

*This section includes AMBICO blast resistant steel door & frame assemblies: fire rated and non-fire rated. This section relies on both Canadian Steel Door Manufacturers Association (CSDMA) as well as the Hollow Metal Manufacturers Association (HMMA) industry standard for steel doors. This section includes proprietary, descriptive and performance type specification requirements. Edit to avoid conflicting requirements.*

## **Part 1            General**

### **1.1                SECTION INCLUDES**

*This article includes a summary of the content of this section which will not be included in other sections. This article is NOT intended to be used as a trade or other form of jurisdictional content.*

- .1        [Non-fire rated] [Fire rated] blast resistant pressed steel frames.
- .2        Blast resistant steel frames [and side/transom lites] [and side/transom panels].
- .3        [Non-fire rated] [Fire rated] blast-resistant steel doors [and panels].
- .4        Architectural door hardware integral to the blast resistant performance of the blast resistant assembly.
- .5        [Factory supplied and installed blast resistant glass and glazing.]

### **1.2                RELATED SECTIONS**

*This article references other specification sections that inter-rely on this section. This listing should include those sections that describe subjects or products that affect this section directly.*

- .1        Section [\_\_\_\_\_ - \_\_\_\_\_]: Masonry mortar fill of metal frames.
- .2        Section 05 50 00 – Metal Fabrications: Steel door frame.
- .3        Section 07 92 00 - Joint Sealing: Caulking between doors and adjacent construction.
- .4        Section 08 71 10 - Door Hardware - General.
- .5        Section 09 91 00 - Painting: Field painting of doors panels
- .6        Division 26 – Electrical: Electrical wiring, conduit, and disconnects for electrical hardware.

### **1.3                REFERENCES**

*Edit this article after editing the rest of this section. Only list reference standards below that are included within the text of this section, when edited for a project specification. Delete references that do not apply to this project.*

- .1        AISC 325-17 - AISC Steel Construction Manual.
- .2        ASTM A36/A36M-14 - Standard Specification for Carbon Structural Steel.
- .3        AWS D1.1/D1.1M:2015, Structural Welding Code - Steel.

- .4 ASTM A653/A653M-15e1 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .5 ASCE – Design of Blast Resistant Buildings in Petrochemical Facilities.
- .6 UFC 3-340-02 - Structures to Resist the Effects of Accidental Explosions.
- .7 UFC 4-010-01 - DoD Minimum Antiterrorism Standards for Buildings.
- .8 ASTM F2247-11(2017) Standard Test Method for Metal Doors Used in Blast Resistant Applications (Equivalent Static Load Method).
- .9 ASTM F2927-12 Standard Test Method for Door Systems Subject to Airblast Loadings.
- .10 CSDMA, Selection and Usage Guide for Steel Doors and Frames, 2009.
- .11 HMMA 802-07 - Manufacturing of Hollow Metal Doors and Frames.
- .12 HMMA 840-07 - Installation and Storage of Hollow Metal Doors and Frames.
- .13 NFPA 80-16 - Standard for Fire Doors and Other Opening Protectives.
- .14 UL 10C-16 - Standard for Positive Pressure Fire Tests of Door Assemblies.
- .15 USGBC – LEEDv4.

#### 1.4 SUBMITTALS

- .1 Section [01 33 00]: Submission procedures.
- .2 Product Data: Provide product data on door construction and [\_\_\_\_\_].
- .3 Shop Drawings: Indicate door and frame elevations, anchor types and spacing, closure methods, [finishes] location of cut-outs for hardware [, and cut outs for glazing].
- .4 Test Data:
  - .1 Submit independent test data from a recognized licensed laboratory indicating compliance with the blast-resistance requirements.
  - .2 When blast resistance is not supported by prototype tests, design calculations by a licensed professional engineer shall be accepted.

*Include the following ONLY if specifying for a LEED project. Specify only the technical requirements necessary to achieve the credits desired for this project. AMBICO Blast Resistant products offer significant advantages to firms interested in supporting LEED certification*

- .5 Sustainable Design:
  - .1 Section 01 35 18: LEED documentation procedures.
  - .2 Provide required LEED documentation for Product.
  - .3 Manufacturer's Certificate: Certify that Products meet or exceed [specified requirements]. Section 01 35 18: LEED documentation procedures.

- .4 Submit Type 3 Environmental Product Declaration (EPD) for Products of this Section.
  
- .6 Closeout Submittals
  - .1 Section 01 78 10: Submission procedures.
  - .2 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with and registered with manufacturer.

*Include the following ONLY if specifying for a LEED project.*

- .3 Sustainable Design Closeout Documentation: [\_\_\_\_\_].

### **1.5 QUALITY ASSURANCE**

- .1 Provide Products of this section from a single manufacturer, unless components are referenced specifically in other sections.
- .2 Pre-installation Meeting: Convene a pre-installation meeting [2] [\_\_\_] weeks before installation of blast resistant door and frame assembly. Require attendance of relevant subcontractors, consultants, and manufacturer's representative. Review installation and coordination with other work.
- .3 Perform Work to requirements of [CSDMA (Canadian Steel Door Manufacturers Association)] [HMMA (Hollow Metal Manufacturers Association)] standards.
- .4 Manufacturer: Minimum 5 years documented experience manufacturing blast resistant door and frame assemblies.

### **1.6 DELIVERY, STORAGE AND PROTECTION**

- .1 Section [01 61 00]: Transport, handle, store, and protect products.
- .2 Comply with HMMA 840, and manufacturer's written instructions.
- .3 Remove doors and frames from wrappings or coverings upon receipt on site and inspect for damage.
- .4 Store in vertical position, spaced with blocking to permit air circulation between components.
- .5 Clean and touch up scratches or disfigurement caused by shipping or handling with zinc-rich primer.
- .6 Weld minimum two temporary jamb spreaders per frame prior to shipment.
- .7 Store materials out of water and covered to protect from damage.

### **1.7 WARRANTY**

- .1 Manufacturer's Limited Warranty: Five (5) years from date of supply, covering material and workmanship.

**Part 2 Products****2.1 MANUFACTURERS**

*List the manufacturers acceptable for this project. Edit the subsequent descriptive specifications of Part 2, to identify project requirements and to eliminate any conflict with specified manufacturer's products.*

- .1 AMBICO Limited  
1120 Cummings Avenue  
Ottawa, Ontario K1J 7R8  
Toll Free Phone 888-423-2224  
Phone 613-746-4663  
Toll Free Fax 800-465-8561  
Fax 613-746-4721
- .2 Other Acceptable Manufacturers:
  - .1 [\_\_\_\_\_].
  - .2 [\_\_\_\_\_].
- .3 Substitutions: [Refer to Section 016000.] [Not permitted.]

**2.2 PERFORMANCE REQUIREMENTS**

*Include this article if all doors should meet the same performance requirement; otherwise, specify individual performance for door types in Part 2 or in a schedule. Specify static performance or dynamic performance in consultation with the factory.*

- .1 Structural Performance (Static loading): Provide doors capable of withstanding explosive pressure of [\_\_\_\_\_] kPa ([\_\_\_\_\_] psi), as tested to ASTM F2247 or as proven by calculations.
    - .1 Rebound: 0-100% [\_\_\_\_\_]
    - .2 Response: [Elastic (no damage)] [Inelastic (minor damage)].
- [OR]**
- .2 Structural Performance (Dynamic loading): Provide doors capable of withstanding a peak reflected pressure of [\_\_\_\_\_] kPa ([\_\_\_\_\_] psi), as tested to ASTM F2927 or as proven by calculations.
    - .1 [Duration: [\_\_\_\_\_] msec] [Impulse: [\_\_\_\_\_] psi-msec].
    - .2 Rebound: [0-100%] [True rebound]
    - .3 Ductility ratio : 1-20 [\_\_\_\_\_]
    - .4 End rotation : 1-12 [\_\_\_\_\_] degrees.

**2.3 MATERIALS**

- .1 Sheet Steel: Galvanized steel to ASTM A653/A653M.
  - .1 Exterior doors: [ZF75 (A25)] coating designation.
  - .2 Interior doors: [ZF001 (A01)] coating designation.
- .2 Structural Steel: ASTM A36.

- .3 Reinforcement [Channel]: To CSA G40.20/G40.21, coating designation to ASTM A653/A653M, [ZF75] ([A25]).
- .4 Core Insulation: Minimum U-value of 0.18.
- .5 Primer: Rust inhibitive zinc phosphate.

*Include the following if this project requires LEED accreditation based on minimum recycled content.*

- .6 Recycled Content: Minimum [\_\_\_\_]%

## **2.4 FABRICATION**

- .1 Manufacture doors and frames to achieve specified performance.

*If more than one type of blast pressure door rating is required, include the assembly in a door schedule and delete the paragraph below. Consider maximum sizes when selecting blast pressure requirements for doors. Specify door thickness and other values with caution; they may vary in order to meet the Blast Resistant and fire ratings available. Higher performance ratings may require thicker doors, and fire ratings may limit door sizes and blast pressure rating.*

- .2 Steel Doors:

- 1. Sheet steel faces, thickness, design, and core suitable to achieve specified blast performance.

*Note that blast or fire ratings may dictate the details of oversize door construction. Where door panels are larger than 4' wide or 10' high, specify the following construction details in consultation with AMBICO.*

- 2. Blast Resistant core construction, longitudinal edges [mechanically inter-locked with visible edge seams] [tacked and filled seamless] [fully welded].
  - 3. Reinforce doors where surface-mounted hardware is required.
  - 4. Drill and tap for mortised, templated hardware.
  - 5. Top and Bottom Channels: Inverted, recessed, welded steel channels.
  - 6. Astragals: Metal acoustic astragals with integral acoustic seals for double doors. [Standard overlapping active/inactive.] [Meeting stile both active for vertical rod devices.]
  - 7. Factory install glazing.
- .3 Steel Frames:
    - 1. Sheet steel, metal thickness as required to maintain door blast and fire ratings, mitred corners, fully welded seams.
    - 2. Factory assemble and fully weld frames.
    - 3. Mullions for Double Doors: [Fixed] [Removable] type.
    - 4. Supply glazing loose, ready for field assembly

**2.5 FACTORY FINISH**

- .1 Factory applied zinc phosphate primer [applied to all surfaces] [touch-up only where Product has been welded and ground smooth].
- .2 Finish Painting: finish painting shall be by Section 09 91 00.

**2.6 ACCESSORIES**

*AMBICO Blast Resistant, Steel Door and Frame Assemblies are supplied with heavy weight hinges and locksets as an integral part of a tested assembly. All other accessories specified in this section shall be supplied by the door manufacturer.*

- .1 Hinges: By door manufacturer to meet performance requirements.
- .2 Glazing Stops: Formed galvanized steel channel [flat bar stock] [bar stock], [butted] [mitred] corners; prepared for countersink style [tamperproof] screws.
- .3 Primer: Rust inhibitive zinc phosphate [; VOC compliant with local indoor air quality regulations].
- .4 Astragal: Minimum 2 mm (14 ga) thick, overlapping or meeting stile, supplied welded [screwed] to appropriate door leaf.
- .5 Nameplates: Affix permanent nameplates to door and frame, indicating manufacturer's name, model number, and performance rating.

**2.7 PRE-INSTALLATION OF GLAZING**

- .1 Glazing shall be designed in conformance with paragraph # 2.2.
- .2 Glazing shall be factory supplied [and pre-installed] [and shipped loose ready for site installation by others].

**Part 3 Execution****3.1 INSTALLATION**

- .1 Install components to manufacturer's written instructions.
- .2 [Install factory supplied glazing in door panels.]
- .3 Install steel doors and frames to [CSDMA] [HMMA 840] standards [and in accordance with [NFPA 80] [UL 10C], and local authority having jurisdiction].
- .4 Coordinate with [masonry] [gypsum board] [concrete] [\_\_\_\_\_] wall construction for anchor placement.
- .5 Utilize welders certified by [Canadian Welding Bureau (CWB)] [American Welding Society (AWS)] for field welding.

- .6 Set frames plumb, square, level and at correct elevation, in accordance with Section 05 50 00.
- .7 Allow for deflection to ensure that structural loads are not transmitted to frame.
- .8 Adjust operable parts for correct clearances and function.
- .9 Finish paint in accordance with Section 09 91 00
- .10 Touch up painted finishes where damaged.

### **3.2 ERECTION TOLERANCES**

*Do not assume that there are industry standards for tolerances. Specify tolerances below as appropriate to the nature or character of the project. Verify that such tolerances are realistic and realizable.*

- .1 Section 01 73 00: Tolerances.
- .2 Installation tolerances of installed frame for squareness, alignment, twist and plumbness are to be no more than  $\pm 1/16$ in (1.5mm) in compliance with HMMA 841.

### **3.3 FIELD QUALITY CONTROL**

- .1 Field supervision to be conducted on-site by factory personnel during the initial installation period. Final commissioning of blast resistant, steel door and frame assemblies shall occur in the presence of a factory representative.
- .2 Provide manufacturer's representative to inspect door installation, and test minimum five (5) cycles of operation. Correct any deficient doors.

**END OF SECTION**