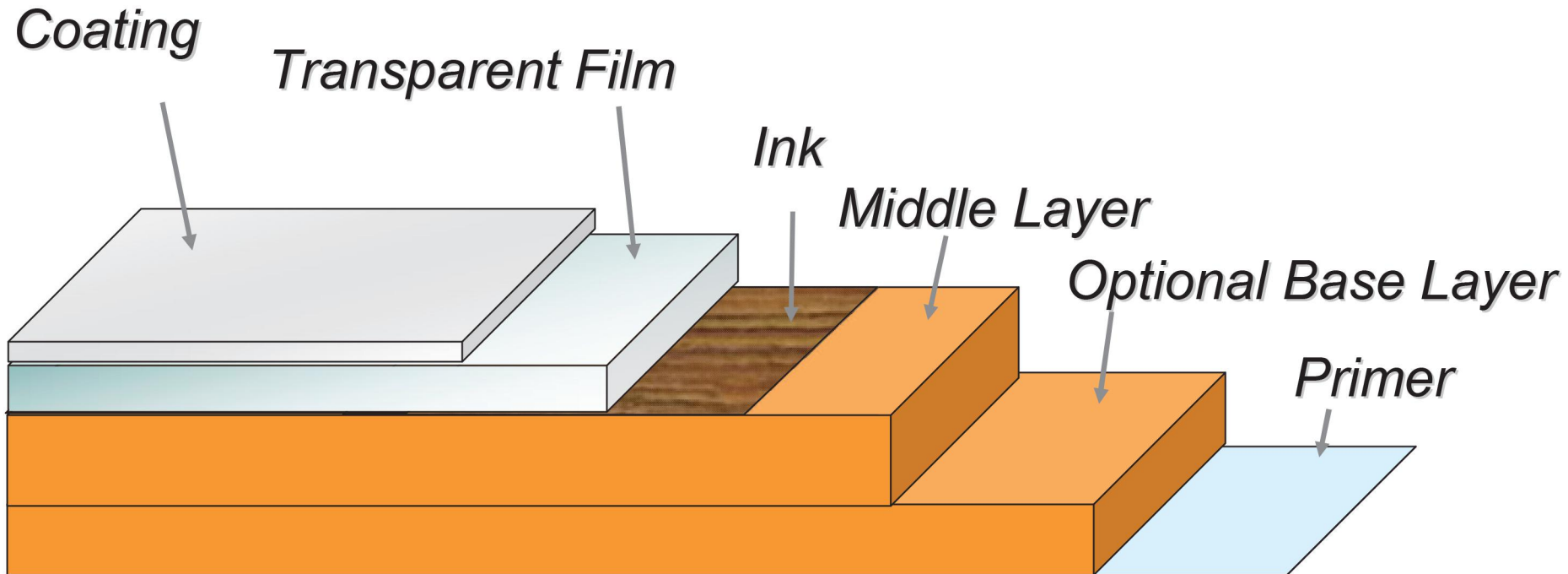
## 3D Laminate Construction – Solid Colors

- Common Solid Color Construction 12 to 20 mils (0.30-0.50 mm) thickness
  - Multiple ply for thicker laminate and for higher recycle content



## 3D Laminate Construction – Prints

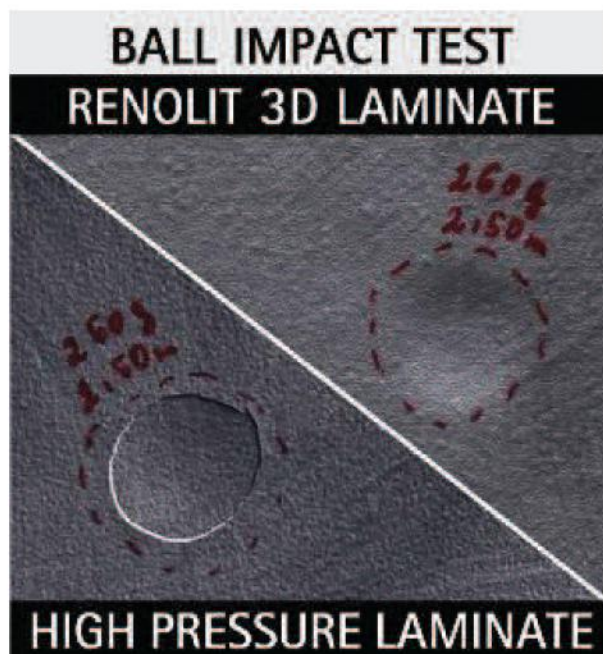
- Printed Construction typically 12-20 mils (0.3-0.5 mm) thickness
  - Functional top-coating and a clear ply protect the inks





# Material Performance Attributes – Impact

- Almost all 3D Laminates share the following performance attributes
  - Thermoplastics are not brittle and conform to impact



| NEMA LD3-2005 |             |                                                                                      | NEMA MINIMUM STANDARDS |                      |                     |
|---------------|-------------|--------------------------------------------------------------------------------------|------------------------|----------------------|---------------------|
|               | TEST        | DESCRIPTION                                                                          | HPL Vertical (VGF)     | HPL Horizontal (HGF) | Typical 3DL Results |
| 3.8           | BALL IMPACT | Resistance to fracturing from a steel ball dropped on laminated surface              | 500 mm (20")           | 1140 mm (45")        | >3000 mm (>118")    |
| 3.9           | DART IMPACT | Resistance to fracturing from a 25 g dart with 5 mm tip dropped on laminated surface | 200 mm (7.9")          | 450 mm (17.7")       | >1100 mm (>43")     |

# Material Performance Attributes – Fit to Healthcare

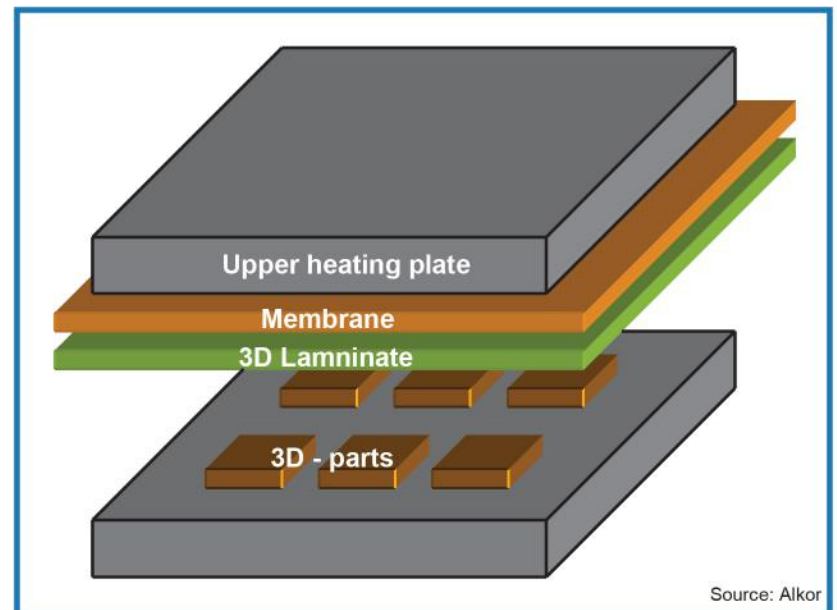


- Chemical Resistance
  - Generally unaffected by bleach and ammonia
  - Resistance to various commercial disinfectants varies

|                                                          |                  |                                                              |             |
|----------------------------------------------------------|------------------|--------------------------------------------------------------|-------------|
| 3M #25H Quat Disinfectant (0.393% Solution)              | <b>EXCELLENT</b> | Johnson Diversey TRIAD III Disinfectant (1.56% Solution)     | <b>GOOD</b> |
| 3M #5 Quat Disinfectant (0.393% Solution)                |                  | Johnson Diversey Virex II 256 Disinfectant (0.393% Solution) |             |
| 3M #3 Neural Cleaner (0.265% Solution)                   |                  | Fantastik Cleaner (Ready to use)                             |             |
| 3M #23L Quat Disinfectant (0.393% Solution)              |                  | Windex (Ready to use)                                        |             |
| Johnson Diversey Expose II 256 (0.393% Solution)         |                  | Caltech Precise - Ready to use (Phenol based)                | <b>FAIR</b> |
| Johnson Diversey Forward SC GP Cleaner (0.393% Solution) |                  | Caltech Citrace - Ready to use (Phenol based)                |             |
| Johnson Diversey ALPHA HP Disinfectant (1.56% Solution)  |                  | Dispatch Disinfectant (Ready to use) - Sheets                |             |
| Huntington Hi Tor Plus Disinfectant (0.393% Solution)    |                  | Johnson Diversey Virex Tb Disinfectant (Ready to use)        |             |
| Huntington Tor HB Disinfectant (1.56% Solution)          |                  | Johnson Diversey Oxivir Tb Disinfectant (Ready to use)       | <b>POOR</b> |
| Steris Vesphene Ilse (0.78% Solution)                    |                  | Dispatch Disinfectant (Ready to use)                         |             |
| Bleach (Full Strength)                                   |                  | Caltech Precise QTB - Ready to use                           |             |
| Bleach (10.0% Solution)                                  |                  | Johnson Diversey Glance HC Disinfectant (2.5% Solution)      |             |
| Non-Chlorine Bleach (10.0% Solution)                     |                  | Huntington Matar 102613 Disinfectant (0.393% Solution)       |             |
| Ammonia (3.1% Solution)                                  |                  | Tincture of Iodine                                           |             |
| Vinegar                                                  |                  |                                                              |             |
| Lysol 4 in 1 Disinfecting Wipes (Ready to use)           |                  |                                                              |             |
| Chlorox Disinfecting Wipes (Ready to use)                |                  |                                                              |             |
| Walgreen's Hand Sanitizer                                |                  |                                                              |             |
| Lysol bathroom Cleaner (Ready to use)                    |                  |                                                              |             |

## 3D Lamination - Process

- 3D Pressing
  - Membrane pressing
  - Membrane-less pressing
  - Vacuum forming





# 3D Lamination Process



With anything from a sketch to a finished 3-D file of your design, a fabricator can route virtually any shape into your wood core components, from compound curves, fine details and corporate logos to deep recesses and wire management holes.



Your routed components are coated with adhesive and placed on a thermoforming table. 3D film is suspended above—then slid into a chamber that heats the film and creates a vacuum, drawing the film tightly onto the part.



Once the part has cooled, and excess film is trimmed from all edges of the backside (which is normally pre-laminated with melamine prior to routing), the membrane pressed parts are ready for assembly.