MATERIALS, TECHNOLOGY AND INNOVATIVE TRENDS IN LAMINATE CASEWORK

This seminar is presented to you by CASE SYSTEMS

PROVIDER NUMBER: J518
Presented by: CASE SYSTEMS, INC.
2700 James Savage Rd
Midland, Mi 48657
Institutional casework has evolved dramatically over the decades. Innovations in materials, concepts and manufacturing technologies offer advantages. This presentation gives a thorough understanding of the finished casework product to assure quality casework is specified and installed.
<table>
<thead>
<tr>
<th></th>
<th>Learning Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Learn about current trends in laminate casework</td>
</tr>
<tr>
<td>2</td>
<td>Understand the core materials and differences that are critical for specifications</td>
</tr>
<tr>
<td>3</td>
<td>Learn areas that need to be included in specifications</td>
</tr>
<tr>
<td>4</td>
<td>Knowledge of Division 6 and Division 12 specifications and their impact on your project</td>
</tr>
<tr>
<td>5</td>
<td>Knowledge of standards and resources to support specifications</td>
</tr>
</tbody>
</table>
# TABLE OF CONTENTS

- Introduction
- Substrate
- Laminate
- Edgeband
- Joinery
- Hardware
- Construction
- Division 6 vs Division 12
- Standards and Resources
- Lessons Learned
INTRODUCTION
INTRODUCTION

PLASTIC LAMINATE CASEWORK OFFERS A WORLD OF COLOR OPTIONS
INTRODUCTION

POPULAR APPLICATIONS OF PLASTIC LAMINATE CASEWORK

- EDUCATION
- HEALTHCARE
- COMMERCIAL
- LABORATORIES
- DORMROOMS
- MOBILE
INTRODUCTION

OVERVIEW: IMPORTANT COMPONENTS OF CASEWORK

Laminates

Edgebanding

Hardware

Toebase

Substrate

Back Panel Joinery
INTRODUCTION

OVERVIEW: SPECIFICATION AREAS

- Hinges
- Exposed Ends
- Cabinet Face
- Pull Style
- Backsplash
- Adjustable shelf edge
- Cabinet front edging
- Glazed door material
- Adjustable shelf thickness
- Exposed interior
- Adjustable shelf edges
- Closed interior
- Door and drawer edging
- Toe Base
- Wall unit bottom
SUBSTRATE

DIFFERENT GRADES OF ENGINEERED PARTICLEBOARD

- SCREW HOLDING FACE
- SCREW HOLDING EDGE
- INTERNAL BOND
- MODULUS OF RUPTURE
- MODULUS OF ELASTICITY

USE THE RIGHT BOARD FOR YOUR SPECIFICATIONS!
USE THE RIGHT BOARD FOR YOUR SPECIFICATIONS!

SUBSTRATE

STRENGTH COMPARISON

**M3i** is STRONGER than **MS**:

- **22%** FACE SCREW HOLDING
- **25%** EDGE SCREW HOLDING
- **38%** INTERNAL BOND
M3i is 32% STRONGER against rupture than MS

USE THE RIGHT BOARD FOR YOUR SPECIFICATIONS!
M3i is 45% more ELASTIC than MS

USE THE RIGHT BOARD FOR YOUR SPECIFICATIONS!
SUBSTRATE

PLYWOOD VS PARTICLE BOARD

- LESS SUSCEPTIBLE TO MOISTURE DAMAGE
- MORE LIGHT WEIGHT
- MORE PRONE TO WARPING

USE THE RIGHT BOARD FOR YOUR SPECIFICATIONS!
LAMINATE

TYPES OF LAMINATES

- HIGH PRESSURE LAMINATE
- THERMALLY FUSED LAMINATE
- TOP COATED MELAMINE

USE THE RIGHT LAMINATE FOR YOUR SPECIFICATIONS!
HIGH-PRESSURE LAMINATE

High-Pressure Laminate is defined as manmade decorative material which is applied to the surface of a substrate.

High-Pressure Laminate is most common in residential and commercial countertops and cabinets, work and laboratory surfaces, retail fixtures, furniture, displays, walls and floors.
LAMINATE

COMPONENTS OF HIGH-PRESSURE LAMINATE

MELAMINE TREATED OVERLAY
DECORATIVE SHEET
KRAFT PAPER LAYERS
SUBSTRATE
WHAT IS HIGH-PRESSURE LAMINATE MADE OF?

10% Rapidly renewable fiber (e.g. Eucalyptus)

20% Post-consumer recycled fiber

30% Resin

40% Controlled and FSC wood fiber
CHARACTERISTICS OF HIGH PRESSURE LAMINATE

- Some HPL sheets have a grain direction
- HPL shows dimensional behavior similar to wood: it expands with humidity or in applications of extreme heat or cold
LAMINATE

THERMALLY FUSED MELAMINE

- AKA ‘Low Pressure laminate’
- Viable alternative in the right application (vertical; low impact environments)
- Thermally fused melamine can be coordinated with High Pressure Laminate in a complementary design
LAMINATE

COMPONENTS OF THERMALLY FUSED MELAMINE

DECORATIVE SHEET
Saturated with melamine resin

SUBSTRATE
LAMINATE

TOP COATED MELAMINE

- Same paper used to make high pressure laminate
- Top coated with melamine resin
- Glued to the substrate
- Poor abrasion resistance
- Poor chemical resistance
- Delaminates and peels
WEAR RESISTANCE - TABER ABRADER TESTS

The TABER Abrader is used to perform accelerated wear testing.

Referenced in numerous international standards, materials include plastics, coatings, laminates, leather, paper, ceramics, carpeting, safety glazing, and many others.
LAMINATE

WEAR RESISTANCE - TABER ABRADER TESTS

HPL 400 CYCLES:

TFL 400 CYCLES:

METAL 200 CYCLES:

WOOD 125 CYCLES:

LAMINATE SURFACES

4X MORE ABRASION RESISTANT THAN METAL SURFACES
LAMINATE

LAMINATE ADHESIVES

- Water based
- Solvent based
- Contact adhesive
LAMINATE

LAMINATE ADHESIVES

- Polyvinyl Acetate (PVA) refers to the **water-based adhesive** used to bond HPL, liner and backer to a core material.
- PVA is mechanically applied to the substrate with a glue spreader and covered with the specified laminate and pressed, utilizing either a cold or hot press process.
- They gain their bonding strengths by utilizing the water as a vehicle to penetrate the surface of each material and linking with the sub surface fibers.
- They are non-toxic and do not emit harmful VOCs or hazardous air pollutants.
LAMINATE

CONTACT ADHESIVE

- Adhesion is created with a “J” roller
  - Downside: no guarantee of consistent pressure
  - Inconsistent pressure can result in laminate failure

- For best results, ensure that your supplier uses a hot press in the lamination process
EDGEBAND

COMMON TYPES OF EDGEBANDING

- 3mm Edge
- 0.20” Edge
- Self Edge
EDGEBAND

3MM EDGE

- Applied with hot melt adhesive
- Visually attractive, as it forms a rounder smooth edge
- BEST IMPACT RESISTANCE
EDGEBAND

0.020” EDGE

- Applied with hot melt adhesive
- CONSISTENT COLOR
- Commercially matched to most laminates
EDGEBAND

SELF EDGE

- HPL is cut in strips and glued to the substrate.
- Leaves the cabinet vulnerable to damage from any blunt object including desk chairs.
- Warranty issues!
CREATIVE POSSIBILITIES

- New 3D, glossy and flexible edge banding products offer endless choices
- High-end aesthetics options
HARDWARE
HARDWARE

DRAWER SLIDES

- Bottom mount slides with 1 1/2” long screws ensure durability and can withstand heavy loads without racking.

- Side mount sides are attached with short (3/8”) screws
  - Force is applied directly to screws
  - Risk of racking
  - Drawer can become inoperable and can fail
HARDWARE

TYPES OF HINGES

☐ 5-Knuckle Hinge
  - Most commonly specified
  - Durable
  - No interior space loss
  - Uses roller or magnetic catches
  - 270° swing

☐ 3-Knuckle Hinge
  - Durable
  - Self closing in last 10°
  - 270° swing

☐ Concealed Hinges
  - Least durable
  - Four areas of adjustment
  - Consumes interior space
  - Self closing in last 10°
  - 170° swing only
  - Clean exterior design
HARDWARE

PULLS

- MOST COMMON: ALUMINUM WIRE
- Contour
- Brass core
- Epoxy-coated
- Stainless Steel
- ABS semi-recessed
- Oversized semi-recessed
- Custom
CONSTRUCTION

WHAT TO LOOK FOR IN THE CONSTRUCTION OF YOUR CASEWORK

- Joinery
- Separate Recessed Toebases
- Durable Drawer Construction
- Strong Backpanels
- 32 mm System
CONSTRUCTION
JOINERY

Mechanical joinery system

- Mechanical joinery systems use spring steel clips and threaded studs.
- PRO: Joints can be disassembled without damage to the cabinets!
- APPROVED as premium grade joinery by AWI (Architectural Woodwork Institute)
- Racking is absorbed by steel spring – returns “home”
DOWEL PIN JOINERY

- Dowel pin joinery uses glue to form a rigid bond
- 8mm dowels
- PRO: Exact Tolerances
- CON: Joint failure accompanied by damage to the substrate can occur
CONSTRUCTION

SEPARATE RECESSED TOEBASES

- Protect the cabinet from moisture, dampness, spills or wet cleaning.
- Gives cabinet full support of end panel and bottom.
- Generally assembled at manufacturing facility.
- Allow use of different material for the base
- Example: Raw exterior grade plywood
CONSTRUCTION

DURABLE DRAWER CONSTRUCTION

TYPICAL DETAILS:
DRAWER BOX CONSTRUCTED OF 1/2" M3 PARTICLEBOARD AND FINISHED WITH THERMALLY FUSED LAMINATE WITH ALL EXPOSED EDGES FINISHED WITH 0.020" PVC

TYPICAL DETAILS:
3/4" PARTICLEBOARD DRAWER FRONTS ARE FINISHED WITH GP28, BALANCED WITH CL 20 LAMINATE AND EDGED WITH 3MM PVC EDGE.

1/2" PLATFORM BOTTOM SCREWED IN PLACE. AMOUNT OF SCREWS VARY DEPENDING ON SIZE OF DRAWER BOX.

100 LB SELF-CLOSING, EPOXY COATED STEEL DRAWER SLIDES. BOTTOM MOUNTED FOR ADDED DURABILITY

DRAWER BOX CORNERS FEATURE HARDWOOD DOWEL JOINTS
CONSTRUCTION

STRONG BACK PANELS

- A fully captured ½" panel will not fail.
  - Wall hung cabinets are hung by fasteners through the cabinet back
  - ½" panels are structurally the best for this application.
- Surface applied, glued or stapled-on back panels, not fully captured
  (especially on wall cases), do not provide structural strength and can fail, causing damage or injury.
- Caution against painted back panels
  - Painted back panels do not wear well.
32mm MANUFACTURING SYSTEM

- 32mm System
  - The use of the 32mm pattern assures casework panels and hardware automatically fits together for consistent quality and conformity with a reduction in manufacturing costs.
- European standard designed for hardware.

Does your casework manufacturer utilize a 32mm system or lean principals to keep your price down?
DIVISION 6 vs DIVISION 12
DIVISION 6 vs DIVISION 12

DIVISION 6 cabinets
AKA “MILLWORK”

DIVISION 12 cabinets
AKA “ENGINEERED CASEWORK”

A DECISION WITH IMPORTANT CONSEQUENCES
DIVISION 6 vs DIVISION 12

REPEATABILITY and CONSISTENCY

DIVISION 6

DIVISION 12
DIVISION 6 vs DIVISION 12

CUSTOMIZATION

DIVISION 6

DIVISION 12
DIVISION 6 vs DIVISION 12

VOLUME

DIVISION 6
50 cabinets/day

DIVISION 12
750 cabinets/day
DIVISION 6 vs DIVISION 12

TIME LINE OF A TYPICAL CASEWORK PROJECT

In the RACE AGAINST TIME the VOLUME your supplier can produce is a crucial factor.
DIVISION 6 vs DIVISION 12

FINANCIAL STABILITY

DIVISION 6

DIVISION 12
DIVISION 6 vs DIVISION 12

WARRANTY

DIVISION 6
1 YEAR WARRANTY

DIVISION 12
5 YEAR WARRANTY
DIVISION 6 vs DIVISION 12

DIVISION 6 cabinets
AKA “MILLWORK”

DIVISION 12 cabinets
AKA “ENGINEERED CASEWORK”

YOUR REPUTATION DEPENDS ON IT!
STANDARDS & RESOURCES

RESOURCES ON INSTITUTIONAL CASEWORK

- Architectural Woodwork Institute (AWI)
- Quality Certification Program (QCP)
- Scientific Equipment and Furniture Association (SEFA)
- Leadership in Energy & Environmental Design (LEED)
The Architectural Woodwork Institute (AWI) is a nonprofit trade association.

4,000 members

www.awiqcp.org

www.awinet.org

What cabinet grade can your casework manufacturer produce?
Typical Standard Construction

Vertical grain on doors and horizontal grain on drawer fronts
Vertical grain on doors and drawer fronts

Vertical grain match on doors and drawer fronts
## STANDARDS & RESOURCES

<table>
<thead>
<tr>
<th>AWI-QCP GRADES</th>
<th>PREMIUM GRADE</th>
<th>CUSTOM GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DGREE DEGREE OF CONTROL</td>
<td>HIGHEST DEGREE</td>
<td>Medium</td>
</tr>
<tr>
<td>LAMINATE</td>
<td>HPL (0.28”)</td>
<td>Decorative Overlay</td>
</tr>
<tr>
<td>LAMINATE DIRECTION ON CABINET FACE</td>
<td>Continuous Vertical Across Doors and drawers front</td>
<td>Vertical Across Doors and Drawer Fronts</td>
</tr>
<tr>
<td>SEMI EXPOSED PARTS</td>
<td>HPL (0.28”)</td>
<td>HPL (0.28”)</td>
</tr>
<tr>
<td>COST</td>
<td>Highest</td>
<td>Medium</td>
</tr>
</tbody>
</table>
The Scientific Equipment and Furniture Association (SEFA) is a voluntary international trade association representing members of the laboratory furniture and casework industry. Founded to promote the expansion, improve the quality, safety and timely completion of laboratory facilities.

Is your casework manufacturer a SEFA member?
LEED

- Leadership in Energy & Environmental Design (LEED) was developed to minimize building effluents and environmental, safety and health impacts to site and neighbors.
- Products and practices that will add cost:
  - Chain-of-custody wood (FSC)
  - ULEF (Ultra Low Emitting Formaldehyde)

Make sure your casework manufacturer has a LEED story or information readily available.
LAMINATE

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

NEMA laminate categories:
- Vertical General Purpose
- Horizontal General surface
- Flame retardant
- Cabinet liner
- Backer

- NEMA sets standards for testing:
  - Cleanability
  - Wear resistance

www.nema.org
LESSONS LEARNED
LESSONS LEARNED

10 SPECS FOR YOUR PEACE OF MIND

SPECIFICATION CHECKLIST
CASE WORK PROJECTS:

- M3i Grade Substrate/Particle board
- High Pressure Laminate
- Water based adhesive
- 3mm Edgebanding
- Mechanical joinery
- Base mounted drawer slides
- Separate recessed Toe Base
- ½” Back Panel
- Division 12
CONCLUSIONS / QUESTIONS

THANK YOU
FOR YOUR TIME AND ATTENTION!

Can we answer any questions?

This concludes The American Institute Continuing Education Systems Program