

*This section includes AMBICO Blast Resistant Steel Window Frame assemblies. This section relies on both the Canadian Steel Door Manufacturers Association (CSDMA.org) industry standard, as well as on the Hollow Metal Manufacturers Association (NAAMM.org) industry standard. 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        Blast-resistant non-fire rated pressed steel frames.
- .2        Blast resistant non-fire rated steel panels.
- .3        Glazed lite blast resistant steel frames.
- .4        Factory supplied [and installed] 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 07 92 00 - Joint Sealing: Caulking between doors and adjacent construction.
- .3        Section 09 91 15 - Painting: Field painting of [doors] [frames] [doors and frames].

### **1.3                REFERENCES**

*Edit this article after editing the rest of this section. List reference standards 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        ASTM A36/A36M-05 - Standard Specification for Carbon Structural Steel.
- .2        ASTM A653/A653M-06 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3        ASTM A1011/A1011M-07 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- .4        UFC 3-340-02 - Structures to Resist the Effects of Accidental Explosions.
- .5        ASCE – Design of Blast Resistant Buildings in Petrochemical Facilities.
- .6        PIP STC01018 – Blast Resistant Building Design Criteria.

- .7 ASTM E330-02 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .8 ASTM F2247 – Standard Test Method for Metal Doors Used in Blast Resistant Applications (Equivalent Static Load Method).
- .9 ASTM E1300 – Determining Load Resistance of Glass in Buildings
- .10 ASTM F2248 – Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass.
- .11 ASTM F1642 – Standard Test Method for Glazing and Glazing Systems Subject to Airblast Loadings.
- .12 Canadian Steel Door Manufacturers Association (CSDMA), Selection and Usage Guide for Steel Doors and Frames, 1990.
- .13 HMMA 802-92 - Manufacturing of Hollow Metal Doors and Frames.
- .14 HMMA 840-99 - Installation and Storage of Hollow Metal Doors and Frames.
- .15 NFPA 80-07 - Standard for Fire Doors and Other Opening Protectives.
- .16 UL10C-98 Standards for Positive Pressure Fire Tests of Door Assemblies.
- .17 GSA US General Services Administration Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings.

**1.4 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 door schedule.*

- .1 Structural Performance (Static Loading):
  - .1 Provide windows capable of withstanding a pressure of \_\_\_\_\_ kPa (\_\_\_\_\_ psi) tested to ASTM E330.
  - .2 Rebound: 0-100% [\_\_\_\_\_]
  
- .2 Structural Performance (Dynamic Loading):
  - .1 Provide windows capable of withstanding a peak reflected pressure of \_\_\_\_\_ kPa (\_\_\_\_\_ psi) tested to ASTM F2247.
  - .2 [Duration: \_\_\_\_\_ msec] or [Impulse: \_\_\_\_\_ psi-msec]
  - .3 Rebound: 0-100% [\_\_\_\_\_]
  - .4 Hazard Rating (as per ASTM F 1642):
    - No Break [\_\_\_\_\_]
    - No Hazard [\_\_\_\_\_]
    - Minimal Hazard [\_\_\_\_\_]
    - Very Low Hazard [\_\_\_\_\_]
    - Low Hazard [\_\_\_\_\_]

High Hazard [\_\_\_\_\_]

**1.5 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, internal reinforcement, anchor types, closure methods, [finishes] location of cut-outs for hardware, and cut-outs [for glazing] [for louvers].
- .4 Samples: Submit manufacturer's door finish samples, as well as manufacturer's frame corner sample.
- .5 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.

**1.6 QUALITY ASSURANCE**

- .1 Perform Work to requirements of [CSDMA (Canadian Steel Door Manufacturers Association)] [HMMA (Hollow Metal Manufacturers Association)] standards.
- .2 Manufacturer: Minimum 5 years documented experience manufacturing blast resistant door and frame assemblies.
- .3 Pre-installation Meeting: Convene a pre-installation meeting [2] [ \_\_\_\_ ] weeks before start of installation of door and frame assemblies. Require attendance of parties directly affecting work of this section, including contractor, architect, installer, and manufacturer's representative. Review installation and coordination with other work.

**1.7 DELIVERY, STORAGE AND PROTECTION**

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

**1.8 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, Canada 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 MATERIALS**

- .1 Sheet Steel: Galvanized steel to ASTM A653/A653M.
  - .1 Coating designation [Z275] ([G90]) for exterior door assemblies.
  - .2 Coating designation [ZF001] ([A01]) for interior door assemblies.
- .2 Reinforcement [Channel]: To CSA G40.20/G40.21, coating designation to ASTM A653/A653M, [ZF75] ([A25]).
- .3 Structural Plate: Hot rolled steel to ASTM A1011.

**2.3 ACCESSORIES**

*AMBICO blast resistant, steel window frame assemblies are supplied with glazing as an integral part of the tested assembly. All other accessories specified in this section shall be supplied by the door and frame manufacturer.*

- .1 Glazing Stops: Formed galvanized steel channel, [butted] [mitred] corners; prepared for countersink style [tamperproof] screws.
- .2 Glass: Type as tested to achieve fire and blast performance ratings. Glazing to be factory supplied [and preinstalled].
- .3 Primer: Rust inhibitive zinc chromate.

**2.4 FABRICATION**

- .1 Manufacture doors and in accordance with performance requirements in Section 1.4 and HMMA 802-92 - Manufacturing of Hollow Metal Doors and Frames.
- .2 Steel Panels, Fixed Type:
  - .1 Sheet steel faces, thickness, design, and core suitable to achieve specified blast performance.
  - .2 Blast resistant construction, longitudinal edges mechanically inter-locked with visible edge seams.
  - .3 Top and Bottom Channels: Inverted, recessed, welded steel channels.
  - .4 Weld structural steel channels flush to top and bottom of door.
- .3 Steel Window Frames: Fixed Type
  - .1 Sheet steel and metal thickness appropriate to maintain door blast and fire ratings, mitred corners.
  - .2 Factory assemble and weld frames.
- .4 Install [glazing and] door silencers.
- .5 Affix permanent metal nameplates to door and frame, indicating manufacturer's name, door tag, model number, and performance rating.

**2.5 PRE-INSTALLATION OF GLAZING**

- .1 Glazing shall be designed in conformance with 1.4.
- .2 Glazing shall be factory supplied [and pre-installed] [and shipped loose ready for site installation by others].

**2.6 FINISHES**

- .1 Factory Finish: Factory applied zinc chromate primer [to be applied to all exposed surfaces] [touch-up only, where product has been welded and ground smooth].

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

- .1 Install components including window frames, and glazing in accordance with manufacturer's written instructions.
- .2 Install doors and frames to [CSDMA] [HMMA 840] standards.
- .3 Coordinate with [masonry] [gypsum board] [concrete] [\_\_\_\_\_] wall construction for anchor placement.
- .4 Set frames plumb, square, level and at correct elevation.
- .5 Finish paint in accordance with Section 09 91 15.

**3.2 ERECTION TOLERANCES**

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

**3.3 FIELD QUALITY CONTROL**

- .1 Provide qualified manufacturer's representative to instruct installers on the proper installation and adjustment of door assemblies.
- .2 Provide manufacturer's representative to inspect door installation, and test minimum ten (10) cycles of operation.

**3.4 SCHEDULE**

*Include this article to identify variations of products or installation requirements specified. If door and/or frame schedules are listed on drawings or on separate schedule sheets, do not repeat statements in this article.*

- .1 Blast Resistant Door and Frame Assembly Schedule:

Tag	Room	Nominal Size	Thickness	Material	Glazing	Fire Rating	Blast Rating	Comments
D-1	100	750mm x 1600mm	300 mm	GS	FPI	NFR	1 psi (7kPa)	
D-2	101	1'0" x 1'0"	20"	GS	SL	NFR	70 psi (490 kPa)	
D-3	105	4'0"x 4'0"	12 "	SS	FPI	NFR	5psi (35 kPa)	
<ul style="list-style-type: none"> <li>• Material types: GS = Galvanized Steel, SS = Stainless Steel</li> <li>• Glazing configuration: FPI = Factory Pre-Installed, SL = Supplied Loose</li> <li>• Blast Ratings: psi = pounds per square inch                      kPa = kilopascals per square meter                      Note: 1 psi = 7 kPa</li> </ul>								

**END OF SECTION**