



MATERIALS, TECHNOLOGY AND INNOVATIVE TRENDS IN LAMINATE CASEWORK

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presented to you by



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MATERIALS, TECHNOLOGY AND INNOVATIVE TRENDS IN LAMINATE CASEWORK

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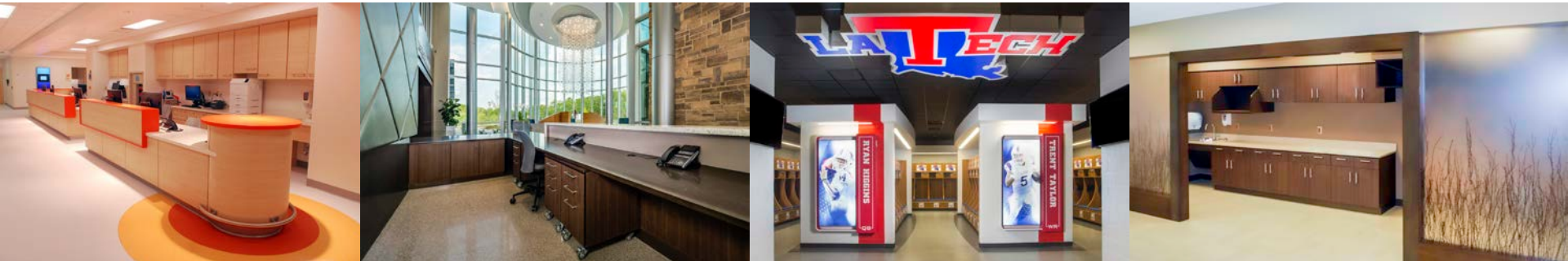


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COURSE DESCRIPTION

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.



LEARNING OBJECTIVES

1

Learn about current trends in laminate casework

2

Understand the core materials and differences that are critical for specifications

3

Learn areas that need to be included in specifications

4

Knowledge of Division 6 and Division 12 specifications and their impact on your project

5

Knowledge of standards and resources to support specifications

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



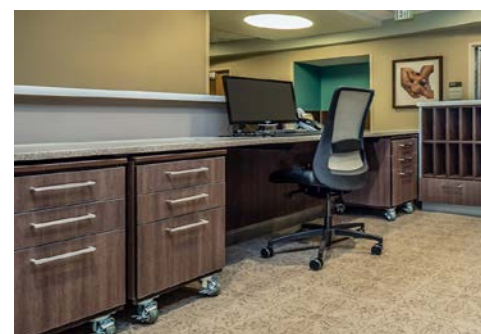
COMMERCIAL



LABORATORIES



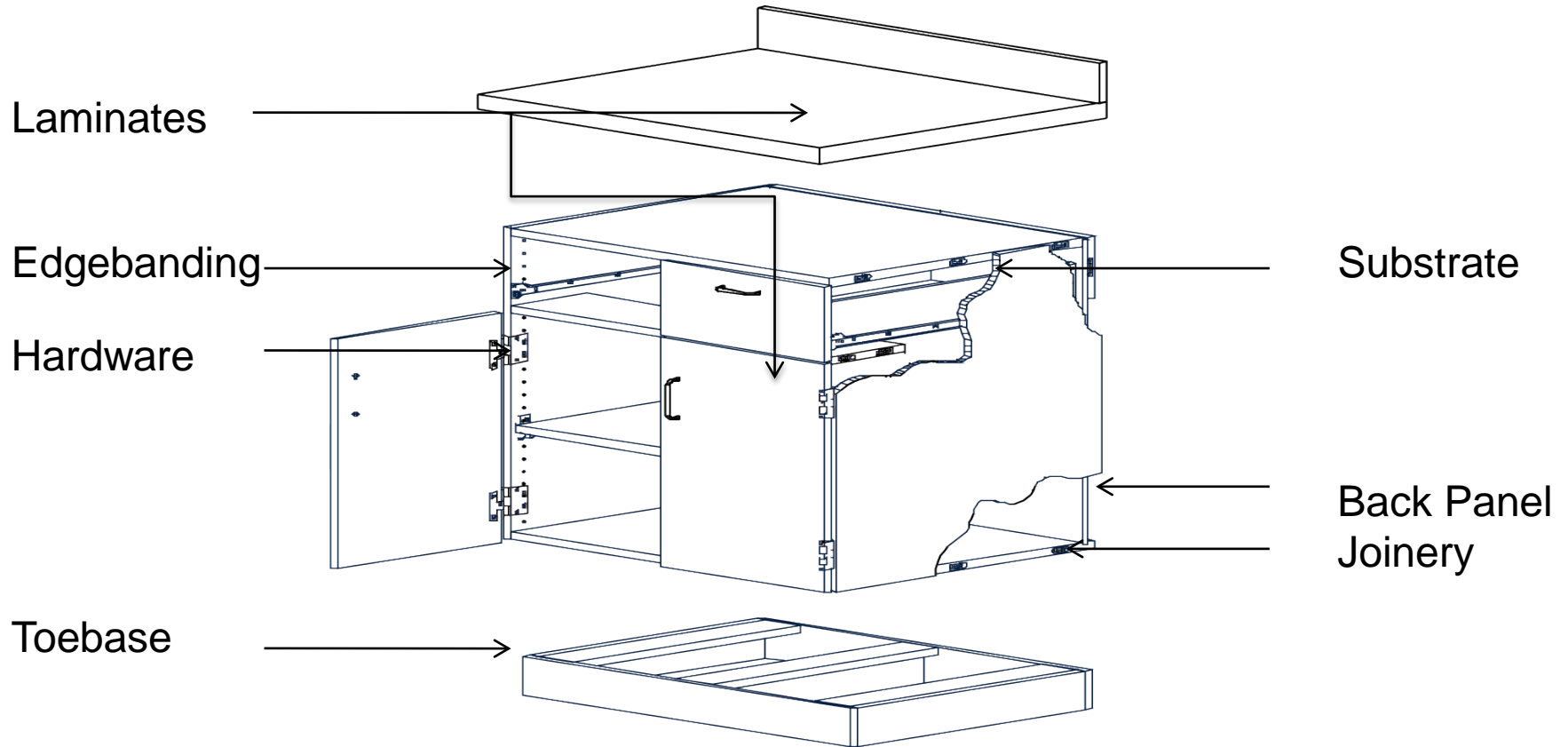
DORMROOMS



MOBILE

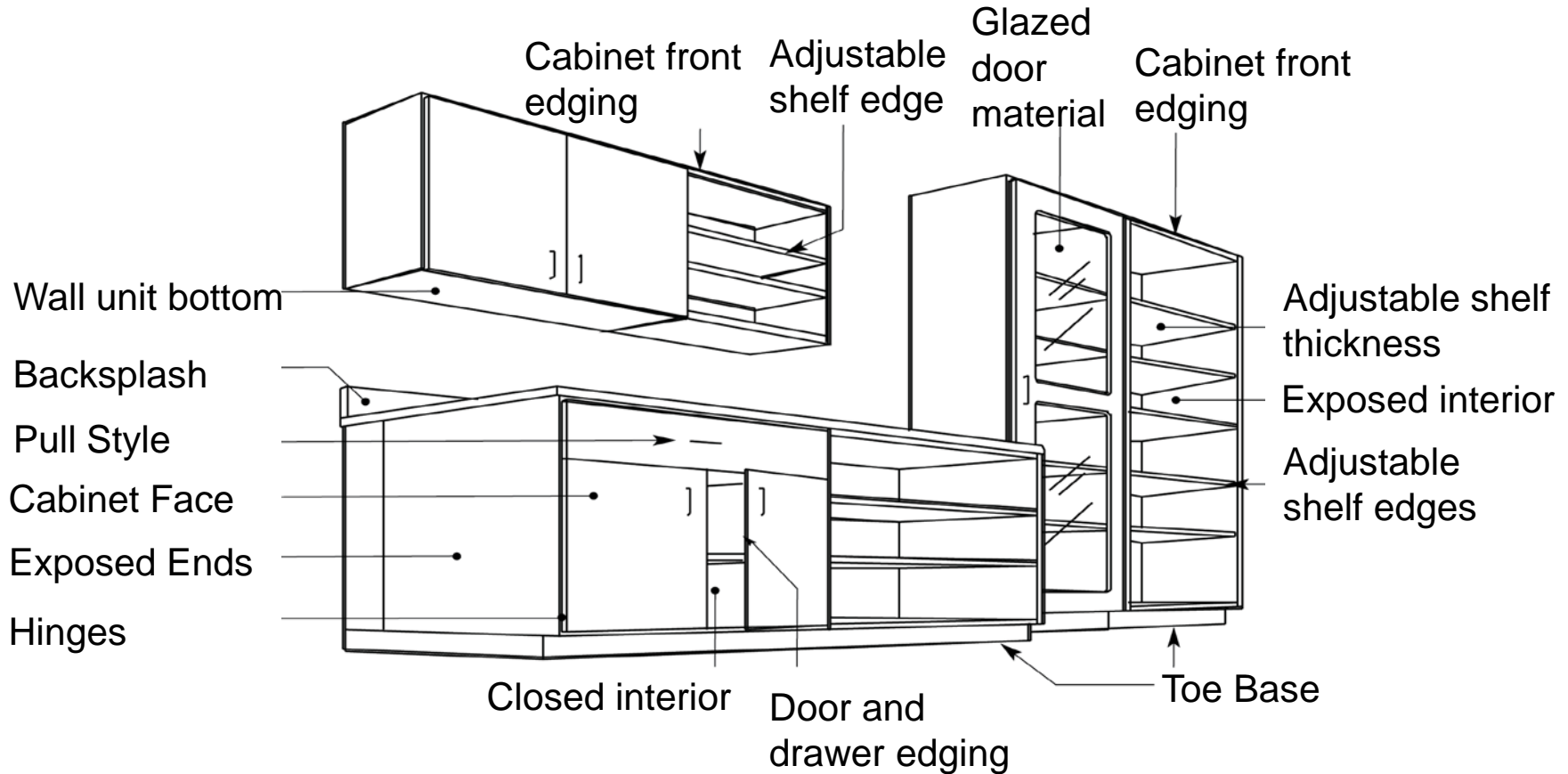
INTRODUCTION

OVERVIEW: IMPORTANT COMPONENTS OF CASEWORK



INTRODUCTION

OVERVIEW: SPECIFICATION AREAS



SUBSTRATE

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!

SUBSTRATE

STRENGTH COMPARISON

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

22% FACE SCREW HOLDING

25% EDGE SCREW HOLDING

38% INTERNAL BOND



USE THE RIGHT BOARD FOR YOUR SPECIFICATIONS!

SUBSTRATE

RUPTURE

M3i is **32%**
STRONGER against
rupture than **MS**



USE THE RIGHT BOARD FOR YOUR SPECIFICATIONS!

SUBSTRATE

ELASTICITY

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

LAMINATE

TYPES OF LAMINATES

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



USE THE RIGHT LAMINATE FOR YOUR SPECIFICATIONS!

LAMINATE

HIGH-PRESSURE LAMINATE

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

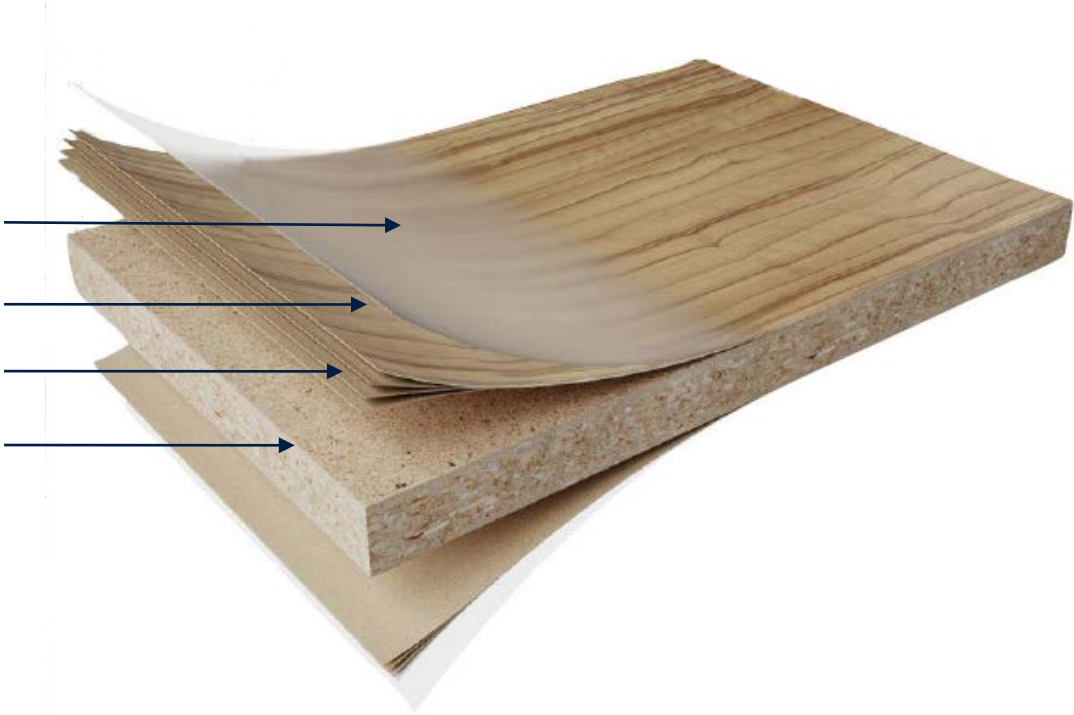
High-Pressure Laminate is most common in residential and commercial countertops and cabinets, work and laboratory surfaces, retail fixtures, furniture, displays, walls and floors.



LAMINATE

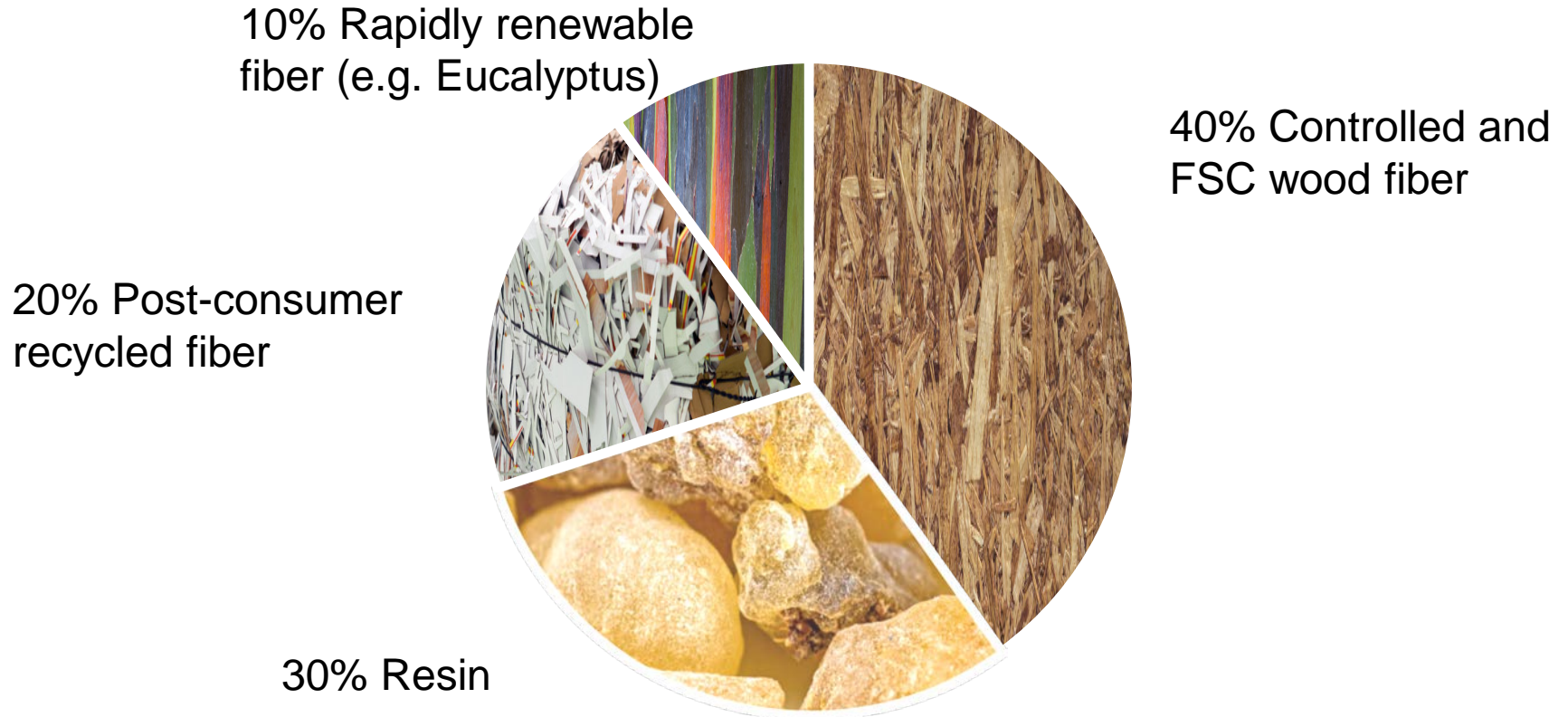
COMPONENTS OF HIGH-PRESSURE LAMINATE

MELAMINE TREATED OVERLAY
DECORATIVE SHEET
KRAFT PAPER LAYERS
SUBSTRATE



LAMINATE

WHAT IS HIGH-PRESSURE LAMINATE MADE OF?



LAMINATE

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

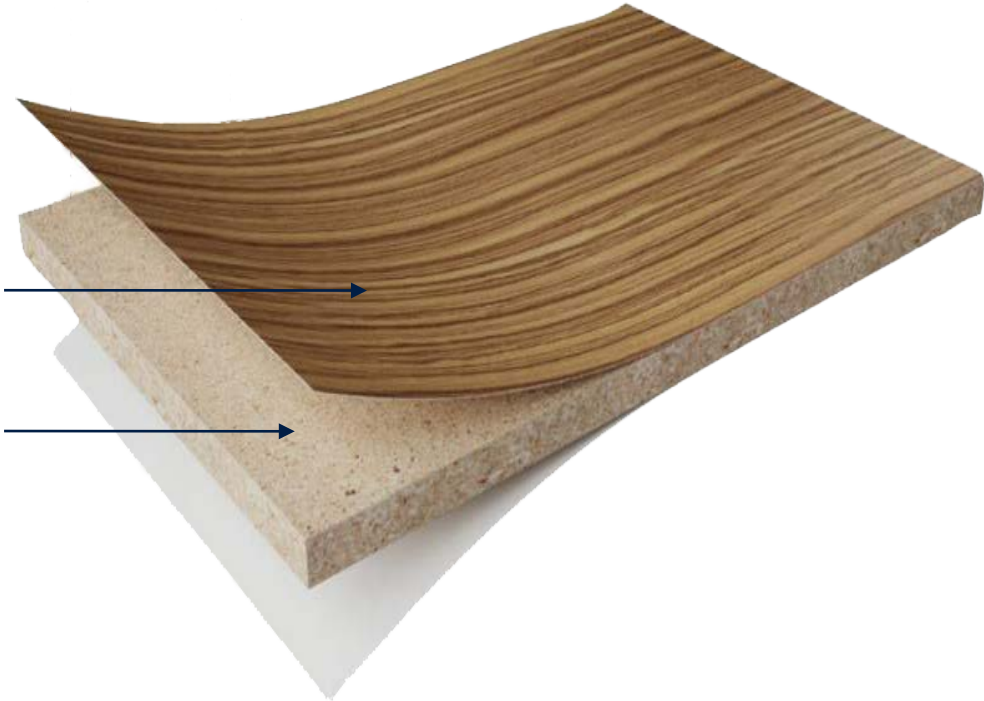


LAMINATE

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

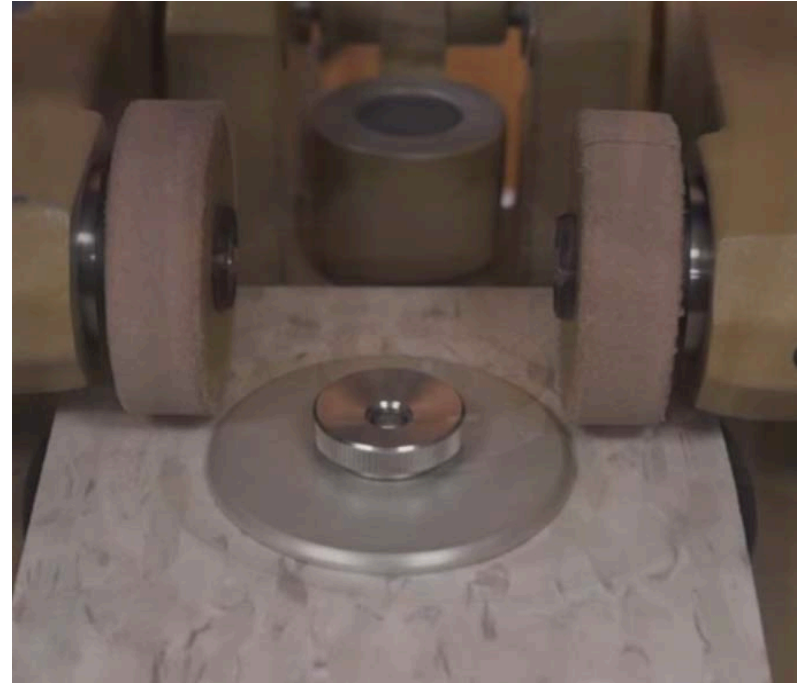


LAMINATE

WEAR RESISTANCE - TABER ABRADER TESTS

The TABER Abrader is used to perform accelerated wear testing.

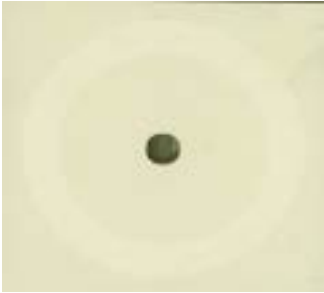
Referenced in numerous international standards, materials include plastics, coatings, laminates, leather, paper, ceramics, carpeting, safety glazing, and many others.



LAMINATE

WEAR RESISTANCE - TABER ABRADER TESTS

HPL 400 CYCLES:



TFL 400 CYCLES:

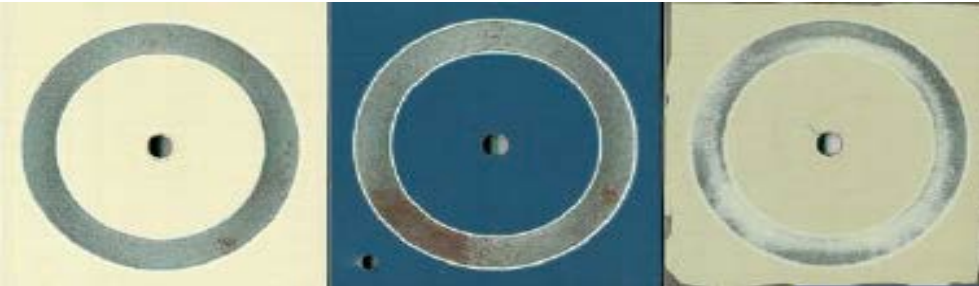


LAMINATE SURFACES

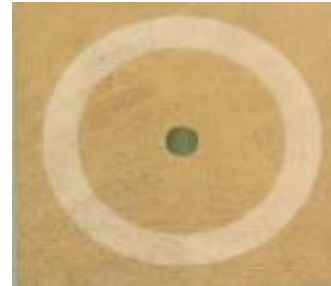
4X

MORE ABRASION RESISTANT
THAN METAL SURFACES

METAL 200 CYCLES:



WOOD 125 CYCLES:



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**



EDGE BAND

EDGE BAND

COMMON TYPES OF EDGE BANDING

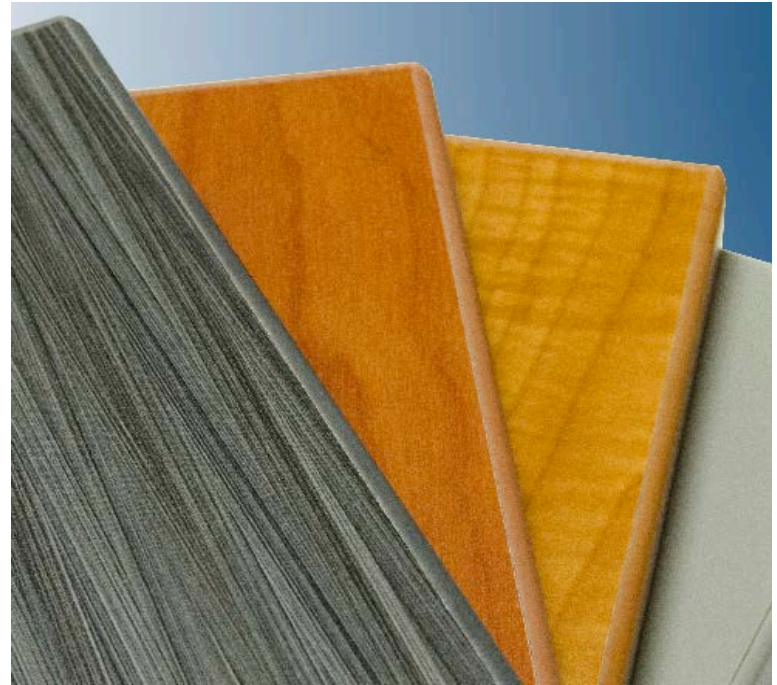
- ❑ 3mm Edge
- ❑ 0.20" Edge
- ❑ Self Edge



EDGE BAND

3MM EDGE

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



EDGE BAND

0.020" EDGE

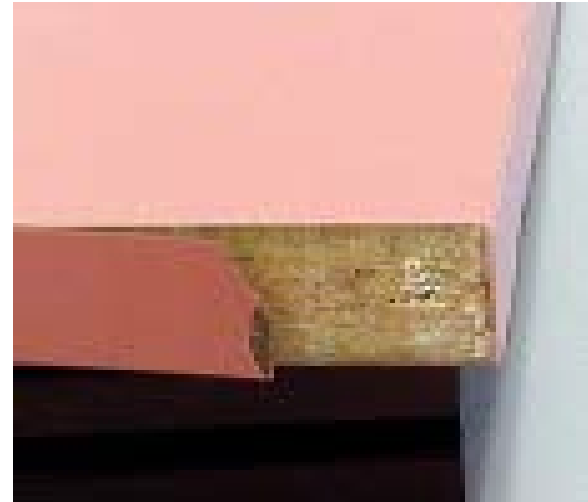
- ❑ Applied with hot melt adhesive
- ❑ CONSISTENT COLOR
- ❑ Commercially matched to most laminates



EDGE BAND

SELF EDGE

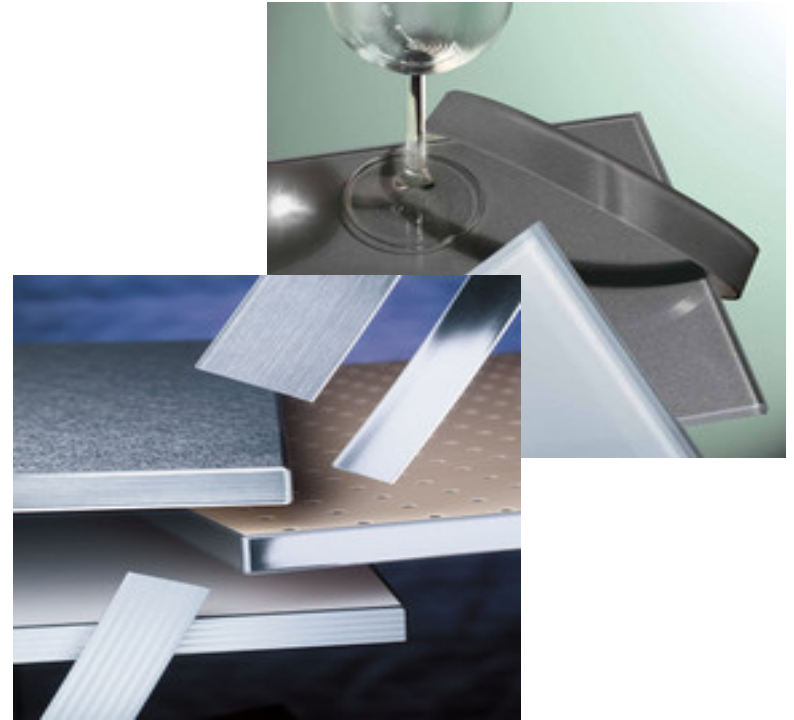
- ❑ HPL is cut in strips and glued to the substrate.
- ❑ Leaves the cabinet vulnerable to damage from any blunt object including desk chairs.
- ❑ Warranty issues!



EDGE BAND

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 slides are attached with short (3/8") screws
 - Force is applied directly to screws
 - Risk of racking
 - Drawer can become inoperable and can fail



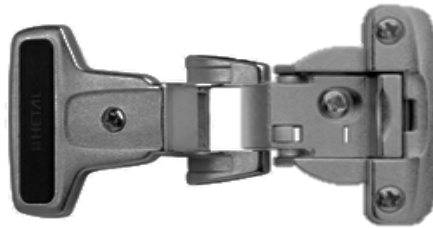
HARDWARE

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 SYSTEM



DOWEL PIN 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”



JOINERY

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

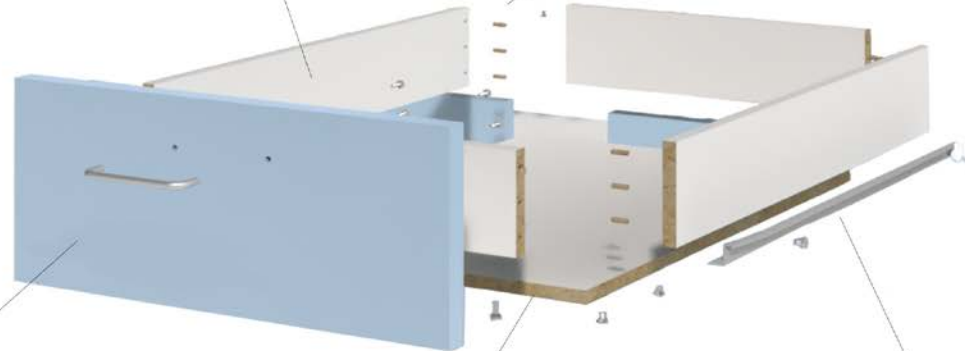


CONSTRUCTION

DURABLE DRAWER CONSTRUCTION

TYPICAL DETAILS:
DRAWER BOX CONSTRUCTED OF
1/2" M3i PARTICLEBOARD AND
FINISHED WITH THERMALLY FUSED
LAMINATE WITH ALL EXPOSED
EDGES FINISHED WITH 0.020" PVC

DRAWER BOX CORNERS
FEATURE HARDWOOD
DOWEL JOINTS



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

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.

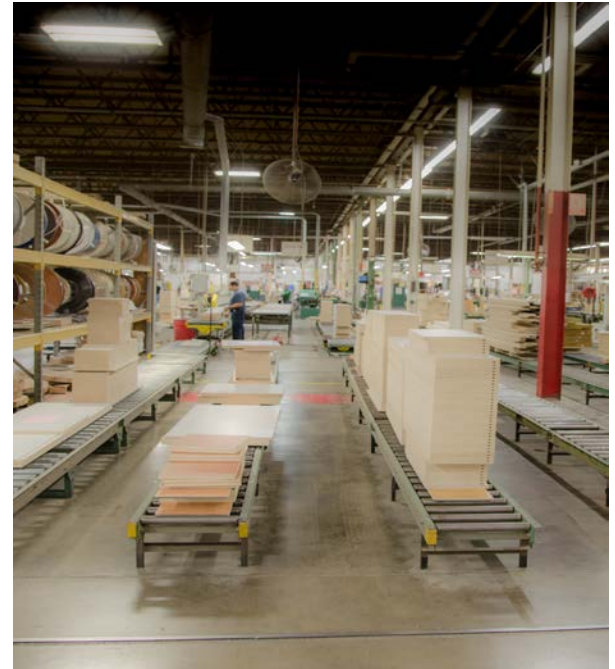


CONSTRUCTION

32mm MANUFACTURING SYSTEM

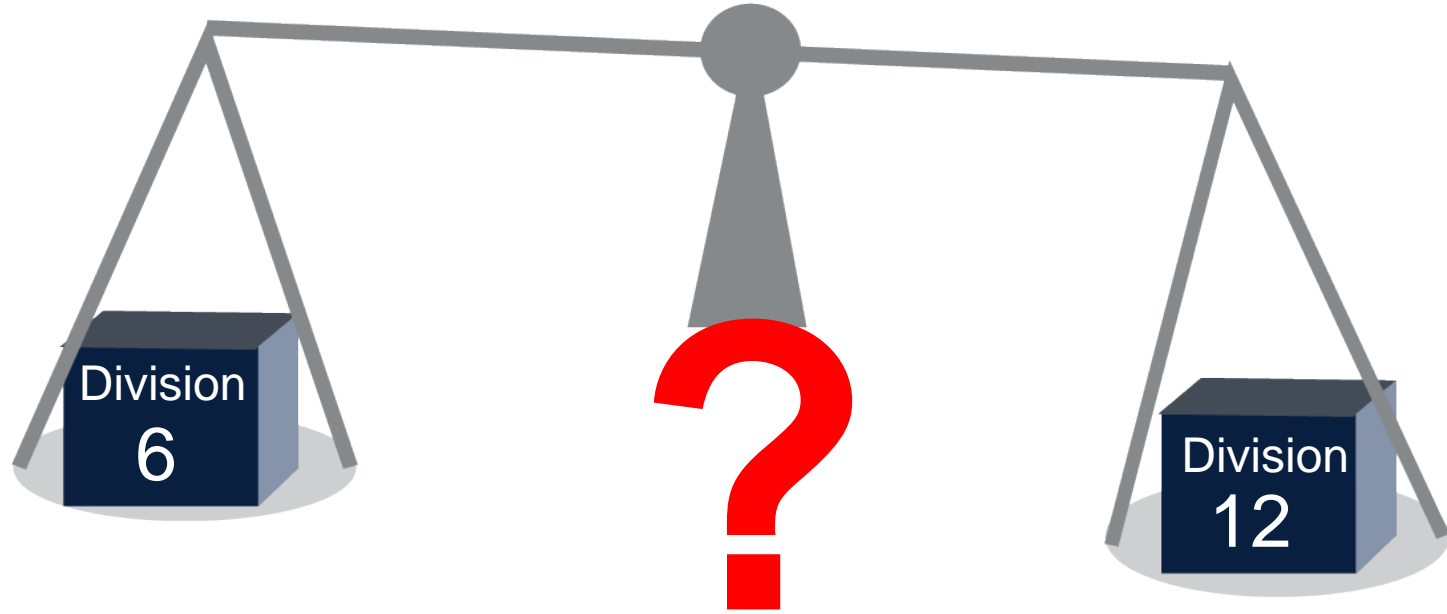
- 32mm System
 - The use of the 32mm pattern assures casework panels and hardware automatically fits together for consistent quality and conformity with a reduction in manufacturing costs.
- European standard designed for hardware.

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



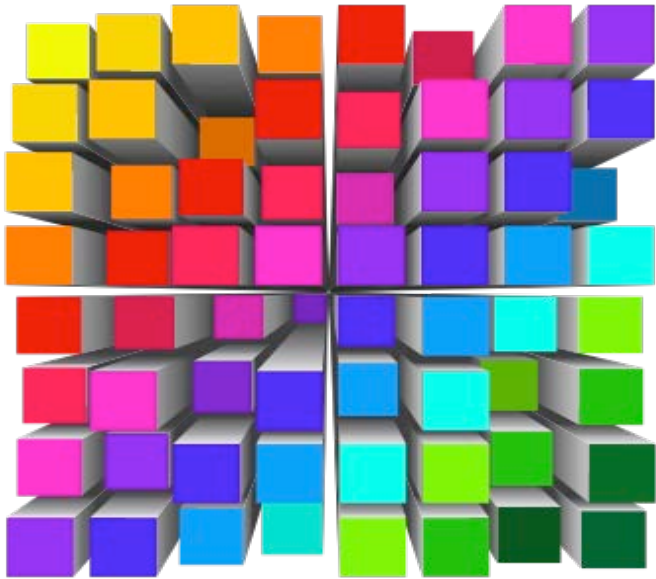
DIVISION 6 cabinets
AKA "MILLWORK"

DIVISION 12 cabinets
AKA "ENGINEERED CASEWORK"

A DECISION WITH IMPORTANT CONSEQUENCES

DIVISION 6 vs DIVISION 12

REPEATABILITY and CONSISTENCY



DIVISION 6

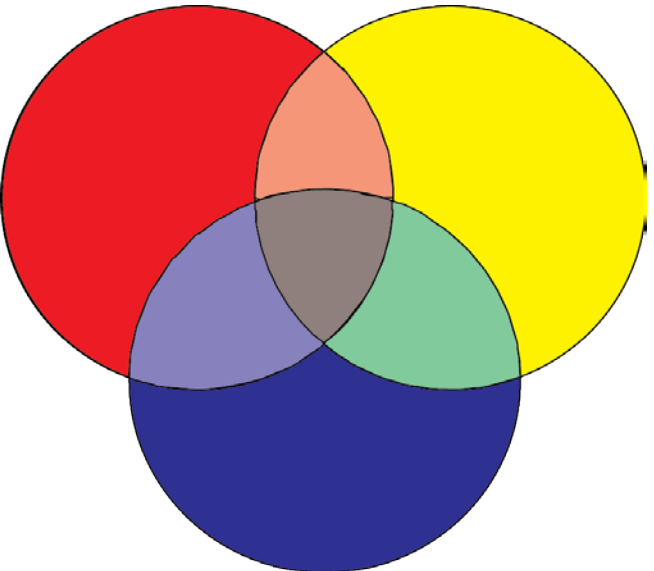


DIVISION 12

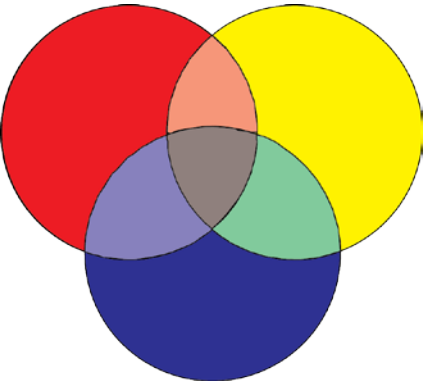


DIVISION 6 vs DIVISION 12

CUSTOMIZATION



DIVISION 6

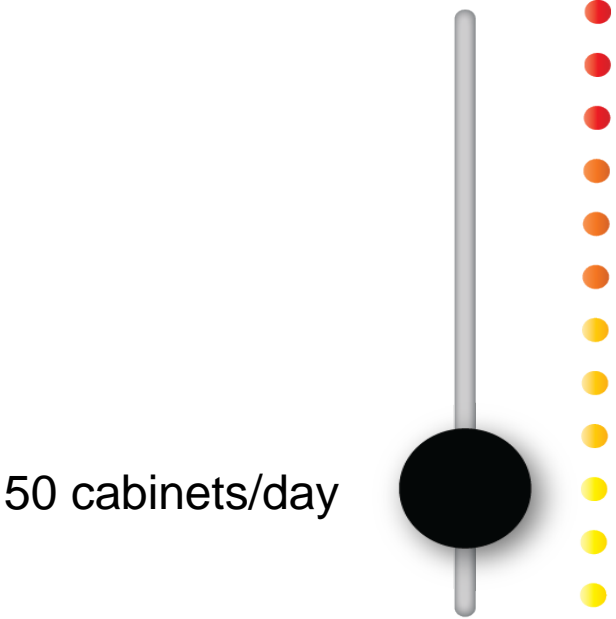


DIVISION 12

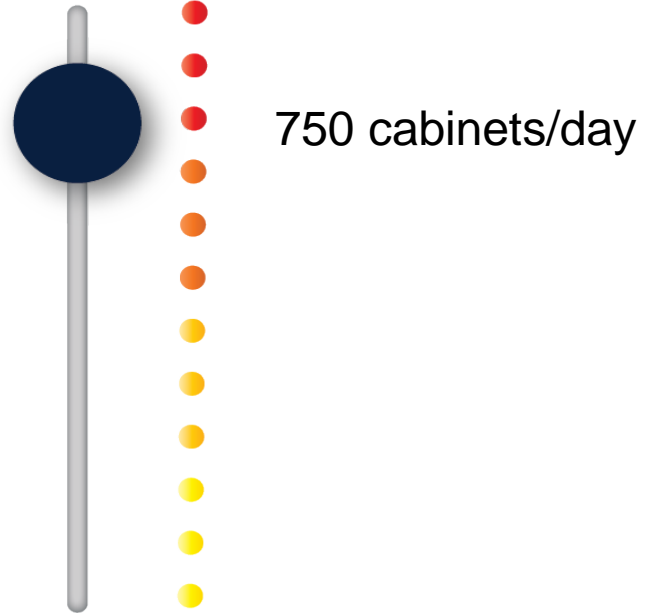


DIVISION 6 vs DIVISION 12

VOLUME



DIVISION 6



DIVISION 12



DIVISION 6 vs DIVISION 12

TIME LINE OF A TYPICAL CASEWORK PROJECT



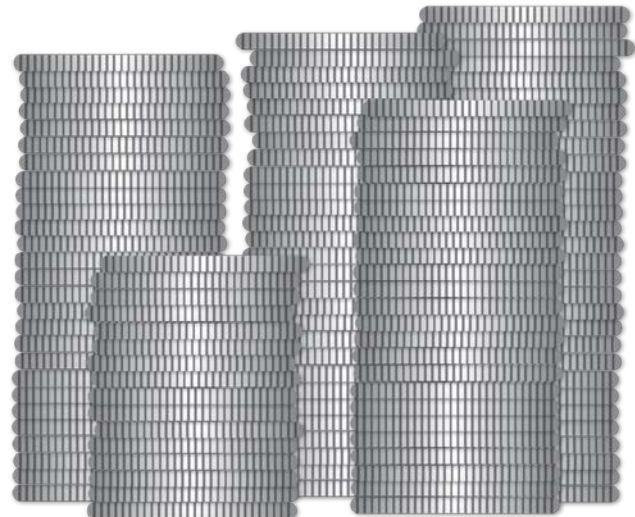
In the RACE AGAINST TIME the VOLUME your supplier can produce is a crucial factor.

DIVISION 6 vs DIVISION 12

FINANCIAL STABILITY



DIVISION 6



DIVISION 12



DIVISION 6 vs DIVISION 12

WARRANTY



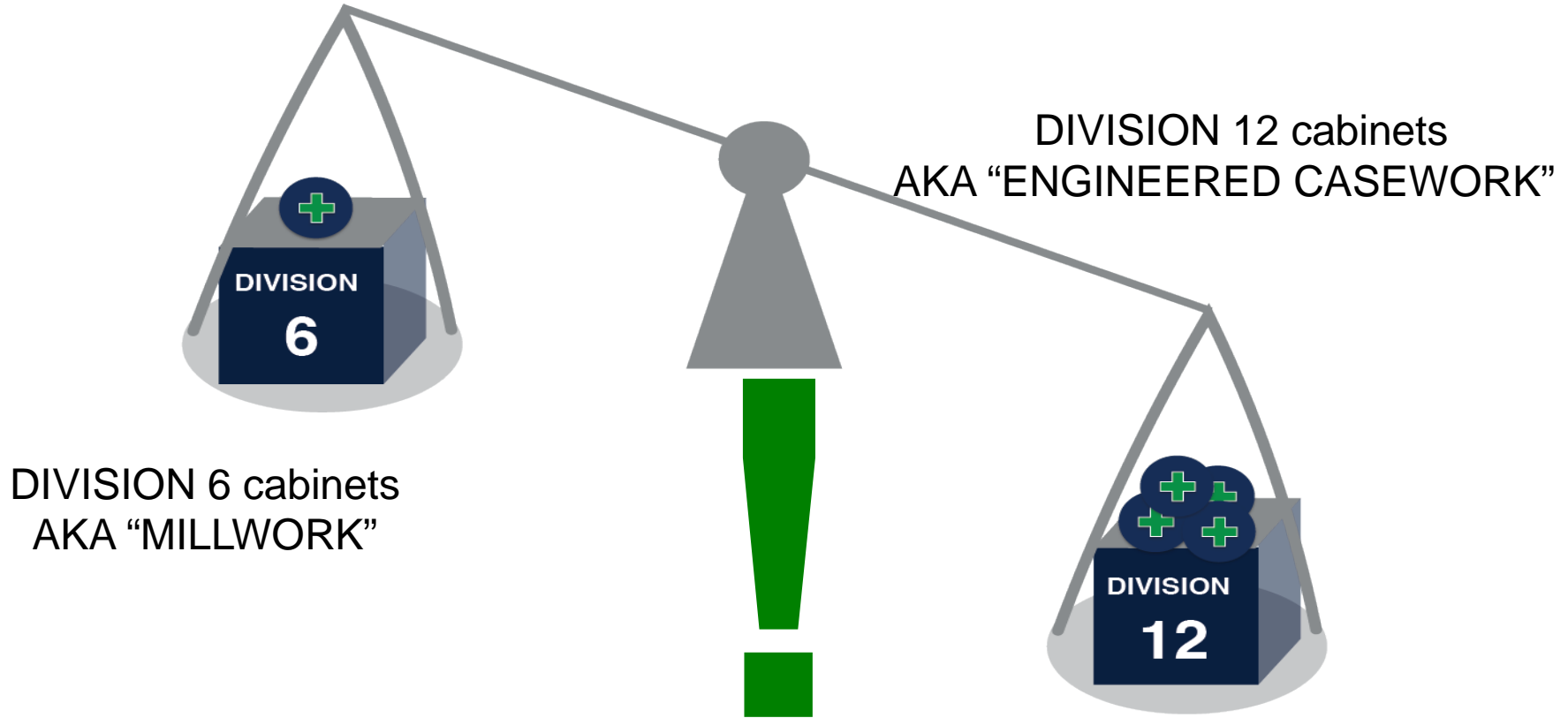
DIVISION 6



DIVISION 12



DIVISION 6 vs DIVISION 12



YOUR REPUTATION DEPENDS ON IT!

STANDARDS & RESOURCES

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)



STANDARDS & RESOURCES

CERTIFIED
QUALITY WOODWORK

AWI ARCHITECTURAL
WOODWORK
INSTITUTE
**QUALITY
CERTIFICATION
PROGRAM**

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ASSURING YOUR VISION SHINES THROUGH

FOR DESIGN PROFESSIONALS ▾ FOR WOODWORKERS ▾ PROJECTS ▾ ABOUT QCP ▾ FIND QCP FIRMS RESOURCES NEWS FEE SCHEDULE CONTACT

STAMP OF QUALITY

AWI – QCP PROGRAM

- ❑ The Architectural Woodwork Institute (AWI) is a nonprofit trade association.
- ❑ 4,000 members
- ❑ www.awiqcp.org
- ❑ www.awinet.org

QCP Licensing is earned by woodworking firms through comprehensive testing and inspection which demonstrates the ability to fabricate, finish and/or install work in accordance with the quality grade criteria set forth in the Architectural Woodwork Standards (AWS). Only licensed companies may provide QCP labels or certificates where required by project contract documents.

● ○ ○ ○ ○

What cabinet grade can your casework manufacturer produce?

Typical Standard Construction



Vertical grain on doors and horizontal grain on drawer fronts

Custom Grade



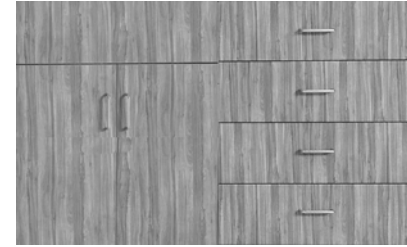
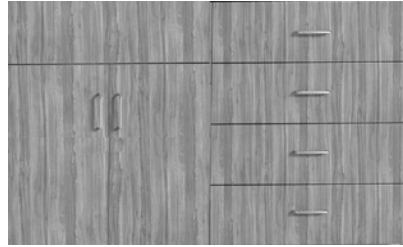
Vertical grain on doors
and drawer fronts

Premium Grade



Vertical grain match on
doors and drawer fronts

STANDARDS & RESOURCES



AWI-QCP GRADES	PREMIUM GRADE	CUSTOM GRADE
DREGREE OF CONTROL	HIGHEST DEGREE	Medium
LAMINATE	HPL (0.28")	Decorative Overlay
LAMINATE DIRECTION ON CABINET FACE	Continuous Vertical Across Doors and drawers front	Vertical Across Doors and Drawer Fronts
SEMI EXPOSED PARTS	HPL (0.28")	HPL (0.28")
COST	Highest	Medium

STANDARDS & RESOURCES



- ❑ 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.
- ❑ www.sefalabs.com

Is your casework manufacturer a SEFA member?

STANDARDS & RESOURCES



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
- ☑ 1/2" Back Panel
- ☑ Division 12



THANK YOU

FOR YOUR TIME AND ATTENTION!

Can we answer any questions?

This concludes The American Institute Continuing Education Systems Program