



## **Storage and Installation of welded LL Hollow Metal Door Frames in Steel Studs**

### **Introduction**

This guide specification is intended to stress the necessary precautions and requirements for receipt, storage, handling and installation of lead lined hollow metal frames.

The proper performance of most products depends not only on how they are manufactured, but how they are installed. This is especially true of lead lined hollow metal door frames. The installation of lead lined doors and frames demands care and skill, if the lead lined doors are to operate properly. Care in manufacturing does not, in itself, guarantee satisfactory performance. Even the best designed and most carefully constructed frames and doors, if incorrectly installed, will not function properly.

Lead Lined Hollow metal frames are fabricated in accordance with the shop drawings, approved by the architect or engineer. Preparation for hardware or other items supplied by others is provided in accordance with the information furnished to the lead lined hollow metal manufacturer.

We are a material supplier, not a subcontractor. We do not include the installation of our products in the building, but only shipment in good condition from the factory.

Should the General Contractor discover any error in the lead lined hollow metal frames delivered to the job site, it is imperative that MarShield be notified in writing and allowed sufficient time before initiating any corrective measure in the field, so that the manufacturer can participate in solving the problem. Failure to do so could result in the cancellation of the warranty and/or fire label and non-acceptance of any cost associated with repair as we must determine whether the fault lies with MarShield or with some other party.

It is essential that material is properly stored prior to installation and skills are exercised in the setting of frames and hanging of doors.

### **Receiving and Storage of Material**

#### **A. Receiving**

Upon delivery, the consignee responsible for receiving lead lined hollow metal frames shall thoroughly inspect for damage in a timely manner prior to forwarding or installing them. Crating and packing materials shall be removed for inspection and to promote air circulation. Any scratches or disfigurements caused in shipping or handling shall be promptly cleaned and touched up with a metal rust inhibitive primer.

Should damaged material be found, the consignee has the option of refusing delivery or to accept the material as damaged. For coordination purposes, MarShield suggests that delivery should not be refused, but rather accepted as damaged. Any damaged items should be noted on the freight bill. Claims will not be honored by the freight carrier, unless the damaged items are noted on the freight bill at the time of delivery. The consignee shall notify MarShield in writing immediately of any item signed for as



damaged. The consignee must telephone or write the local office of the freight carrier and request an inspection of the damage. This procedure will help to expedite the repair or replacement of the damaged items and the processing of the damage claim with the freight carrier.

## B. On Site Storage

Proper storage of lead lined hollow metal frames at the construction site will help prevent damage to the primer coat of paint. Prime coated steel must be protected when exposed to the elements such as high humidity, salt air, rain, snow, etc.... Particular attention must, therefore, be given to steel products having a coat of factory applied primer. Primer is porous to properly receive and hold top coats. Water or moisture, in contact with primer coated steel will seep through to the steel. An electrolytic action then follows, resulting in corrosion and causing the paint film to lose adhesion. The presence of oxygen at the water-air interface behind the loosened paint film accelerates corrosive action and the prime coat further deteriorates.

Even when zinc coated steel is used to provide corrosion resistance, one week of product exposure to water, due to improper storage, can be equivalent to at least a year of outdoor exposure to the elements.

NOTE: Paint manufacturers advise that the primer should receive a finish coat of paint within 30 days of delivery. It is the responsibility of the General Contractor to sand, touch up and clean prime painted surfaces prior to finish painting in accordance with the finish paint manufacturer's instructions.

The following procedures shall always be observed in storing lead lined hollow metal door frames at the job site:

1. Store all materials in a dry area, under cover. All products shall be stored where they will not be exposed to, or come in contact with the elements.
2. Do not use non-vented plastic or canvas. These materials create a humidity chamber, which promotes blistering and corrosion.
3. Store frames in an upright position with heads uppermost.
4. Place no more than 5 welded frames in a group. Small groups not only minimize the likelihood of damage due to excess handling, but also facilitate selection from the group for installation. In the case of multi-opening frames, no more than three units should be stored in a group, to avoid serious damage to the bottom most frame.
5. Place all material on planking or blocking at least 4 in. (100 mm) off the ground, 2 in. (50mm) off a paved area or the floor slab.
6. Provide at least 1/4 in. (6.4 mm) space between all units to permit air circulation.

## Installation of Frames:

### General

Welded lead lined door frames are checked at the factory to ensure that they are square and that no jamb twists have occurred during fabrication. Temporary steel spreaders are then attached to the jamb base to minimize misalignment or other damage during handling and shipment. The frames are loaded on the carrier by personnel experienced in frame packing. The spreaders are for shipping and handling purposes only and must be removed before installing the frame.



**At no time shall the spreaders be used during installation.**

In spite of our precautions, lead lined frames can and sometimes do arrive at the job site with minor alignment deviations. Minor deviations from true form and alignment can be corrected by the contractor responsible for installation.

**Prior to Installation**

The installer shall perform the following prior to installation:

The area of floor on which the lead lined frame is to be installed and the path of the door swing shall be checked for flatness and levelness. Permissible tolerance is +/- 1/16 in. (1.5mm). If the floor exceeds this, it is the general contractor's responsibility to correct the area that is out of tolerance before the frame is installed.

**Frame shall be checked for correct size, swing, preps, fire rating and opening number prior to installation.**

Remove temporary steel spreaders. Spreaders can typically be removed with cold chisel and hammer. With lead lined frame standing on concrete, position cold chisel at weld joint of spreader and jamb and strike chisel with hammer.

**Installation Tolerances**

During the setting of the frame, check and correct as necessary for opening width, opening height, squareness, alignment, twist and plumbness. Permissible frame product installation tolerances shall be maintained within the following limits:

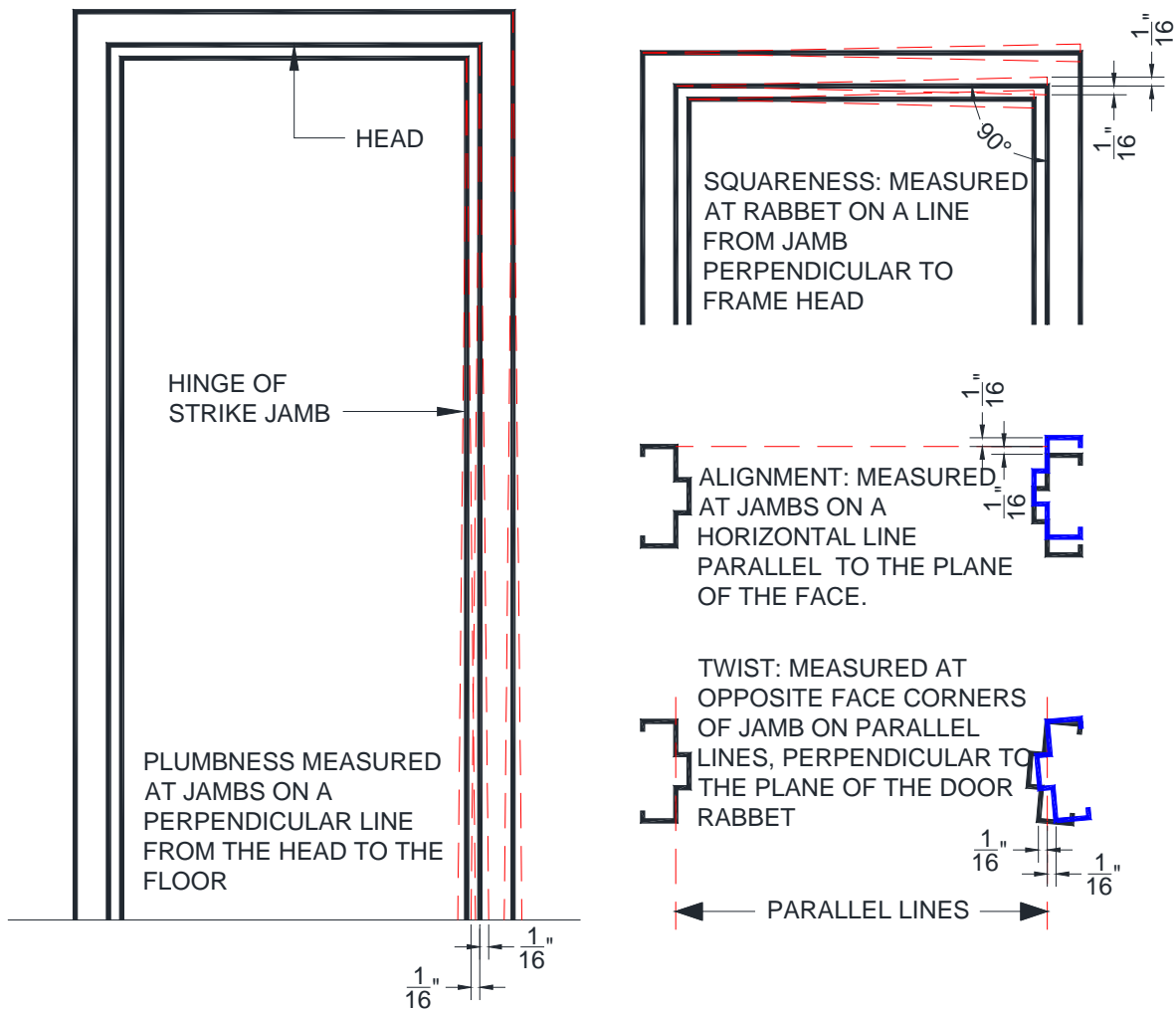
- Opening width: Measured horizontally from rabbet to rabbet at top, middle and bottom of frame; +/- 1/16 in. (1.5mm).
- Opening height: Measured vertically between the frame head rabbet and top of floor or bottom of frame minus jamb extension at each jamb and across the head; +/- 3/64 in. (1.2mm).
- Squareness: Measured at rabbet on a line from jamb, perpendicular to frame head; not to exceed 1/16 in. (1.5mm).
- Alignment: Measured at jambs on a horizontal line parallel to the plane of the face; not to exceed 1/16 in. (1.5mm).
- Twist: Measured at opposite face. Corners of jamb on parallel lines, perpendicular to the plane of the door rabbet.
- Plumbness: Measured at jambs on a perpendicular line from the head to the floor; not to exceed 1/16 in. (1.5mm).

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The tolerances shown provide a reasonable guideline for proper installation of hollow metal frame products. However, it should be noted that the cumulative effect of the installation tolerances at or near their maximum levels could result in sufficient misalignment to prevent the door from functioning properly. Installers should be careful not to create a tolerance buildup. Tolerance buildup occurs when several tolerances are at or near their maximums. Care should be taken to keep each of these tolerances as close to zero as possible.

NOTE: It is very important to use a plumb line to make sure the jambs are plumb especially the hinge jamb. Pivots require that their centerlines line up from top to bottom in a plumb alignment. Refer to pivot manufactures installation instructions for more details.

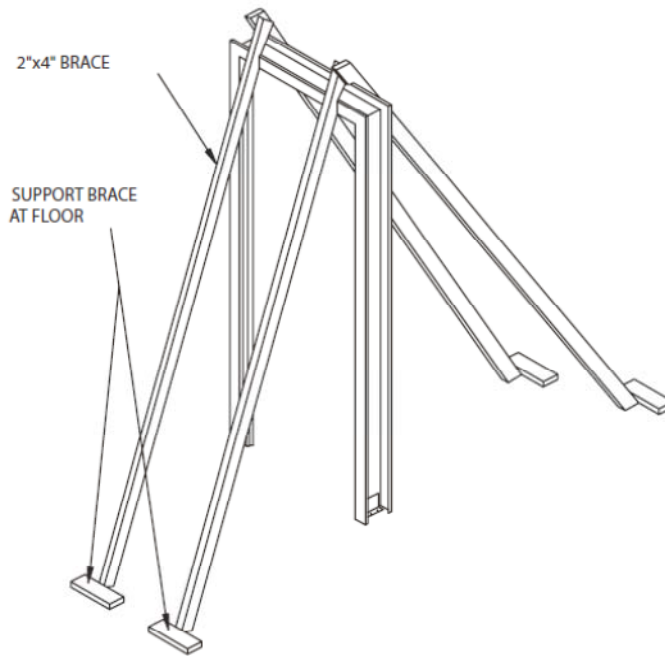


## Typical Installation Procedures

Position frame in the correct location and brace the frame as shown on the next page. Do not brace in the direction of intended wall.

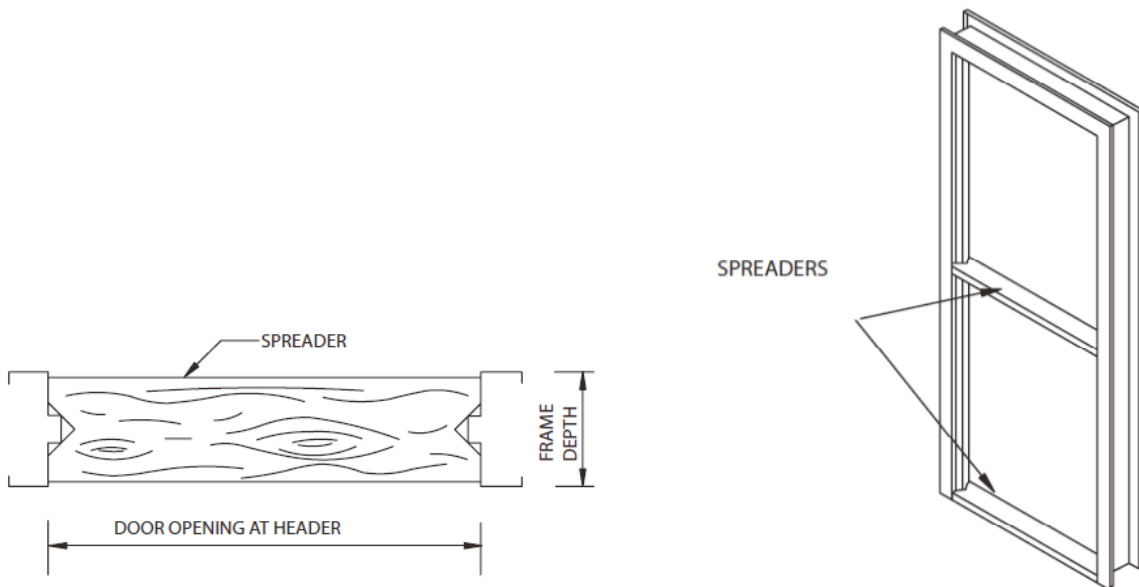
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With frame in position, install the temporary wood spreaders. The wood spreader must be square and no less than 1 in. (25 mm) thick. Correct length is the door opening width between the jambs at the header. Cut clearance notches for frame stops. Spreader must be nearly as wide as frame depth for proper installation. Install a spreader at the bottom of the frame and a second wood spreader at the mid or strike point to maintain a proper door opening and to prevent bowing of the jambs. Clamp or wire spreaders to frame to hold spreaders in place until the frames are set permanently in the wall.

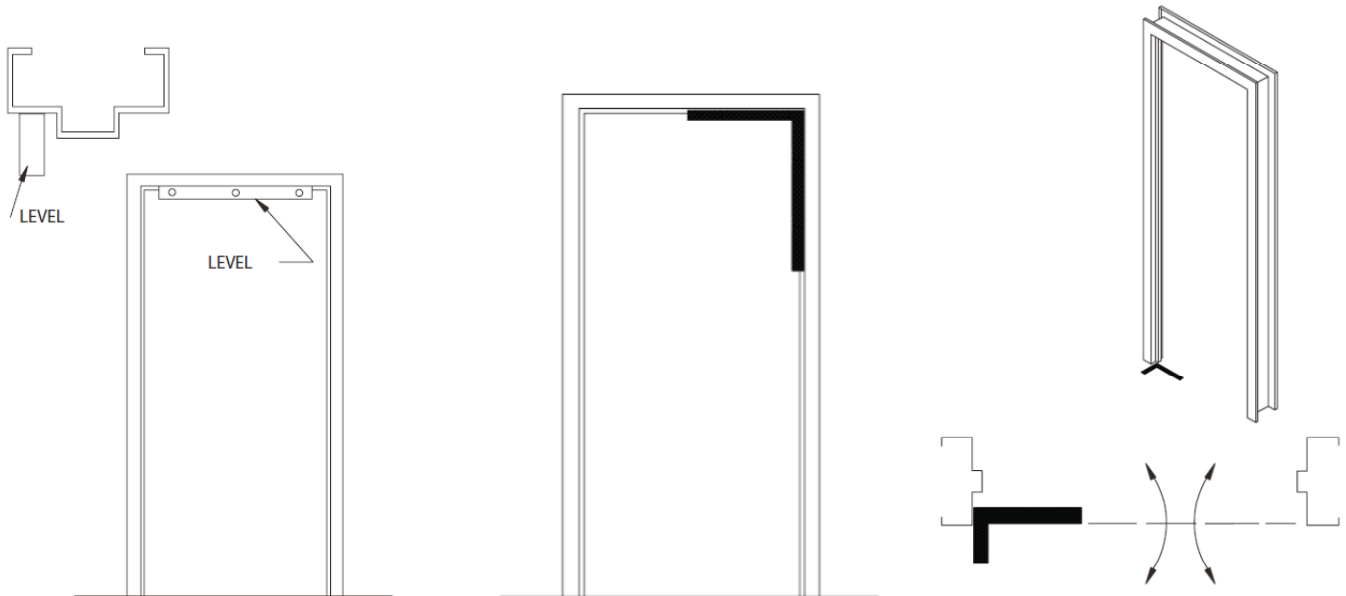
NOTE: If nominal door height is taller than 84 in. (2,134mm), space wood spacers at a maximum of 36 in. (914mm) center to center between header and bottom of frame.



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The installation contractor shall have a plumb bob, carpenter level and builder's square. Level the head by positioning the level to the head door rabbet. If necessary, adjust for high spots in floor by shimming under the jamb floor anchor. Note, for labeled openings the maximum floor clearance is 3/4 in. (19mm). With builder's square, check frame for squareness and twist. Position square against jamb and head at door rabbet to check for square, adjust as required. Position square against door rabbet and project line perpendicular to the plane of the door rabbet, adjust as required.



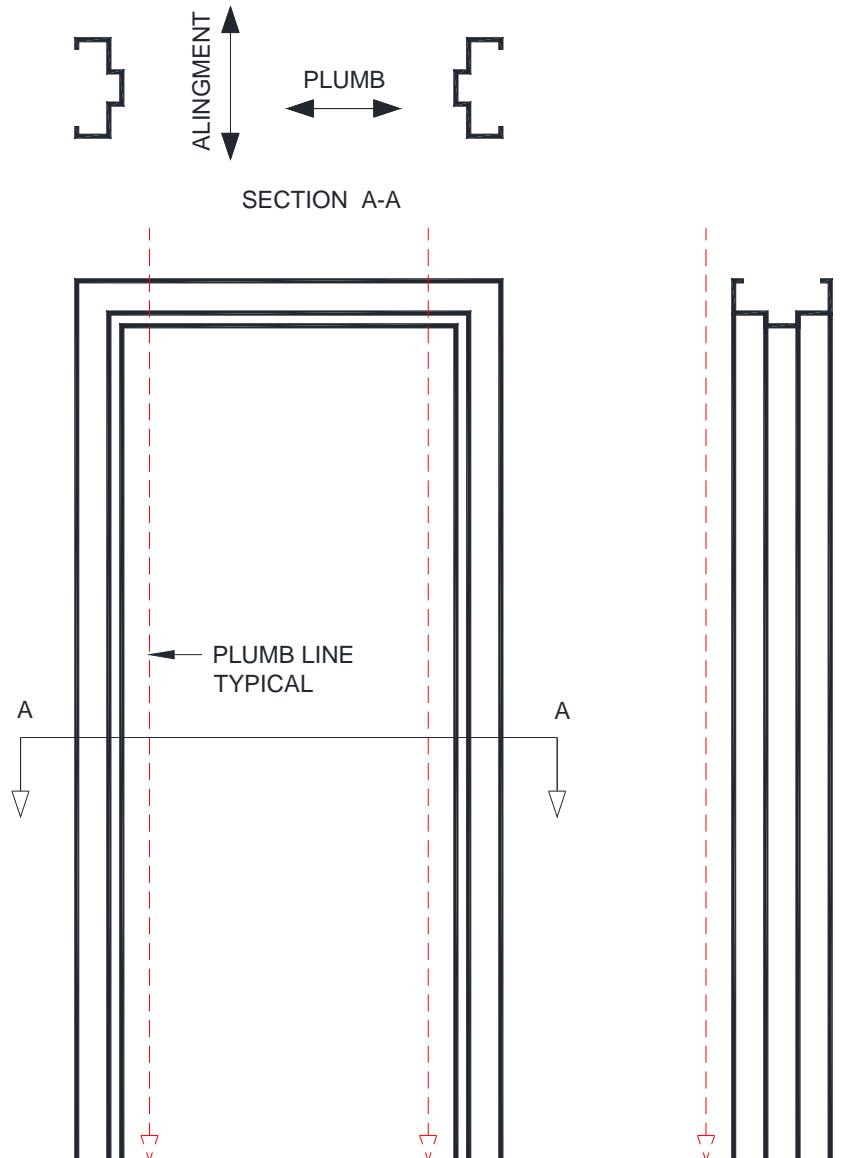
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With a plumb bob and line check the frame for plumbness and alignment:

For plumbness, position plumb lines at both hinge and strike jambs in the rabbet and measure both top and bottom to make sure they are plumb.

For alignment, position plumb lines to check both hinge and strike jambs, adjust as required.



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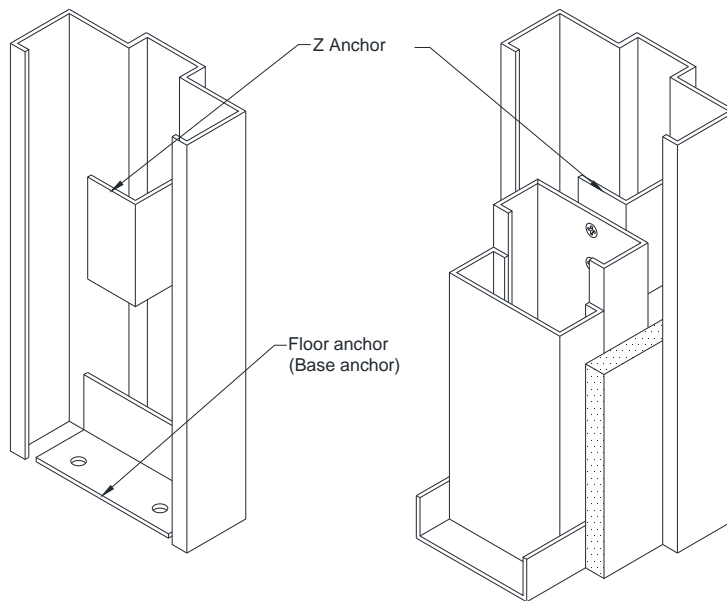
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Once the installer has ensured that the frame is in the correct position, anchor the jamb to the floor.

**Floor Anchors (Base anchors):** The fixed floor anchor is welded to the base of the jamb, typically secured to the floor by mechanical fasteners (by others), providing solid anchorage for the base of each jamb. Shimming must be used if the floor is not level.

**Jamb Anchors:** Z shaped anchor is welded to frame rabbet inside the jamb. Steel studs are mechanically fastened to the exposed flange through the throat of the stud.

Position the vertical steel studs in the frame throat opening in accordance with Architect's details. Attach the vertical steel studs to floor and ceiling runners and fasten to the steel stud anchors with mechanical fasteners.



Proper frame anchoring is vitally important to the proper performance of the door opening. A variety of jamb wall anchors are available to suit the various types of wall construction. We are only covering anchors for welded frames with steel studs in this document.

**Wall Construction:** It is extremely important that the steel stud manufacturer's recommendation on thickness and general construction technique be followed to ensure that a solid and stable opening is achieved.

Continually check squareness, plumbness, alignment, and twist in the frame as wall progresses.