

Guide Specifications for Standard and Custom Steel Doors and Frames

NMS Division 8, section 08100

Scope

This guide covers standard and custom swinging Hollow Metal Steel Door and Frame products for use in commercial, industrial, institutional and high-rise or multiple unit residential construction.

Introduction

Use this guide when preparing specification documents for new or retrofit construction.

This guide contains options not available on every project.

This guide may be used by the professional either verbatim or edited to suit the particular project.

It is the users responsibility to apply information contained herein in accordance with applicable building and fire codes, manufacturers recommendations and professional judgement.

Artek Door (1985) Limited disclaims all liability for or arising from any use or application, in whole or in part, of information contained herein.

Products referred to in this guide meet or exceed the 'Specifications for Commercial Steel Doors and Frames' published by the Canadian Steel Door Manufacturers Association (CSDMA).

Part 1 - General

1.01SUMMARY

Section includes metal doors and frames in accordance with requirements of the Contract Documents. Work includes the following:

- Hollow Metal doors*
- Louver doors*
- Metal door frames*
- Installation*

Related sections:

- Section 03600 Grout*
- Section 04220 Concrete Unit masonry*
- Section 07910 Joint Fillers and Gasket*
- Section 07920 Sealants*
- Section 08305 Access Panels*
- Section 08510 Steel Windows*
- Section 08710 Door hardware*
- Section 08711 Hardware Set Schedule*
- Section 08800 Glazing*
- Section 09900 Painting*

1.02 REFERENCES

American National Standards Institute (ANSI)

ANSI A115 Specification for Hardware Preparations in Standard Steel Doors and Frames
ANSI A115.1G Installation Guide for Doors and Hardware
ANSI/UL 10B Fire Tests for Door Assemblies
ANSI/NFPA 80 Fire Doors and Fire Windows
ANSI/NFPA 252 Fire Tests of Door Assemblies
ANSI A250.6 Hardware on Steel Doors (Reinforcement-Application)
ANSI A250.7 Nomenclature for Standard Steel Doors and Steel Door Frames

American Society for Testing and Materials (ASTM)

ASTM A653/A653M Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
ASTM A366/A366M Specification for Steel Sheet, Carbon, Cold-Rolled, Commercial Quality
ASTM A568 Standard Specification for Steel Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements
ASTM A924 Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM A307 Specification for Carbon Steel Externally Threaded Standard Fasteners
ASTM E90 Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions
ASTM E152 Method for Fire Tests of Door Assemblies

National Standard of Canada

CAN4-S104 (ULC-S104) Standard Method of Fire Tests of Door Assemblies
CAN4-S105 Standard Specification for Fire Door Frames meeting the performance required by CAN4-S104

1.03 SUBMITTALS

Product Data

Submit, for information only, to the Engineers representative in accordance with requirements of the Contract Documents, copies of the manufacturers specifications and installation instructions for Hollow Metal Doors and Frames.

Shop Drawings

Submit Door and Frame Schedule with Shop Drawings in accordance with requirements of the Contract Documents. Include details of each door and frame type, finish hardware types and locations, frame profiles, door and frame elevations, mitre details, glazing preparation details and anchor details and locations. Submit manufacturers technical product data to substantiate product compliance. Use the same opening reference numbers as those on Contract Drawings.

Sample

Submit to the Engineers representative, in accordance with requirements of the Contract Documents, a cut-away sample door, with provision for lockset and hinge, and corner section of frame.

1.04 QUALITY ASSURANCE

Manufacturer Qualifications

Provide doors and frames manufactured by a firm specializing in the design and production of standard and custom Hollow Metal steel doors and frames.

Regulatory Requirements for Fire-rated Assemblies

Provide U.L., U.L.C., W.H.I. or F.M. labelled products where indicated. Labelled doors shall be installed in appropriately labelled frames of the type to accommodate the specified hardware and meet local code requirements. Construction Labels shall be applied to assemblies that exceed the manufacturers fire rating capabilities. Labels shall be affixed to the door, frame component and assembled screen and window.

Compliance

Provide doors and frames complying with CSDMA 'Specifications for Commercial Steel Doors and Frames' or equivalent.

1.05 DELIVERY, STORAGE AND HANDLING

Protect Hollow Metal units from damage during transit, storage and installation. Inspect doors and frames for damage. Storage at building site must be under cover with units raised to a minimum of 100mm off the floor. Avoid using shelters that create or hold humidity. Remove wet packaging immediately. Provide a minimum 6mm spacing between stacked doors to promote circulation.

1.06 PROTECTION AND CLEANING

Protect steel doors and frames during installation and general construction to prevent damage and undue deterioration from adverse weather conditions, unusual wear, misuse or abuse.

1.07 WARRANTY

Submit a written warranty, executed by the contractor and installer, agreeing to repair or replace Hollow Metal components or entire units that fail due to materials or workmanship, within the specified warranty period. Hollow Metal doors and frames shall carry the manufacturers standard warranty to take effect from date of substantial completion.

Part 2 - Products

2.01 MANUFACTURERS

Provide steel doors and frames manufactured by:

*Artek Door (1985) Limited
225 Wycroft Road
Oakville, Ontario, Canada*

1 Substitutions

The products and manufacturers specified herein are listed for the purpose of establishing quality standards. Products equal to or better than those specified will be considered acceptable. The decision to accept a product shall rest with the Engineers representative.

2.02 MATERIALS

Steel

Galvanneal Sheet Steel to ASTM A653 with coating designation A25, phosphatized, stretcher leveled for doors

Galvanized Sheet Steel to ASTM A653 with coating designation G90, phosphatized, stretcher leveled for doors

Supports and Anchoring Devices

Structural Steel to ASTM A36; Sheet steel to ASTM A366 cold-rolled or ASTM A569 hot-rolled or ASTM A568; to comply with ASTM A153, class B.

Filler

Sound deadening and heat-retarding mineral fibre insulating material approved for fire doors.

Fasteners: Galvanized or Cadmium plated

Bolts and Nuts to ASTM A307, grade A

Expansion Bolts: FS FF-S-325, group III; Expansion Shields (self-drilling tubular expansion shell bolt anchor), type 1 or 2 with galvanized bolts

Machine Screws: FS-FF-S-92, carbon steel, type III cross-recessed, design I or II recess, style 2c flat head

Galvanized Steel Primer: FS TT-P-641 type II (alkyd, zinc-dust, zinc-oxide)

Weather/Acoustic Seals: Neoprene

Door silencers: single stud rubber or neoprene type

Smoke Seal: Hot smoke seal of chemically inert highly stable expandable graphic strip of 12.7mm wide x 0.04mm thick with multi-directional expansion

2.03 FABRICATION - GENERAL

Fabricate steel doors, frames, transoms, sidelites and borrowed lites to the design and dimensions shown in Schedules and Drawings and in accordance with Shop practices. Take field measurements where co-ordination with adjoining work is necessary.

Fabricate steel doors and frames to be rigid, neat in appearance and free from defects, warp, wave or buckle with all corners square unless otherwise indicated.

Operating clearances between door and frame shall be not more than 3mm (1/8") at top and sides. Door undercut shall be not more than 19mm (3/4") or as specified. Operating clearance between meeting stiles of fire labelled pairs of doors without astragal shall be not more than 3mm (1/8").

Drill and tap or reinforce doors and frames for mortised or surface mounted hardware in accordance with an approved Hardware Schedule, ANSI A115 'Specifications for Door and Frame preparation for Hardware', NFPA 80 'Standard for Fire Doors and Fire Windows' or manufacturers recommendations.

Provide louvers made of minimum 20 gauge (.85mm) steel or aluminum. Where required, provide listed louvers for fire rated openings.

Prepare doors or frames to receive weather or acoustic seals as required.

Countersink exposed fasteners unless otherwise shown. Use flat or oval head screws.

Provide glazing stops and bead of minimum 20 gauge steel. Apply non-removable stops facing the secured side of the opening. Apply screw-in or snap-in bead on non-secured side.

2.04 FABRICATION - DOORS

Fabricate doors and panels to a thickness of 45mm (1 3/4"), unless specified otherwise.

Provide steel doors to ANSI A250.8 - 1998 levels and models or equivalent:

Level 1, Model 1

Level 2, Model 1

Level 3, Model 1

Door face sheets shall be 18 gauge (1.2mm) or as specified in Schedules. Exposed seams or joints on door faces are not permitted. Exposed seams on edges are permitted.

Fabricate doors with core material (honeycomb, polystyrene, polyurethane, vertical steel stiffeners or rigid mineral fibre) laminated to the inside of both face sheets.

Close top and bottom of doors and panels with inverted steel channels, welded to both face sheets, as an integral process of door construction.

Provide 'flat' or 'Z' astragal at meeting stiles of pairs of doors when specified or if required for fire rating according to the manufacturers listing.

Provide flush steel or vinyl closure at top of exterior doors, if specified.

2.05 FABRICATION - FRAMES

Frames components shall be 16 gauge (1.5mm) or as specified in Schedules.

Frames for masonry (KD) or drywall (KDDW) shall be supplied knocked-down or welded according to site conditions and Engineers requirements. Knocked-down frames are assembled using mechanically interlocking mitre tabs or screws leaving a hairline seam visible on frame faces. Welded frames are assembled by continuously welding the mitre-line, at corners and stops, grinding or filling the face and touching-up all surfaces where the coating has been removed with zinc-rich primer.

Anchor frames in masonry openings using wire or strap 'T' or bolt and expansion shield method according to manufacturers recommendations and site conditions.

Anchor frames in drywall openings using stud or strap or welded-in 'Z' clip method according to manufacturers recommendations and site conditions.

Provide steel spreader bars at bottom of welded frames or screens for doors to prevent distortion and twisting during transport. Remove spreader bars after installation.

Provide minimum 26 gauge steel mortar guards at back of hardware preparations of frames for use in masonry openings.

Provide mullions and transom bars of closed construction type. For fixed condition, attach members to frame with butt-welded joints. For removable condition, attach members with removable mullion anchors.

Provide a structural lintel, by others, above the frame to support the wall construction.

Conceal fastenings unless otherwise indicated.

2.06 WEATHER/ACOUSTIC SEALS

Install seals in single lengths for each side with uniform exposure of 10mm, using adhesive or other attachments as detailed and recommended by the manufacturer.

2.07 PAINTING

For doors and frames manufactured from Galvanneal steel sheet, priming is not recommended.

Galvanneal doors and frames must be finish painted. Painting may be done locally or on site. Surface must be clean and dry prior to painting. Touch-up only where coating has been removed. Galvanneal doors and frames may be undercoated and/or painted without pretreatment or factory applied primer. See Division 9, section 'Painting'.

For doors and frames manufactured from Galvanized steel sheet.

Galvanized doors and frames must be pretreated, primed and finish painted. Painting may be done locally or on site. Clean surfaces with non-petroleum solvent to remove oil and other contaminants. Where galvanized coating has been removed, clean affected areas and apply galvanizing repair paint to comply with ASTM A780. (Galvanizing Repair Paint: high-zinc-dust-content paint with dry film with not less than 94 percent zinc dust by weight and complying with DOD-P-21035 or SSPC-Paint 20).

Apply a conversion coat of a type suited to the primer coat.

Apply an air-dried primer immediately after cleaning and pretreatment. Primer specified as zinc-dust, zinc-oxide complying with performance requirements of FS TT-P-641, type II.

Apply finish paint as soon as primer is ready.

For doors and frames manufactured from Cold-rolled steel sheet, factory applied primer is required.

After fabrication, thoroughly clean all metal surfaces of loose scale, shavings, filings, dirt and other foreign materials to comply with SSPC-SP-5 or SSPC-SP-8. Remove grease and oil by one of the methods specified in SSPC-SP-1 'Solvent Cleaning'.

Apply conversion coat of a type suitable for priming immediately after surface preparation.

Apply factory primer complying with ANSI A224.1 and capable of providing a suitable foundation for field-applied finish paint. Coat exposed and concealed surfaces of steel doors and frames.

Apply two (2) coats of primer to all surfaces that will come in contact with masonry or concrete.

Provide minimum coating thickness as recommended by the manufacturer.

Part 3 - Execution

3.01 INSTALLATION

Install steel doors and frames in accordance with the Shop Drawings and manufacturers instructions.

Place steel frames accurately at locations shown, in true alignment, rigid, plumb and rack free. Brace frames to prevent displacement. Anchor bottoms of frames to floor with power driven fasteners as permitted by wall conditions. After installation and anchoring, remove braces and spreaders. Leave frame surfaces smooth and undamaged.

Install doors plumb, in true alignment in frame and fastened to achieve the maximum operational effectiveness and appearance.

Install fire rated doors and frames in accordance with NFPA 80.

3.02 TOLERANCES

Maximum diagonal tolerance, measured from corner to corner, shall be 1.5mm.

3.03 ADJUSTING AND CLEANING

Repair all damage caused during installation and general construction.

Upon completion of installation, clean exposed surfaces as recommended and leave ready for finish painting.

For doors and frames manufactured from cold-rolled steel sheet with shop-applied primer and requiring finish painting, sand smooth any rusted or damaged areas and touch-up with compatible air-drying primer.

Apply hardware after door and frame finish painting is completed.

After finish painting, check and adjust hardware, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION