

# Solanum™ Steel

Solanum Steel is a next-generation pre-oxidized weathering steel that offers rich earth tones and enduring beauty. With hues of browns to deep reds, Solanum Steel brings the warm tones and rugged durability of a steel that has endured years of exposure to the elements, without the wait.

## MAIN FEATURES AND CHARACTERISTICS

- Pre-weathering delivers a decades-old look upon delivery.
- Zahner's Solanum process reduces the rust runoff and staining that accompanies natural oxidation.
- Available in a wide variety of sheet thicknesses, sizes and order quantities - Solanum Steel can fit almost any project and budget.
- 100% metal construction means familiar and common fabrication techniques, a non-combustible surface, and easy recyclability at end-of-life.

## AVAILABLE THICKNESSES AND SIZES

Solanum Steel is supplied in a variety of sheet thicknesses and sizes, and is available as either a single- or double-sided product. Refer to the table below for more detailed information regarding the standard thicknesses and sizes.

| THICKNESS AND SIZE AVAILABILITY |                                        |          |          |         |          |          |
|---------------------------------|----------------------------------------|----------|----------|---------|----------|----------|
| Gauge ["]                       | Sheet Sizes                            |          |          |         |          |          |
|                                 | 4' x 8'                                | 4' x 10' | 4' x 12' | 5' x 8' | 5' x 10' | 5' x 12' |
| 18 ga [0.048"]                  | available single-sided or double-sided |          |          |         |          |          |
| 16 ga [0.060"]                  |                                        |          |          |         |          |          |
| 14 ga [0.075"]                  |                                        |          |          |         |          |          |
| 12 ga [0.105"]                  |                                        |          |          |         |          |          |
| 11 ga [0.120"]                  |                                        |          |          |         |          |          |
| 3/16" [0.179"]                  |                                        |          |          |         |          |          |

## DIMENSIONS AND TOLERANCES

Dimensional tolerances for Solanum Steel are provided in the table below.

| DIMENSIONAL TOLERANCES               |                   |            |
|--------------------------------------|-------------------|------------|
| Property                             | Unit              | Value      |
| Width                                | in                | +1-1/2, -0 |
| Length                               | in                | +1, -0     |
| Out-of-Square deviation <sup>1</sup> | in per 6 in width | 1/16       |
| Flatness <sup>2</sup>                |                   |            |
| 18 ga                                | in                | 3-3/8      |
| 16 ga - 3/16"                        | in                | 2-1/2      |

<sup>1</sup> The out of square deviation is one half of the difference between the diagonals of a sheet. For example, in a 4' x 10' sheet, the out-of-square tolerance would be (1/16") x (48" ÷ 6") = 1/2", which translates to an acceptable difference between diagonals of 1".

<sup>2</sup> Maximum deviation from a horizontal, flat surface.

## PATTERN AND COLOR

Solanum Steel is made to order by Zahner artisans, using an accelerated weathering process that results in an authentic ferrous oxide layer that is subject to natural variations in color and pattern. No two sheets of Solanum Steel are identical. If anticipating the need for the future replacement of Solanum Steel sheets, it is recommended to order additional sheets to minimize batch-to-batch variation.

MATERIAL HEALTH AND TRANSPARENCY

Solanum Steel is qualified under the International Living Future Institute's Declare label program and is free of toxic ingredients as defined by the ILFI Red List.

MATERIAL AND PHYSICAL PROPERTIES

Solanum Steel is a high strength, low alloy steel with improved atmospheric corrosion resistance as designated under ASTM A606 for Type 4 steel. Select material and physical properties are presented in the table below.

SELECT MATERIAL AND PHYSICAL PROPERTIES

| Property                         | Unit                | Value                  |
|----------------------------------|---------------------|------------------------|
| Density                          | lbs/ft <sup>3</sup> | 490                    |
| Coefficient of Thermal Expansion | in/in/°F            | 6.5 × 10 <sup>-6</sup> |

FLAMMABILITY

Solanum Steel is 100% monolithic steel with a ferrous oxide surface layer and is a non-combustible material.

OUTDOOR USE AND LIMITATIONS

Solanum Steel in thicknesses 14 gauge and thicker can be used in most exterior applications. Due to the potential for deterioration due to long-term oxidation, 16 gauge and thinner should be back-painted if used on exterior applications. 18 gauge should only be used in interior applications.

Certain horizontal applications, such as exterior counters or seating, are discouraged for all thicknesses due to the potential for water to pool and create spotting or other staining effects.

CLEANING

Clean Solanum Steel using warm soapy water and a clean, soft cotton cloth, followed by a thorough rinse using clean water. Wipe dry with a clean, soft cotton cloth.

When cleaning for the first time, test in an inconspicuous area. If a successful result is obtained, cleaning the rest of the surfaces can begin. Clean the entire surface equally to avoid visible differences in appearance.

FABRICATION GUIDELINES

Please follow the guidelines for fabricating sheets of Solanum Steel.

General notes for all fabrication

- Follow best-practices in regards to proper occupational health and safety measures, such as the wearing of eye protection, and the use of respirator devices when grinding or polishing.
- Prior to fabrication for your project, it is strongly recommended that any fabrication steps be tested on sample material or fall-off.

Cutting and Drilling

Use high speed steel, heavy duty machine drill bits at the proper speed when drilling holes in Solanum Steel.

Solanum Steel may be cut using a shear for simple linear cuts. The use of cardboard or other surface protection measures are recommended to protect the surface from oils and other debris.

For the cutting of simple curves and forms, the use of manual cutting methods appropriate for sheet steel, eg, a bandsaw, a cutting wheel, or a jigsaw with proper blade, etc. will suffice.

For the cutting of complex and/or detailed shapes, CNC methods, such a plasma or laser cutting machine capable of cutting steel, is recommended. For appropriate cutting parameters (speed, power, etc), please reference the manufacturer's recommended settings for steel.

Use of a waterjet cutting machine is discouraged, as the water stream will alter the appearance of the Solanum surface in regions near the cut path.

**NOTE**

Operations such as cutting and drilling will expose raw, non-oxidized edges. If needing to adjust the appearance of these edges to blend more naturally with the original Solanum surface, see the instructions in the REFINISHING section below.

**Bending**

Solanum Steel can be bent to a variety of forms using commonly practiced sheet-metal bending techniques. To maintain the appearance of the Solanum surface, the following best-practices are recommended:

- DO use a brake-press with a properly sized punch and die.
- DO use Rhino Hide or an equivalent aid to protect the surface.
- DO NOT bend to a radius less than 2.5x the thickness of the sheet.

**Welding and Soldering**

Solanum Steel is compatible with all steel welding methods, including stud welding techniques.

Note that the Solanum Steel surface in the vicinity of the welds will need to be removed prior to welding. Therefore, it is recommended that designs that require welding take this into account and locate the welds where they will be hidden from view.

**Gluing**

Solanum Steel is compatible with a variety of common adhesives designed for metals. Follow the manufacturer's recommended procedures for steel/metal when bonding Solanum Steel to other materials. Do not bond directly to the Solanum surface as the oxide can, over time, separate from the base steel substrate and result in adhesion failure.

**STORAGE AND HANDLING**

Solanum Steel should be stored in its original packaging in a dry, indoor location away from direct sunlight. Store the product on flat, level ground. Keep in a low-traffic location to help protect all edges from incidental damage. Any protective masking, if applied, should be removed within 6 months of the date of shipment.

- Do not store outside, in direct sunlight, or in wet environments.
- Do not stack objects on top of the products or packaging.

**Handling**

When handling Solanum Steel, the wearing of cotton, nitrile or latex gloves is recommended to prevent dirt and oils from contaminating the finish. When carrying or manually transporting, take all necessary precautions to prevent denting, scratching or other damage to the finish. If temporarily setting sheets of Solanum Steel on an edge, the use of wood blocking and/or shop towels is recommended between the sheet's edge and the ground in order to prevent denting or deforming of the edge.

## REFINISHING

The surface of Solanum Steel is self-repairing. Over time, scratches that penetrate the surface will re-oxidize naturally.

If an accelerated regeneration of the oxide finish is required, the recommended process is as follows:

1. Dilute 2 tablespoons of sodium chloride (table salt) in 17 fl oz water. Using a spray bottle adjusted to fine mist, spray the exposed surface. Keep the spray to a light mist and avoid allowing the water to bead up on the surface and run.
2. Allow to air dry.
3. Repeat as often as possible over an 8 hour period, or until the weathered oxidation finish has regenerated.

Initial results may not exactly match the color of the original Solanum Steel, but additional coloration will occur naturally over time. If the finish is not acceptable at this point, the sheet will need to be replaced.

## END OF LIFE AND DISPOSAL

Solanum Steel is 100% monolithic steel and can be recycled at end of life using the existing scrap and recycling streams for metals.