

# Architectural Woodwork Standards

## APPENDIX A

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# REFERENCE SOURCE DIRECTORY

## CONTINUING EDUCATION

- AIA** - American Institute of Architects
- AIBD** - American Institute of Building Design
- BHMA** - Builders Hardware Manufacturers Association
- CRA** - California Redwood Association
- IDC** - Interior Design of Canada
- IIDA** - International Interior Design Association
- RAIC** - Royal Architectural Institute of Canada

## STANDARDS & REGULATION

- ANSI** - American National Standards Institute
- ARE** - Association for Retail Environments
- ASID** - American Society of Interior Designers
- AWI** - Architectural Woodwork Institute
- AWMAC** - Architectural Woodwork Manufacturers Association of Canada
- CSC** - Construction Specifications Canada
- CSI** - Construction Specifications Institute
- ICC** - International Code Council
- IWPA** - International Wood Products Association
- NFPA** - National Fire Protection Association
- NHLA** - National Hardwood Lumber Association
- NIST** - National Institute of Standards & Technology
- SCS** - Scientific Certification Systems (Green Cross)
- SEFA** - Scientific Equipment & Furniture Association
- SFI** - Sustainable Forest Initiative
- UL** - Underwriters' Laboratories
- WI** - Woodwork Institute
- WMMPA** - Wood Moulding and Millwork Producers Association
- WWPA** - Western Wood Products Association

## MANUFACTURING

- AF&PA** - American Forest & Paper Association
- AHFA** - American Home Furnishings Alliance
- CFPC** - Certified Forest Products Council
- NAM** - National Association of Manufacturers
- NEMA** - National Electrical Manufacturers Association
- WDMA** - Window & Door Manufacturers Association

## TESTING AND GRADING

- APA** - The Engineered Wood Association
- ASTM** - American Society for Testing and Materials
- ITS** - Intertek Testing Services/Warnock Hersey

## SUSTAINABLE BUILDING

- FSC** - Forest Stewardship Council - United States
- LEED** - Leadership in Energy and Environmental Design
- SMART WOOD** - The Rainforest Alliance
- TFF** - Tropical Forest Foundation
- USGBC** - U.S. Green Building Council

## SPECIALIZED PRODUCT

- HPVA** - Hardwood Plywood & Veneer Association
- KCMA** - Kitchen Cabinet Manufacturers Association
- LMA** - Laminating Materials Association, Inc.
- NHLA** - National Hardwood Lumber Association
- WDMA** - Window & Door Manufacturers Association
- WRCLA** - Western Red Cedar Lumber Association

## REFERENCE SOURCE LISTINGS

(Page 1 of 3)

- AF&PA** - American Forest & Paper Association  
1111 19th Street NW, Suite 800  
Washington, DC 20036  
Ph: 800-878-8878 ● Fax: 202-463-2700  
www.afandpa.org
- AHFA** - American Home Furnishings Alliance  
Box HP-7  
High Point, NC 27261  
Ph: 336-884-5000 ● Fax: 336-884-5303  
www.ahfa.us
- AIA** - American Institute of Architects  
1735 New York Avenue NW  
Washington, DC 20006  
Ph: 800-242-3837 ● Fax: 202-626-7547  
www.aia.org
- AIBD** - American Institute of Building Design  
7059 Blair Road NW, Suite 201  
Washington, DC 20012  
Ph: 800-366-2423 ● Fax: 202-249-2473  
www.aibd.org
- ANSI** - American National Standards Institute  
25 West 23<sup>rd</sup> Street, 4<sup>th</sup> Floor  
New York, NY 10036  
Ph: 212-642-4900 ● Fax: 212-398-0023  
www.ansi.org
- APA** - The Engineered Wood Association  
7011 South 19th Street  
Tacoma, WA 98466  
Ph: 253-565-6600 ● Fax: 253-565-7265  
www.apawood.org
- ARE** - Association for Retail Environments  
4651 Sheridan Street, Suite 407  
Hollywood, FL 33021-3657  
Ph: 954-893-7300 ● Fax: 954-893-7500  
www.are.org
- ASID** - American Society of Interior Designers  
608 Massachusetts Avenue NE  
Washington, DC 20002-6006  
Ph: 202-546-3480 ● Fax: 202-546-3240  
www.asid.org
- ASTM** - American Society for Testing and Materials  
100 Barr Harbor Drive  
West Conshohocken, PA 19428-2959  
Ph: 610-832-9585 ● Fax: 610-832-9555  
www.astm.org
- AWI** - Architectural Woodwork Institute  
46179 Westlake Drive, Suite 120  
Potomac Falls, VA 20165  
Ph: 571-323-3636 ● Fax: 571-323-3630  
www.awinet.org
- AWMAC** - Architectural Woodwork Manufacturers Association of Canada  
516 - 4 Street West  
High River, Alberta, Canada, T1V 1B6  
Ph: 403-652-7685 ● Fax: 403-762-7384  
www.awmac.com
- BHMA** - Builders Hardware Manufacturers Association  
355 Lexington Avenue, 15th Floor  
New York, NY 10017  
Ph: 212-297-2122 ● Fax: 212-370-9047  
www.buildershardware.com
- CFPC** - Certified Forest Products Council  
1306 NW Hoyt Street, Suite 403  
Portland, OR 97209  
Ph: 503-224-2205 ● Fax: 503-224-2216  
www.metafore.org
- CPA** - Composite Panel Association  
19465 Deerfield Avenue, Suite 306  
Leesburg, VA 20176  
Ph: 703-724-1128 ● Fax: 703-724-1588  
www.pbmdf.com
- CRA** - California Redwood Association  
818 Grayson Road, Suite 201  
Pleasant Hill, CA 94523  
Ph: 925-935-1499 ● Fax: 925-935-1496  
www.calredwood.org
- CSC** - Construction Specifications Canada  
120 Carlton Street, Suite 312  
Toronto, ON, M5A 4K2, Canada  
www.csc-dcc.ca
- CSI** - Construction Specifications Institute  
99 Canal Center Plaza, Suite 300  
Alexandria, VA 22314  
Ph: 800-689-2900 ● Fax: 703-684-8436  
www.csinet.org
- DHI** - The Door and Hardware Institute  
14150 Newbrook Drive, Suite 200  
Chantilly, VA 20151-2223  
Ph: 703-222-2010 ● Fax: 703-222-2410  
www.dhi.org
- FSC** - Forest Stewardship Council - United States  
11100 Wildlife Center Drive, Suite 100  
Reston, VA 20190  
Ph: 703-438-6401 ● Fax 703-438-3570  
www.fscus.org
- HPVA** - Hardwood Plywood & Veneer Association  
1825 Michael Faraday Drive  
Reston, VA 20190  
Ph: 703-435-2900 ● Fax: 703-435-2537  
www.hpva.org
- ICC** - International Code Council  
500 New Jersey Avenue NW, 6th Floor  
Washington, DC 20001-2070  
Ph: 888-422-7233 ● Fax: 202-783-2348  
www.iccsafe.org
- IDC** - Interior Design of Canada  
220-6 Adelaide Street East  
Toronto, Ontario, M5C 1H6, Canada  
Ph: 416-594-9310 ● Fax: 416-921-3660  
www.interiordesigncanada.org

**REFERENCE SOURCE LISTINGS**

(Page 2 of 3)

**IIDA** - International Interior Design Association  
13-122 Merchandise Mart  
Chicago, IL 60654-1104  
Ph: 312-467-1950 ● Fax: 312-467-0779  
www.iida.org

**ITS - Intertek Testing Services**  
Ph: 800-967-5352  
www.intertek-etlsemko.com

**IWPA** - International Wood Products Association  
4214 King Street West  
Alexandria, VA 22302  
Ph: 703-820-6696 ● Fax: 703-820-8550  
www.iwpawood.org

**KCMA** - Kitchen Cabinet Manufacturers Association  
1899 Preston White Drive  
Reston VA 20191-5435  
Ph: 703-264-1690 ● Fax: 703-620-6530  
www.kcma.org

**LEED** - Leadership in Energy and Environmental Design  
(see **USGBC - U.S. Green Building Council**)

**NAM** - National Association of Manufacturers  
1331 Pennsylvania Avenue NW  
Washington, DC 20004-1790  
Ph: 202-637-3000 ● Fax: 202-637-3182  
www.nam.org

**NEMA** - National Electrical Manufacturers Association  
1300 North 17th Street, Suite 1752  
Rosslyn, Virginia 22209  
Ph: 703-841-3200 ● Fax: 703-841-5900  
www.nema.org

**NFPA** - National Fire Protection Association  
P.O. Box 9101  
Quincy, MA 02269  
Ph: 617-770-3000 ● Fax: 617-770-0700  
www.nfpa.org

**NHLA** - National Hardwood Lumber Association  
6830 Raleigh-Lagrange Road  
Memphis, TN 38184-0518  
Ph: 901-377-1818 ● 901-382-6419  
www.natlhardwood.org

**NIST** - National Institute of Standards & Technology  
100 Bureau Drive, Stop 3460  
Gaithersburg, MD 20899-3460  
Ph: 301-975-6478 ● Fax: 301-926-1630  
www.nist.gov

**RAIC** - Royal Architectural Institute of Canada  
330-55 Murray Street  
Ottawa, Ontario, K1N 5M3, Canada  
Ph: 631-241-3600 ● Fax: 613-241-5750  
www.raic.org

**SCS** - Scientific Certification Systems (Green Cross)  
2000 Powell Street, Suite 1350  
Emeryville, CA 94608  
Ph: 510-452-8003 ● Fax: 510-452-8001  
www.scs1.com

**SEFA** - Scientific Equipment & Furniture Association  
1205 Franklin Avenue, Suite 320  
Garden City, NJ 11530  
Ph: 516-294-54248 ● Fax: 516-294-2758  
www.sefalabfurn.com

**SFI** - Sustainable Forest Initiative  
(see **AF&PA**)  
www.aboutsfi.org

**Smart Wood** - The Rainforest Alliance  
Goodwin-Baker Building, 65 Millet Street, Suite 201  
Richmond, VT 05477  
Ph: 802-434-5491 ● Fax: 802-434-3116  
www.smartwood.org

**TFF** - Tropical Forest Foundation  
2121 Eisenhower Avenue, Suite 200  
Alexandria, VA 22314  
Ph: 703-518-8834 ● Fax: 703-518-8974  
www.tropicalforestfoundation.org

**UL** - Underwriters' Laboratories  
333 Pfingsten Road  
Northbrook, IL 60062-2096  
Ph: 847-272-8800 ● Fax: 847-272-8129  
www.ul.com

**USGBC** - U.S. Green Building Council  
1015 18th Street NW, Suite 805  
Washington, DC 20036  
Ph: 202-828-7422 ● Fax: 202-828-5110  
www.usgbc.org

**WDMA** - Window & Door Manufacturers Association  
1400 East Touhy Avenue, Suite 470  
Des Plaines, IL 60118  
Ph: 800-223-2301 ● Fax: 847-299-1286  
www.wdma.com

**WH** - Warnock - Hersey  
(see **ITS - Intertek Testing Services**)  
www.warnockhersey.com

**WI** - Woodwork Institute  
P.O. Box 980247  
West Sacramento, CA 95798  
Ph: 916-372-9943 ● Fax: 916-372-9950  
www.woodworkinstitute.com

**WMMPA** - Wood Moulding and Millwork Producers Association  
507 First Street  
Woodland, CA 95695  
Ph: 530-661-9591 ● Fax: 530-661-9586  
www.wmmpa.com

## REFERENCE SOURCE LISTINGS

(Page 3 of 3)

**WRCLA** - Western Red Cedar Lumber Association  
1200 - 555 Burrard Street  
Vancouver, BC, Canada V7X 1S7  
Ph: 604-684-0266 ● Fax: 604-687-4930  
www.wrcla.org.

**WWPA** - Western Wood Products Association  
Yeon Building, 522 SW Fifth Avenue  
Portland, OR 97204-2122  
Ph: 503-224-3930 ● Fax: 503-224-3934  
www.wwpa.org

## PRESERVATIVE & WATER-REPELLENT TREATMENTS

Within the United States, preservative and water-repellent treatments are governed under I.S. - 4, latest edition, as published by the Window and Door Manufacturers Association (WDMA), [www.wdma.com](http://www.wdma.com), subject to any applicable EPA or local Air Quality Management District's restrictions on what may be used for the project location. Within Canada, they are governed by the National Building Code of Canada, Section 3.8, Appendix A. Contact the National Research Council Canada at [www.nrc.ca](http://www.nrc.ca).

## FIRE-RETARDANT COATINGS

Fire-retardant coatings are typically subject to listing by an accredited testing laboratory and require a registration number for approval recognized by fire inspectors.

## FIRE CODES

Within the United States, fire codes are primarily governed by the International Code Council, Inc. (ICC), [www.iccsafe.org](http://www.iccsafe.org), and the National Fire Protection Association (NFPA), [www.nfpa.org](http://www.nfpa.org). Within Canada, they are governed by the National Building Code of Canada, Section 3.8, Appendix A. Contact the National Research Council Canada at [www.nrc.ca](http://www.nrc.ca).

## ADA REQUIREMENTS

Within the United States, ADA requirements are governed by the Federal Americans with Disabilities Act (ADA) subject to any applicable state or local requirements that might be more stringent for the project location. For further information regarding national regulations: a) in the United States, contact the Access Board at [www.access-board.gov](http://www.access-board.gov), and b) in Canada, see the National Building Code of Canada, Section 3.8, Appendix A. Contact the National Research Council Canada at [www.nrc.ca](http://www.nrc.ca).

## RATED FIRE DOOR ASSEMBLIES

Within the United States, rated fire door assemblies are governed in accordance with the National Fire Protection Association's Publication NFPA 80, "Standard for Fire Doors and Fire Windows," subject to any applicable state or local requirements that might be more stringent for the project location. Within Canada, governance is by the National Building Code of Canada, Section 3.8, Appendix A, which can be reviewed at [www.nrc.ca](http://www.nrc.ca).

## BUILDING CODE REQUIREMENTS

Within the United States, building code requirements are governed by the National Uniform Building Code (UBC), subject to any applicable state or local requirements that might be more stringent for the project location. Within Canada, they are governed by the National Building Code of Canada, Section 3.8, Appendix A. Contact the National Research Council Canada at [www.nrc.ca](http://www.nrc.ca).

## SEISMIC FABRICATION & INSTALLATION REQUIREMENTS

**A**

Within the United States, seismic fabrication and installation requirements are governed by the International Building Code (IBC), subject to any applicable state or local requirements that might be more stringent for the project location. Within Canada, they are governed by the National Building Code of Canada, Section 3.8, Appendix A. Contact the National Research Council Canada at [www.nrc.ca](http://www.nrc.ca).

## ADHESIVES GUIDELINES

### PERFORMANCE RATINGS:

Type I	Fully Waterproof (Exterior)	Two-Cycle Boil/Shear Test
Type II	Water-Resistant (Interior)	Three-Cycle Soak Test

### GENERAL INFORMATION:

GENERIC NAME	BONDING	RATING	CHARACTERISTICS
<b>ALIPHATIC</b> (Carpenter's Glue)	Wood to wood	Type II	Non-toxic; non-flammable; non-staining; water-resistant
<b>CASEIN</b>	Wood to wood	Type II	Water-resistant
<b>CONTACT ADHESIVE</b>	HPDL and wood veneer to wood	Type II	Water-resistant
<b>EPOXY</b>	Wide range; wood; wood to metals	Type I	Two-part system; fully waterproof
<b>HOT-MELT</b> Polyurethane Reactive (PUR)	Wide variety of materials	*	Liquefies when heated; bonds in a liquid state; solidifies as it cools.
<b>PVA</b> (Polyvinyl Acetate)	Wood to wood Wood to HPDL	*	General purpose
<b>PVA</b> (Polyvinyl Acetate - Catalyzed)	Wood to wood	Type I	Fully waterproof
<b>PVC</b> (Polyvinyl Chloride)	Wide variety of materials	*	Crystal clear; fast drying.
<b>RESORCINOL RESIN</b>	Wood to wood and laminates	Type I	Fully waterproof; purple glue line; two-part system; limited pot life (3 hours)
<b>UREA RESIN</b>	Wood to wood	Type II	Mixes with water; must be clamped; 3 to 7 hours of drying time at 70° F (21.1° C).
<b>PANEL/CONSTRUCTION ADHESIVE</b>	Wide variety of materials	Type II	Plastic epoxy base; liquid state; dries fast; difficult to remove; can be used to set adjustment screws in European-type hinges.

\* Check manufacturer's rating.



## SPECIFIC GRAVITY & WEIGHT OF HARDWOODS

SPECIES	SPECIFIC GRAVITY <sup>1</sup>	WEIGHT <sup>2</sup>	SPECIES	SPECIFIC GRAVITY <sup>1</sup>	WEIGHT <sup>2</sup>
<b>ALDER, RED</b> Alnus rubra	.37	28	<b>MAPLE, RED</b> Acer rubrum	.49	38
<b>ASH, WHITE</b> Average of 4 species	.54	41	<b>MAPLE, SILVER</b> Acer saccharinum	.44	33
<b>ASPEN</b> Populus tremuloides	.35	27	<b>MAPLE, SUGAR</b> Acer saccharum	.57	44
<b>AVODIRE</b> Turraeanthus africanus	n/a	36	<b>MYRTLE</b> Umbellularia Californica	.51	39
<b>BASSWOOD</b> Tilia americana	.32	26	<b>NARRA</b> Pterocarpus indicus	.52	42
<b>BEECH</b> Fagus grandifolia	.56	45	<b>OAK, COMMERCIAL RED</b> Average of 9 species	.56	44
<b>BIRCH, SWEET</b> Betula lenta	.60	46	<b>OAK, COMMERCIAL WHITE</b> Average of 6 species	.59	47
<b>BIRCH, YELLOW</b> Betula alleghaniensis	.55	43	<b>ORIENTAL WOOD</b> Endiandro palmerstoni	n/a	44
<b>BUBINGA</b> Guibourtia demeusil	n/a	55	<b>OSAGE-ORANGE</b> Maclura pomifera	.76	n/a
<b>BUTTERNUT</b> Juglans cinerea	.36	27	<b>PADUAK (AFRICAN)</b> Pterocarpus soyauxii	n/a	43
<b>CATALPA, NORTHERN</b> Catalpa speciosa	.38	29	<b>PADUAK (ANDAMAN)</b> Pterocarpus dalbergioides	.62	45
<b>CATIVO</b> Prioria copaifera	.40	29	<b>PADUAK (BURMA)</b> Pterocarpus macrocarpus	.75	54
<b>CHERRY, BLACK</b> Prunus serotina	.47	35	<b>PALDAO</b> Dracontomelum dao	.59	44
<b>CHESTNUT</b> Castanea dentata	.40	30	<b>PECAN</b> Carya illinoensis	.60	47
<b>COTTONWOOD, EASTERN</b> Populus deltoides	.37	28	<b>PEARWOOD (EUROPEAN)</b> Purus communis	n/a	43
<b>CUCUMBER TREE, YELLOW</b> Magnolia acuminata	.44	34	<b>PHILIPPINE HARDWOODS</b>		
<b>CYPRESS (BALD CYPRESS)</b> Taxodium distichum	.42	32	<b>RED LAUAN</b>	.40	36
<b>DOGWOOD, FLOWERING</b> Cornus florida	.64	51	Shorea negrosensis		
<b>EBONY (NIGERIAN)</b> Diospyros crassiflora	n/a	63	<b>WHITE LAUAN</b>	n/a	36
<b>ELM, AMERICAN</b> Ulmus Americana	.46	36	Pentacme contorta		
<b>SWEETGUM (RED AND SAP)</b> Liquidambar styraciflua	.44	34	<b>TANGUILE</b> Shorea polysperma	.53	39
<b>TUPELO, WATER</b> Nyssa aquatica	.46	35	<b>POPLAR, YELLOW (TULIPTREE)</b> Liriodendron tulipifera	.38	28
<b>HACKBERRY</b> Celtis occidentalis	.49	37	<b>PRIMAVERA</b> Cybistax donnell-smithii	.40	30
<b>HICKORIES, TRUE</b> Average of 4 species	.65	51	<b>ROSEWOOD (BRAZIL)</b> Dalbergia nigra	n/a	50
<b>HOLLY</b> Ilex opaca	.50	40	<b>SAPELE</b> Entandrophragma cylindricum	.54	40
<b>LIMBA</b> Terminalia superba	.45	34	<b>SATINWOOD (EAST INDIAN)</b> Chloroxylon swientenio	.83	67
<b>LOCUST, BLACK</b> Robinia pseudoacacia	.66	48	<b>SONORA (MANGGASINORO)</b> Shorea philippinensis	.42	31
<b>MAHOGANY, AFRICAN</b> Khaya ivorensis	.43	31	<b>SYCAMORE</b> Platanus accidentalis	.46	35
<b>MAHOGANY, CUBAN</b> Swietenia mahogany	.57	41	<b>TEAK</b> Tectona grandis	.60	43
<b>MAHOGANY, CENTRAL AMERICAN</b> Swietenia species	.45	32	<b>TIGERWOOD</b> Lavoa klaineana	.45	34
<b>MAKORE</b> Tieghemella heckelii		40	<b>WALNUT, AMERICAN (BLACK)</b> Juglans nigra	.51	39
			<b>WILLOW, BLACK</b> Salix nigra	.34	26
			<b>ZEBRAWOOD</b> Microberlinia brazzavillensis	.62	48

The data for native species as furnished on this chart are from the U.S. Forest Products Laboratory's Technical Bulletin 158.

<sup>1</sup> Based on green volume and oven dry weight.

<sup>2</sup> Based on pounds per cubic foot at 12% moisture content.

### ANSI/BHMA - A156.9-01



**CABINET HARDWARE REFERENCES**

(Page 1 of 4)

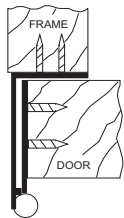
The following illustrations and tables are from ANSI/BHMA's - A156.9-01: Cabinet Hardware Standards (one of a series of standards running from A156.1 through A156.24) and are reproduced with permission as a reference guide.

The following will help you understand the numbering system. Using the first item listed below as an example, "B01011":

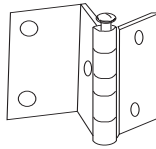
B	=	Product class (as designated by BHMA)
0	=	Optional material (predominant base material)
1	=	Hinge (product type)
01	=	Semi-concealed (function/description)
1	=	Grade 1 (performance level)

For further information, clarification, or copies of the ANSI/BHMA Standards, you may contact BHMA at:

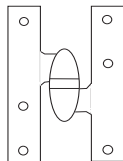
**Builders Hardware Manufacturers Association**  
355 Lexington Avenue, Suite 1700, New York, NY 10017  
www.buildershardware.com

**REFERENCE BY ILLUSTRATION**

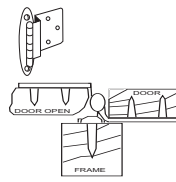
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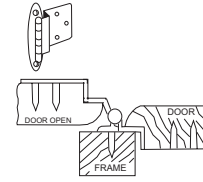
BO1201-3



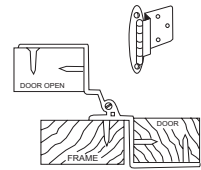
BO1241-3



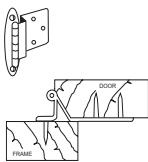
BO1251-3



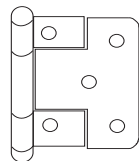
BO1261-3



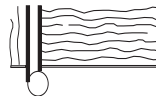
BO1301-3



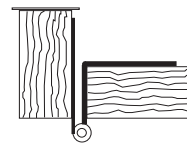
BO1311-3



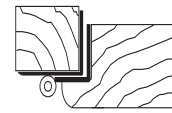
BO1341-3



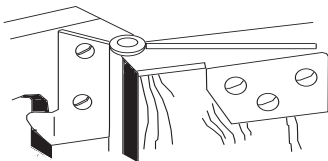
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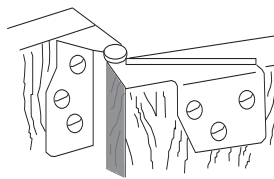
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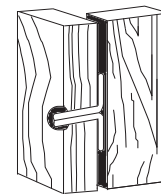
BO1371-3



BO1411-3 &amp; BO1421-3



BO1431-3 &amp; BO1441-3

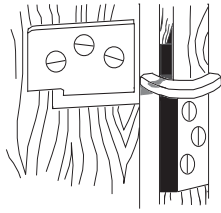


BO1451-3 &amp; BO1461-3

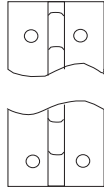
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**ANSI/BHMA - A156.9-01**  
**CABINET HARDWARE REFERENCES**  
 (Page 2 of 4)

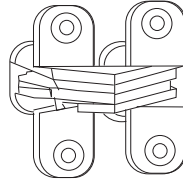
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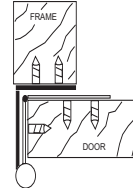
BO1471-3 & BO1481-3



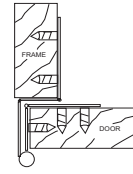
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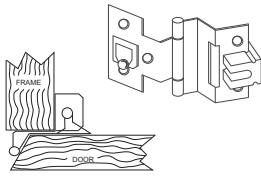
BO1501-3



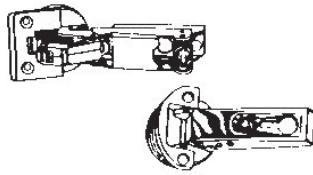
BO1511-3



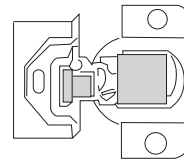
BO1521-3



BO1581-3



BO1602 & 3



BO1612 & 3



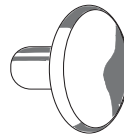
BO2011



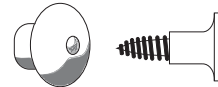
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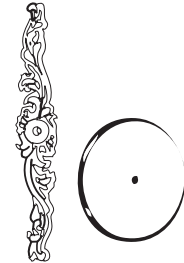
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BO2131



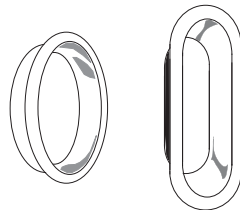
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BO2181



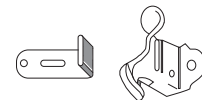
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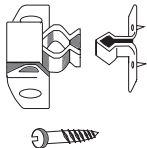
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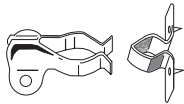
BO3013



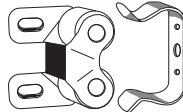
BO3023



BO3033



BO3043



BO3053

## ANSI/BHMA - A156.9-01 CABINET HARDWARE REFERENCES

(Page 3 of 4)

### REFERENCE BY DESCRIPTION

ANSI/ BHMA #	CABINET	DOOR	DESCRIPTION
BO1011-3	Face	Edge	Hinge, Semi-concealed, Overlay Doors, Locked, Knurled or Loose Pin, Rounded or Button Tip
BO1201-3	Edge	Edge/Back	Hinge, Semi-concealed, Flush Door, Loose or Fast Pin
BO1241-3	Face	Face	Hinge, Exposed, Flush Door, Olive Knuckle
BO1251-3	Face	Back	Hinge, Semi-concealed, Overlay Door
BO1261-3	Face	Back	Hinge, Semi-concealed, Inset Lipped Door
BO1301-1	Face	Back	Hinge, Semi-concealed, Flush Door
BO1311-3	Face	Back	Hinge, Semi-concealed, Reverse Bevel Door
BO1331-3	Edge	Back	Hinge, Semi-concealed, Inset Lipped Door
BO1341-3	Face	Back	Hinge, Semi-concealed, Overlay Door
BO1351-3	Edge	Edge	Hinge, Semi-concealed, Flush Door, Locked, Knurled or Loose Pin, Rounded or Button Tip
BO1361-3	Edge	Back	Hinge, Semi-concealed, Flush Door, Locked, Knurled or Loose Pin, Rounded or Button Tip
BO1371-3	Edge	Back	Hinge, Semi-concealed, Inset Lipped Door, Locked, Knurled or Loose Pin, Rounded or Button Tip
BO1411-3	Face	Back	Hinge, Pivot, Overlay Door, Top and Bottom Door Mount, Vertical Frame Mount
BO1421-3	Face	Back	Hinge, Same as Above with Bearing at Joint
BO1431-3	Face	Back	Hinge, Pivot, Overlay Door, Top and Bottom Door Mount, Horizontal Frame Mount
BO1441-3	Face	Back	Hinge, Same as Above with Bearing at Joint
BO1451-3	Edge	Back	Hinge, Pivot, Overlay Door, Mid-Door Edge Mount
BO1461-3	Edge	Back	Hinge, Same as Above with Bearing at Joint
BO1471-3	Edge	Back	Hinge, Pivot, Lipped Door, Mid-Door Edge Mount
BO1481-3	Edge	Back	Hinge, Same as Above with Bearing at Joint
BO1491-3	Face/Edge	Face/Edge/Back	Hinge, Continuous (Piano)
BO1501-3	Edge	Edge	Hinge, Concealed (Soss)
BO1511-3	Face	Edge/Back	Hinge, Semi-concealed, Overlay Door, Locked, Knurled or Loose Pin, Rounded or Button Tip
BO1521-3	Edge	Edge/Back	Hinge, Semi-concealed, Overlay Door, Locked, Knurled or Loose Pin, Rounded or Button Tip
BO1581 & 3	Face/Edge	Back	Hinge, Semi-concealed, Reverse Bevel Door, with Catch
BO1602 & 3	Edge	Back	Hinge, Concealed, European - Frameless
BO1612 & 3	Edge	Back	Hinge, Concealed, European - Face Frame
BO2011	n/a	Back	Pull, 3" (76.2 mm) Center Standard
BO2031	n/a	Back	Pull, Drop, Swing, or Fixed
BO2041	n/a	Face	Pull
BO2131	n/a	Back	Knob

A

## ANSI/BHMA - A156.9-01 CABINET HARDWARE REFERENCES

(Page 4 of 4)

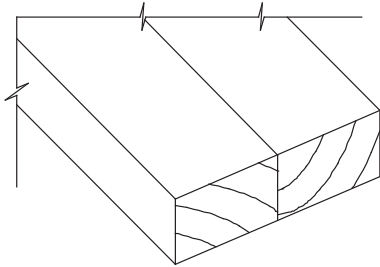
### REFERENCE BY DESCRIPTION (continued)

ANSI/ BHMA #	CABINET	DOOR	DESCRIPTION
BO2141	n/a	Face	Knob
BO2181	n/a	n/a	Backing Plate for Knobs
BO2191	n/a	n/a	Backing Plate for Pulls
BO2201	n/a	Face	Flush Pull, Mortised into Door Face
BO3013	Edge	Edge	Catch, Bullet or Ball Friction
BO3023	Edge	Back	Catch, Elbow
BO3033	Edge	Back	Catch, Friction
BO3043	Edge	Back	Catch, Friction
BO3053	Edge	Back	Catch, Roller Spring, Under Shelf Mount
BO3063	Edge	Back	Catch, Friction Spring
BO3071 & 2	Edge	Back	Catch, Roller
BO3091 & 2	Edge	Back	Catch, Roller
BO3112	Edge	Back	Catch, Roller
BO3131 & 2	Face	Back	Catch, Magnetic, Push-In
BO3141 & 2	n/a	Back	Catch, Magnetic, Under Shelf Mount
BO3151-2	n/a	Back	Catch, Magnetic, Door Mount
BO3161-2	n/a	Back	Catch, Magnetic, Under Shelf Mount, Double Door
BO3171-2	Edge	Back	Catch, Magnetic, Heavy Duty
BO3243	Face	Face	Latch, Cupboard
BO3282	Edge		Pusher, for Use with Secret/Touch Latches
BO3333	Edge	Back	Latch, Secret/Touch
BO3343	Edge	Back	Latch, Child-Resistant
BO3352	Face	Face	Latch/Pull, Positive
BO3363	Edge	Back	Latch, Secret/Touch
BO4013			Shelf Rests, Cabinet, for Bored Holes
BO4063	Edge		Shelf Standard, Cabinet, Adjustable, Non-mortising
BO4073	Edge		Shelf Standard, Cabinet, Adjustable, Surface or Mortise Mounted
BO4081 & 3			Shelf Rest, Cabinet, Closed, for Metal Standard
BO4091 & 3			Shelf Rest, Cabinet, Open, for Metal Standard
BO4102 & 3			Shelf Standard, Slotted, Wall, Adjustable
BO4112 & 3			Shelf Bracket, for Slotted Standard
BO5011-3			Drawer Slide, Side Mount Bottom Capture
BO5081-3			Drawer Slide, Center Bottom Mount
BO5061-3			Drawer Slide, Center Top Mount
BO5051-3			Drawer Slide, Side Mount

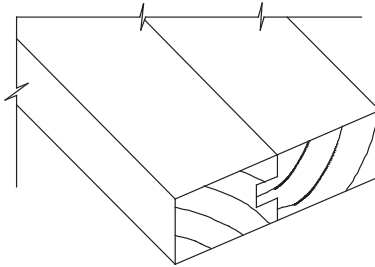
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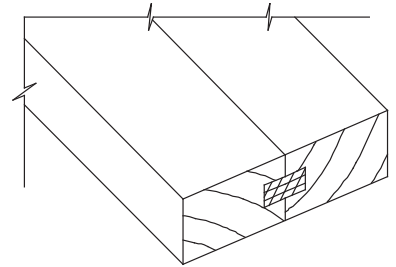
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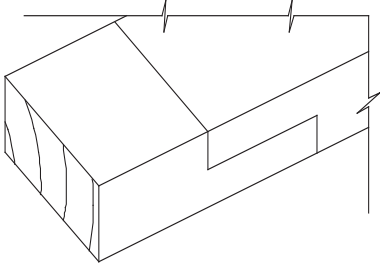
BUTT



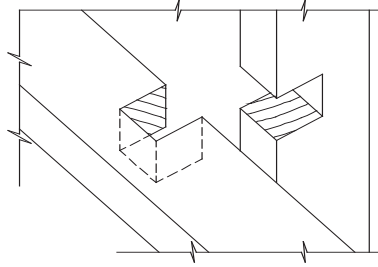
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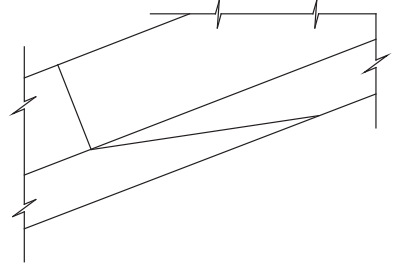
SPLINE



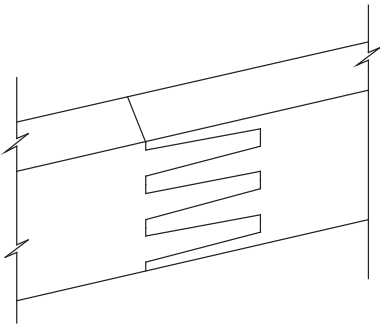
HALF LAP



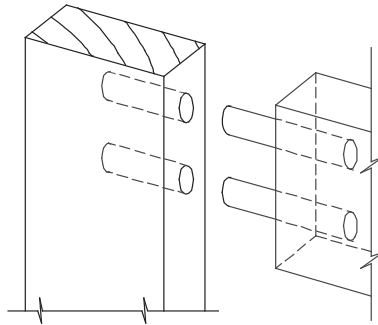
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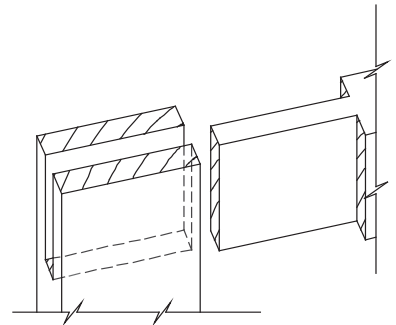
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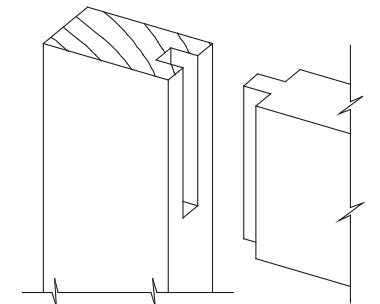
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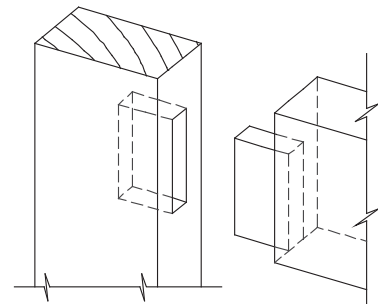
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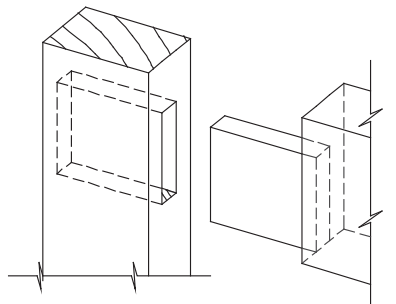
SLOTTED MORTISE & TENON



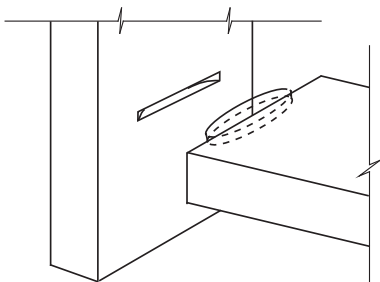
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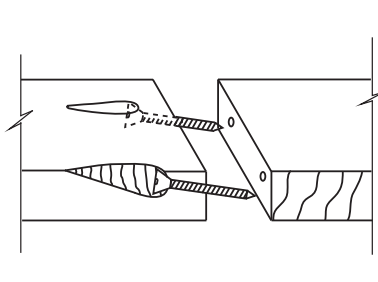
BLIND MORTISE & TENON



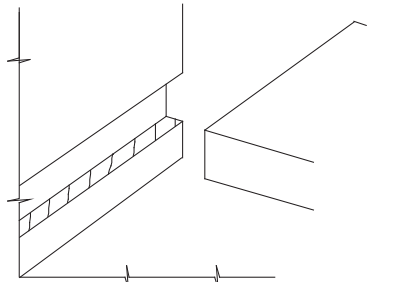
THROUGH MORTISE & TENON



BISCUIT



POCKET SCREW



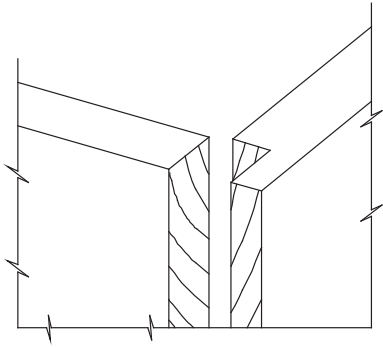
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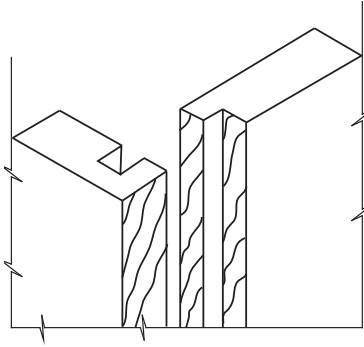
# JOINERY DETAILS

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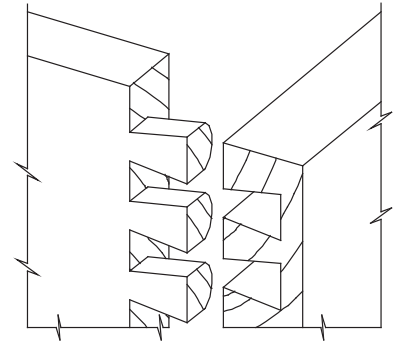
AWS Edition 1, 2009 - [WI WebDoc [10/09]]



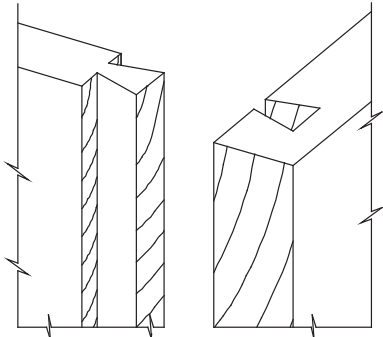
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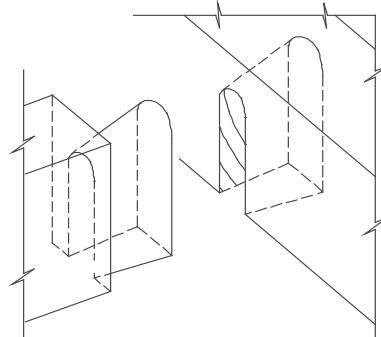
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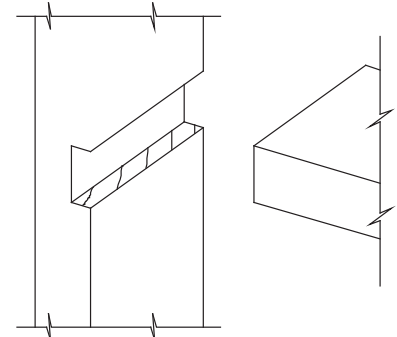
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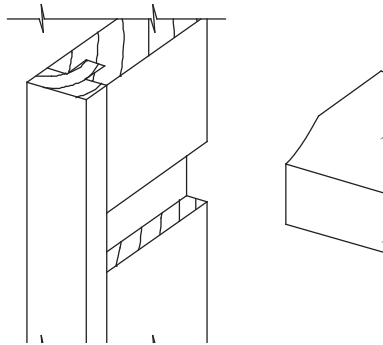
DOVETAIL (French) DADO



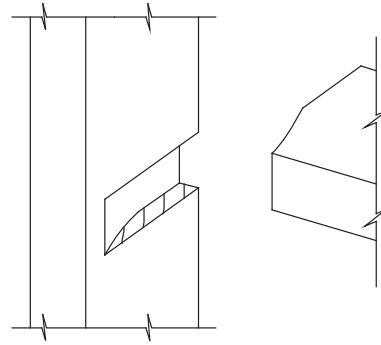
BLIND DOVETAIL



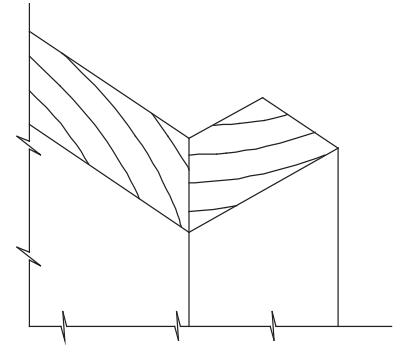
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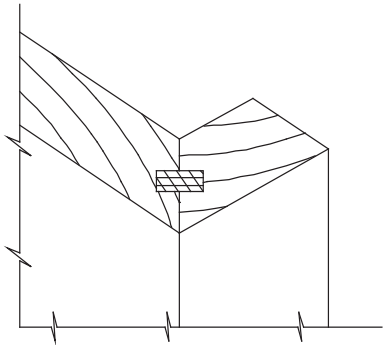
DADO, BLIND OR STOPPED



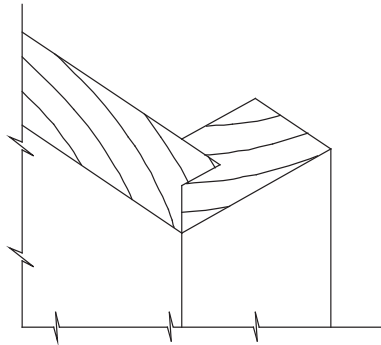
DADO, BLIND OR STOPPED



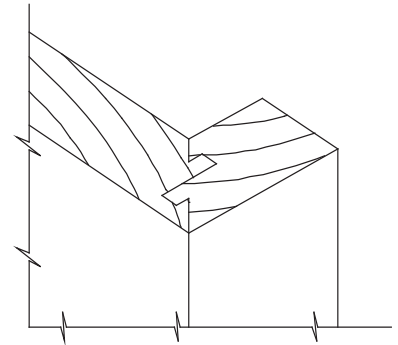
MITER



SPLINED MITER



SHOULDER MITER



LOCK MITER

A

## SEFA CHEMICAL AND STAIN RESISTANCE

(Page 1 of 2)

If chemical and/or stain resistance is a concern, users should consider the chemical and staining agents that might be used on or near casework or countertop surfaces. Common guidelines can be found in NEMA LD3 (latest edition) for chemical resistance and ASTM D3023 and C1378 (latest editions) for stain resistance. Because chemical and stain resistance is affected by concentration, time, temperature, humidity, housekeeping, and other factors, it is recommended that actual samples are tested in a similar environment with those agents that are of concern.

In lieu of actual sample testing to evaluate the resistance a finish has to chemical spills, these standards have adopted SEFA's (Scientific Equipment and Fixture Association) standard list of 49 chemicals/concentrations, their required methods of testing, and their minimum acceptable results as the means of establishing a minimum acceptable chemical resistance for exposed and semi-exposed surfaces where required by specification.

### REQUIREMENT:

Exposed horizontal surfaces, such as countertops, are required to pass a 24-hour exposure test, whereas exposed vertical surfaces and semi-exposed surfaces are required to pass a 1-hour exposure test.

### TEST PROCEDURE:

Obtain one sample panel measuring 14" x 24" (356 mm x 610 mm) and test for chemical resistance as described herein:

Place the panel on a flat surface, clean with soap and water, and blot dry. Condition the panel for 48 hours at 73° ±3° F (20° ±2° C) and 50% ±5% relative humidity. Test the panel for chemical resistance using the 49 different chemical reagents (listed on the following page) by one of the following methods:

**METHOD A** - Test volatile chemicals by placing a cotton ball saturated with reagent in the mouth of a 1-oz. (29.574 cc) bottle and inverting the bottle on the surface of the panel.

**METHOD B** - Test non-volatile chemicals by placing five drops of the reagent on the surface of the panel and covering with a 24 mm watch glass, convex side down.

For both of the above methods, leave the reagents on the panel for a period of:

One (1) hour for exposed vertical surfaces and semi-exposed surfaces.

Twenty-four (24) hours for exposed horizontal surfaces such as countertops.

Wash off the panel with water, clean with detergent and naphtha, and rinse with deionized water. Dry with a towel and evaluate after 24 hours at 73° ±3° F (20° ±2° C) and 50% ±5% relative humidity using the following rating system:

### RESULT CLASSIFICATIONS:

**LEVEL 0** - No detectable change.

**LEVEL 1** - Slight change in color or gloss.

**LEVEL 2** - Slight surface etching or severe staining.

**LEVEL 3** - Pitting, cratering, swelling, or erosion of coating; obvious and significant deterioration.

### ACCEPTANCE LEVEL:

Results will vary from product to product, and suitability for a given application is dependent upon the chemicals used in a given laboratory setting. Without specification requiring otherwise, an acceptable level of chemical and stain resistance for products requiring such in accordance with these standards and a project's specifications shall be:

**FINISHES** with test results **SHOWING NO MORE THAN** four of the Level 3 Result Classifications.

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**SEFA CHEMICAL AND STAIN RESISTANCE**

(Page 2 of 2)

	CHEMICAL REAGENT	TEST METHOD
1	Acetate, Amyl	A
2	Acetate, Ethyl	A
3	Acetic Acid, 98%	B
4	Acetone	A
5	Acid Dichromate, 5%	B
6	Alcohol, Butyl	A
7	Alcohol, Ethyl	A
8	Alcohol, Methyl	A
9	Ammonium Hydroxide, 28%	B
10	Benzene	A
11	Carbon Tetrachloride	A
12	Chloroform	A
13	Chromic Acid, 60%	B
14	Cresol	A
15	Dichlor Acetic Acid	A
16	Dimethylformamide	A
17	Dioxane	A
18	Ethyl Ether	A
19	Formaldehyde, 37%	A
20	Formic Acid, 90%	B
21	Furfural	A
22	Gasoline	A
22	Hydrochloric Acid, 37%	B
24	Hydrofluoric Acid, 48%	B
25	Hydrogen Peroxide, 3%	B

	CHEMICAL REAGENT	TEST METHOD
26	Iodine, Tincture of	B
27	Methyl Ethyl Ketone	A
28	Methylene Chloride	A
29	Mono Chlorobenzene	A
30	Naphthalene	A
31	Nitric Acid, 20%	B
32	Nitric Acid, 30%	B
33	Nitric Acid, 70%	B
34	Phenol, 90%	A
35	Phosphoric Acid, 85%	B
36	Silver Nitrate, Saturated	B
37	Sodium Hydroxide, 10%	B
38	Sodium Hydroxide, 20%	B
39	Sodium Hydroxide, 40%	B
40	Sodium Hydroxide, Flake	B
41	Sodium Sulfide, Saturated	B
42	Sulfuric Acid, 33%	B
43	Sulfuric Acid, 77%	B
44	Sulfuric Acid, 96%	B
45	Sulfuric Acid, 77% and Nitric Acid, 70% - equal parts	B
46	Toluene	A
47	Trichloroethylene	A
48	Xylene	A
49	Zinc Chloride, Saturated	B

## CASEWORK DESIGN SERIES (CDS)

(Page 1 of 20)

**THESE CASEWORK ILLUSTRATIONS ARE PROVIDED TO ASSIST DESIGN PROFESSIONALS AND CASEWORK USERS IN SELECTING TYPICAL DESIGNS. THESE ILLUSTRATIONS ARE NOT INTENDED TO LIMIT OR RESTRICT CREATIVITY, OR TO BE ALL-INCLUSIVE.**

When **UTILIZING THE CDS NUMBERING SYSTEM**, it is not necessary to show casework elevations in your architectural drawings. However, it is necessary to show a plan view with each **CDS** number indicated along with the width, height, and depth in inches or millimeters (example: 102-36"x30"x18" [102-914 mm x 762 mm x 457 mm]). Cabinet dimensions indicate the nominal outside dimension (floor to top of countertop for height and face of finished wall to face of cabinet door for depth). Manufacturers are permitted a tolerance of plus/minus 1/2" (12.7 mm) in width only.

When **DESIGNS OTHER THAN THOSE PROVIDED FOR IN THE CDS SYSTEM ARE DESIRED**, they may be indicated by selecting the **CDS** number most closely representing the desired design, followed by the letter "M" and a description or illustration of the design modification (example: 102M - 2 shelves - 36"x30"x18" [102M - 2 shelves - 914 mm x 762 mm x 457 mm] or 102M - no shelves -36"x30"x18" [102M - no shelves -914 mm x 762 mm x 457 mm]). It is suggested that a standard number/ dimension convention similar to that shown below, is used.

If the **CDS** numbering system is **USED IN CONJUNCTION WITH CABINET ELEVATIONS** on architectural drawings, the cabinet elevations shall govern on any conflict between the requirements of the elevation and the **CDS** number.

**CDS** cabinets are intended for **TYPE A** construction with integral finished ends and scribes at wall-to-wall installations not exceeding 1-1/2" (38.1 mm) in width.

The following **BASE CASEWORK HEIGHTS** are recommended for various school grades, subject to ADA requirements:

Kindergarten - Grade 1	24" (610 mm)
Grades 2 - 3	27" (686 mm)
Grades 4 - 6	30" (762 mm)
Grades 7 - 9	33" (838 mm)
Grades 10 and above	36" (914 mm)

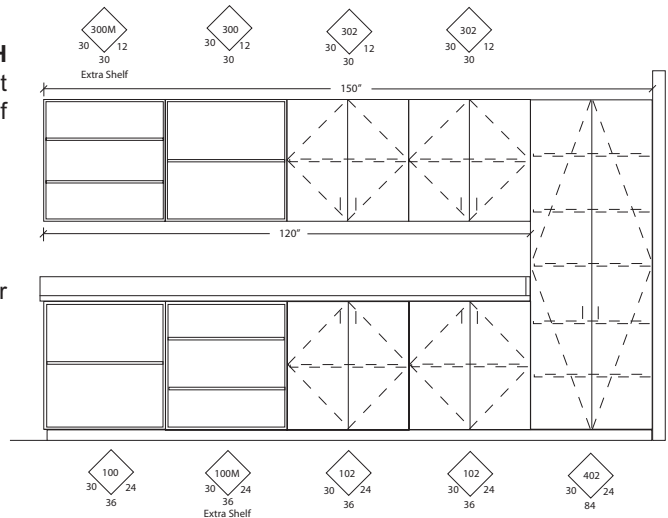
The **CDS** is subdivided as follows:

Base Cabinets w/o Drawers	100 Series	Tall Wardrobe Cabinets	500 Series
Base Cabinets w/ Drawers	200 Series	Library Cabinets	600 Series
Wall-Hung Cabinets	300 Series	Moveable Cabinets	700 Series
Tall Storage Cabinets	400 Series		

**HARDWARE** and **ACCESSORIES** shall be as provided for in these standards.

### GENERAL NOTES:

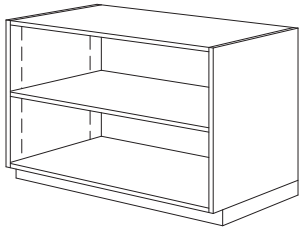
- 100 or 200 Series cabinets may be converted into moveable cabinets by prefixing a "7" to the number. (Example: 7-102-36"x30"x18" [7-102-914 mm x 762 mm x 457 mm]).
- Moveable cabinets shall be equipped with adequate approved casters for the intended load capacity.
- CDS #'s 728, 729, 735, 736, 737, 738, and 739 require metal angle reinforced corners.
- Carts and rolling tall storage cabinets with doors, lacking any horizontal and/or vertical stabilizing dividers, require a diaphragm bottom; specifically CDS #'s 702, 712, 716, 722, 743, 744, 746, 747, 750, and 751.
- Wardrobe cabinets (500 Series) with doors require a framed mirror on one door, and cabinets # 533 and 534 require a paper roller/cutter and slide-out tilting paper shelves.
- Cart storage cabinets are required to have hardwood side guides, specifically CDS #'s 160, 161, and 162.
- Ceramics drying cabinets are required to have galvanized metal frame shelves with wire mesh, specifically CDS #'s 198 199, and 459.
- File drawers require full-extension slides and a file-hanging system, specifically CDS #'s 223, 224, 230, 231, 240, 242, 253, 255, 531, 532, and 533.
- Wardrobe cabinets are required to have a shelf, pole, and framed mirror when closed with hinged doors, specifically CDS #'s 501, 511, 512, 522, 530, 531, 532, and 552.



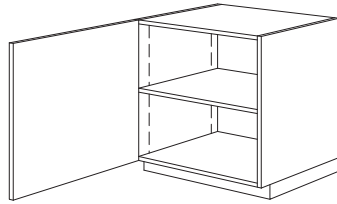
# CASEWORK DESIGN SERIES (CDS)

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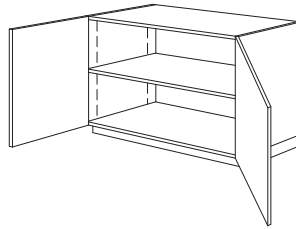
## 100 SERIES - BASE CABINETS w/o DRAWERS



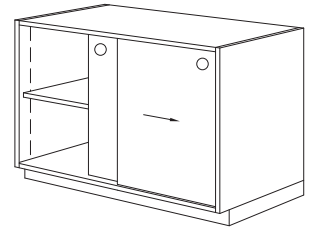
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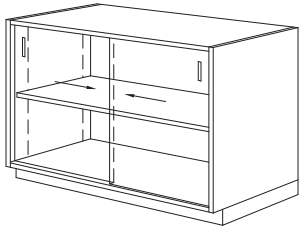
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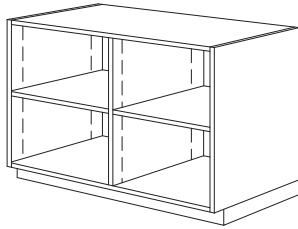
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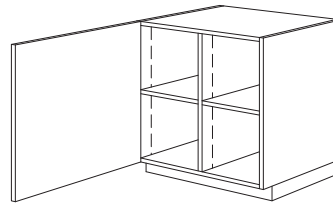
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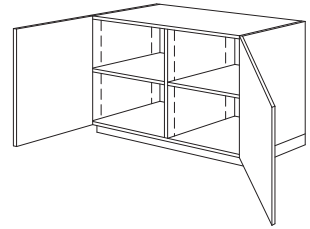
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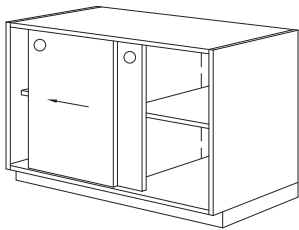
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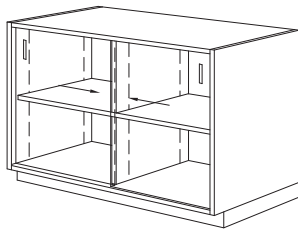
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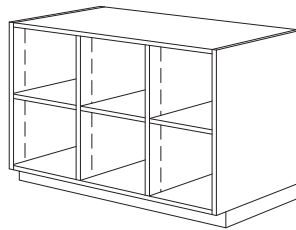
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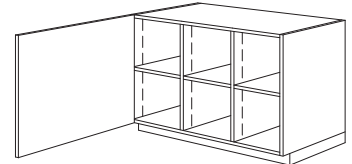
116



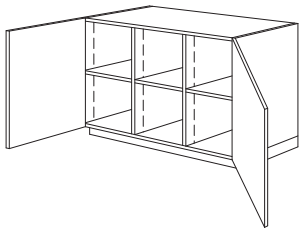
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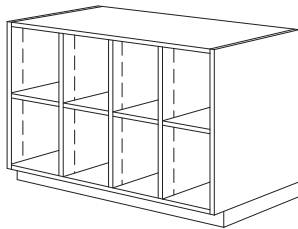
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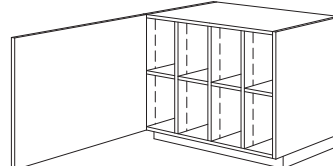
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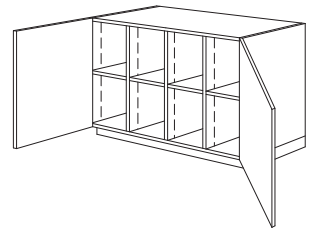
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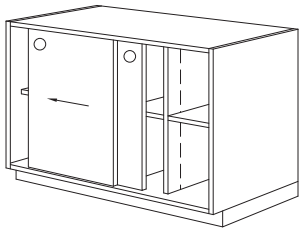
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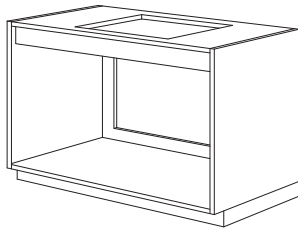
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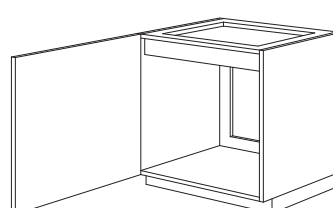
132



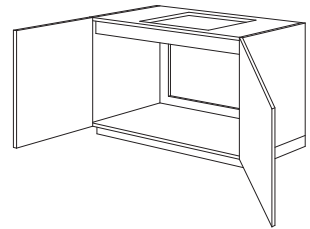
136



140  
Removable Back



141  
Removable Back



142  
Removable Back

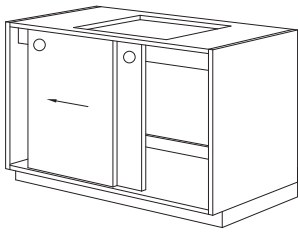
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# CASEWORK DESIGN SERIES (CDS)

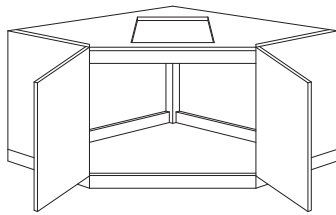
(Page 3 of 20)

## 100 SERIES - BASE CABINETS w/o DRAWERS

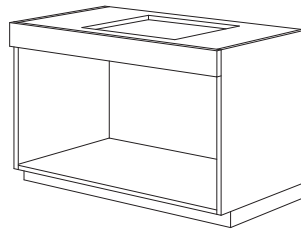
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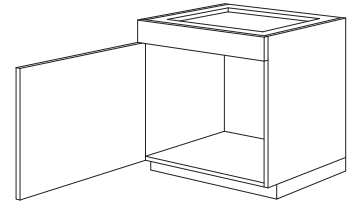
**146**  
Removable Back



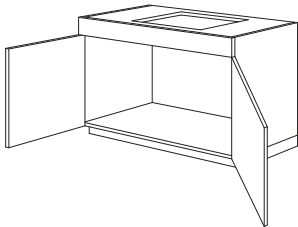
**148**  
Removable Back



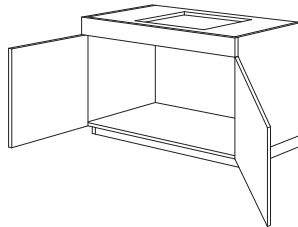
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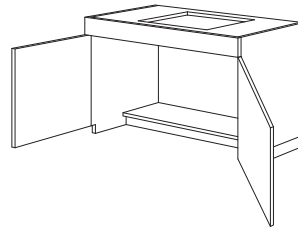
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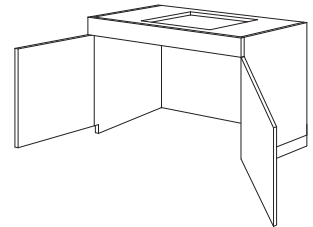
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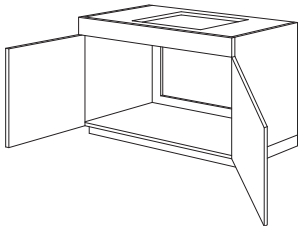
**153**  
Removable Base/Toe



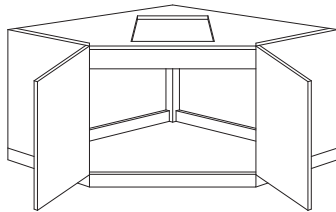
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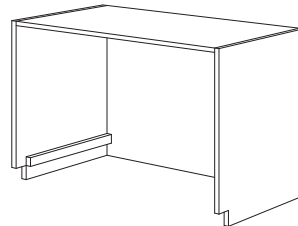
**155**



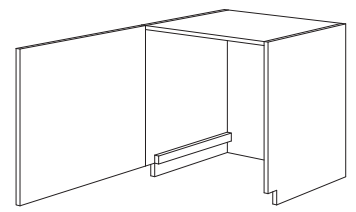
**156**  
Removable Back



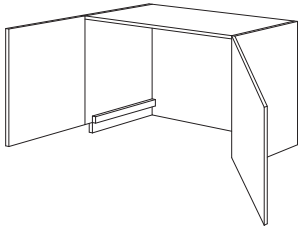
**157**  
Removable Back



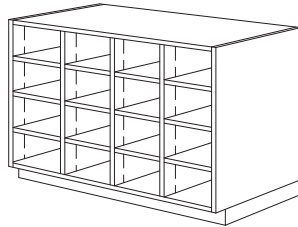
**160**  
Cart Storage



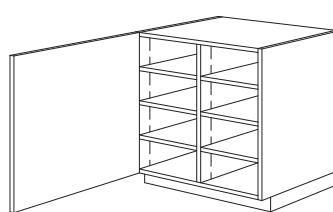
**161**  
Cart Storage



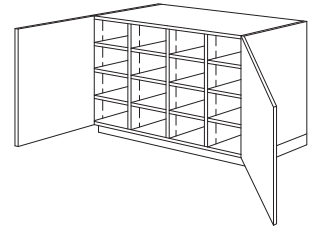
**162**  
Cart Storage



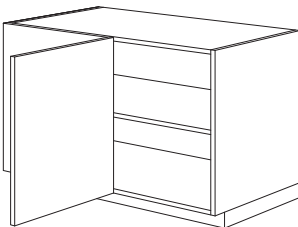
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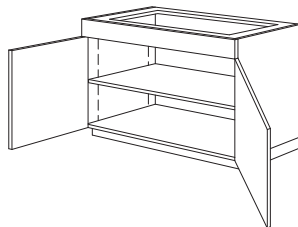
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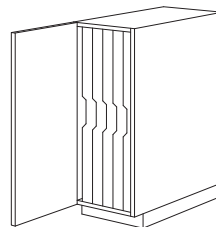
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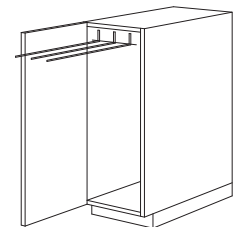
**176**



**177**



**178**



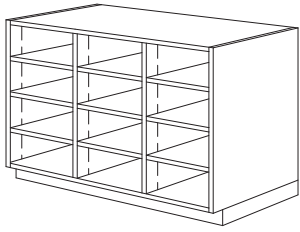
**179**  
Retractable Towel Rack

**A**

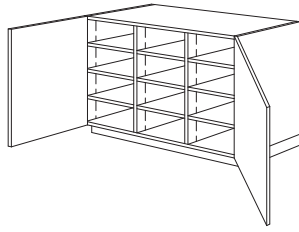
# CASEWORK DESIGN SERIES (CDS)

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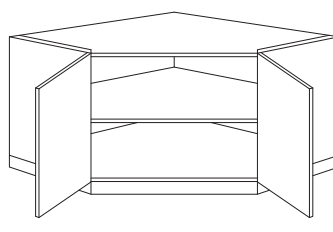
## 100 SERIES - BASE CABINETS w/o DRAWERS (continued)



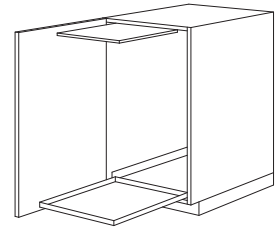
180



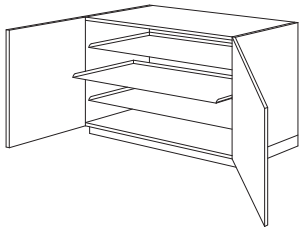
182



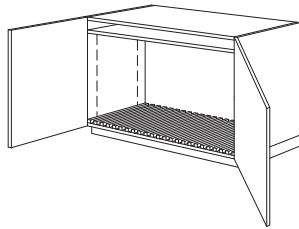
186



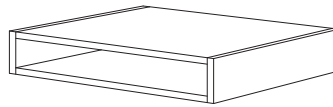
187  
Sliding Tray & Lift Shelf



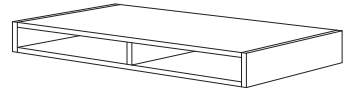
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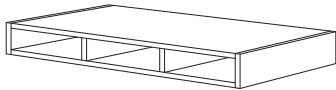
189  
Drawing Board Rack



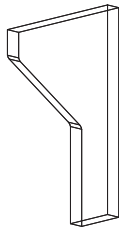
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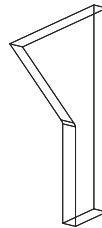
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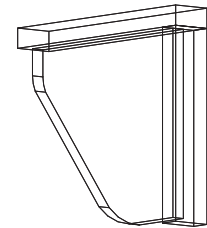
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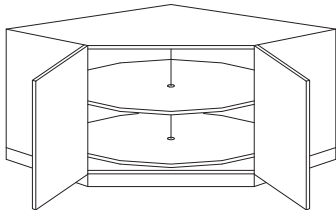
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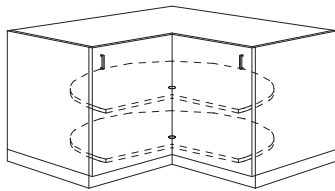
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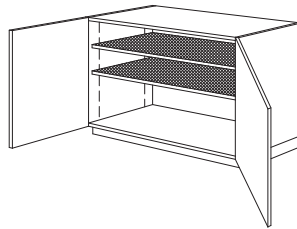
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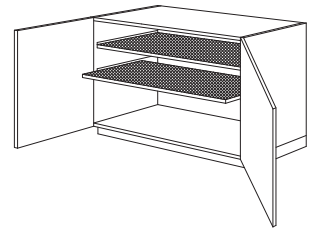
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197



198



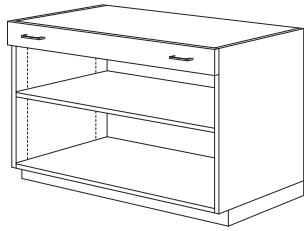
199

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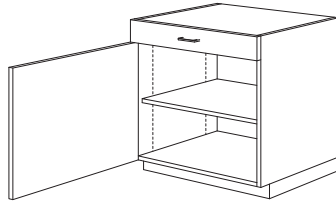
# CASEWORK DESIGN SERIES (CDS)

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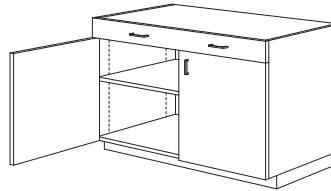
## 200 SERIES - BASE CABINETS w/ DRAWERS



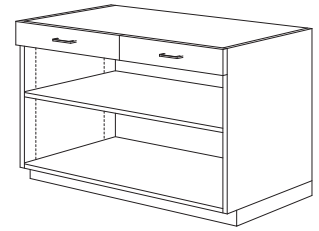
210



211



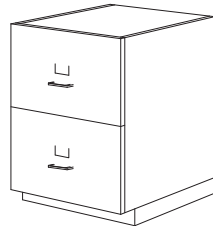
212



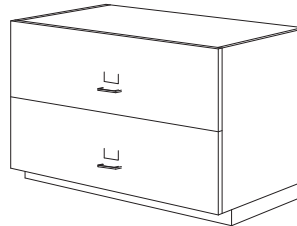
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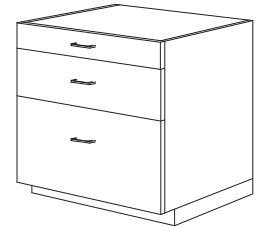
222



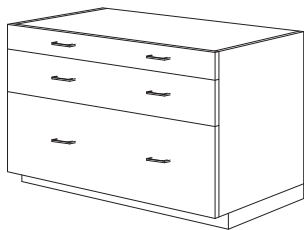
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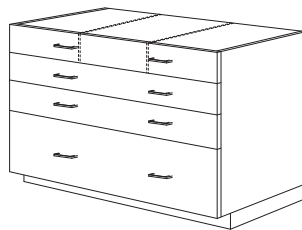
224



230



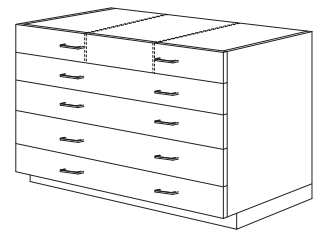
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240



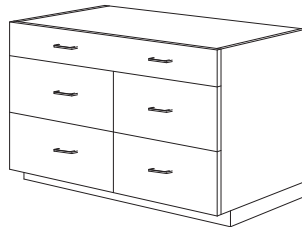
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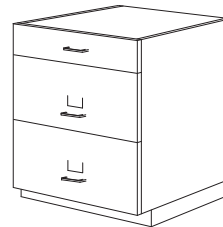
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251



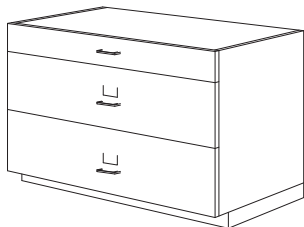
252



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255



260



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262

A

# CASEWORK DESIGN SERIES (CDS)

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## 200 SERIES - BASE CABINETS w/ DRAWERS (continued)



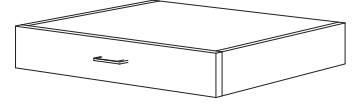
270



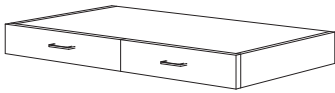
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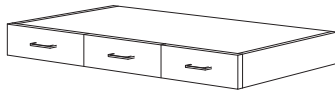
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290



291



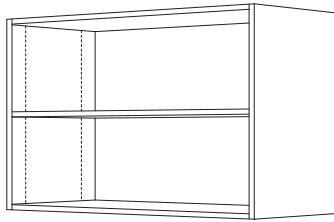
292



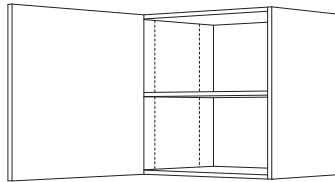
# CASEWORK DESIGN SERIES (CDS)

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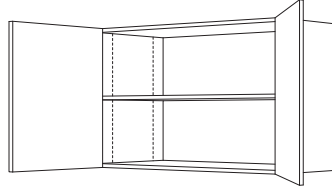
## 300 SERIES - WALL-HUNG CABINETS



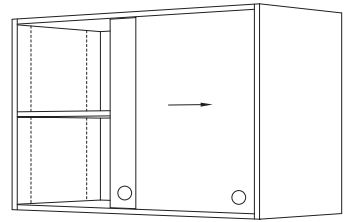
300



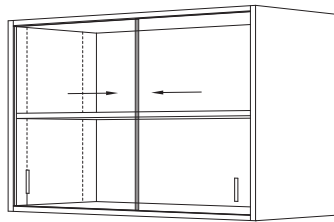
301



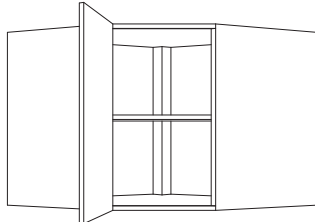
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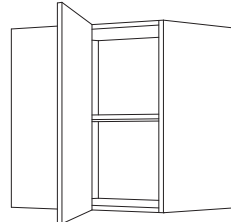
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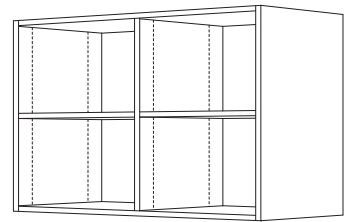
307



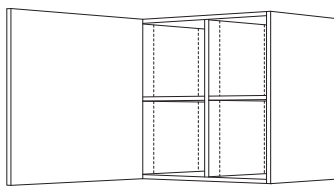
308  
Angle Corner



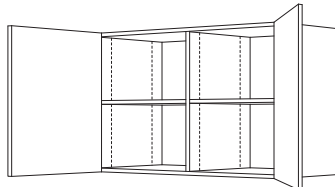
309  
Blind Corner



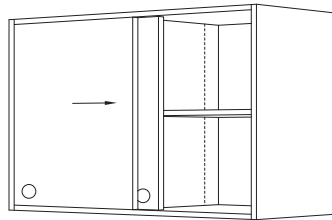
310



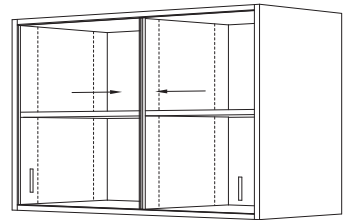
311



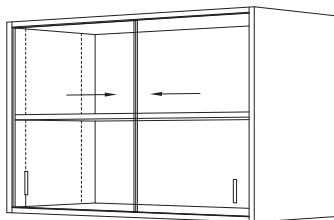
312



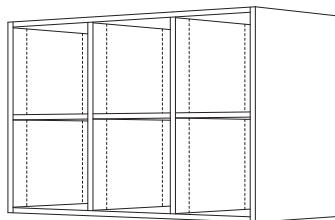
316



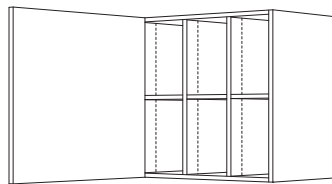
317



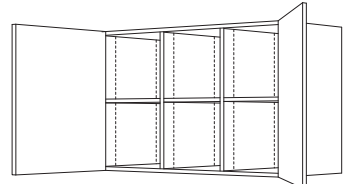
318



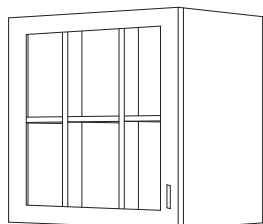
320



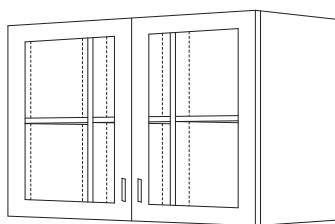
321



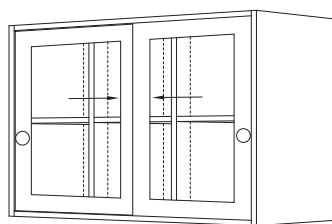
322



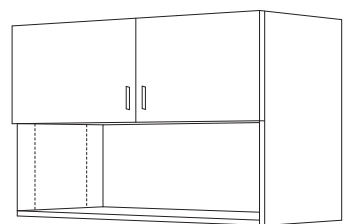
323



324



325



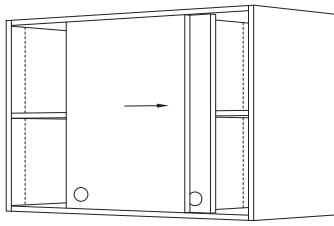
326

A

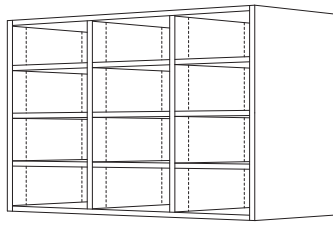
# CASEWORK DESIGN SERIES (CDS)

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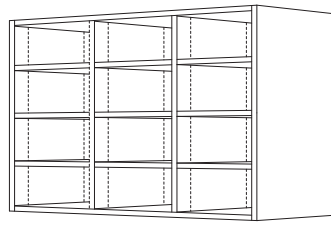
## 300 SERIES - WALL-HUNG CABINETS (continued)



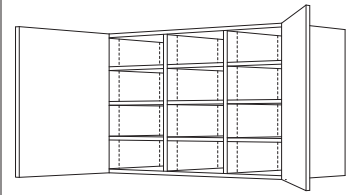
**336**



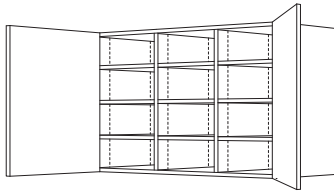
**340**



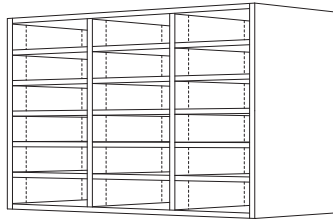
**341**  
Open Back



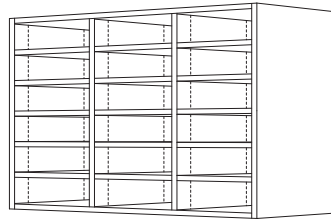
**342**



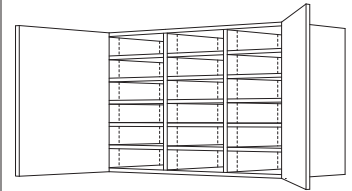
**343**  
Open Back



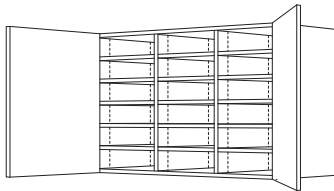
**350**



**351**  
Open Back



**352**



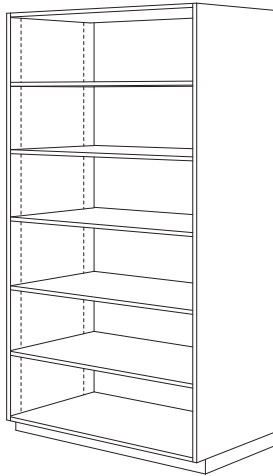
**353**  
Open Back

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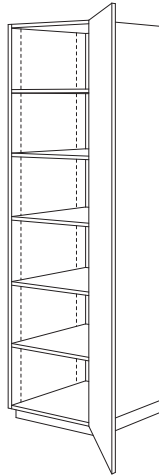
# CASEWORK DESIGN SERIES (CDS)

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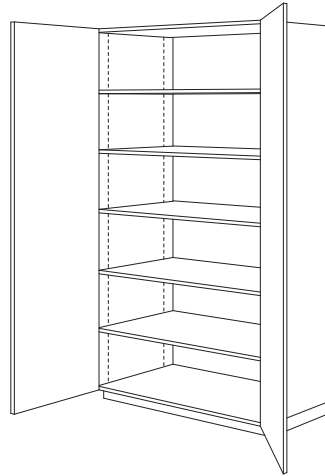
## 400 SERIES - TALL STORAGE CABINETS



400



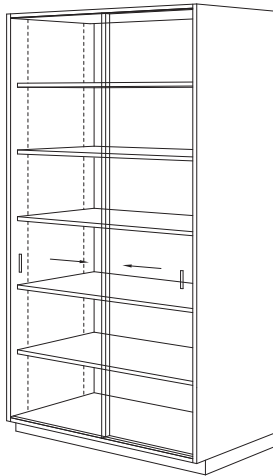
401



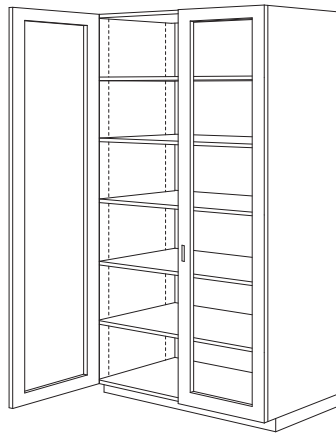
402



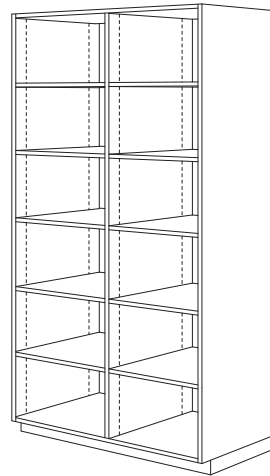
406



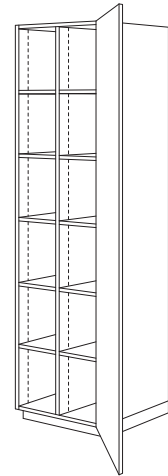
407



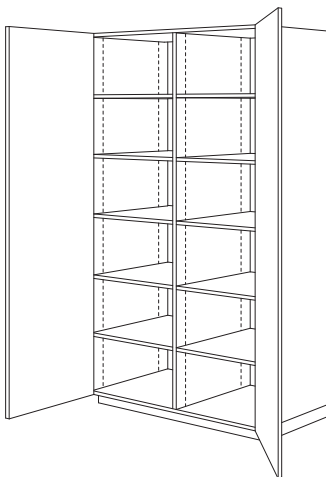
408



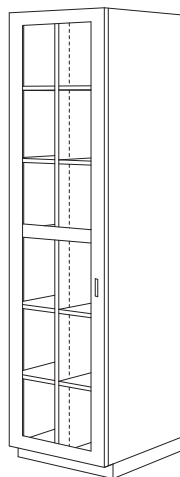
410



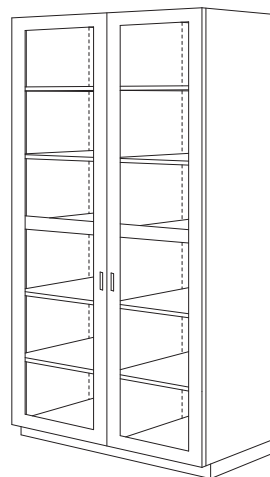
411



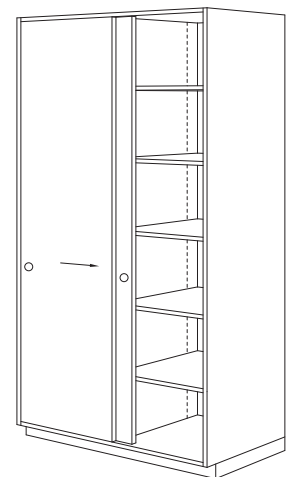
412



413



414



416

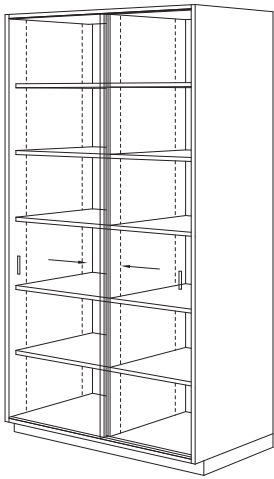
A

# CASEWORK DESIGN SERIES (CDS)

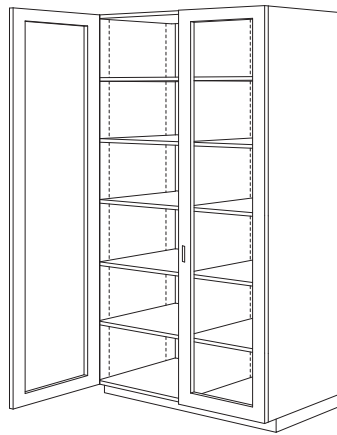
(Page 10 of 20)

## 400 SERIES - TALL STORAGE CABINETS (continued)

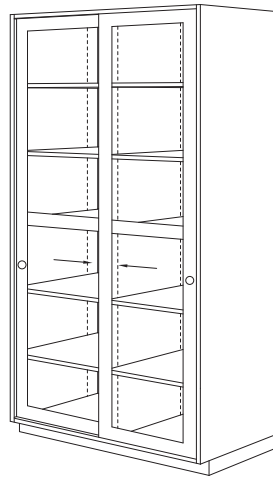
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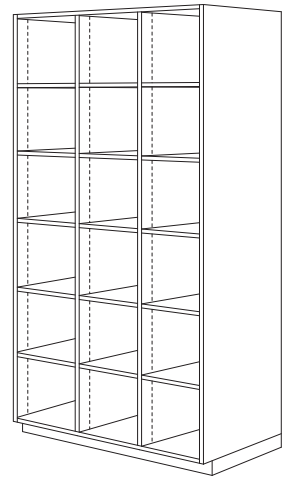
417



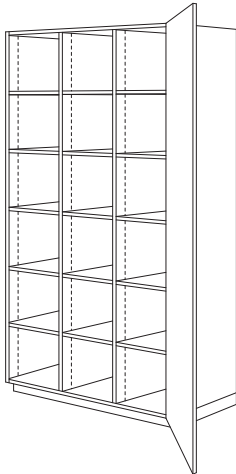
418



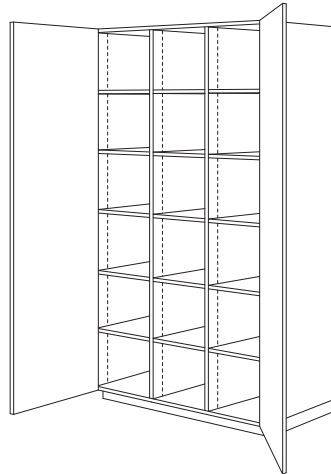
419



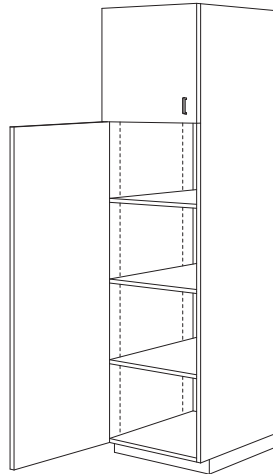
420



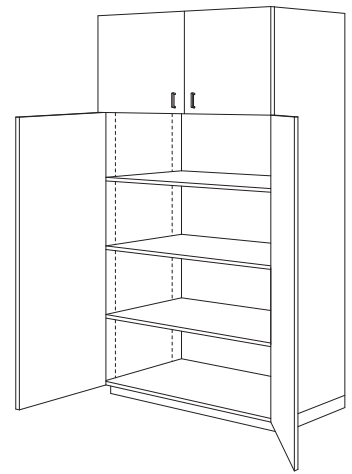
421



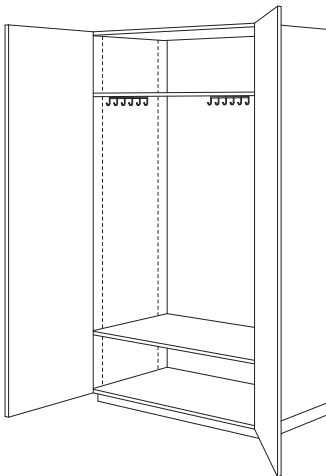
422



423

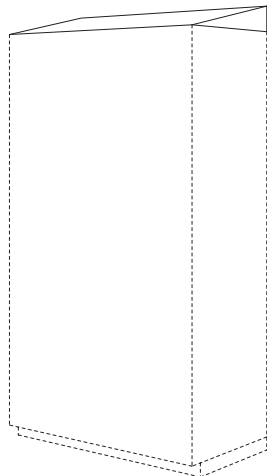


424

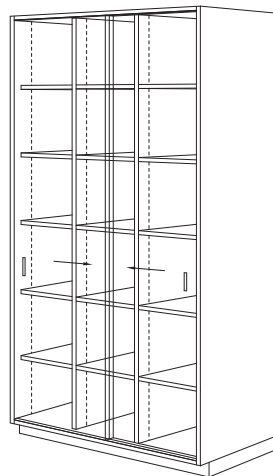


425

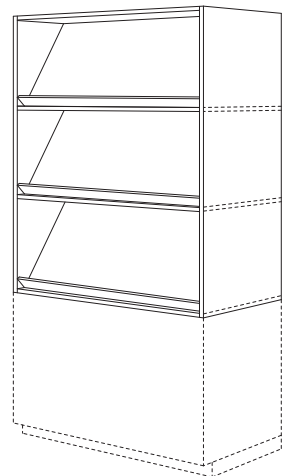
Dust Panel, Integral or Separate



426



427



429

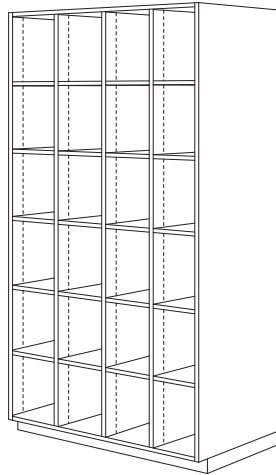
Hutch w/ Fixed Shelves

A

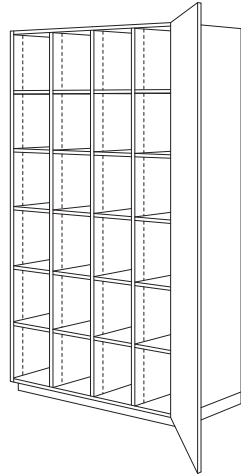
# CASEWORK DESIGN SERIES (CDS)

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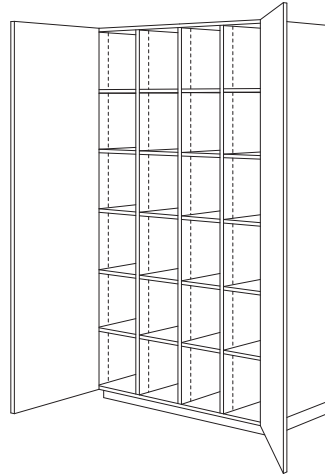
## 400 SERIES - TALL STORAGE CABINETS (continued)



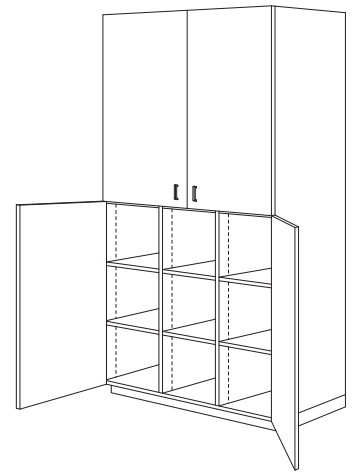
430



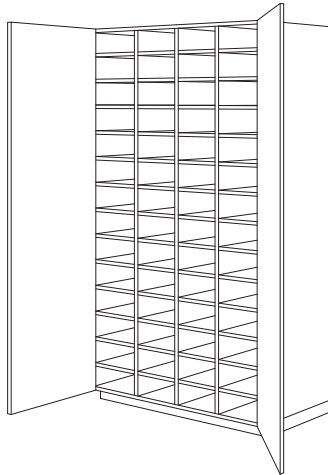
431



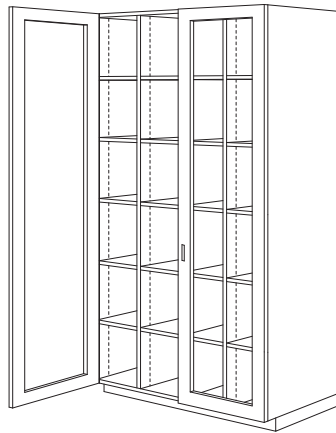
432



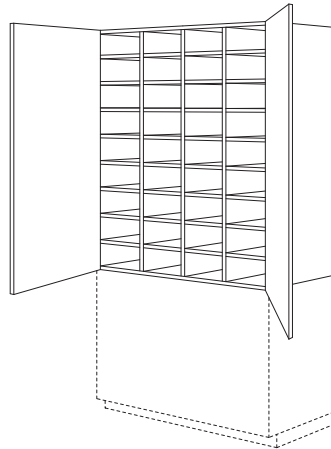
434



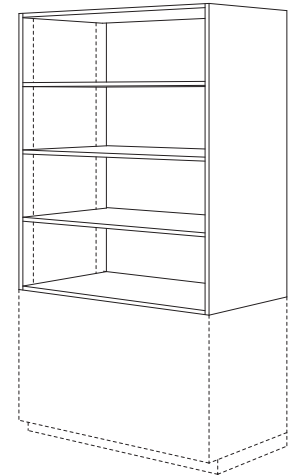
435



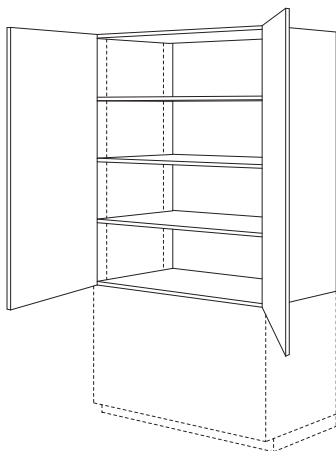
438



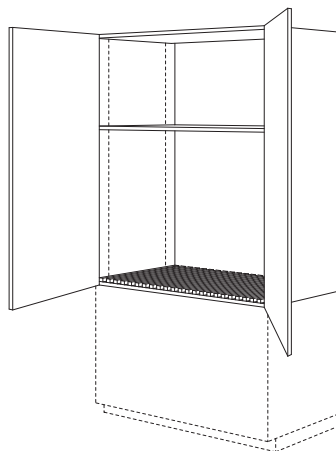
439  
Hutch



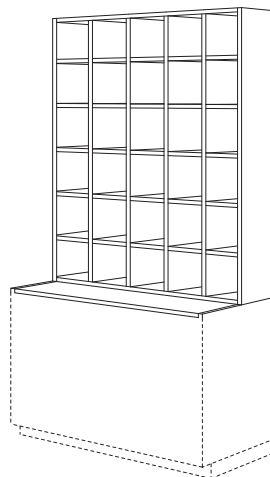
440  
Hutch



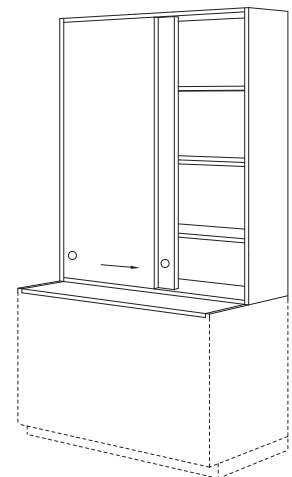
441  
Hutch



443  
Hutch



444  
Hutch



445  
Hutch

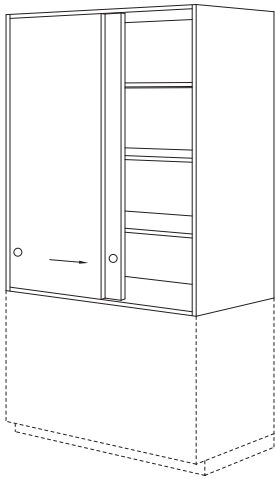
A

# CASEWORK DESIGN SERIES (CDS)

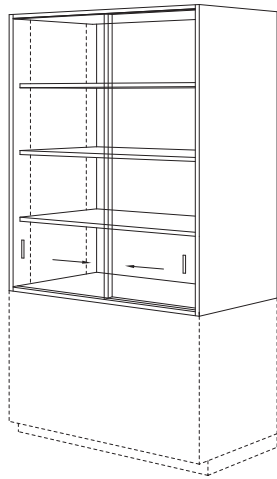
(Page 12 of 20)

## 400 SERIES - TALL STORAGE CABINETS (continued)

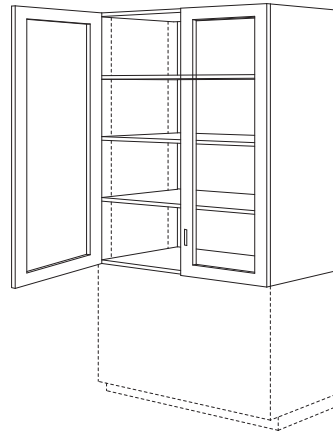
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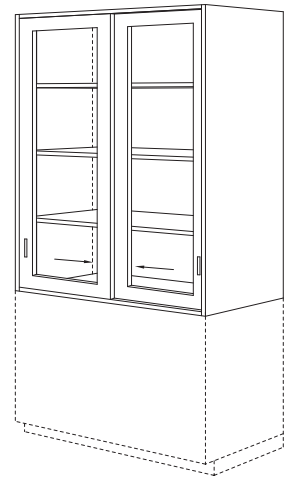
**446**  
Hutch



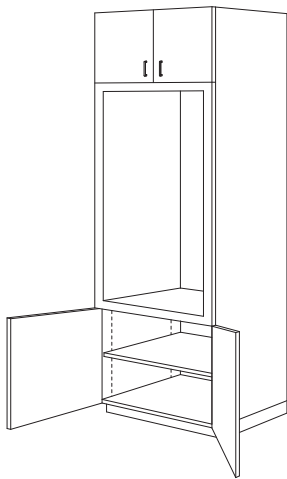
**447**  
Hutch



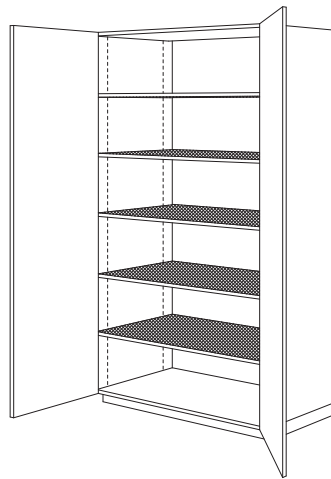
**448**  
Hutch



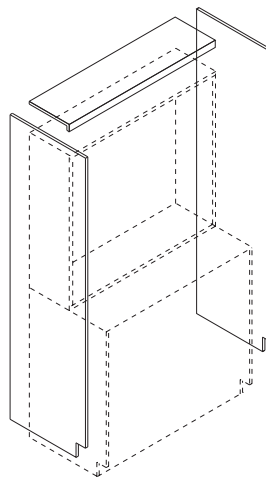
**449**  
Hutch



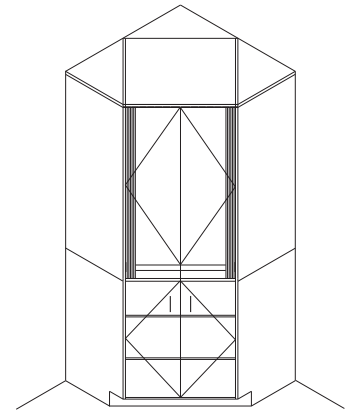
**454**



**459**



**460**

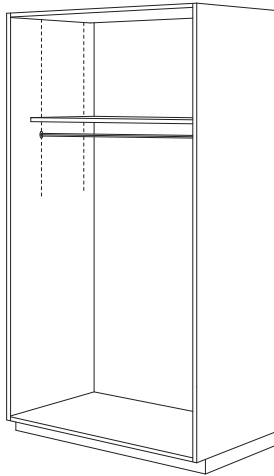


**461**

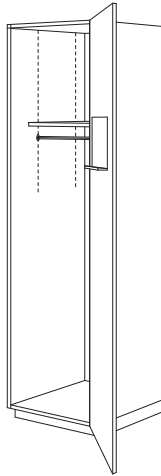
# CASEWORK DESIGN SERIES (CDS)

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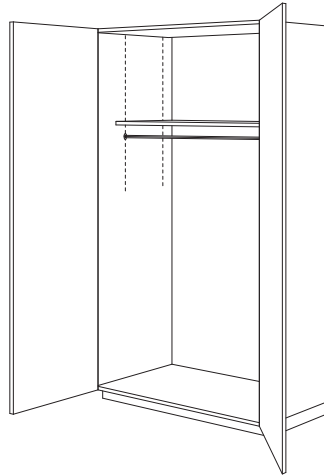
## 500 SERIES - WARDROBE CABINETS



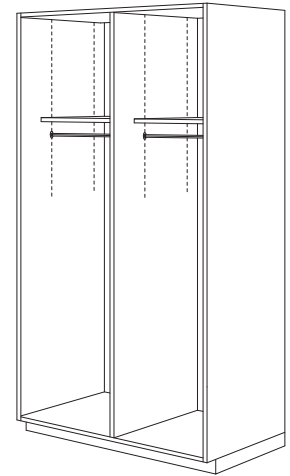
500



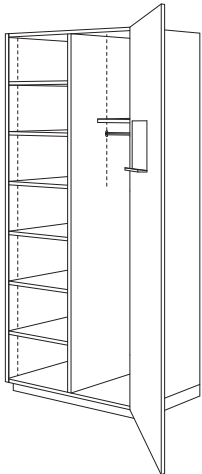
501



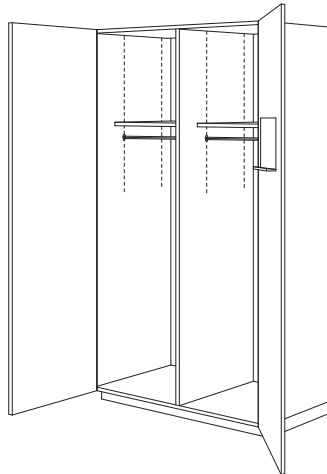
502



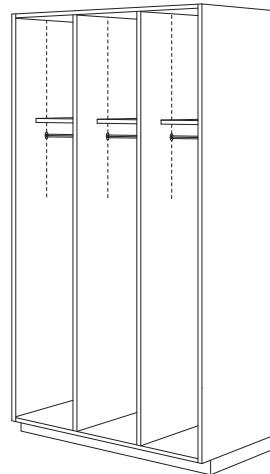
510



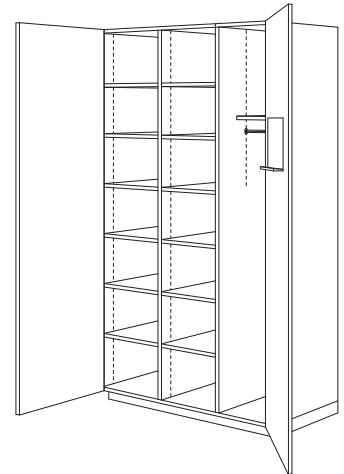
511



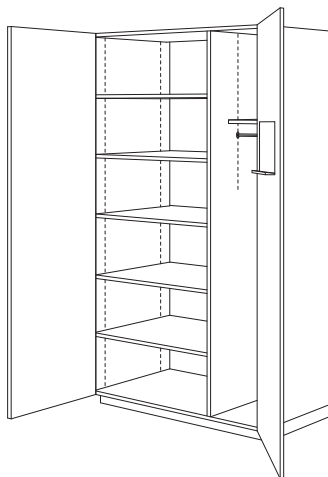
512



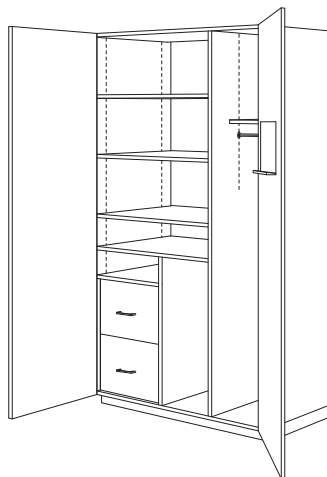
520



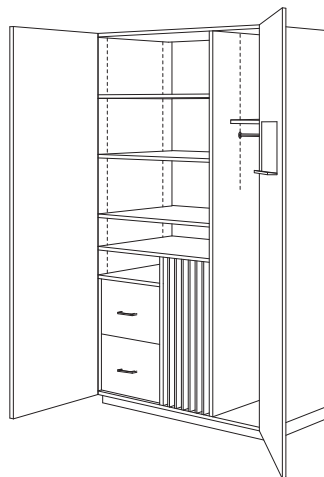
522



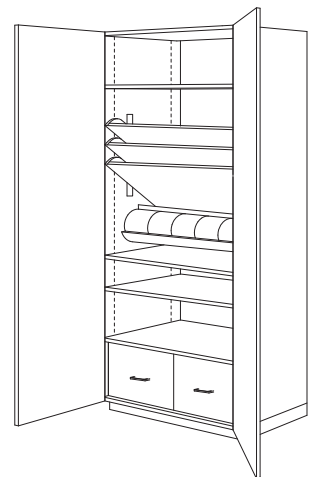
530



531



532



533

See General Notes

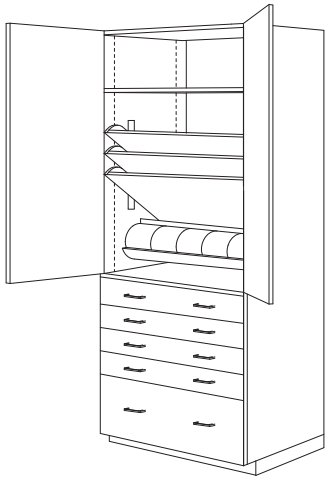
A



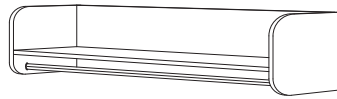
# CASEWORK DESIGN SERIES (CDS)

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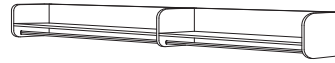
## 500 SERIES - WARDROBE CABINETS (continued)



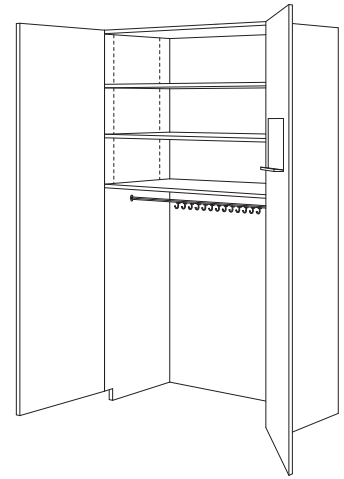
**534**  
See General Notes



**540**



**541**



**552**  
Pole w/ Wall Hooks

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# CASEWORK DESIGN SERIES (CDS)

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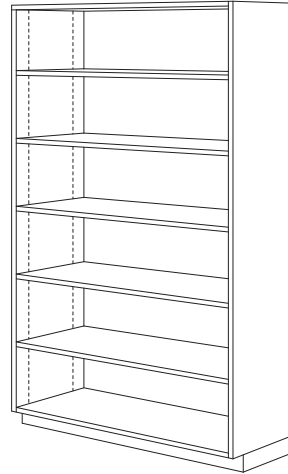
## 600 SERIES - LIBRARY CABINETS



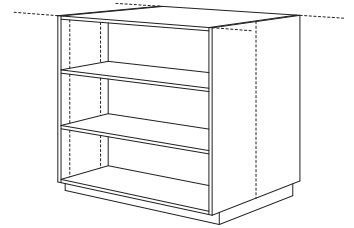
**600**  
605 w/o Back



**601**  
606 w/o Back



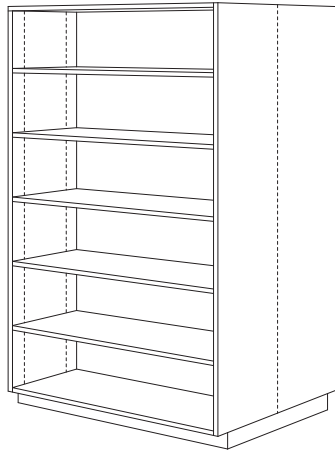
**602**  
607 w/o Back



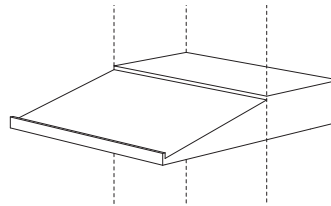
**620**  
625 w/o Back



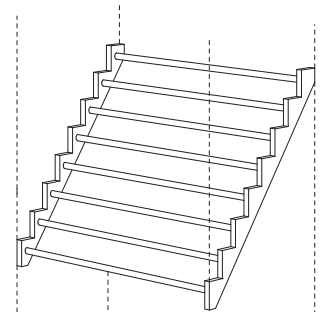
**621**  
626 w/o Back



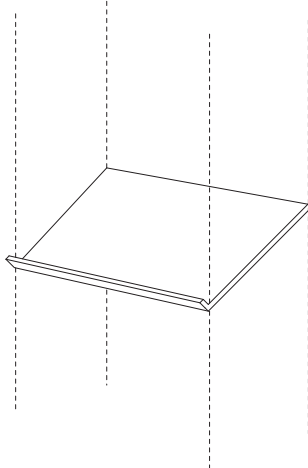
**622**  
627 w/o Back



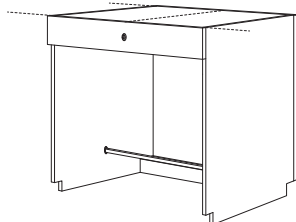
**614**  
Library of Congress Shelf



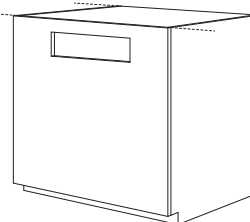
**624**  
Newspaper Rack



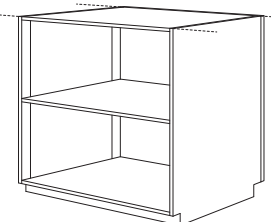
**634**  
Display Shelf



**640**  
Charge Desk



**641**  
Book Return



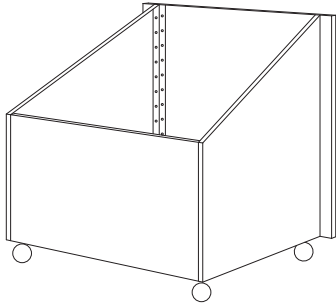
**644**

**A**

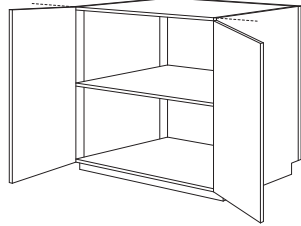
# CASEWORK DESIGN SERIES (CDS)

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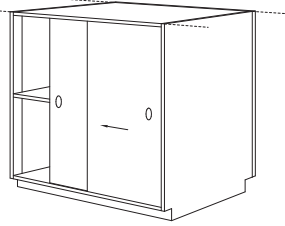
## 600 SERIES - LIBRARY CABINETS (continued)



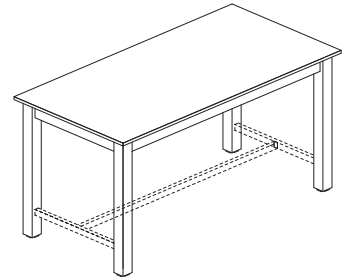
**651**  
Book Cart



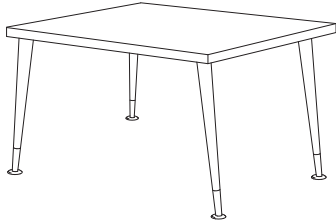
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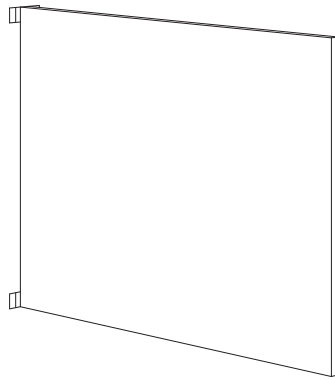
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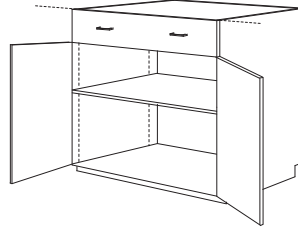
**671a**  
671b w/ Lateral Bracing



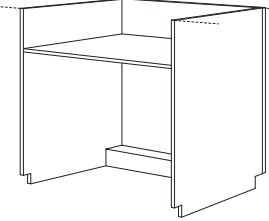
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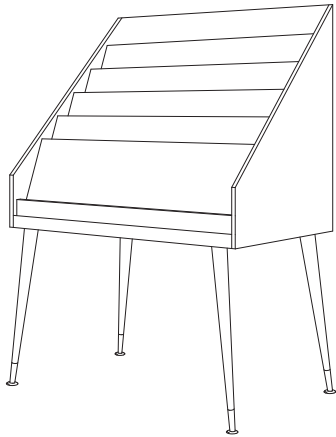
**673**  
Gate



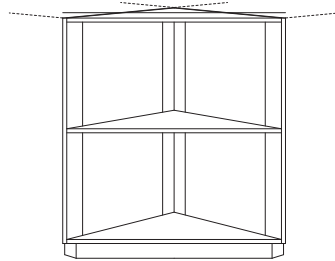
**674**



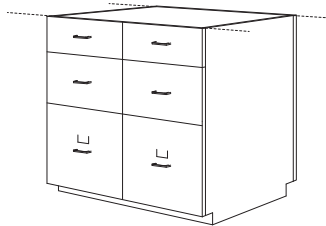
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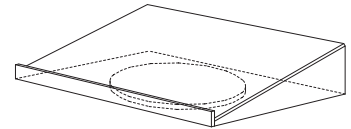
**682 / 692**  
Magazine Rack



**683**



**684**



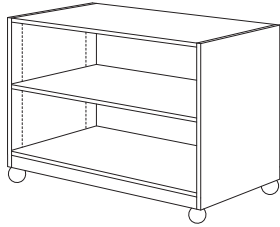
**693**  
Dictionary Stand

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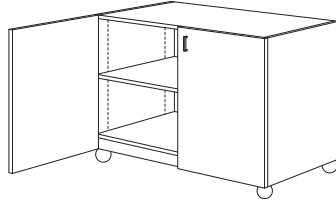
# CASEWORK DESIGN SERIES (CDS)

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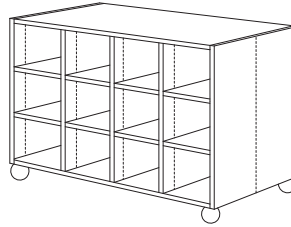
## 700 SERIES - MOVEABLE CABINETS



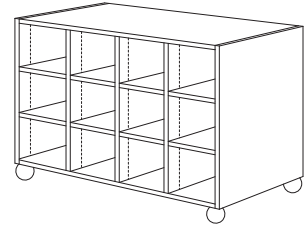
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702



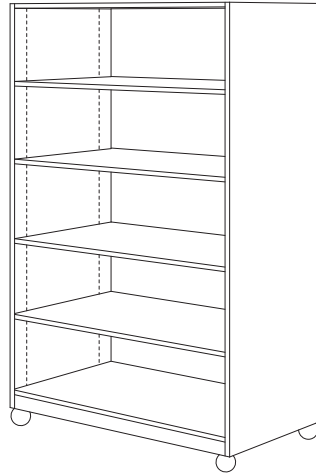
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704



707



710



712

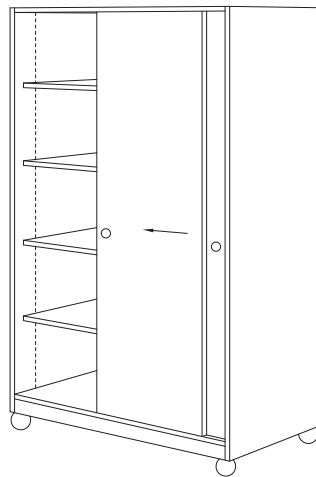


714

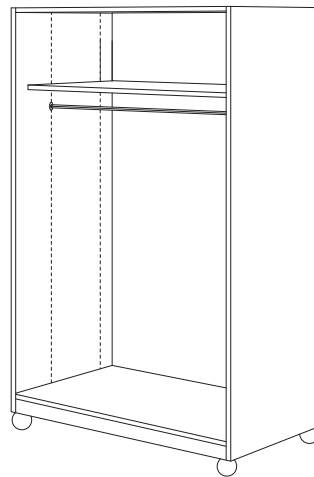


715

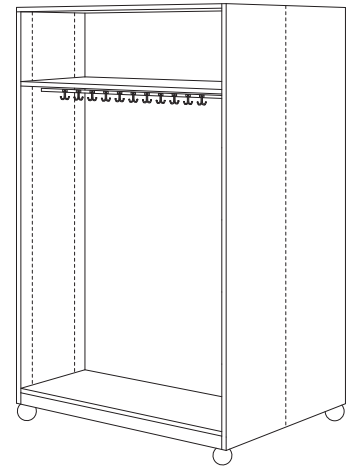
Slide-Out Tilting Paper Shelves



716



720

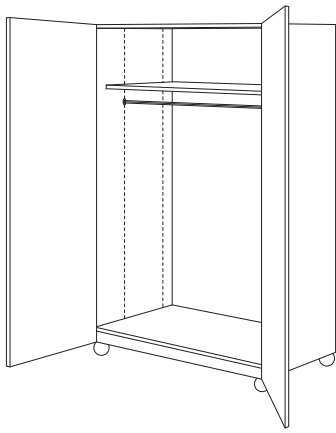


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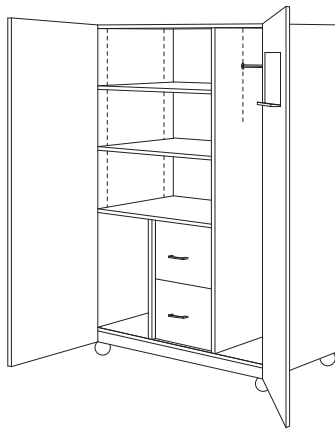
# CASEWORK DESIGN SERIES (CDS)

(Page 18 of 20)

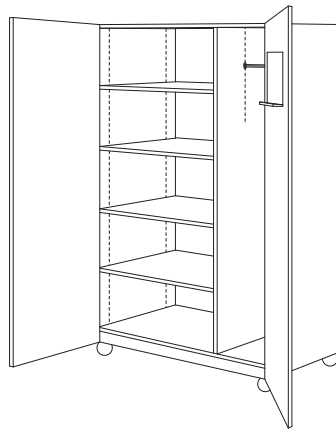
## 700 SERIES - MOVEABLE CABINETS (continued)



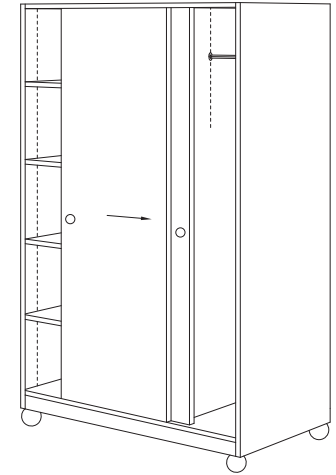
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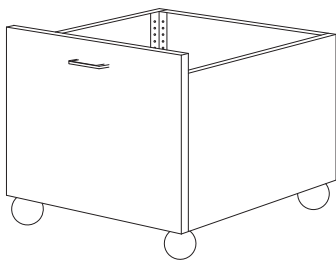
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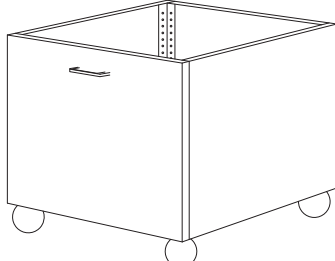
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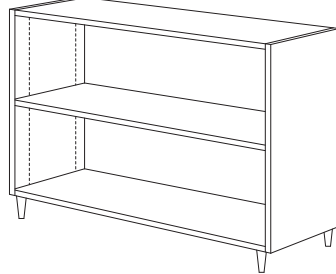
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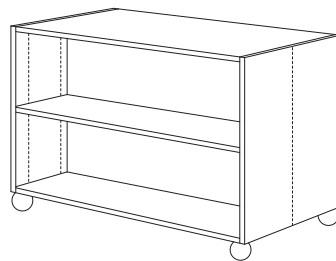
728  
Toy Cart



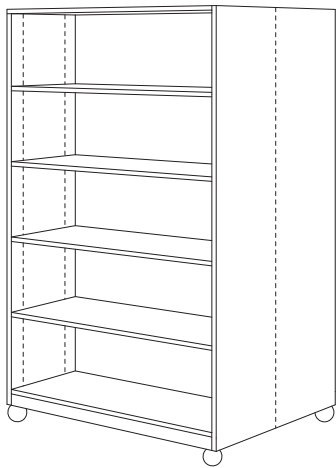
729  
Toy Cart



730



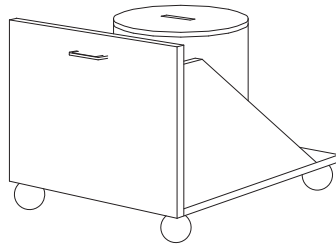
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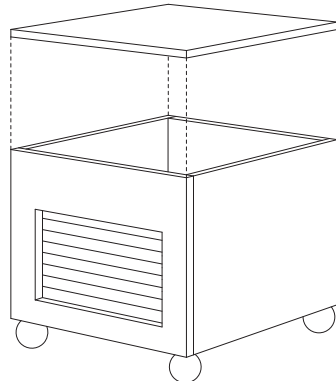
732



734



735  
Clay Cart, Tin NIC



736  
Metal-Lined Clay Cart

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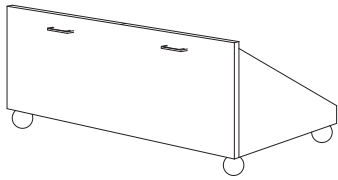
# CASEWORK DESIGN SERIES (CDS)

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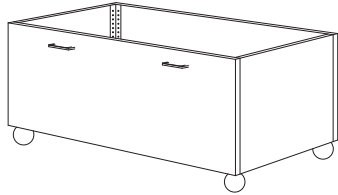
## 700 SERIES - MOVEABLE CABINETS

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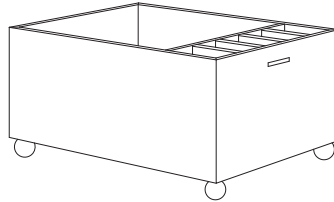
AWS Edition 1, 2009 - [WI WebDoc [10/09]]



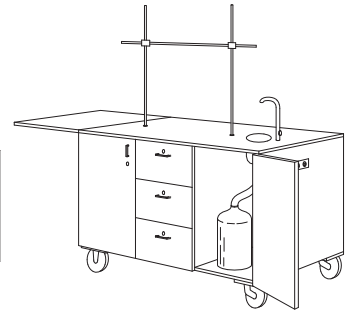
**737**  
Block Cart



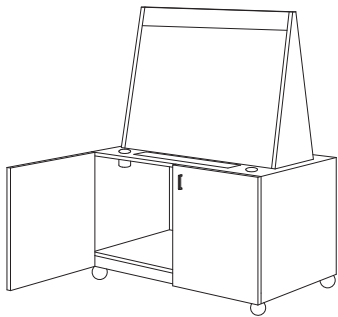
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Block Cart



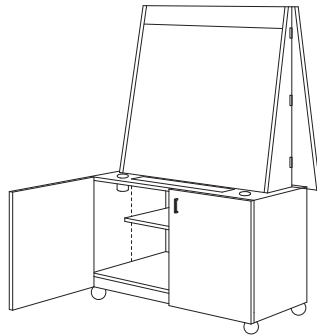
**739**  
Ball & Bat Cart



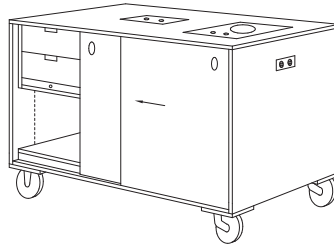
**742**  
Lab Demonstration Cart



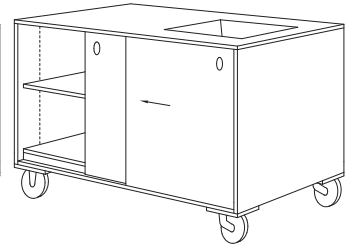
**743**  
Two-Sided Easel



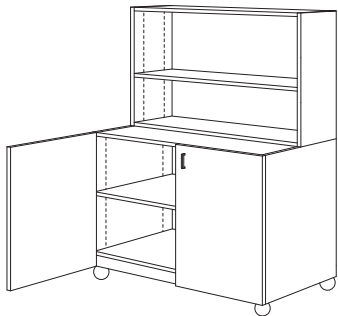
**744**  
Single-Sided Easel



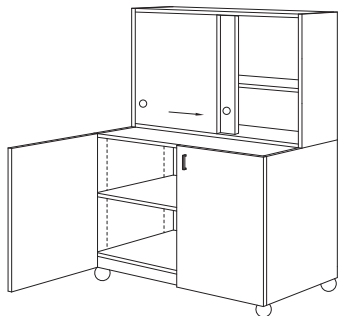
**746**  
Cooking Demonstration Cart



**747**  
Nature Demonstration Cart



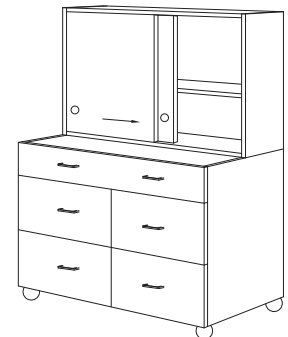
**750**



**751**



**752**



**753**

# CASEWORK DESIGN SERIES (CDS)

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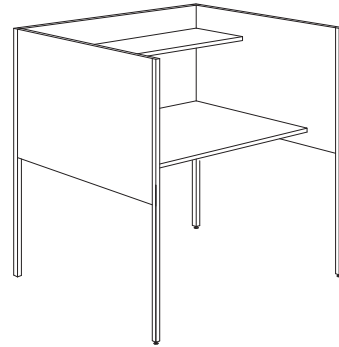
## 700 SERIES - MOVEABLE CABINETS (continued)



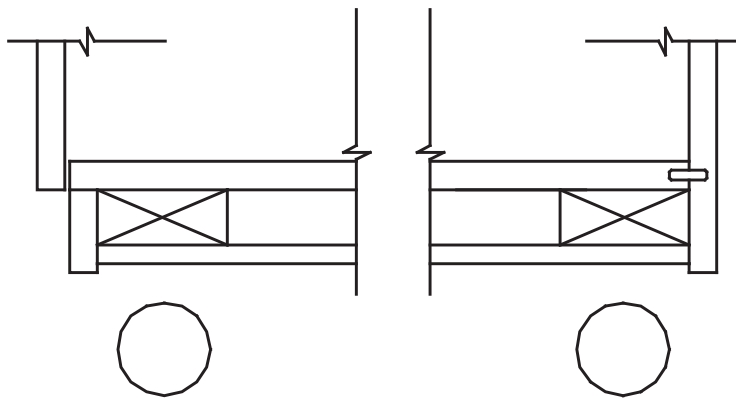
754



755



760  
Study Carrel



Typical Diaphragm Bottom Detail



# CASEWORK INTEGRITY

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To evaluate the overall integrity of casework, these standards have adopted **SEFA's** (Scientific Equipment and Fixture Association) methods of testing and acceptable results as the minimum acceptable level of integrity for casework conforming to all **GRADES**.

## TEST LISTING

**Structural Integrity - Base Cabinet**  
**Concentrated Load - Base Cabinet**  
**Torsion - Base Cabinet**  
**Base Submersion**  
**Structural Integrity - Wall Cabinet**  
**Door Durability**  
**Door Impact**

**Door Hinge**  
**Drawer Bottom Impact**  
**Drawer Support**  
**Drawer and Door Pull**  
**Drawer Rolling Load**  
**Drawer Load Cycle**  
**Shelf Load**  
**Structural Integrity - Table**

**BASE CABINET TEST UNIT** - Shall be 48" (1219 mm) wide, 36" (914 mm) high, and 22" (559 mm) deep with one full-width drawer (approximately one-fourth the height of the cabinet's face opening) and two doors. Cabinet shall be designed to provide unobstructed entry into the cabinet interior with the doors open and shall contain one adjustable shelf. For **LABORATORY USE**, the cabinet back shall be removable and tested with the cabinet back removed.

The cabinet shall be free-standing, squared, and set level. A piece of 1" (25.4 mm) thick medium-density fiberboard shall be positioned on the cabinet without glue or fasteners of any kind, of such dimensions that it will overhang the cabinet perimeter by 1" (25.4 mm), and its weight shall be included in the test as live load. Doors and the drawer should be free-moving, and the door shall latch properly.

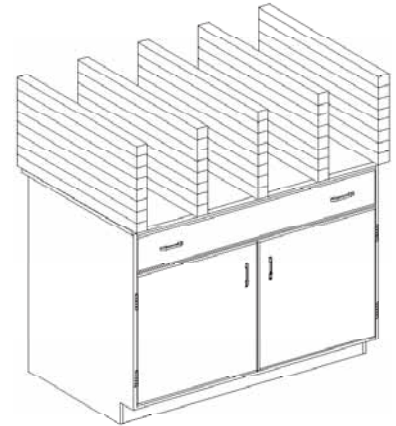


## STRUCTURAL INTEGRITY TEST - BASE CABINET

**CHALLENGES** the load-bearing capability of a cabinet's construction.

**PROCEDURE** - Load the cabinet top by using 2000 lbs (907 kg) of solid steel bars stacked four high and evenly spaced for a time period of 10 minutes, then unload the cabinet.

**ACCEPTANCE LEVEL** - Cabinet shall have no signs of permanent failure. If used, inspect the levelers; any deformation shall not interfere with the function of the leveling system.

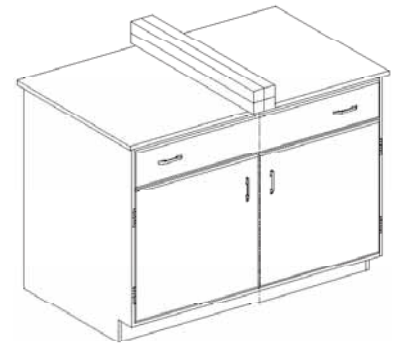


## CONCENTRATED LOAD TEST - BASE CABINET

**CHALLENGES** the functional characteristics of the cabinet when subjected to a concentrated load on the center of the cabinet top.

**PROCEDURE** - Using solid weights or 10 lb (4.53kg)sand bags, apply a total of 200 lbs (90.7 kg) to the top of the cabinet along the cabinet centerline. Operate the doors and the drawer.

**ACCEPTANCE LEVEL** - Door and drawer operation shall be normal under condition of test load and there shall be no signs of permanent distortion to the front rail, cabinet joinery, doors, or the drawer after load is removed.



A

**CASEWORK INTEGRITY**

(Page 2 of 5)

**TORSION TEST - BASE CABINET**

**CHALLENGES** the structural integrity of the cabinet construction when subjected to a torsional load.

**PROCEDURE** - The cabinet shall be tested in its normal upright position, raised not less than 4" (101.6 mm) off the floor, and supported on both rear corners and one front corner. The area of support under the cabinet shall be located not more than 6" (152.4 mm) in from each supported corner. Secure the cabinet diagonally from the unsupported corner with seven solid steel bars (350 lbs [159 kg]) on the top of the cabinet to prevent overturning. Apply four solid steel bars (200 lbs [90.7 kg]) to the unsupported corner for a period of 15 minutes. Remove the weight, and place the cabinet on the floor in its normal upright position. Observe the cabinet joinery. Level the cabinet and measure the face and back of the cabinet across the diagonal corners.

**ACCEPTANCE LEVEL** - When returned to the normal position, the operation of the cabinet shall be normal without any signs of permanent damage. The difference between the two measurements taken from measuring the diagonal corners shall be no more than 1/8" (3.2mm).

**SUBMERSION TEST - BASE CABINET**

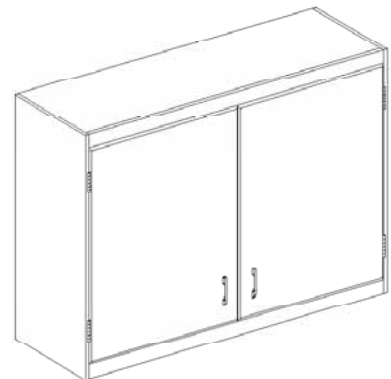
(Only applicable to casework specified for laboratory use)

**CHALLENGES** the cabinet's resistance to standing water and is only applicable to cabinets whose bases are within 2" (50.8 mm) of the finished floor.

**PROCEDURE** -The material thickness along the perimeter of the cabinet shall be measured on 6" (152.4 mm) increments. Record the thickness of the material to be submerged in water. Calculate the arithmetic mean of the data taken. Place the entire test cabinet in its upright position so that the cabinet is submerged in a pan filled with 2" (50.8 mm) of water. After 4 hours, remove the unit from the water and immediately measure the thickness of the material at the same points measured initially. Calculate the new arithmetic mean. After the unit has been allowed to dry, inspect for other damage.

**ACCEPTANCE LEVEL** - The cabinet will show no signs of permanent deformation or deterioration. Any increase in thickness of the base material shall not exceed 4% of the initial mean measurements.

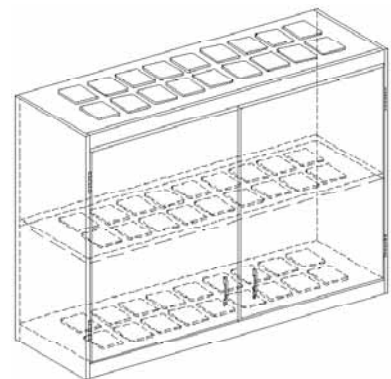
**WALL CABINET TEST UNIT** - Shall be 48" (1219 mm) wide, 36" (914 mm) high, and 12" (305 mm) deep with two swinging doors and one shelf, and shall be designed in such a way that when the doors are open, access to the cabinet is unobstructed.

**STRUCTURAL INTEGRITY TEST - WALL CABINET**

**CHALLENGES** the strength of the back of the wall cabinet as well as the joinery of the cabinet and the function of the doors when the wall-mounted unit is subjected to load.

**PROCEDURE** - Using sand or shot bags weighing 10 lbs (4.5 kg) each, load the cabinet bottom, shelf, and top uniformly to a maximum of 200 lbs (90.7 kg) each, with the maximum load not exceeding 600 lbs (272 kg).

**A** **ACCEPTANCE LEVEL** - With weights in place, operate the doors through full travel to verify the normal operation of the doors. Remove the weights and operate the doors to verify normal operation. Verify that there is no significant permanent deflection of the cabinet top, cabinet back, cabinet bottom, or shelf. After the weights are removed, the cabinet shall show no permanent damage to the cabinet, cabinet bottom, or shelf.



# CASEWORK INTEGRITY

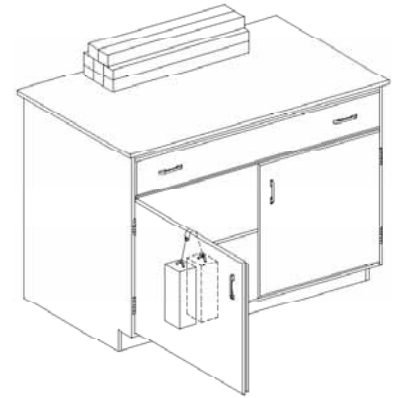
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## DOOR DURABILITY TEST

**CHALLENGES** the durability of the door and its hardware (hinge leaf, screws, etc.) to an applied load of 200 lbs (90.7 kg).

**PROCEDURE** - Remove the shelf for this test. With the unit and top set, add sufficient weight to the top in order to prevent overturning. With the cabinet door open 90 degrees, hang a sling made up of two 100-lb (45.4 kg) weights (shot bags or solid weights) over the top of the door at a point 12" (305 mm) out from the hinge centerline. Slowly move the door through the full cycle of the hinge, up to a 160-degree arc. Remove the weight, swing the door through its full intended range of motion, and close the door.

**ACCEPTANCE LEVEL** - The open door shall withstand a load of 200 lbs (90.7 kg) when applied at a point 12" (305 mm) from the hinge centerline without significant permanent distortion that will cause binding of the door or hinges or that will adversely affect the operation of the catch.

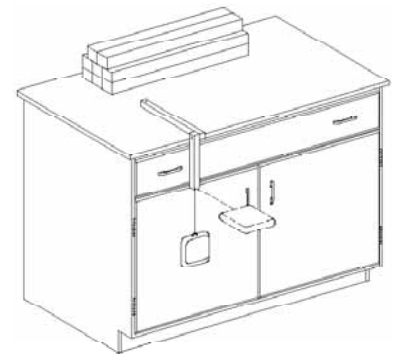


## DOOR IMPACT TEST

**CHALLENGES** the resistance of a 240 inch-pound impact to the door face and is applicable only to cabinet doors that extend below the work surface, excluding glass doors.

**PROCEDURE** - With the unit and top set, add sufficient weight to the top in order to prevent overturning. A 20-lb (9 kg) sand bag shall be suspended and dropped to provide an impact of 240 inch-pounds at the center of the closed door.

**ACCEPTANCE LEVEL** - After the test, the door and catch shall operate normally and show no signs of permanent damage.



## DOOR HINGE TEST

**CHALLENGES** the durability of the door hinge hardware to withstand 100,000 cycles as a reliable measure for longevity.

**PROCEDURE** - This test shall be in conformance to the ANSI test procedure A156.9, Grade 1, requirements for cycle testing of doors. A cycling mechanism shall swing the door 90 degrees. The door shall operate for 100,000 cycles with a speed not greater than 15 cycles per minute.

**ACCEPTANCE LEVEL** - The door shall operate for the full cycle period without deterioration that will significantly affect the function of the door. The door shall operate freely without binding.

## DRAWER BOTTOM IMPACT TEST

**CHALLENGES** the resistance to impact of the drawer bottom and slide mechanism.

**PROCEDURE** - Open the drawer to 13" (330 mm) of travel. Drop a 10-lb (4.5 kg) sand or shot bag from a height of 24" (610 mm) into the bottom of the drawer at the center of the width of the drawer and 6" (152 mm) back from the inside face of the drawer. Remove the sand or shot bag.

**ACCEPTANCE LEVEL** - Operate the drawer through the full cycle. The drawer shall operate normally. Any deformation will not cause binding or interfere with the operation of the drawer.

## DRAWER SUPPORT TEST

**CHALLENGES** the ability to support a point load given to the front of the drawer and will challenge the attachment of the drawer head to the drawer.

**PROCEDURE** - With the unit and top set, add sufficient weight to the top in order to prevent overturning. Open the drawer to 13" (330 mm) of travel and hang 150 lbs (68 kg) from the drawer head at the centerline of the drawer for 5 minutes. Remove the weight and operate the drawer through the full cycle.

**ACCEPTANCE LEVEL** - There shall be no interference with the normal operation of the drawer.

A

**CASEWORK INTEGRITY**

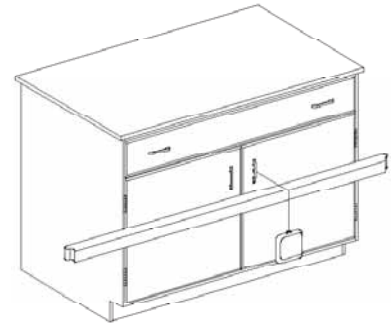
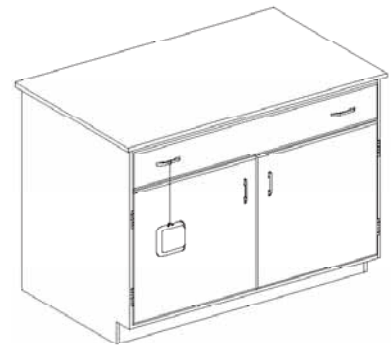
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**DRAWER AND DOOR PULL TEST**

**CHALLENGES** the strength of the pull hardware.

**PROCEDURE** - Pulls are to be installed in accordance with the manufacturer's practice, using the specified attaching hardware and method. Block the door and the drawer closed. Using a cable pulley-and-weight assembly, apply a force of 50 lbs (22.7 kg) perpendicular to each pull. Revise the setup to hang weight from each pull.

**ACCEPTANCE LEVEL** - The pulls shall resist force and support weight without breakage. After completion of the test and removal of the weight, there shall be no significant permanent distortion. Some pull designs will require variations to set up apparatus. These pulls shall be tested in conformance to the applied pull forces.

**DRAWER ROLLING LOAD TEST**

**CHALLENGES** the strength of the drawer head, bottom, and back as a result of opening and closing the drawer with a rolling load.

**PROCEDURE** - Position the drawer on a table at a 45-degree angle. Place a 2" (50.8 mm) diameter by 12" (305 mm) long steel rod (approximately 10 lbs [4.5 kg]) 13" (330 mm) from the target impact area (so that the rod will roll freely to impact the back) of the drawer. Subject the back to three impacts, and reverse the drawer to subject the front to three additional impacts.

**ACCEPTANCE LEVEL** - The drawer shall show no signs (other than minor scratches and dents) of permanent damage. All joinery shall be intact, and the drawer, when replaced in the unit, shall operate normally. Minor scratches and dents are acceptable.



**SHELF TEST UNIT** - Shelves, both fixed and/or adjustable, regardless of material or application, shall be tested using the following procedure. This is inclusive of shelves in wall cabinets, base cabinets, full-height cabinets, wall-mounted shelves, and free-standing shelves.

**SHELF LOAD TEST**

**CHALLENGES** the ability of a shelf and its mounting hardware to support normal loads.

**PROCEDURE** - The shelf shall be mounted as designed. Measure the distance from the underside of the shelf to a reference point perpendicular to the center of the shelf. Using shot or sand bags weighing 10 lbs (4.5 kg) each, uniformly load the shelf to a maximum of 200 lbs (90.7 kg). Measure the deflection on the shelf by measuring the distance to the reference point and calculating the difference between the two measurements.

**A ACCEPTANCE LEVEL** - The maximum deflection shall be 1/180 of the span, not to exceed 1/4" (6.4 mm).

# CASEWORK INTEGRITY

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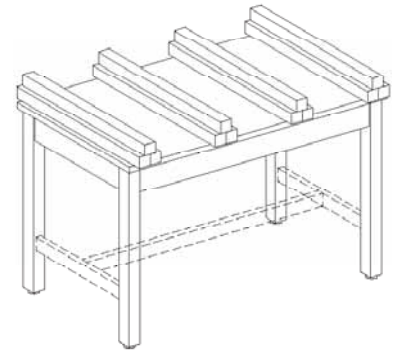
**TABLE TEST UNIT** - Shall be 48" (1219 mm) long, 24" (610 mm) deep, and 36" (914 mm) high. A top of 1"-(25.4 mm) thick medium-density fiberboard shall be positioned on the table so that it will overhang the frame perimeter by 1" (25.4 mm), and its weight shall be included in the test as live load. Tables are represented by a large range of styles and designs, including free-standing tables, desks, aprons mounted between two fixed areas (such as a wall or casework), mobile tables (free-standing tables on wheels or casters), and mobile under-counter units.

## TABLE STRUCTURAL INTEGRITY TEST

**CHALLENGES** the table components to a normal load.

**PROCEDURE** - Load the table top with an evenly distributed load of no less than 300 lbs (136 kg) for mobile, 600 lbs (272 kg) for free-standing, and 2000 lbs (907 kg) for fixed. Include the weight of the working surface as a live load by using solid steel bars, each weighing 50 lbs (22.7 kg).

**ACCEPTANCE LEVEL** - No structural breakage shall occur, and the apron rails shall not deflect more than 1/8" (3.2 mm). In the case of a table with a drawer, the deflection of the rail shall not interfere with the function of the drawer.



## FRACTION/DECIMAL/MILLIMETER CONVERSION TABLE

FRACTION	DECIMAL	MILLIMETER
1/64	0.01563	0.3969
1/32	0.03125	0.7938
3/64	0.04688	1.1906
1/16	0.06250	1.5875
5/64	0.07813	1.9844
3/32	0.09375	2.3813
7/64	0.10937	2.7781
<b>1/8</b>	<b>0.12500</b>	<b>3.1750</b>
9/64	0.14063	3.5719
5/32	0.15625	3.9688
11/64	0.17188	4.3656
3/16	0.18750	4.7625
13/64	0.20312	5.1594
7/32	0.21875	5.5563
15/64	0.23438	5.9531
<b>1/4</b>	<b>0.25000</b>	<b>6.3500</b>
17/64	0.26563	6.7469
9/32	0.28125	7.1438
19/64	0.29688	7.5406
5/16	0.31250	7.9375
21/64	0.32813	8.3344
11/32	0.34375	8.7313
23/64	0.35938	9.1281
<b>3/8</b>	<b>0.37500</b>	<b>9.5250</b>
25/64	0.39063	9.9219
13/32	0.40625	10.3188
27/64	0.42188	10.7156
7/16	0.43750	11.1125
29/64	0.45313	11.5094
15/32	0.46875	11.9063
31/64	0.48438	12.3031
<b>1/2</b>	<b>0.50000</b>	<b>12.7000</b>

FRACTION	DECIMAL	MILLIMETER
33/64	0.51563	13.0969
17/32	0.53125	13.4938
35/64	0.54688	13.8906
9/16	0.56250	14.2875
37/64	0.57813	14.6844
19/32	0.59375	15.0813
39/64	0.60938	15.4781
<b>5/8</b>	<b>0.62500</b>	<b>15.8750</b>
41/64	0.64063	16.2719
21/32	0.65625	16.6688
43/64	0.67188	17.0656
11/16	0.68750	17.4625
45/64	0.70313	17.8594
23/32	0.71875	18.2563
47/64	0.73438	18.6531
<b>3/4</b>	<b>0.75000</b>	<b>19.0500</b>
49/64	0.76563	19.4469
25/32	0.78125	19.8438
51/64	0.79688	20.2406
13/16	0.81250	20.6375
53/64	0.82813	21.0344
27/32	0.84375	21.4313
55/64	0.85938	21.8281
<b>7/8</b>	<b>0.87500</b>	<b>22.2250</b>
57/64	0.89063	22.6219
29/32	0.90625	23.0188
59/64	0.92188	23.4156
15/16	0.93750	23.8125
61/64	0.95313	24.2094
31/32	0.96875	24.6063
63/64	0.98438	25.0031
<b>1</b>	<b>1.00000</b>	<b>25.4000</b>



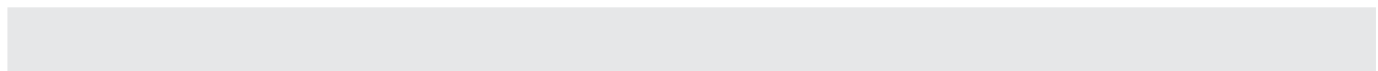
## MISCELLANEOUS CONVERSION FACTORS

▼ WHEN KNOWN ▼	▼ MULTIPLY BY ▼	▼ TO FIND ▼
Inches	2.54	Centimeters
Inches	25.4	Millimeters
Square Inches	6.452	Square Centimeters
Feet	30.48	Centimeters
Square Feet	.0929	Square Meters
Yards	.9144	Meters
Square Yards	.8361	Square Meters
Miles	1.6	Kilometers
Square Miles	2.59	Square Kilometers
Acres	.4047	Hectares
Ounces	28.349527	Grams
Pounds	.4536	Kilograms
Pressure	.0703	Bar
Radius	2	Diameter
Diameter	.5	Radius
Diameter	3.1416	Circumference
Diameter	.8862	Side of an Equal Square
Circumference	.31831	Diameter
Circumference	.15915	Radius
Circumference	.2821	Side of an Equal Square
Square of Diameter	.7854	Area of Circle
Square of Diameter	3.1416	Square of Sphere of Globe
Square of Circumference	.07958	Area of Circle
Square of Radius	3.1416	Area of Circle

▲ TO FIND ▲

▲ DIVIDE BY ▲

▲ WHEN KNOWN ▲



▼ WHEN KNOWN ▼	▼ MULTIPLY BY ▼	▼ TO FIND ▼
Fahrenheit	0.556 after subtracting 32	Celsius
Celsius	1.8 and add 32	Fahrenheit

# NOTES

*AWS Edition 1, 2009 - [WI WebDoc [10/09]]*

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