

# TCS Satin™ Specifications

## PRODUCT DESCRIPTION

**Basic Use:** TCS Satin is used for all types of roofing (standing seam, batten seam, Bermuda seam and flat lock), for perimeters, for mansards, for fascia, for coping, for gravel stops, for wall covering and for all flashing, exposed or concealed. TCS Satin is suitable for all types of weathersealing and drainage (gutters, all styles and downspouts).

**Composition and Materials:** TCS Satin is a type 304 (Non-Magnetic) dead soft stainless steel covered on both sides with the new ZT ALLOY (50% tin, 50% zinc) to a thickness of 20 microns and micro-embossed under high pressure rollers to create a low reflective surface.

The chromium-nickel content and the annealed properties make TCS Satin one of the most versatile and one of the most corrosion resistant roofing and flashing materials available today.

**Sizes:** Sheets - widths 20, 24, and 36 inches. Lengths 96 and 120 inches. Special sizes available up to 36 by 144 inches. 50 foot rolls in widths of 20, 24, and 36 inches. Also available in all widths are 2000# to 4000# mill coils.

**Gauges:** 24, 26, and 28 plus coating. Only 36" wide available in 24 gauge.

**Weight:** 28 gauge - .67# per sq. foot; 26 gauge - .77# per sq. foot; 24 gauge - 1.02# per sq. foot (Note: All weights are theoretical, and could vary.)

**Color:** Under most atmospheric conditions, TCS Satin will weather to an attractive, warm gray. However, since the weathering of TCS Satin is accomplished through atmospheric exposure color may vary relative to the local environment. TCS Satin does not require painting.

## INSTALLATION

**Method:** Install in accordance with standard sheet metal practices (See Follansbee TCS Satin specifications and data manual).

**Note:** Follansbee TCS Satin specifications and data manual do not purport to provide information covering all design and application situations, which may confront architects and applicators. In order to safeguard all purchaser's warranty rights; architects and applicators should in every case first refer to the most recent details or procedures concerning designs or applications involving Follansbee products, which were published by Follansbee. Additional application and detail information may be found in the current Architectural Sheet Metal Manual published by Sheet Metal and Air Conditioning Contractors National Association, Inc. However, should any conflict arise between any details or procedures published by Follansbee and those published in any other publication the detail or procedures published by Follansbee shall take precedence. Failure to comply with any of the conditions set forth herein will void Follansbee's warranty. All projects should be designed to divert water away from the vertical surface of the building.

**Forming:** TCS Satin, a dead-soft metal, forms with conventional hand and regular sheet metal shop tools and can be cut with standard sheet metal hand snips or power tools. For standing seam roofs, preformed ready to apply pans are available in lengths up to 25 feet. Special sizes up to 35 feet maximum.

**Soldering:** Surfaces can be pre-tinned to facilitate soldering. Use soldering irons only (3lb. minimum). Do not use torches or welding. Use pure tin solder. Use rosin flux or Follansbee's speed flux only.

**Note:** The pre-weather wash coat must be removed for a good solder joint. Lacquer thinner works best when removing the wash coat.

Minimum Gauge Application Recommendations: Roofing - Standing Seam, .015 minimum gauge; Flat lock seam, .015 maximum gauge; Mansard, .015 minimum gauge. Flashing - Exposed, .015 minimum gauge; Concealed, .015 minimum gauge. Fascia - .018 minimum gauge. Gravel Stop - .015 minimum gauge. Rain-carrying Equipment - .015 minimum gauge.

## **MAINTENANCE**

TCS Satin is essentially a maintenance free product in that no protective surface painting or treatment is required. Debris, which settles upon the roof, should be removed promptly to avoid stain or discoloration due to oxides or chemical reactions. Severe staining related to the above is an aesthetic problem, which may require painting in order to restore desired appearance. The typical weathering process of TCS Satin transitions from virgin metallic to milky gray and eventually to an earth tone shade of gray. This process is in reaction to atmospheric conditions at the project site and transformation time varies relative to local conditions. No oxide accelerants should be used in an attempt to speed this natural process.

## **PREFORMED STANDING SEAM DETAIL**

Prefomed standing seam roof sheets are available in standard 8', 10', and 12' lengths. Special sizes up to 35'. Panforming equipment is available for lease to accomplish lengths in excess of 35'.

## **TECHNICAL SERVICES**

Call 800-624-6906 for any additional information or technical assistance.

# TCS Satin®

**Table 1: Comparative Property of Architectural Metals**

| Property  | TCS Satin  | Terne                           | Copper | Lead-Coated Copper | Aluminum | Galvanized Steel |
|---|--|---------------------------------|--------|--------------------|----------|------------------|
| Standard Thickness  | .015 + coating   | .015                            | .0217  | .0217 + coating    | .025     | .0217            |
| Weight per Sq. Ft. Lbs.   | .67  | .65                             | 1.00   | 1.15               | .356     | .908             |
| Core Metal  | 304 non-Magnetic Stainless Steel (18% Chrome, 8% Nickel) | Copper Bearing Carbon Steel     | None   | Copper             | None     | Carbon Steel     |
| Coating   | ZT alloy (50% Zinc, 50% Tin)                             | Terne Alloy (80% Lead, 20% Tin) | None   | 96% Lead, 4% Tin   | None     | Zinc             |
| Nominal Temper  | Soft   | Soft                            | Soft   | Soft               | 0        | Soft             |
| Yield Strength 1000 psi   | 42   | 30                              | 11     | 11                 | 10       | 40               |
| Tensile Strength 1000 psi   | 80   | 45                              | 35     | 35                 | 25       | 52               |
| Elongation % in 2"  | 50   | 30                              | 30     | 30                 | 20       | 27               |
| Expansion in 64th of an inch per 100° F. per 10' length (approximate) | 8  | 5                               | 8      | 8                  | 10       | 5                |

## Type 304 Chemical / composition (%)

| Ni    | Cr    | Si   | C    | P     | S     | Mn   |
|-------|-------|------|------|-------|-------|------|
| 8.00  | 8.00  | 1.00 | 0.08 | 0.045 | 0.030 | 2.00 |
| 10.50 | 10.50 | MAX. | MAX. | MAX.  | MAX.  | MAX. |

## SECTION 07610 SHEET METAL ROOFING

### 1.1 GENERAL

**A. Performance Requirements:** Provide a custom sheet metal roofing system capable of withstanding structural movement, thermally induced movement, and a complete watertight enclosure fabricated from TCS Satin sheets to the configuration and details described herein and depicted on the architectural drawings accompanying these specifications. The system includes all custom formed sheet metal roofing pans, solder, felt and rosin paper.

**B. Submit the following: Product Data:** Include Follansbee's product data, general specifications, standard details, wind uplift test results. Shop drawings: Show plan of TCS Satin panel layout and how, if needed, expansion and contraction of material is provided using stationary cleats or expansion cleats. Show direction of roof expansion and contraction. All penetrations through TCS Satin panels. Details at eave, ridge, hip, valley, rake, cricket, flashings, and penetrations and any special details. Show all cross seams locations and type depending on roof pitch. Sufficient technical data to demonstrate compliance with these specific requirements. Fastener, cleat and attachment layout, with load carrying capacity to meet these specifications and how the cleat and fastener will hold into the substrate. A description of installation procedures which, when approved by the architect, will become the basis for accepting or rejecting the work.

## 1.2 QUALITY ASSURANCE

**A. Installer Qualifications:** Installer must be proven, experienced applicator who has completed several custom projects using SMACNA or Follansbee Specifications and details along with owner, architect and general contractor contacts. Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work.

**B. Guarantee:** Roofing contractor to provide standard two year material and workmanship for a watertight installation. This warranty does not cover damages caused by acts of God, ordinary wear and tear or unusual abuse or neglect or acts and omissions of parties other than the sheet metal roofing manufacturer or installer. **Warranty:** Provide Follansbee's standard warranties covering products to be free from perforation resulting from corrosion.

**C. Referencing Specifications and Standards:** Follansbee Steel Specifications and Data Manual Sheet Metal and Air Conditioning Contractors National Association (SMACNA) American Society for Testing and Materials (ASTM)

## 1.3 PERFORMANCE AND TESTING

**A. Provisions for thermal movement:** Metal roofing systems shall be fabricated and installed so that they provide for expansion and contraction of the component materials without buckling, hole elongation, fastener failure or excess stress loading situations developing at any time during the temperature cycle. Cleats shall be installed to resist rotation (2 fasteners per cleat) and to avoid stress when roofing expands and contracts. Any continuous panel run exceeding 30 feet must involve expansion cleats. Follow Follansbee Specifications and Data Manual or SMACNA for all recommendations to design details.

"Oil Canning"

*The Architect should be aware that minor surface deflections known as oil canning are inherent in thin sheet metal skins. Factors such as reflectivity will amplify the oil canning appearance until the patina occurs. Also wide flat surfaces will show deflections readily. Oil canning does not affect the finish or structural integrity of the panel and is, therefore, not cause for rejection. Oil canning induced from buckling stresses however, should not be allowed. These are normally a result of improper application.*

**B. Uplift resistance:** Metal roofing systems shall be fabricated to resist the negative pressure and uplift loads as shown in the SMACNA Manual - 5th edition, appendix A-4.

If necessary a separate independent test can be performed to determine the actual pullout of the particular fastener in the particular substrate. Most fastener manufacturers have tested their parts in different substrates. It is recommended that a safety factor be used with all fastener applications.

## 1.4 PRODUCT

**A. Micro-embossed, ZT ALLOY® Coated Stainless Steel (TCS Satin):** ASTM.240, type 304 stainless steel coated both sides with a minimum alloy (50 Tin/50 Zinc) to a thickness of 20 microns and micro-embossed under high pressure rollers.

**B. Standing Seam Roof Panels:** Standing seam system shall be designed for concealed mechanical attachment of roofing panels to substrate.

**C. Cleats:** Use Follansbee preformed cleats or fabricate from TCS Satin or TCS II flat stock sheet product to Follansbee's Specifications.

**D. Slip Sheet:** Use rosin sized paper as final underlayments under TCS Satin

**E. Felt Underlayment:** Minimum one layer 15 lb./100 sq. ft. asphalt saturated felt paper.

**F. Fasteners:** Minimum 7/8" Series 300 stainless steel ring shank nail or equal screw type fastener.

**G. Solder:** Remove pre-weather wash coat around edges to be soldered with lacquer thinner. To facilitate soldering, it is recommended that the edges of sheets to be joined be pre-tinned.

Use pure tin solder with rosin of Follansbee speed flux. Flux residues must be neutralized with soda water and removed. Use soldering irons only. Do not use abrasives in preparing the surface for solder.

### **1.5 FABRICATION**

A. Shop fabricate to the maximum extent possible.

1. Custom fabricate all flashings by obtaining field dimensions for accurate fit.
2. Layout so cross seams, when required, will be in the direction of flow with higher pans overlapping the lower pans. Keep field cutting to a minimum.
3. Cross Seams: Provide staggered transverse seams.
4. Provide expansion cleats on standing seam pans 30 feet or more in length.
5. Provide expansion joints as required.
6. Penetrations through the roof are to be fabricated and installed to allow for expansion and contraction of the roof sheet without buckling.

### **1.6 STORAGE AND HANDLING OF TCS SATIN**

- A. Materials stored at a project site must be covered and sloped for moisture to drain from the surfaces.
- B. Follansbee recommends that TCS Satin not be exposed to weather and should be in a climate controlled environment.
- C. Materials stored on site must be vented to allow condensation to escape.
- D. Handling: The Architectural Sheet Metal Contractor shall not be required to move his materials except as needed to install the roof.

### **1.7 INSTALLATION**

#### **1.7.1 Surface Conditions:**

- A. Pre-roofing conference after substrate is installed; with all related trades, architect, general contractor and owner's representative. Conference should agree that surface is ready for installation of finished custom metal roofing.
- B. Examine the areas and conditions under which work of this Section will be performed. Do not proceed until unsatisfactory conditions are corrected.
- C. Verify that the substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored, and that provisions have been made for roof drains, scuppers, flashings, and all other interface items attaching to or penetrating through the work of this Section.
- D. TCS Satin to be applied to wood or fluted metal deck minimum ½" plywood to be specified. TCS Satin should NOT be installed over CCA (Chromated Copper Arsenate) or ACQ (Alkaline Copper Quaternary) treated lumber. If sheathing boards are specified, maximum 2" spacing between boards.

#### **1.7.2 General**

A. The installed work of this Section will not be used as a storage space for other materials.

B. Do not permit unnecessary waling on the finished roof. Require all personnel to wear rubber-soled shoes when installing or walking on a finished roof.

### **1.7.3 Installation of Roofing:**

#### **A. Procedures**

1. Install roofing felts lapping a minimum of 4 inches (102 mm). Apply the specified slip sheet. Prevent moisture from damaging substrate prior to installation of final metal skin.
2. Install roofing sheets and flashings in strict accordance with original design, pertinent regulations of governmental agencies having jurisdiction, and the recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under the anticipated weather conditions. Initially layout and locate all lines and panel terminations. For batten seam roofs, layout all battens accurately onto the substrate prior to installation of the sheets.
3. Install clips to hold sheet into position. Use two fasteners per clip to prevent rotation.
4. Installation performed by qualified trained personnel experienced in the installation of metal roofing and employed by the metal roofing contractor.
5. Installation to have seams and lines as established by the approved shop erection drawings.
6. Metal roofing to be installed per approved drawings with fixed points determined by direction of expansion.
7. Nail cleats a maximum of 12 inches (305 mm) on center; turn tabs over nail or use appropriate stainless steel fasteners. For battens, preinstalled clips, anchor battens to substrate using compatible fasteners spaced as required to hold design uplift but at no times greater than 18 inches (460 mm) apart. Clips should be centered no more than 12 inches (305 mm) on center on the battens.
8. Complete seaming of standing seam panel by automatic seaming machine or other accepted and approved method designed to obtain the proper seam dimension and height.
9. Minimize all exposed fasteners, utilize cleated seams whenever possible.
10. Protect against dissimilar metal contact.
11. Details should be per SMACNA ARCHITECTURAL SHEET METAL MANUAL recommended details.

### **1.8 ACCEPTANCE AND CLEANUP:**

1. Remove and properly dispose of all foreign material and debris from roof and gutters. Be sure no dissimilar metal or other materials are left on roof surface.
2. Clean and neutralize all flux materials.
3. Clean off all excess solder and sealants.
4. Wipe off all hand prints, smudges and other superficial stains that were placed on the custom metal roofing and flashings during fabrication and installation.
5. Remove and replace all dented and damaged materials.

ll specification details available on [www.follansbeeroofing.com](http://www.follansbeeroofing.com).