

## TYLER BUILDING SYSTEM MATERIAL SPECIFICATIONS

### 1. GENERAL

#### 1.1. SCOPE

- 1.1.1. These specifications apply to material used to fabricate metal buildings systems as engineered and designed by Tyler Building Systems, L.P. (“Tyler”).
- 1.1.2. These specifications describe the material Tyler uses to fabricate Tyler’s “standard” metal building system. In the absence of contract requirements or restrictions to the contrary, these specifications accurately describe the material provided by Tyler. However, these specifications are in no way intended to limit the available options associated with Tyler’s metal building system.
- 1.2. Research & Development: Because of a continuing program of research and development these specifications are subject to change without notice.

### 2. BASIC MATERIAL SPECIFICATIONS

#### 2.1. PRIMARY FRAMING STEEL

##### 2.1.1. Built-Up Sections:

2.1.1.1. Steel for the web portions of built-up sections shall conform to the following table:

Nominal Thickness	Nom. Decimal Thick. (inch)	Min. Decimal Thick. (inch)	ASTM Spec.	Yield
10 ga.	.1345	0.1270	A-1011	Grade 50
8 ga.	.1644	.01569	A-1011	Grade 50
3/16 in.	N/A	0.183	A-1011	Grade 50
1/4 in.	N/A	0.240	A572	Grade 50
5/16 in.	N/A	0.3025	A572	Grade 50
3/8 in.	N/A	0.365	A572	Grade 50

- 2.1.1.2. Steel for flange portions of built-up sections shall conform to the requirements of ASTM Specification A-529 Grade 50, with a minimum yield of 50 ksi.
- 2.1.1.3. The flatness variance plus the material thickness must not exceed 1 inch.
- 2.1.2. Mill-Shape Sections: All wide-flange shapes shall conform to A-992 with a minimum yield of 50 ksi. All other mill shapes, including Channels and S-Beams, shall conform to ASTM A-36 or A-572, with a minimum yield of 36 ksi.
- 2.1.3. Pipe used for interior columns shall conform to ASTM A-53 Type S Grade B or ASTM A-500B, with a minimum yield of 35 ksi. Tubing used for interior columns shall conform to ASTM A-500B with a minimum yield of 46 ksi.
- 2.1.4. Steel for all endwall “C” sections shall conform to the requirements of A-1011 Grade 55, with a minimum yield of 55 ksi.

## 2.2. SECONDARY FRAMING STEEL

- 2.2.1. Steel for purlins, girts, eave struts, and “C” sections shall conform to the requirements of ASTM A-1011 Grade 55. Minimum yield shall be 55 ksi. When coils of this material are purchased, they shall conform to the following dimensions:

Maximum Weight	Maximum O.D.	Minimum I.D.	Maximum Width
10,000#	56”	15”	20-7/8”

- 2.2.2. Steel for zinc-coated purlins, girts, eave struts, and “C” sections shall conform to the requirements of ASTM A-653 G90 Grade 55. Minimum yield shall be 55 ksi.

- 2.2.3. Minimum decimal equivalents for gauges are as follows:

Nominal Size	Minimum Decimal Thickness (inch)
16 ga.	0.056
14 ga.	0.067
13 ga.	0.081
12 ga.	0.100
10 ga.	0.128

- 2.2.4. Purlins and girts shall be cold-formed “Z” or “C” sections with stiffened flanges. They shall be punched during the fabrication process as required by Design Department documentation.

- 2.2.5. All Secondary Framing Steel not manufactured by Tyler shall be procured from a vendor certified to Part B of AC-472.

## 2.3. WELDING FILLER MATERIAL

- 2.3.1. All welding filler material shall specific to the particular Welding Procedure Specification for each welding process.

## 2.4. ROOF AND WALL PANEL MATERIAL

- 2.4.1. Panel material specified as 26 gauge (.0185 min.) shall be Galvalume<sup>®</sup> or Galvalume<sup>®</sup> Plus material conforming to the requirements of ASTM A792 Grade 80 AZ50 (for painted panels) or AZ55 (for bare panels). Minimum yield stress shall be 80 ksi (industry standards Grade E.)

- 2.4.2. Panel material specified as 24 gauge (.023 min.) shall be Galvalume<sup>®</sup> or Galvalume<sup>®</sup> Plus material conforming to the requirements of ASTM A792 Grade 50 AZ50 (for painted panels) or AZ55 (for bare panels). Minimum yield stress shall be 50 ksi (industry standards Grade D.).

- 2.4.3. Panel material specified as 22 gauge (.029 min.) shall be Galvalume® or Galvalume® Plus material conforming to the requirements of ASTM A792 Grade 50 AZ50 (for painted panels) or AZ55 (for bare panels). Minimum yield stress shall be 50 ksi (industry standards Grade D.).
- 2.4.4. All Roof and Wall Panels not manufactured by Tyler shall be procured from a vendor certified to Part B of AC-472.

### 3. MISCELLANEOUS MATERIAL SPECIFICATIONS

#### 3.1. FASTENERS

- 3.1.1. Structural Bolts: All bolts used in frame splices and in connections of secondary framing to primary framing shall be zinc plated ANSI Grade 2, ASTM A307 or yellow-zinc plated ASTM F3125, Grade A325 or A325T, as required by design. The nuts used shall comply with ASTM 563. When washers are required, they shall comply with ASTM 844 for use with Grade 2 or ASTM A307 bolts, and ASTM A436 for use with ASTM A325 bolts.
- 3.1.2. Fasteners for Roof Panels: All panels shall be attached to the secondary framing members by means of a self-drilling structural carbon steel screw with a #12-14 x 1-1/4" long-life zinc-alloy head, with or without paint, assembled with an EPDM washer. These fasteners are applicable for use with fiberglass blanket insulation from 0" to 4" thick. All self-drilling lap screws are 1/4"-14 x 7/8" with a long-life zinc alloy head and EPDM washer, regardless of structural screw length.
- 3.1.3. Fasteners for Wall Panels: Wall panels shall be attached to the secondary framing members by means of a self-drilling fastener made of carbon steel, #12 x 1-1/4" screw with EPDM washers for use with fiberglass blanket insulation up to 3" thick and #12 x 1-1/2" for use with fiberglass blanket insulation 4" to 6" thick. If no wall insulation is present, #12 x 1" screws with EPDM washers will be used. Screws for panel side laps shall be with self-drilling #1/4-14 x 7/8 screws with EPDM washers.
- 3.1.4. Fasteners for Standing Seam roof systems shall be as recommended by the metal roof system manufacturer.
- 3.1.5. Blind Fasteners: All blind fasteners shall be stainless steel 1/8" diameter with a grip range of .126-.187, Size 43.
- 3.1.6. Anchor rods and/or bolts: Anchor bolts are provided by the buyer.

#### 3.2. SEALANTS AND CLOSURES

- 3.2.1. Closure Strips: The corrugations of the roof and wall panels shall be filled with solid or closed-cell, preformed rubber, neoprene or polyethylene closures along the eave, ridge, and rake when required for weather tightness.
- 3.2.2. Metal Closures: Metal closures for standing seam roof systems shall be as recommended and supplied by the metal roof system manufacturer.
- 3.2.3. Sealants: Roof panels shall be sealed as indicated on the Erection Drawings with 1/2" x 3/32" tape sealer. The material shall be a butyl base elastic compound with a minimum solid content of 99%, Schnee-Morehead #5227 or equal. The sealer shall have good adhesion to metal and be non-staining, non-corrosive, non-shrinking, non-oxidizing, non-toxic and non-volatile. The service temperature shall be from -40° F to +180° F.

- 3.2.4. Caulk: Caulk shall be gray or bronze pigmented caulk of polyurethane base, equivalent to Schnee-Morehead SM7100. The caulk shall comply with ASTM C-920 Type S, Grade NS, Class 25, Use-NT, A, M, G & O.

### **3.3. TRIM MATERIAL**

- 3.3.1. Material for 26 gauge trim shall be 26 gauge (.0185 min.) Galvalume® or Galvalume® Plus steel conforming to ASTM A792 Grade 50 AZ50 (for painted material) or AZ55 (for bare material) with a minimum yield of 50 ksi (industry standards Grade D).
- 3.3.2. Material for 24 gauge trim shall be 24 gauge (.023 min.) Galvalume® or Galvalume® Plus steel conforming to ASTM A792 Grade 50 AZ50 (for painted material) or AZ55 (for bare material) with a minimum yield of 50 ksi (industry standards Grade D).
- 3.3.3. The dimensions of the material used for production:
- 3.3.3.1. Length: -1/16, +3/4 inch
- 3.3.3.2. Width: -1/16, +1/8 inch
- 3.3.3.3. All trim angles shall be within 4° of the angle indicated on the drawing.

### **3.4. BRACING MATERIAL**

- 3.4.1. All cable used for bracing shall be 1X7 strand and shall meet ASTM A-475, Class A. The uncut length shall be +/- 1 inch of that required on the TBS Shipper.
- 3.4.2. All steel rods used for bracing shall meet ASTM A-36.

## **4. STRUCTURAL COATINGS**

### **4.1. STRUCTURAL PAINTING**

- 4.1.1. Primer shall be formulated for application by airless handguns and shall be high-solids shop primer. Primer color shall be Red Oxide, tinted to match a paint specimen provided by Tyler.
- 4.1.2. Steel preparation specification: SSPC-SP 2
- 4.1.3. The coating shall meet or exceed SSPC-Paint 15 with the additional requirements:
- 4.1.3.1. Type of Coating Used: High solids, low VOC Shop coat primer
- 4.1.3.2. Maximum VOC: 3.13
- 4.1.3.2.1. Minimum Thickness
- 4.1.3.2.1.1. Wet: 4 mils
- 4.1.3.2.1.2. Dry: 2.5 mils
- 4.1.3.3.1.3. Dry to Touch: 25 minutes Set-to-touch within ¼ to 1 hour.
- 4.1.3.3. Dry through within 18 hours.

- 4.1.4. Tyler’s standard red oxide primer is designed for short-term field protection during the erection process.

Note: Primer systems are not intended as finish coat paint systems and do not offer the uniformity of appearance, durability or corrosion resistance of a top coat applied over a primer. Primers are designed to promote the wetting action and adhesion of a top coat and offer only short-term corrosion protection from ordinary atmospheric exposure. Primer is compatible only for top coating with solvent-based alkyd and modified alkyd top coat paints. Abrasions caused by handling after painting as well as the flaking of tight mill scale are to be expected. Primer shall be furnished to touch-up or field painting as specified in the contract documents.

## **4.2. STRUCTURAL HOT-DIPPED GALVANIZING**

- 4.2.1. All structural parts requiring galvanizing shall have molten zinc applied utilizing a hot dip process conforming to ASTM A-123.

## **4.3. PRECOATED PAINTING**

- 4.3.1. All cold-formed structural framing members shall be cleaned according to SSPC-SP8, or SSPC-SP6, and then chemically pre-treated before being coated with a minimum of .5 mils of polyester-based red primer. The primer contains a “wax” type lubricant to facilitate roll forming and deter marring during these operations. Hairline crazing, which may occur during forming operations, is considered normal. Special preparation is required before a finish coat can be applied over this “wax” finish.

## **4.4. PAINTED PANELS**

- 4.4.1. Base metal for 26 gauge panels shall be 26 (.0185 min.) Galvalume<sup>®</sup> or Galvalume<sup>®</sup> Plus steel conforming to the requirements of ASTM A792 Grade 80 AZ50. Minimum yield stress shall be 80 ksi (industry standards Grade E.)
- 4.4.2. Base metal for 24 gauge panels shall be 24 gauge (.023 min.) or 22 gauge (.029 min.) Galvalume<sup>®</sup> or Galvalume<sup>®</sup> Plus steel conforming to the requirements of ASTM A792 Grade 50 AZ50. Minimum yield stress shall be 50 ksi (industry standards Grade D.)
- 4.4.3. All coatings, colors, and finishes shall be as specified in the contract documents.
- 4.4.4. The panel finish shall be either Siliconized Polyester (Series 200), or 70% Fluoropolymer system (Series 300) as specified in the contract documents.
- 4.4.4.1. Both coatings have the following specifications:
- 4.4.4.1.1. Specular gloss – ASTM D523 – 25-35° at 60° viewing
  - 4.4.4.1.2. Abrasion resistance – ASTM D968 – 30 liters (Series 300 system – 50 liters)
  - 4.4.4.1.3. Humidity Resistance – ASTM 2247 (Series 300 system is additionally covered by ASTM D714) – 1000 hours with no more than 10% showing #8 size blister (Series 300 system – no more than 5% showing #8 size blister)
  - 4.4.4.1.4. Salt Spray Resistance – ASTM B117 (Series 300 system is additionally covered by ASTM D714) – 1,000 hours in 5% salt fog at 95% humidity with no more than 1/16” (Series 300 system – no more than 1/8” average) creepage or loss of adhesion from scribed line and few blister no larger than #8

- 4.4.4.1.5. Weatherometer Test – ASTM D822 & G23 – 2,000 hours exposure
- 4.4.4.1.6. Post-Formability – D522 – 180° bend around 1/8” mandrel (with Series 200 system, slight microfracturing is acceptable)
- 4.4.4.1.7. Pencil Hardness:
  - 4.4.4.1.7.1. Series 200 system – F-3H
  - 4.4.4.1.7.2. Series 300 system – ASTM D3363 – HB-H
- 4.4.4.1.8. Adhesion:
  - 4.4.4.1.8.1. Series 200 system – ASTM D2794 – No loss of adhesion between coating and substrate after 80”# impact over .019” minimum
  - 4.4.4.1.8.2. Series 300 system – ASTM D3359 – No removal of finish after 1/16” cross-hatching to bare metal, to impact limits or point of metal rupture
- 4.4.4.2. Painted Panel Warranty available upon request.
- 4.4.5. Interior Finish: The interior finish shall have a white or parchment top coat over epoxy primer or an epoxy base coat, white or parchment, with a clear polyester top coat.
- 4.4.6. All panel material delivered to TBS shall be crated and covered so that all panels are protected from damage during shipment.

## 5. ACCESSORIES

### 5.1. WINDOWS

- 5.1.1. Standard Windows shall be horizontal slide units, polished aluminum finish 3’-0” x 3’-0”, 4’-0” x 3’-0”, or 6’-0” x 3’-0”. They shall be furnished complete with hardware and half screen. They shall be certified by Architectural Aluminum Manufacturers Association for performance requirements of ANSI/AAMA 101-97.

### 5.2. PERSONNEL DOORS

- 5.2.1. Personnel doors shall be 3’-0” x 7’-0” x 1 3/4” manufactured from 20 gauge galvanized steel.
- 5.2.2. Door shall have square edges for no-handed installation.
- 5.2.3. Door shall have an embossed finish with a white prime coat.
- 5.2.4. Doors shall be flush and have vertical mechanical interlocking seams on both hinge and lock edges.
- 5.2.5. Doors shall be provided with top and bottom inverted 16 gauge galvanized steel channels spot welded within the door.
- 5.2.6. Doors shall have a pre-foamed polystyrene slab filling the inside of the doors, secured to the face sheets with a waterproof adhesive applied with automated spray equipment.
- 5.2.7. Doors shall be reinforced for applicable hardware.

- 5.2.8. Doors shall be solid, half glass, or side vision (narrow lite).
- 5.2.9. All glazing shall be by other trades in the field. Glazing is not provided by Tyler.
- 5.2.10. Door frames shall be 16 gauge galvanized steel, pre-painted white.
- 5.2.11. Door jambs shall be constructed for non-hand installation.
- 5.2.12. Door frames shall be provided with head and jamb flashing.
- 5.2.13. Door frames shall be provided with three 4 ½” x 4 ½” hinges and reversible strike plate.
- 5.2.14. The standard lockset shall be a deadbolt with a passage lever. The deadbolt shall meet ANSI A156.5 – E5152 or equal.
- 5.2.15. Door threshold shall be aluminum and is compatible with A.D.A. requirements. A sweep is supplied with each threshold. Note: Tyler’s standard threshold is designed for use with out-swinging doors only. For building applications requiring in-swinging doors, Tyler recommends a special-ordered threshold as well as a door canopy.

**5.3. OVERHEAD DOORS**

- 5.3.1. Overhead doors shall be equivalent to Overhead Door Systems Series 430.
- 5.3.2. Roll-up doors shall be equivalent to Overhead Door Systems Series 880.

**5.4. GRAVITY VENTILATORS**

- 5.4.1. Gravity ridge ventilators shall be manufactured from Galvalume® A792 Grade 50 pre-painted or bare. The ventilator body shall be 26 gauge (.0185 min.) with flat skirts and shall be pre-formed for a 1:12 pitch. Chain operated damper will be furnished. Ventilators shall be equipped with bird screens, dampers, and riveted end caps. Ventilators shall be 10’ long and have a 9” throat. Twelve inch throat ventilators are available as an option. Remote operators capable of controlling a maximum of 3 vents shall be provided when required by the contract.
- 5.4.2. 20” round ventilators shall be 24 gauge and shall be supplied with a base for ridge mounting.
- 5.4.3. Single vents shall be operated by a 3’ pull chain with handle. For operation of multiple vents, a remote operator kit, including a lever arm and 40’ of cable, is available.

**5.5. LOUVERS**

- 5.5.1. Tyler’s Standard Louvers – The following louvers are Tyler’s standard louvers. If a louver other than these standard louvers is used, the person specifying the alternative louver is responsible for ensuring that the louver will work in the given application.

Type	Product Name	Manufacturer	Supplier
Fixed Fin	Wall Louver	Metallic Products	Metallic Products
Moveable Fin (Manual)	Wall Louver	Metallic Products	Metallic Products
Moveable Fin (Electric)	Motorized Damper	Dayton	Grainger

## 5.6. LIGHT TRANSMITTING PANELS

- 5.6.1. High Strength light transmitting panels (“LTP”) are fiberglass reinforced polyester and shall comply with ASTM D3841, Type CC2, and Grade 2. Standard LTP’s match ‘R’ panel profiles, weigh 8 ounces per square foot, and are white in color. Standard lengths are 10’-8” and 5’-4”. Other profiles, including standing seam, are available.

## 5.7. INSULATION

- 5.7.1. Fiberglass Blanket Insulation shall conform to ASTM specification C991 and NAIMA 404. The standard facing for fiberglass insulation shall be PSK (WMP-VR Plus) for reinforced insulation. Non-reinforced insulation utilizing white vinyl facing is available, as are other facings.

- 5.7.2. Standard thicknesses available are shown on the following chart:

<b>‘R’ Factor</b>	<b>Thickness</b>
R-10	3”
R-11	3.5”
R-13	4”
R-19	6”
R-25	8”
R-30	9-1/2”

## 5.8. ROOF CURBS

- 5.8.1. Roof curbs shall conform to Tyler Building Systems’ Roof Curb Standard.

## 5.9. PIPE FLASHING

- 5.9.1. Pipe flashing shall be of a one piece construction and fabricated from an EPDM membrane and shall have an aluminum base that can be field conformed to any panel configuration. Pipe flashing shall be flexible for mounting on any roof slope. Service temperature ranges shall be from –30°F to +250°F. Pipe flashing is not required unless specified by the contract.