

MACHINING SPECIFICATIONS

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F411

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F411-90-1-MACH
Edition 10

Applicant:
Wolman Wood and Fire Protection GmbH
Werk Sinzheim E-EBE/WB
Bau 2, Dr.– Wolman – Str. 31-33
76547 Sinzheim, Germany

ATTENTION: Andreas Bolz, Business Manager Fire Protection Materials

APPLICABLE REQUIREMENTS:

CAN/ULC S104-15 (R2020) *Standard Method for Fire Tests of Door Assemblies*
UL 10B (2020) *Fire Tests of Doors Assemblies*
UL 10C (2021) *Fire Tests of Doors Assemblies – Positive Pressure*
NFPA 252 (2022) *Standard Methods of Fire Tests of Door Assemblies*
ASTM E90-09 (2016) *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*
ASTM E1425-14 *Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems*
ASTM E2235-04 (2020) *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*
ASTM E413-22 *Classification for Rating Sound Insulation*
ASTM E1332-22 *Standard Classification for Rating Outdoor-Indoor Sound Attenuation*

SUBJECT:

MACHINING SPECIFICATIONS FOR WOLMAN - 90 MIN NEUTRAL & POSITIVE PRESSURE RATED CATEGORY "A" or CATEGORY "B" FIRE DOORS WITH HOSE STREAM

Note: There is no option for CATEGORY "B" Doors (doors without concealed intumescent in door edges).

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90-MINUTE LAMINATED CORE PANEL FIRE DOORS:

Minimum 1-3/4" Thickness

Swing Type:	Maximum Dimensions		Panel Type:	Latching:
	Width:	Length:		
Single Swing	3'6" (1067 mm)	9'0" (2743 mm)	Flat or Raised	Single or 2 Point
	4'0" (1219 mm)	7'0" (2134 mm)		
Standard Pairs	7'0" (2134 mm)	8'0" (2438 mm)	Flat or Raised	3 or 4 Point
	8'0" (2438 mm)	7'0" (2134 mm)		
	7'0" (2134 mm)	9'0" (2743 mm)	Flush only	
Double Egress Pairs	See Below			

Minimum 2-1/4" Thickness

Swing Type:	Maximum Dimensions		Panel Type:	Latching:
	Width:	Length:		
Single Swing	4'0" (1219 mm)	10'0" (3048 mm)	Raised only	2 Point
	3'6" (1067 mm)	9'0" (2743 mm)	Flat or Raised	Single or 2 Point
Standard Pairs	8'0" (2438 mm)	10'0" (3048 mm)	Raised only	4 Point
	6'0" (1829 mm)	8'0" (2438 mm)	Flat or Raised	4 Point
Double Egress Pairs	8'0" (2438 mm)	10'0" (3048 mm)	Raised only	4 Point

Note: All door constructions can be built as flush doors using flush faces, and flush doors can be V-Grooved as per Mfg Specifications. Door thickness may be increased to 2" or 2 1/4" by adding face material. All door constructions can be made as shallow arch construction.

Temperature rise

- @30 min = 250°F MAX where lights do not exceed 100 in²
- @60 min = 450°F MAX where lights do not exceed 100 in²

LATCHING METHODS

Single Point Latching – Cylindrical or Mortise latches and deadbolts, or rim type fire exit hardware for single swing doors, or active leaf of pairs when permitted.

Two Point Latching – Surface mount or concealed vertical rod exit devices. Concealed vertical rod exit devices requires special door construction (see manufacturing specifications). For Single swing doors - 2 point latching can be a mortise lock and a firing pin located within 10" of the top of the door, installed in the latch edge.

Three Point Latching – Single point latch for active leaf of standard pairs, Surface mount manual, or Mortise type or manual or automatic flush bolts, or surface mount vertical rod exit devices for inactive leaf of standard pairs.

Four Point Latching - Surface mount or concealed vertical rod exit devices for both leaves of pairs. Concealed vertical rod exit devices requires special door construction (see manufacturing specifications).

COMPONENTS (SEE APPENDIX B AND UL DIRECTORY FOR APPROVED HARDWARE):

Latch Sets (Listed and labeled for use in composite doors rated for 90 minutes, evaluated to UL 10C)

- Cylindrical Latches
 - Maximum 2-1/8" diameter bore
 - Maximum 2-3/4" backset
 - Minimum 1/2" Throw
- Mortised Latch
 - Mortise pocket must be lined with Interdens intumescent on both sides of mortise case.
 - Cardlocks – see Appendix B

Deadbolts (Listed and labeled for use in composite doors rated for 90 minutes, evaluated to UL 10C)

- Maximum 2-1/8" diameter bore
- Maximum 2-3/4" backset
- Located a minimum of 3-1/2" center-line to center-line above the latch set
 - Interconnected Deadbolts are allowed

Hinges (Listed and labeled for rated opening)

- Hinges as per NFPA 80, Table 6.4.3.1.
- Tectus concealed hinges require special door construction See Figure 7.

Fire Exit Devices (Listed and labeled for use in composite doors and evaluated to UL 10C)

- Surface Mounted Vertical Rod Fire Exit Device.
- Rim Type Fire Exit Devices.
- Through-bolts are required.
- Concealed Vertical Rod [see Figure 5]:
 - Permitted in 2-1/4" thick flat or raised panel doors with Palusol SWR 90-2 core

only.

- Maximum door pairs size 72" x 96" (width x height).
- Stiles: Palusol SWR 90-1 Core on both sides (minimum 5" wide).
- Laminated rails and stiles are reinforced with the use of 5 through-bolts per slab.
- Maximum allowable rod channel size: 7/8" x 7/8".

Door Closers (Listed and labeled for rated opening)

- Surface Mounted Door Closers are required to be mounted with through-bolts
- Concealed Door Closers - Closer track only permitted in doors, [Not permitted in Double Egress Doors] [See Figures 3-4]. Concealed closers that mount in the door hinge edge permitted.

Surface Mounted Protection Plates

- Metal or composite materials, Max 12" High.

Louvers

- Listed Louvers permitted to be installed in 1 3/4" door section thickness, and below latch level.

Metal Edges/Astragals (Listed and labeled for rated opening)

- Metal edges and Z-Astragal set for meeting edges of pairs (not required).

Viewers (Listed and labeled for 90 minute rated composite doors)

- Maximum 1" diameter.
- Multiple viewers located a minimum of 12" on center.
- Viewers located a minimum 5-1/2" away from edges of doors.
- Installed in 1 3/4" door section thickness.

Glass Lights

- Glazing material shall be listed and labeled for rated opening, light kit and door type.
- Glazing installed in accordance with NFPA 80, and the listed light kit frame installation instructions.
- Maximum 1080 sq. in. area (Max. Dimension of 36") with Listed Steel Lite Kit (Listed for use in composite doors and evaluated to UL 10C), using Listed ceramic glazing [See Figure 1].
- Maximum 600 sq. in. area (Max. Dimension of 30") with Listed 'Z' channel using Listed ceramic glazing [See Figure 1].
- Proprietary glazing materials are available that provide larger door lite glass sizes when installed as described in the glazing system listing. The required glazing frame and maximum door sizes will be described in the applicable listing. Lite sizes are limited in temperature rise rated locations – refer to Code requirements.

Plant-Ons

- MDF or solid wood plant-on moldings may be applied to one or both sides of a door.
- Adhesive and/or mechanical fasteners with a maximum penetration of 3/4".
- Moulding may not be applied closer than 3-1/2" to edge of door, edge of light or edge of hardware cutout.

Electric Raceway

- Allowed see Figure 8.

Concealed Vertical Rod

- Permitted in 2-1/4 inch door thickness only See Figure 5

Door Bottoms Seals [Double Egress Doors - Surface mounted only]

- Surface Mounted Snap-In in dual durometer vinyl with bulb and fins or with all fins
- Semi-mortised, or full-mortised bottom seals may be used [See Figure 2].
- Cutout dimensions are restricted to 1" wide and 1-3/4" deep x full width of the door.

Door Flush Bolts (Listed and labeled for rated opening)

- Concealed manual or automatic flush bolts.
- Cutout dimensions limited to 1" wide x 8-1/2" long x 2" deep.
- One layer of Wolman Palusol SW 20-1 on each side of the flush bolt pocket [See Figure 6].

Surface Mounted Hardware

- Permitted

Top of Door Markings

The top of door of doors eligible for machining shall be marked with the following information;

- The fire resistance rating, as either "90" or "XC"
- The manufacturer's name.
- The specification – "Wolman"
- "Hinge Side" where doors are not reversible.
- Top of Door when appropriate
- Category A.

LABELLING GUIDELINES**A. Doors conforming to CAN/ULC S104 (neutral pressure)**

Labels shall bear the QAI listing mark with c identifiers, 90 minute rating, Neutral pressure.

B. Doors conforming to UL10C (positive pressure)

Labels shall bear the QAI listing mark with us identifier and indicate 90 minute rating.

Sound Transmission Classification (STC) Ratings for 90 minute rated doors

Ratings below are based on testing a 3'0 by 7'0 door installed in a Wolman composite wood frame, using (3) 4 1/2" x 4" hinges and a single point cylindrical latch. Single flat panel recessed panel doors were tested. Ratings will vary for differing sizes and panel design or hardware configurations. The sealed rating is based on the gap around the door sealed with putty, while the operable rating is a

fully operational door with seals installed. All of the threshold, weatherstrip and seal products were supplied by Legacy Manufacturing, Bronx, NY.

Recessed Single Panel Door, 1 3/4" thick, 5/8" thick panel, SWR 90-1 or SWR 90-2 cores

STC Ratings		
Sealed	Operable	Seals/Weatherstrip Components Required
35	36	Threshold – 3665 Series Auto Door Bottom – 7763 (surface applied) Head and Jamb Acoustical Seals applied to stops - 5574 Series Finned gasket installed in door rabbet - 505175 Bk

Test Reports:

Report No.	Date Issued
Intertek Test Report # 3072255 (a)	April 19, 2005
Intertek Test Report # 3081748 (d)	September 21, 2005
Intertek Test Report # 3105928COQ-012	June 21, 2007
Intertek Test Report # 3168448COQ-003 (d)	June 29, 2009
QAI Test Report # T848-5	June 2, 2014
QAI Test Report # T848-6	February 18, 2015
QAI Test Report # T848-18	March 17, 2016
QAI Test Report # T848-20a	June 27, 2017
QAI Engineering Evaluation # F411-5-7	April 15, 2015
QAI Engineering Evaluation # F411-5-18	August 15, 2016
QAI Engineering Evaluation # F411-5-24	February 8, 2017
QAI Engineering Evaluation # F411-5-26	October 16, 2017
QAI Engineering Evaluation # F411-5-29	October 16, 2017
QAI Engineering Evaluation # F411-5-30 (T848-22a)	February 2, 2018
QAI Test Report # T848-24A	April 3, 2019
QAI Engineering Evaluation # T848-24F	May 15, 2019
QAI Engineering Evaluation # T848-24L	April 25, 2019
QAI Test Report # T1470-3A	March 1, 2022
QAI Test Report # 13098rev1	Nov. 28, 2022

APPENDIX A

Page	Title
A1	Glazing details
A2-A6	Concealed hardware details

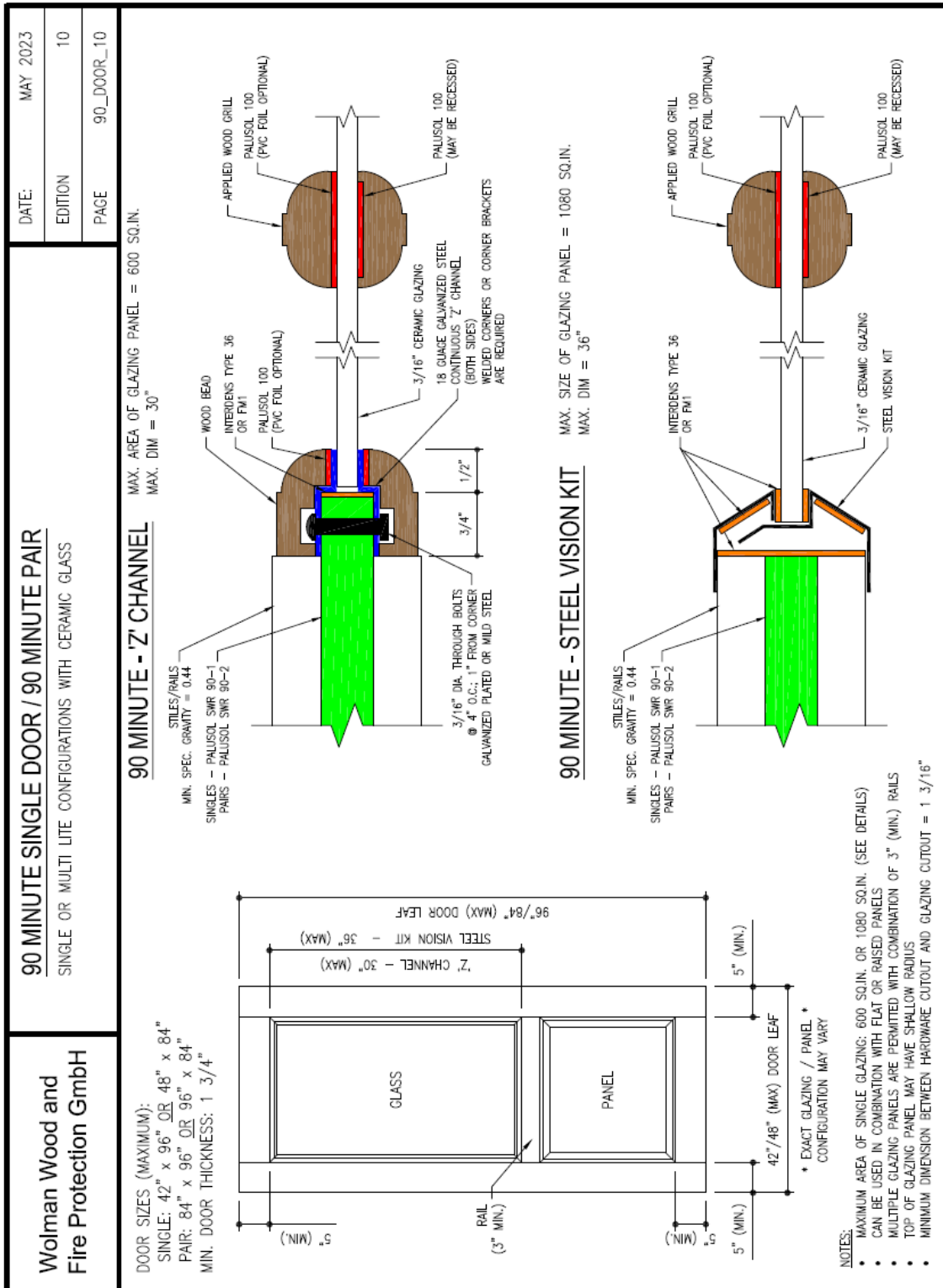


Figure 1: 90 minute rated door assembly glazing detail – steel vision kit and 'Z' channel.

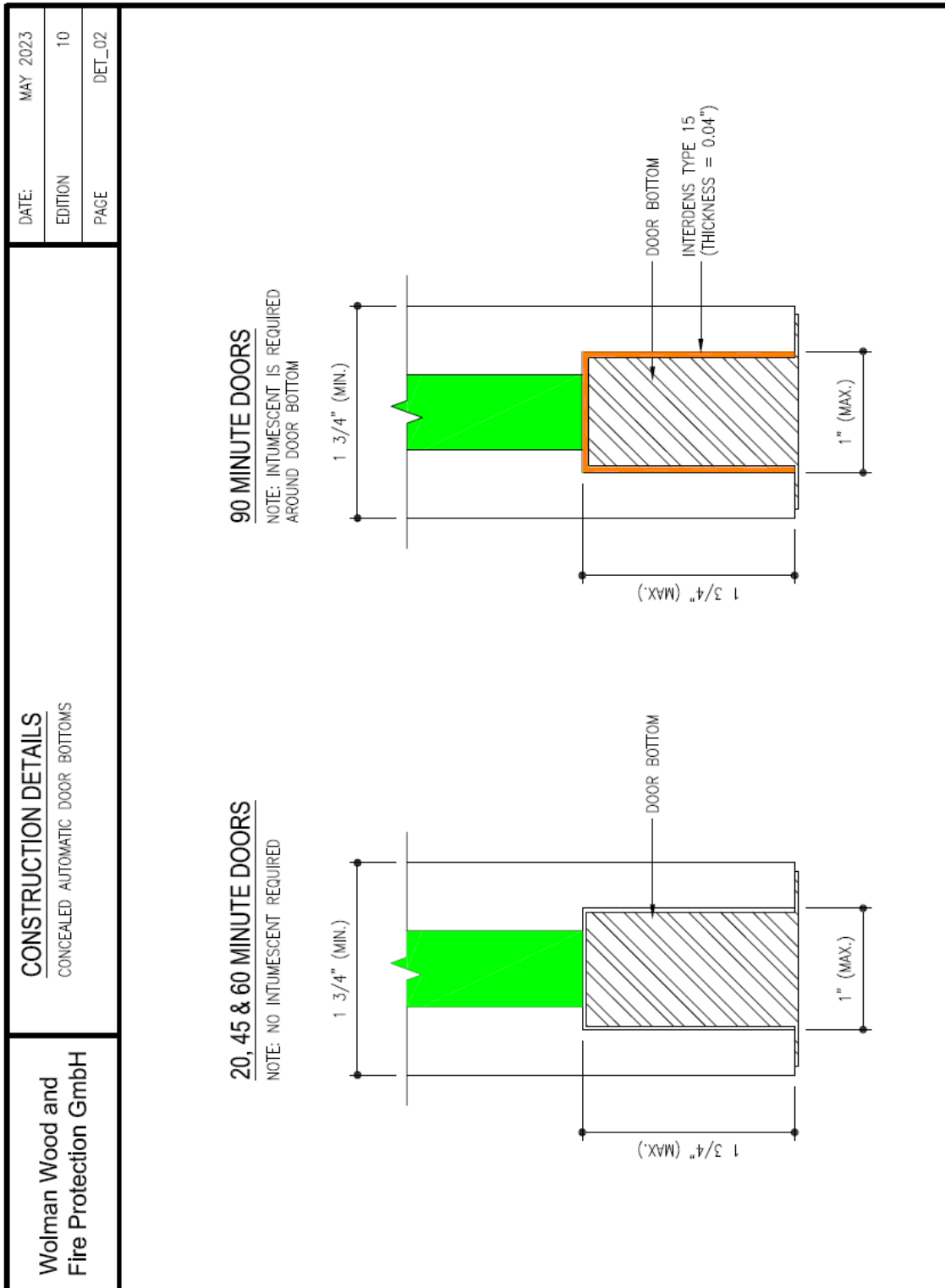


Figure 2: 20-90 minute rated concealed door bottom detail for listed door assembly.

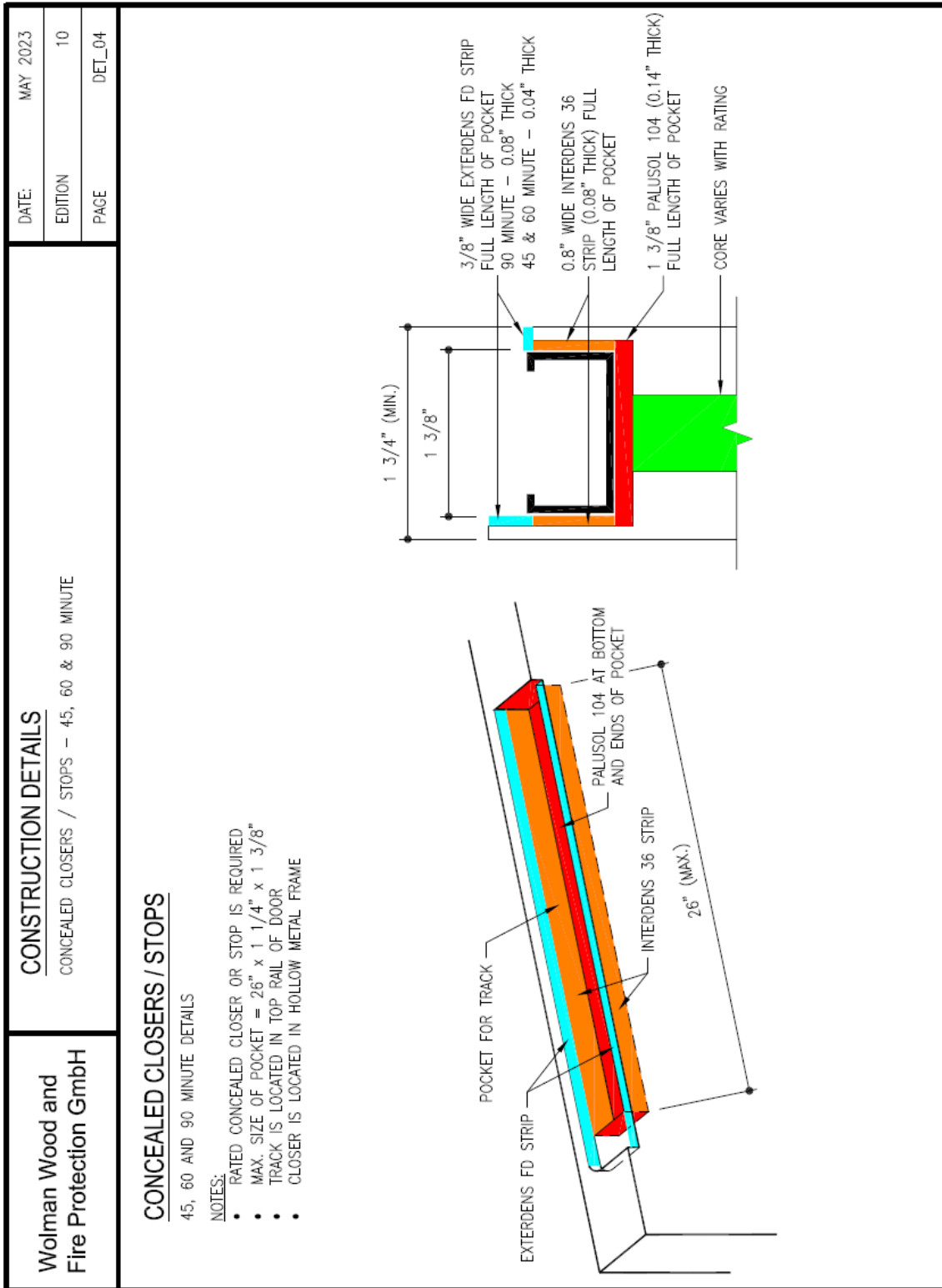


Figure 3: 45-90 minute rated door assembly - concealed closer detail.

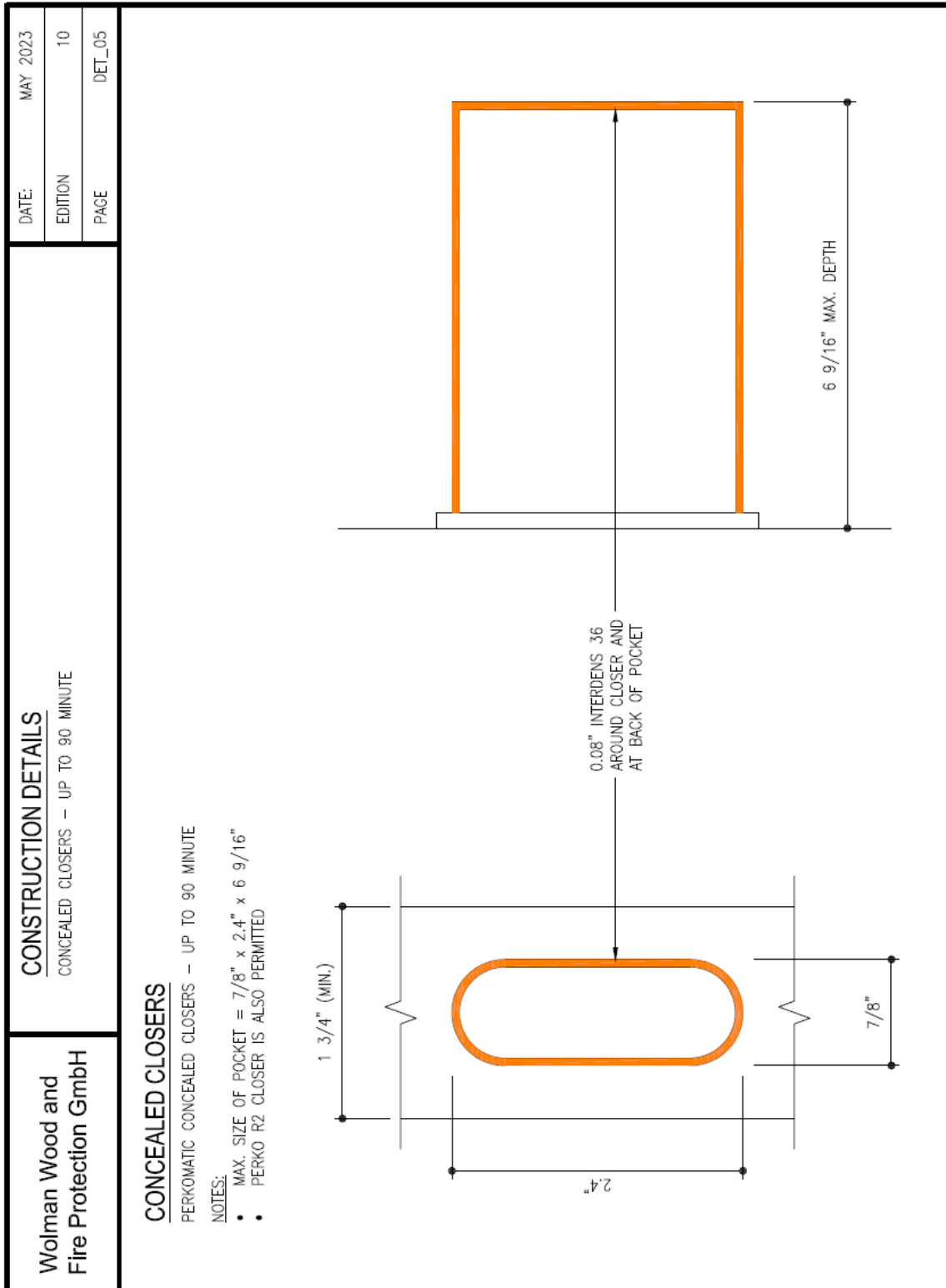


Figure 4: 20-90 minute rated door assembly – Door Edge concealed closer detail.

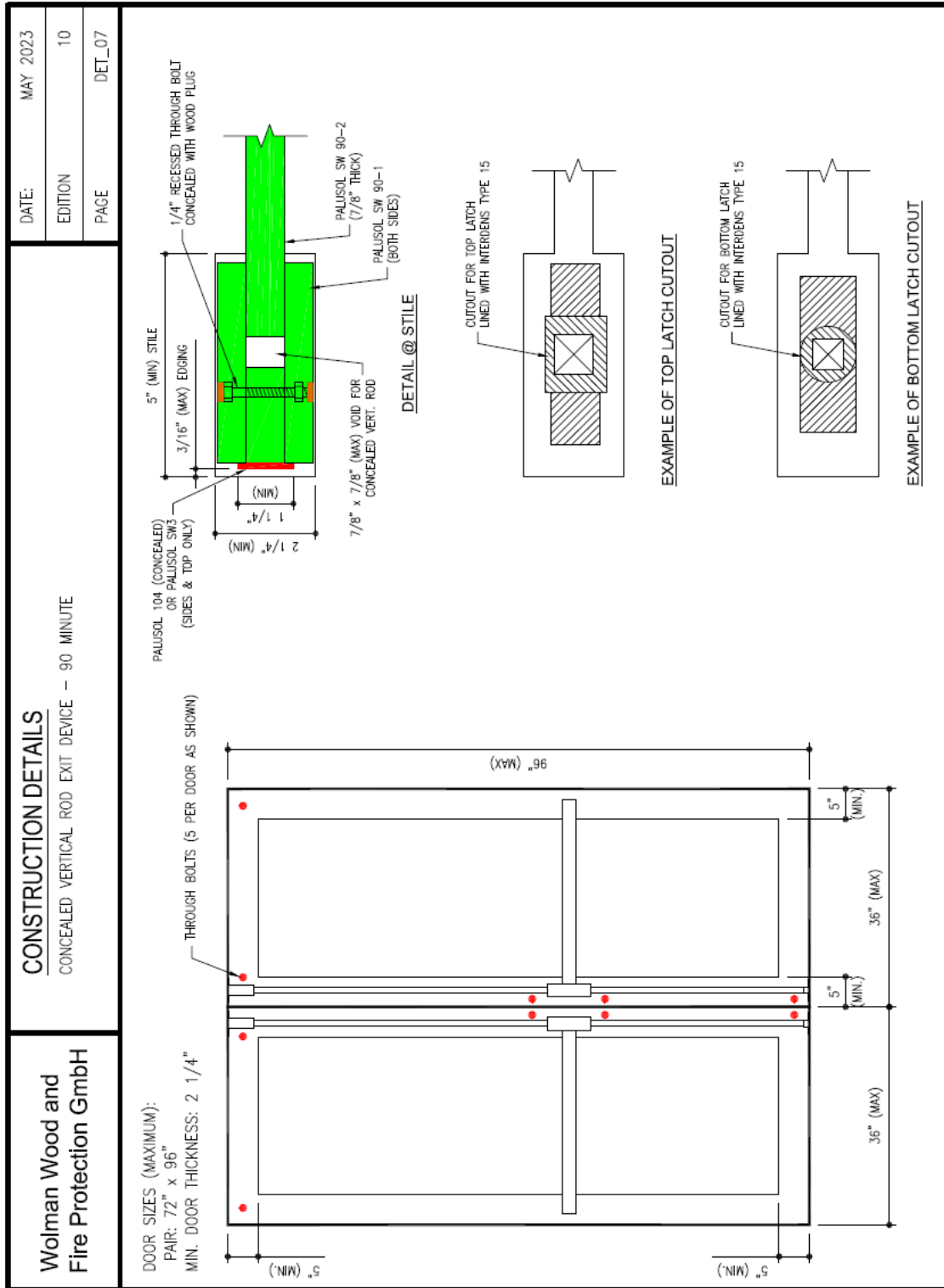


Figure 5: 90 minute rated door assembly - concealed vertical rod detail.

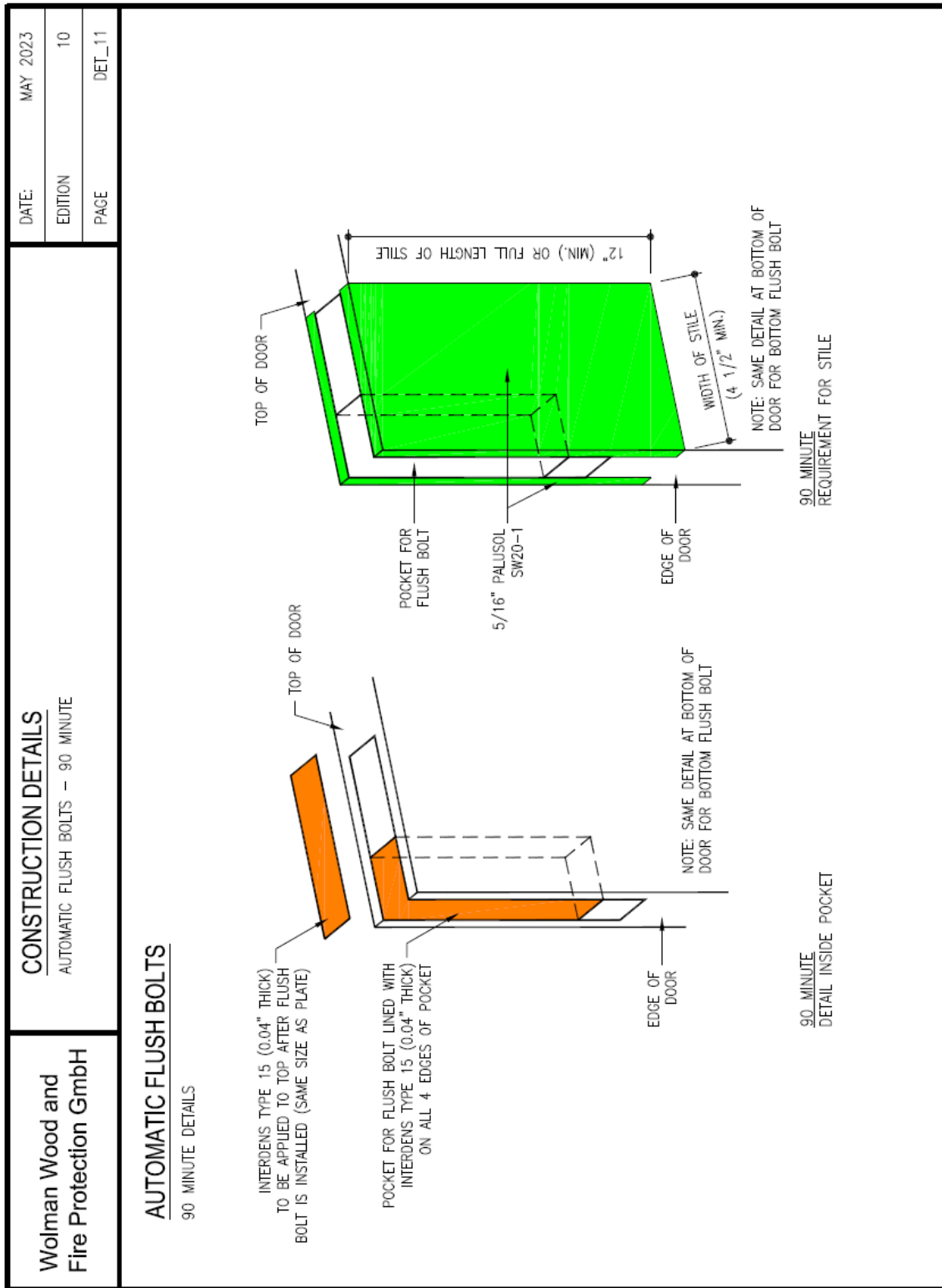


Figure 6: 90 minute rated door assembly - concealed automatic flush bolt detail.

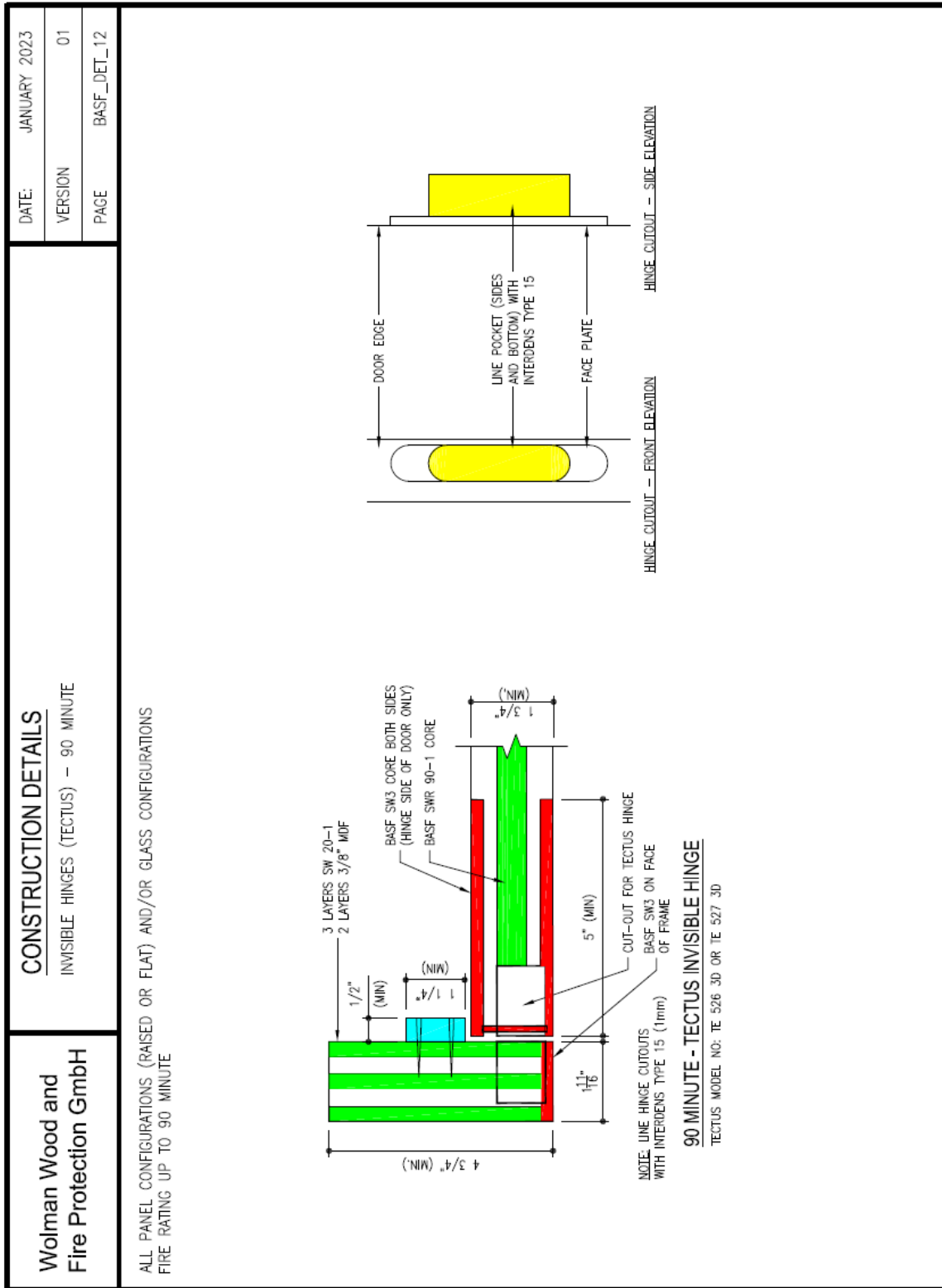


Figure 7: 90 minute rated door assembly - concealed hinge detail.

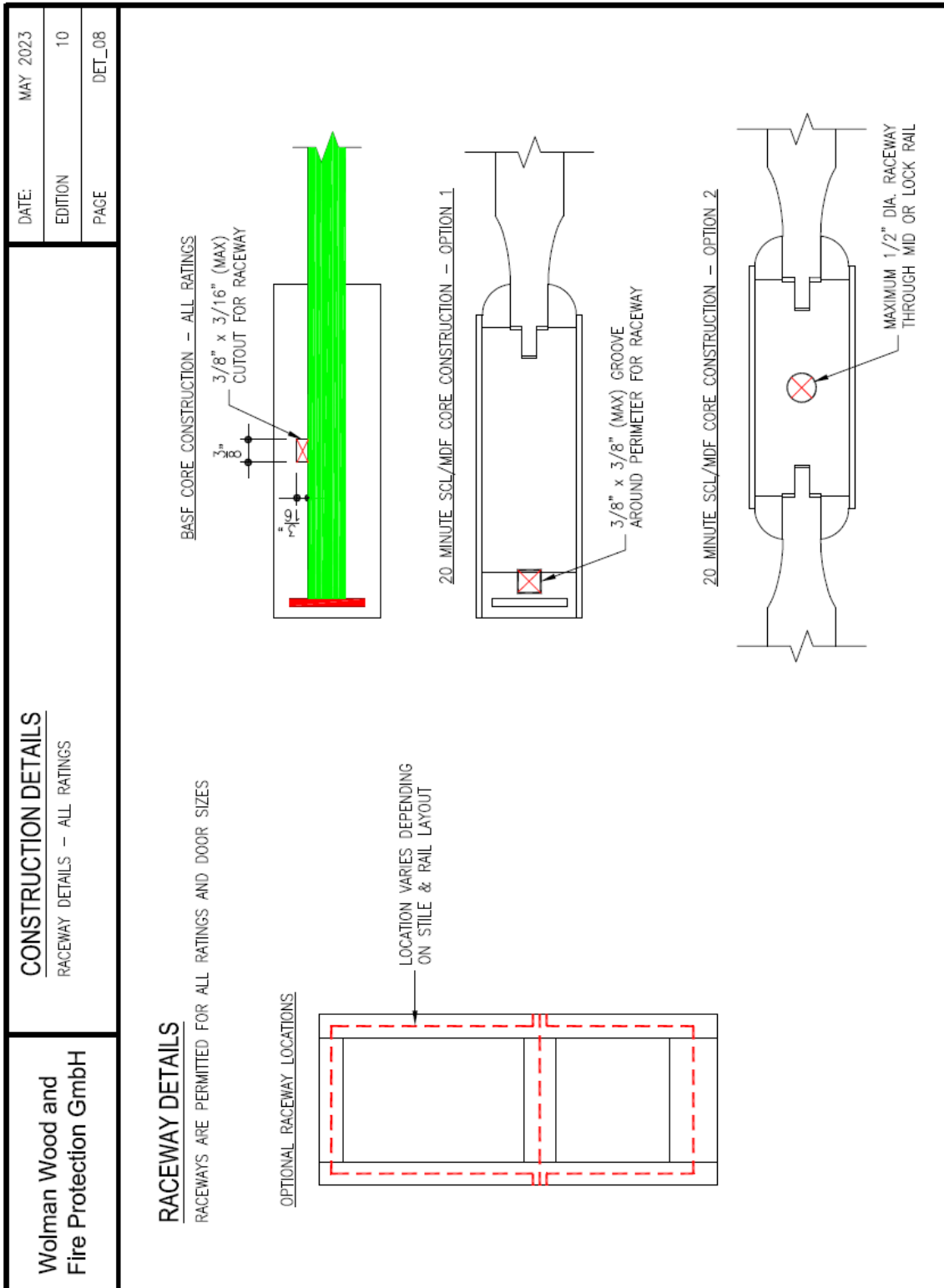


Figure 8: Wire Raceway Details.

Appendix B

Electrically Controlled Single-point Locks and Latches, Cardlock type

[See General Information for Electrically Controlled Single-point Locks and Latches in UL Directory](#)

ASSA ABLOY GLOBAL SOLUTIONS NORWAY AS

R19020

Anolitveien 1-3

1400 Ski Norway, NORWAY

Compact multiple check in security system programmers, Model(s) 2100, may be used with VingCard electronic locks, 2600, may be used with VingCard electronic locks.

Mortise type, battery operated units, with 3/4 in. (19.05 mm) latch bolts, "Ving-Card and VingCard-Euro", Model(s) 1080*, 1090*, 2100*, 3000*, 3100*, 3200*, 3500*, VC 3000 Persona, VC3000, VC3000IR

Mortise type, battery operated units, with 3/4 in. (19.05 mm) latch bolts, Model(s) Allure Series, Euro, ANSI and US ANSI, for use with steel doors rated 3 hr or less measuring up to 4 ft in width and 8 ft in height, wood and plastic-covered composite doors rated up to 1-1/2 hr (90 minutes) and wood core or timber doors rated 1/3 hr (20 minutes) measuring up to 3 ft 11 in. in width and 7 ft in height.

Mortise type, battery operated units, with 3/4 in. (19.05 mm) latch bolts, Model(s) Signature Series, Euro, ANSI and US ANSI, for use with Classified steel-covered composite, hollow-metal doors rated up to and including 3hr, wood and plastic-covered composite doors rated up to and including 1-1/2 hr measuring up to 4 ft in width and 8 ft in height.

Mortise type, battery operated units, with 3/4 in. (19.05 mm) latch bolts, for use with doors rated 3/4 hr or less measuring up to (4 ft) in width and (8 ft) in height, Model(s) 3000 DaVinci, Euro DaVinci, Presidio

Mortise type, battery operated units, with 3/4 in. (19.05 mm) latch bolts, for use with steel composite and hollow metal doors rated 1/2 hr or less measuring up to 1219 mm (4 ft) in width and 2438 mm (8 ft) in height, Model(s) Classic RFID Online

Mortise type, battery operated units, with 3/4 in. (19.05 mm) latch bolts, for use with swinging fire doors rated up to and including 3/4 hr (45 minutes) measuring up to 4 ft in width and 8 ft in height, Model(s) FLEX

Mortise type, battery operated units, with 3/4 in. (19.05 mm) latch bolts, for use with timber doors rated 1/3 hr (20 minutes) measuring up to 3 ft 11 in. in width and 7 ft in height., Model(s) Euro, ANSI (DB) and US ANSI (DA).

Mortise type, battery operated units, with 3/4 in. (19.05 mm) latch bolts, for use with wood and plastic-covered composite doors rated up to 1-1/2 hr (90 minutes) and wood-core doors rated 20 min, measuring up to 3 ft in width and 7 ft in height., Model(s) Essence Series.

* - May include suffix C or S.

DORMAKABA USA INC

R13197

6161 E 75TH ST

PO BOX 50444

INDIANAPOLIS, IN 46250 USA

Cylindrical electrified type, with 9/16 (14.3 mm) or 3/4 in. (19.1 mm) latch bolts, rated 24Vdc, 0.21 A or 12 Vdc, 0.25 A, Model(s) 8KW or 9KW, for use on doors not exceeding 4 ft (1219 mm) in width and 10 ft (3048 mm) in height,

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also available with aluminum or zinc.

Cylindrical electronic stand alone locksets, with 9/16 (14.3 mm) or 3/4 in. (19.1 mm) latch throws, Model(s) 8KV, 9KV, 9KG, 9KM, 9KN, 9KQ, 83KV, 84KV, 85KV, 83KW, 84KW, 9KBV, 93KW, 95KW or Basis 9KZ, for use on doors not exceeding 4 ft (1219 mm) in width and 10 ft (3048 mm) in height, also available with aluminum or zinc lever handles or brass or bronze knobs.

Cylindrical type, electrically controlled single point locksets, with 9/16 (14.3 mm) or 3/4 in. (19.1 mm) latch bolt throws, Model(s) 9KX, for Classified steel covered composite doors, hollow-metal doors rated up to 3 h, fiberglass, wood and plastic-covered composite doors rated up to 1-1/2 h.

Cylindrical type, with 1/2 in. (13 mm) latch bolt for single doors, Model(s) C800, may be used with zinc lever handles.

Cylindrical type, with 1/2 in. latch bolts, rated 24 Vdc, 0.145 A or 12 Vdc, 0.25 A, Model(s) QCL170EL, QCL170ELX, QCL170EU, QCL170EUX

Cylindrical type, with 3/4 in. (19mm) latch bolt for pair doors, Model(s) C800, may be used with zinc lever handles.

Mortise electrified type, with 3/4 in. (19.1 mm) latch bolts, Model(s) 40HQ, 45HBV, 45HZ, 45HX, 45HN or 45HG, for use on doors not exceeding 4 ft. (1219 mm) in width and 10 ft. (3048 mm) in height rated up to and including 3hrs, also available with aluminum, brass, bronze, or stainless steel lever handles.

Mortise electrified type, with 3/4 in. (19.1 mm) latch bolts, Model(s) 45HM, 45HW or 40HW, for use on doors not exceeding 4 ft. (1219 mm) in width and 10 ft. (3048 mm) in height rated up to and including 3hrs, 45HW incorporates a Temperature Control Module (TCM-12V).

Mortise electrified type, with 3/4 in. (19.1 mm) latch bolts, rated 24 Vac or dc, 0.75 A or 12 Vdc, 0.55 A, Model(s) 40 IDH, 40 IDH 1300 or 40 IDH, for use on doors not exceeding 4 ft (1219 mm) in width and 10 ft (3048 mm) in height rated up to and including 3hrs, also available with aluminum, brass, bronze, stainless steel or zinc lever handles or brass or bronze knobs.

Mortise electrified type, with 3/4 in. (19.1 mm) latch bolts, rated 24 Vac or dc, 0.75 A; or 12 Vdc, 0.55 A, Model(s) 34HW or 35HW, for use on doors not exceeding 4 ft in width and 10 ft in height, up to and including 3hrs, also available with aluminum, brass, bronze, stainless steel or zinc lever handles or brass or bronze knobs.

Mortise electronic stand alone locksets, with 3/4 in. (19.1 mm) latch throws, Model(s) 34HV, 35HV, 35HG or Basis 35HZ, for use on doors not exceeding 4 ft (1219 mm) in width and 10 ft (3148 mm) in height rated up to and including 3hrs, also available with aluminum brass, bronze stainless steel or zinc lever handles or brass or bronze knobs.

Mortise or cylindrical type, with 1/2 or 3/4 in. latch bolt throws, Model(s) OM-100, OM-300, OM-500, followed by C, M, MD, MR, MDR, may include additional suffixes, with 1/2 inch latch bolt throw for cylindrical locks and with 3/4 inch latch bolt throw for mortise locks, 6 VDC alkaline battery operated 120 mA, for use with door rated 1-1/2 hr. and not exceeding 4 ft in width and 8 ft in height.

Mortise or cylindrical type, with 1/2 or 3/4 in. latch bolt throws, Model(s) OM2000, may include additional suffixes, with 1/2 inch latch bolt throw for cylindrical locks and with 3/4 inch latch bolt throw for mortise locks, 6 VDC alkaline battery operated 120 mA, for use with doors rated 1-1/2 hr. and not exceeding 4 ft in width and 8 ft in height.

Mortise or cylindrical type, with 1/2 or 3/4 in. latch bolt throws, Model(s) OMW, OPW, EMW, PMW, PSW, QAW and QPW-2000, may include additional suffixes, with 1/2 inch latch bolt throw for cylindrical locks and with 3/4 in. latch bolt throw for mortise locks, VDC alkaline battery operated 120 mA, includes wireless antenna for access control system, for use with doors rated 1-1/2 hr. and not exceeding 4 ft in width and 8 ft in height.

Mortise or cylindrical type, with 1/2 or 3/4 in. latch bolt throws, Model(s) OP2000, may include additional suffixes, with 1/2 inch latch bolt throw for cylindrical locks and with 3/4 in. latch bolt throw for mortise locks, Vdc alkaline battery operated 120 mA, for use with doors rated 1-1/2 hr. and not exceeding 4 ft in width and 8 ft in height.

Mortise type, with 3/4 in. (19 mm) latch bolt, for use with swinging type fire doors, Model(s) M9000

Tubular electrified type, with 1/2 in. (12.7 mm) latch bolt throws, Model(s) QEL200, may be followed by suffixes, for use with door rated 1-1/2 hr. and not exceeding 4 ft (1219 mm) in width and 8 ft (2438 mm) in height..

Note - Models are evaluated in accordance with standard UL 10C.

Trademark and/or Tradename:  ,  ,  , 

SCHLAGE LOCK CO L L C

R8458

11819 N PENNSYLVANIA ST

CARMEL, IN 46032 USA

Cylindrical type bored, rated 24 Vdc, 0.145 A, Model(s) D80-EL, D80-EU may have additional suffixes. with a 1/2 in. latch bolt. The entire assembly shall be rated 24 v, dc, 0.145A. For use on fire rated steel single swing doors rated up to and including 3 h and fire rated single swing wood composite doors rated up to an including 1-1/2 h, measuring up to 4 ft. (1219 mm) wide and 10 ft. (3048 mm) high when incorporating a 1/2 in. (12.7 mm) latch throw. Fire rated steel pairs rated and fire rated wood composite pairs rated up to and including 1-1/2 h, measuring up to 8 ft. (2438 mm) wide and 10 ft. (3048 mm) high when incorporating a 3/4 in. (19.1 mm) latch throw.

Cylindrical type bored, with 1/2 or 3/4 in. latch bolts, Model(s) D12-EL, D12-EU, D80-EL or D80-EU, may have additional suffixes, D80PDEL, D80PDEU with 1/2 in. or 3/4 in. latch bolts, provided with solenoid rated 24 v, dc, .35 amp, for use on fire rated steel single swing doors rated up to and including 3 h and fire rated single swing wood composite doors rated up to an including 1-1/2 h, measuring up to 4 ft. (1219 mm) wide and 10 ft. (3048 mm) high when incorporating a 1/2 in. (12.7 mm) latch throw. Fire rated steel pairs rated and fire rated wood composite pairs rated up to and including 1-1/2 h, measuring up to 8 ft. (2438 mm) wide and 10 ft. (3048 mm) high when incorporating a 3/4 in. (19.1 mm) latch throw.

Cylindrical type, with 1/2 in. (12.7 mm) or 3/4 in. (19.1 mm) latch bolts, Model(s) Series NDE and NDEB for use on fire rated steel single swing doors rated up to and including 3 h and fire rated single swing wood composite doors rated up to an including 1-1/2 h, measuring up to 4 ft. (1219 mm) wide and 10 ft. (3048 mm) high when incorporating a 1/2 in. (12.7 mm) latch throw. Fire rated steel pairs rated and fire rated wood composite pairs rated up to and including 1-1/2 h, measuring up to 8 ft. (2438 mm) wide and 10 ft. (3048 mm) high when incorporating a 3/4 in. (19.1 mm) latch throw.

Cylindrical type, with 1/2 in. (12.7 mm), 9/16 in. (14.3 mm) or 3/4 in. (19.1 mm) latch bolts, Model(s) RU851 or RU881, for use with swinging fire doors measuring up to 48 in. (1219 mm) wide and 96 in. (2438 mm) height, rated for 24 Vdc, 0.15 A or 24 Vdc, 0.185 A.

Cylindrical type, with 1/2 in. (12.7 mm), 9/16 in. (14.3 mm) or 3/4 in. (19.1 mm) latch bolts, Model(s) T851, T881 for use on fire rated steel single swing doors rated up to and including 3 h and fire rated single swing wood composite doors rated up to an including 1-1/2 h, measuring up to 4 ft. (1219 mm) wide and 10 ft. (3048 mm) high when incorporating a 1/2 in. (12.7 mm) latch throw. Fire rated steel pairs rated and fire rated wood composite pairs rated up to and including 1-1/2 h, measuring up to 8 ft. (2438 mm) wide and 10 ft. (3048 mm) high when incorporating a 3/4 in. (19.1 mm) latch throw. Device is rated for 24 V dc, 0.15 A or 24 V dc, 0.185 A.

Cylindrical type, with 1/2 in. latch bolts, Model(s) KPL

Cylindrical type, with 1/2 in. latch bolts, rated 24 Vdc, 0.145 A, Model(s) D80-EU, D80-EU (a)

Cylindrical type, with 1/2 or 3/4 in. latch bolts, "NDPEU and NDPEL Series", Model(s) NDPEU and NDPEL and Models ND12DEL, ND12DEU, ND80PDEL, ND80PDEU, ND80GDEL, ND80GDEU, ND80RDEL, ND80RDEU, ND96PDEL, ND96PDEU, ND96GDEL, ND96GDEU, ND96RDEL, ND96RDEU. For use on fire rated steel single swing doors rated up to and including 3 h and fire rated single swing wood composite doors rated up to an including 1-1/2 h, measuring up to 4 ft. (1219 mm) wide and 10 ft. (3048 mm) high when incorporating a 1/2 in. (12.7 mm) latch throw. Fire rated steel pairs rated and fire rated wood composite pairs rated up to and including 1-1/2 h, measuring up to 8 ft. (2438 mm) wide and 10 ft. (3048 mm) high when incorporating a 3/4 in. (19.1 mm) latch throw.

Cylindrical type, with 1/2 or 3/4 in. latch bolts, for use on doors not exceeding 4 ft. (1219 MM) in wide by 10 ft. (3048 mm) high, Model(s) Series AD 200, 300, 400 - CY, may have additional suffixes, for use on fire rated steel single swing doors rated up to and including 3 h and fire rated single swing wood composite doors rated up to an including 1-1/2 h, measuring up to 4 ft. (1219 mm) wide and 10 ft. (3048 mm) high when incorporating a 1/2 in. (12.7 mm) latch throw. Fire rated steel pairs rated and fire rated wood composite pairs rated up to and including 1-1/2 h, measuring up to 8 ft. (2438 mm) wide and 10 ft. (3048 mm) high when incorporating a 3/4 in. (19.1 mm) latch throw.

Cylindrical type, with 1/2 or 3/4 in. latch bolts, for. (3048 mm) high, Model(s) Series CO 100, 200, 220, 300, 400 - CY for use on fire rated steel single swing doors rated up to and including 3 h and fire rated single swing wood composite doors rated up to an including 1-1/2 h, measuring up to 4 ft. (1219 mm) wide and 10 ft. (3048 mm) high when incorporating a 1/2 in. (12.7 mm) latch throw. Fire rated steel pairs rated and fire rated wood composite pairs rated up to and including 1-1/2 h, measuring up to 8 ft. (2438 mm) wide and 10 ft. (3048 mm) high when incorporating a 3/4 in. (19.1 mm) latch throw.

Interconnected type, with a 1/2 in. (12.7 mm) latch bolts, Model(s) FE410F90, for use with swinging type fire doors for a 90 minute rating.

Interconnected type, with a 1/2 in. (12.7 mm) latch bolts, for swinging type fire doors, 9 Vdc battery operated, Model(s) FE210F, FE215F

Mortise type, with 3/4 in. (19 mm) latch bolts, Model(s) LE, for use on single swinging type fire doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 120 in. (3048 mm)

Mortise type, with 3/4 in. (19.1 mm) latch bolts, Model(s) L9090 or L9490, may be EL/EU and additional suffixes, for use on single swinging type fire doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 120 in. (3048 mm) high.

Mortise type, with 3/4 in. (19.1 mm) latch bolts, Model(s) LEB, for use on single swinging type fire doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 120 in. (3048 mm)

Mortise type, with 3/4 in. (19.1 mm) latch bolts, rated 12 Vdc, 0.61 A or 12 Vac, 0.5 A or 24Vdc, 0.33 A or 24 Vac 0.3 A, Model(s) L9080-EL for use on single swinging type fire doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 120 in. (3048 mm) high.

Mortise type, with 3/4 in. (19.1 mm) latch bolts, rated 12 Vdc, 0.61 A or 12 Vac, 0.5 A or 24Vdc, 0.33 A or 24 Vac 0.3 A, Model(s) L9080-EU for use on single swinging type fire doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 120 in. (3048 mm) high.

Mortise type, with 3/4 in. (19.1 mm) latch bolts, rated 24 Vdc, 0.16 or 24 Vac, 0.255 A., Model(s) L9080-EL, L9080-EU, LV9080-EL or LV9080-EU, may have additional suffixes, for use on single swinging type fire doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 120 in. (3048 mm) high.

Mortise type, with 3/4 in. (19.1 mm) latch bolts, with swinging type fire doors, rated 12 or 24 Vdc, "Falcon", Model(s) MA 851 (Fail Safe) for use on single swing doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 96 in. (2438 mm) high fire doors

Mortise type, with 3/4 in. (19.1 mm) latch bolts, with swinging type fire doors, rated 12 or 24 Vdc, "Falcon",
Model(s) MA 851-RX (Fail Safe) for use on single swing doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 96 in. (2438 mm) high fire doors

Mortise type, with 3/4 in. (19.1 mm) latch bolts, with swinging type fire doors, rated 12 or 24 Vdc, "Falcon",
Model(s) MA 881 (Fail Secure) for use on single swing doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 96 in. (2438 mm) high fire doors

Mortise type, with 3/4 in. (19.1 mm) latch bolts, with swinging type fire doors, rated 12 or 24 Vdc, "Falcon",
Model(s) MA 881-RX (Fail Secure) for use on single swing doors or on the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) wide and 96 in. (2438 mm) high fire doors

Mortise type, with 3/4 in. latch bolts, for use on single swing doors or the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) in wide by 120 in. (3048 mm) high,
Model(s) AD 200-MD (a), AD 200-MS (a), AD 300-MD (a), AD 300-MS (a), AD 400-MD (a), AD 400-MS (a), CO 100-MD (a), CO 100-MS (a), CO 200-MD (a), CO 200-MS (a), CO 300-MD (a), CO 300-MS (a), CO 400-MD (a), CO 400-MS (a)

Mortise type, with 3/4 in. latch bolts, for use on single swing doors or the active leaf of door pairs rated up to and including 3 hr., with individual door leafs measuring up to 48 in. (1219 mm) in wide by 120 in. (3048 mm) high,,
Model(s) CO 220-MD, CO 220-MS

(a) - May have additional suffixes.

Note - Models are also evaluated in accordance with Standard UL 10C.

TOWNSTEEL INC

R21040

17901 RAILROAD ST

CITY OF INDUSTRY, CA 91748-1113 USA

Cylindrical type, with 1/2 in. (12.7 mm) latch bolts, Model(s) e-Elite series, for use on single swinging type Classified steel-covered composite, hollow-metal doors rated up to 3 h; fiberglass, wood and plastic-covered composite doors rated up to 1-1/2 h; for door sizes measuring up to 48 in. (1219 mm) wide by 96 in. (2438 mm) high

Cylindrical type, with 1/2 in. (12.7 mm) latch bolts, Model(s) FCE, for use on single swinging type Classified steel-covered composite, hollow-metal doors rated up to 3 h; fiberglass, wood and plastic-covered composite doors rated up to 1-1/2 h; for door sizes measuring up to 48 in. (1219 mm) wide by 96 in. (2438 mm) high.

Cylindrical type, with 1/2 in. (12.7 mm) latch bolts, Model(s) XCE, for use on single swinging type Classified steel-covered composite, hollow-metal doors rated up to 3 h; fiberglass, wood and plastic-covered composite doors rated up to 1-1/2 h; for door sizes measuring up to 48 in. (1219 mm) wide by 96 in. (2438 mm) high.

Cylindrical type, with 1/2 or 3/4 in. latch bolts, Model(s) XCDC

Cylindrical type, with 3/4 in. (19 mm) latch bolts, Model(s) XCD 6000

Interconnected type, with 1/2 in. (12.7 mm) latch bolt, for use with swinging -type fire doors,, Model(s) e-Genius Series

Mortise type electrically controlled lockset, with a 3/4 in. (19 mm) latch bolt throw, Model(s) e-KONTOS Series

Mortise type, with 3/4 in. (19 mm) latch bolts, for use with swinging type fire doors, 6 Vdc battery operated,
Model(s) FME, Gibraltar, MT Select, Saflock MT, Saflok, Saflok V, TCOR A3385, TS A7385, TS A7485R4, TS A7605-PDK, TS A7615-PDK, TS M3805, TS M3807-PDK, TS M3807-PR, TS M3815, TS M3817-PDK, TS M3817-PR, TS M6705, TS M7805, TS M7815, TSL 3385A25, TSL A3335A20, TSL A3335A22, XME

Note - Models are evaluated in accordance with Standard UL 10C.

TOWNSTEEL INC

R26038

17901 RAILROAD ST

CITY OF INDUSTRY, CA 91748-1113 USA

Mortise type, with 1/2 in. (12.7 mm) latch bolts, for use with swinging type fire doors, Model(s) TS A5912-2 (Fail Secure), TS A5924-2 (Fail Secure)

Mortise type, with 1/2 in. (12.7 mm) latch bolts, use with swinging type fire doors, Model(s) TS A5912-1 (Fail Safe)

Mortise type, with 3/4 in. (19 mm) latch bolts, for use with swinging type fire doors, Model(s) MX A7851-12 (Fail Safe), MX A7851-12-RX (a), MX A7851-24 (Fail Safe), MX A7851-24-RX (a), MX A7881-12 (Fail Secure), MX A7881-12-RX (a), MX A7881-24 (Fail Secure), MX A7881-24-RX (a), TS A7912-1 (Fail Safe), TS A7912-1-RQE-X (a), TS A7912-1DB (Fail Safe), TS A7912-2 (Fail Secure), TS A7912-2-RQE-X (a), TS A7912-2DB (Fail Secure), TS A7912PRIV-X, TS A7912PRIV-XDB, TS A7924-1 (Fail Safe), TS A7924-1-RQE-X (a), TS A7924-1DB (Fail Safe), TS A7924-2 (Fail Secure), TS A7924-2-RQE-X (a), TS A7924-2DB (Fail Secure)

(a) - Suffix -RX or RQE-X indicates - request to exit function.

Note - Models are evaluated in accordance with Standard UL 10C.

HAGER COMPANIES

R26142

139 VICTOR ST

SAINT LOUIS, MO 63104-4724 USA

Cylindrical type, with 1/2 in. (13 mm) latch bolts, rated 24 vdc, 0.145A or 12 vdc, 0.25A, Model(s) 3480EL, 3480EL/RX, 3480EU, 3480EU/RX

Cylindrical type, with 1/2 or 3/4 in. latch bolts, Model(s) 34K Series

Mortise Type, with 3/4 in. latch bolts, assembly may be rated 12vdc, 0.61A or 12vac, 0.5A or 24vdc, 0.33A or 24vac 0.3A, Model(s) 3880DPM, 3880EL, 3880EL/RX, 3880EU, 3880EU/RX, 3882EL, 3882EL/RX, 3882EU, 3882EU/RX

Mortise Type, with 3/4 in. latch bolts, assembly may be rated as follows 12v dc, 0.61A or 12v ac, 0.5A or 24v dc, 0.33A or 24v ac 0.3A., Model(s) 3880RX

Mortise type, with Salto Ai6 Series Escutcheon, with 3/4 in. (19 mm) latch bolts, 6 vdc battery operated, Model(s) HB38, HE38, HK38, HP38, HR38, HS38, HT38

Note - Models are evaluated in accordance with Standard UL 10C.

CODELOCKS INC

R26926

1929 Main St, Suite 104

Irvine, CA 92614 USA

Cylindrical type, with a 1/2 in. latch bolt, 6 vdc battery operated, Model(s) CL5000

Note - Models are evaluated in accordance with Standard UL 10C.

SECUREALL CORP

R27436

695 WOBURN CT

MOUNTAIN VIEW, CA 94040 USA

Mortise type, with 1/2 in. (13 mm) latch bolts, Model(s) SA-CDR

Mortise type, with 3/4 in. (19 mm) latch bolts, Model(s) SA-MDR

Note - Models are evaluated in accordance with Standard UL 10C.

DESIGN HARDWARE L L C

R27401

3440 STANWOOD BLVD NE

HUNTSVILLE, AL 35811 USA

Cylindrical type, with 1/2 in. latch bolts, rated 24 v dc, 0.13A or 12 v dc, 0.29A, Model(s) E-Z-86M-FSE@, E-Z-86M-FSF@, E-Z-87M-FSE@, E-Z-87M-FSF@

Cylindrical type, with 1/2 in. latch bolts, rated 24 vdc, 0.145A or 12v dc, 0.25A, Model(s) E-Z-86-FSE@, E-Z-86-FSF@, E-Z-87-FSE@, E-Z-87-FSF@, Z-86@

Cylindrical type, with a 1/2 in. (12.7 mm) latch bolts, Model(s) KPC Series, with a 1/2 in. (12.7 mm) latch bolt intended for use on single swinging type Classified steel-covered composite, hollow-metal doors rated up to 3 h; fiberglass, wood and plastic-covered composite doors rated up to 1-1/2 h; for door sizes measuring up to 48 in. (1219 mm) wide by 96 in. (2438 mm) high.

Cylindrical type, with a 1/2 in. (12.7 mm) latch bolts, Model(s) RFC Series, with a 1/2 in. (12.7 mm) latch bolt intended for use on single swinging type Classified steel-covered composite, hollow-metal doors rated up to 3 h; fiberglass, wood and plastic-covered composite doors rated up to 1-1/2 h; for door sizes measuring up to 48 in. (1219 mm) wide by 96 in. (2438 mm) high.

Mortise type, with 3/4 in. (19 mm) latch bolts, rated as 12v dc, 0.61A or 12v ac, 0.5A or 24v dc, 0.33A or 24v ac 0.3A, Model(s) E-M-07-FSE*, E-M-07-FSF*, E-M-30-FSE*, E-M-30-FSF*, M-Series*

Mortise type, with 3/4 in. latch bolts, Model(s) E-M-07M-FSE*, E-M-07M-FSF*, E-M-30M-FSE*, E-M-30M-FSF*

Mortise type, with 3/4 in. latch bolts, for use 6 Vdc battery operated swinging type fire doors, Model(s) KPM, RFM

* - May be followed by REX, LBM or SM, where M refers to the alternate motor operated lockset modifications.

@ - May be followed by REX for E-Z.

Note - Models are evaluated in accordance with Standard UL 10C.

CORBIN RUSSWIN INC

R7863

225 EPISCOPAL RD

BERLIN, CT 06037-1524 USA

Cylindrical type, with 1/2 in. (13 mm) latch bolts, rated 12 or 120/24v dc, Model(s) CL33600, IN Series access control products, prefixes IP, IPS, CP, BIP, BIPS, BCP or 700 multi-class access control products, prefixes TCPIP1, TCPWI1, SELP10 multi-class Series access control products with Access 600, prefix SE.

Cylindrical type, with 1/2 in. (13 mm) latch bolts, rated 9v dc, Model(s) CL33100, CL33700, CL33800 or CL33800 TCNE, IN Series access control products, prefixes IP, IPS, CP, BIP, BIPS, BCP or 700 multi-class access control products, prefixes TCPIP1, TCPWI1, SELP10 multi-class series access control products with Access 600, prefix SE.

Mortise type, with 3/4 in. (19 mm) latch bolts, "ML20900 Series", Model(s) ML20906xSAF (\$), ML20906xSEC (\$), ML20907xSAF (\$), ML20907xSEC (\$), ML20914xSAF (\$), ML20914xSEC (\$), ML20915xSAF (\$), ML20915xSEC (\$), ML20932xSAF (\$), ML20932xSEC (\$), ML20987xSAF(\$), ML20987xSEC (\$)

Mortise type, with 3/4 in. (19 mm) latch bolts, Model(s) ML20100, ML20200, ML20700, ML20800 or ML20800 TCNE Series, for use with doors rated up to 3 hrs, measuring up to and including 4 ft (1219 mm) wide by 10 ft (3048 mm) high. Rated 9 v dc. IN Series access control products, prefixes IP, IPS, CP, BIP, BIPS, BCP or 700 multi-class access control products, prefixes TCPIP1, TCPWI1, SELP10 multi-class Series access control products with Access 600, prefix SE.

Mortise type, with 3/4 in. (19 mm) latch bolts, Model(s) ML20600, for use with doors rated up to 3 hrs, measuring up to and including 4 ft (1219 mm) wide by 10 ft (3048 mm) high, rated 12 or 120/24v dc, IN Series access control products, prefixes IP, IPS, CP, BIP, BIPS, BCP or 700 multi-class access control products, prefixes TCPIP1, TCPWI1, SELP10 multi-class Series access control products with Access 600, prefix SE.

(\$) - for use with doors rated up to 3 hrs, measuring up to and including 4 ft (1219 mm) wide by 10 ft (3048 mm) high.

Note - Models are also evaluated in accordance with Standard UL10C.