

# FOLLANSBEE

*Lifetime roofing metals*

CI/SfB reference

(47) Mh2&3

October 2009

## TCS<sup>®</sup>

The Original Terne Coated  
Stainless Steel



## Klassickolors<sup>®</sup>

The Colour Coated Terne Metal

# Introduction

**Follansbee have been producing terne coated roofing materials for over 100 years and with many prestigious projects completed they have gained an excellent reputation for durability. A programme of continuous development has produced the current range of lead free lifetime roofing materials – TCS II, the terne coated stainless steel, and KlassicKolors, the colour coated terne metal.**

In 1968 Follansbee introduced TCS, the original terne coated stainless steel. This used the same protective terne coating on a stainless steel substrate to produce a maintenance free product. TCS began creating its own history of service as a roofing material, with a natural weathered appearance and a long, maintenance free life. TCS has since been specified by many of the world's leading architects and used on many prestigious projects.

Now, Follansbee is writing a new and exciting chapter in the evolution of roofing materials with the introduction of TCS II. This is an improved version of the original TCS, with a new patented ZT alloy coating, which offers a longer life, due to its improved corrosion resistance, with an environmentally sensitive lead-free alloy composition, and a low reflective finish.

KlassicKolors are a PVDF coating on our ZT alloy coated carbon steel. The PVDF coating is Valspar's Kynar 500 high performance solar reflective paint finish, which reduces the heat absorbed by the metal roof and so keeps the building cooler. There is a wide colour choice, including copper patina and stainless.

## The ZT Alloy



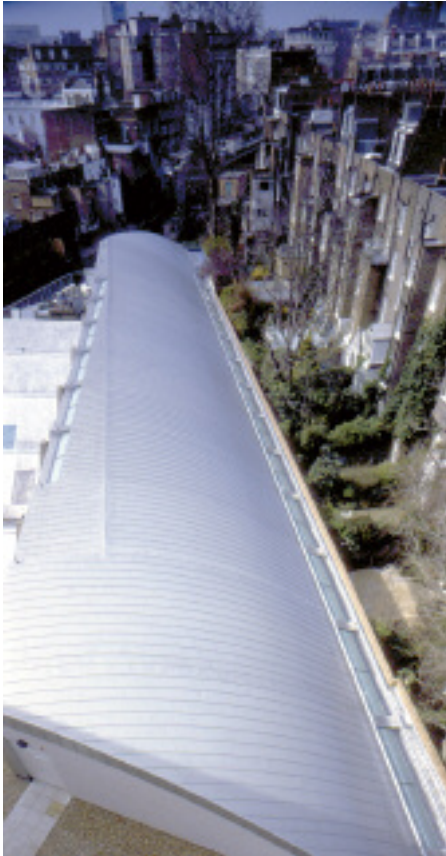
Environmental concerns prompted research into alternative coating compositions and after 7 years of testing Follansbee have perfected their ZT alloy. This tin/zinc alloy has been shown in both laboratory and field tests to have improved corrosion resistance, particularly in marine atmospheres. Samples have been exposed to 5000 hours of salt spray testing, and 5 years of exposure to industrial and marine atmospheres, with no evidence of corrosion.

The durability of a coating depends on its corrosion resistance, thickness and adherence to the metal substrate. The ZT coating has been proved to have excellent corrosion resistance and TCS II has a thick 20 micron coating on both sides. Follansbee's hot dip coating technology produces a pore free coating that diffuses into the

stainless steel to produce a unique inter-metallic zone, where the coating diffuses into the stainless steel, that guarantees excellent adherence.

Tests by Ove Arup on TCS II have confirmed that the ZT coating averages 20 microns per side and is uniform, continuous, with no evidence of porosity. They confirmed the presence of the inter-metallic layer, and that this and the anodic nature of the coating protects the substrate even where the coating has been damaged. Corrosion testing showed that the stainless substrate pays no part in the corrosion resistance of TCS II and confirmed that the product was suitable for use in all atmospheric conditions, even in aggressive coastal atmospheres.

# Application



Follansbee terne metals are one of the most durable and versatile architectural metals ever developed for roofing and cladding applications.

In addition to the traditional standing seam roof, they can be used for wall cladding, barrel vaults and domes. They are suited to rural, industrial and marine environments and can be used for both cold and warm roof applications where absence of underside corrosion is a particular advantage.

They are one of the lightest roofing metals, being a quarter the weight of code 5 lead, and so reduces the load on the structure. This is an advantage

for over-roofing or re-roofing of existing buildings, reducing the need for strengthening the roof structure.

They have a high fatigue strength and low coefficient of expansion so that long lengths can be used in roofs and gutters. This speeds installation, reduces the number of joints and so reduces cost.



Material	Coefficient of thermal expansion 10 <sup>-6</sup> per °C	Expansion mm per metre per 60°C temperature difference									
		0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
Aluminium	23.9	[Bar chart showing expansion values for Aluminium]									
Copper	17.5	[Bar chart showing expansion values for Copper]									
Lead	29.1	[Bar chart showing expansion values for Lead]									
Klassickolors	13.4	[Bar chart showing expansion values for Klassickolors]									
TCS	17.3	[Bar chart showing expansion values for TCS]									
Zinc	31.0	[Bar chart showing expansion values for Zinc]									

The natural weathered appearance of TCS is useful in conservation projects, where planning authorities would like to retain the appearance of lead but where the weight and costs may be prohibitive. The strength and low scrap value of TCS is also an advantage where theft is a problem.

Klassickolors are useful where planning authorities and architects wish to retain the appearance of a traditional copper or zinc roof but the client cannot afford these within his budget, as Klassickolors are substantially cheaper.

The high fatigue strength, low coefficient of expansion and ease of soldering make TCS an excellent choice for long gutters, as steps can be eliminated and downpipes reduced.

# TCS<sup>®</sup>

## The Original Terne Coated Stainless Steel

### Description

Introduced in 1968, Follansbee TCS is the original terne coated stainless steel. Designed as a maintenance free material for fully supported roofing and cladding applications, it has a natural weathered appearance and a 60 year design life expectancy.

Environmental concerns about lead in the terne coating prompted a 7 year research programme to look at alternative alloys and in 1998 Follansbee introduced their patented ZT, tin/zinc alloy coating and commenced production of TCS II. The lead-free ZT alloy has a better corrosion resistance than the original tin/lead alloy, particularly in marine atmospheres, and weathers to a more

consistent warm grey patina in all situations.

TCS II is an architectural stainless steel with a 20 micron coating of the ZT alloy on both sides. It is supplied in coil form to contractors, who roll form the material into trays for installing on the roof.

The new low reflective 'satin' finish eliminates the initial reflectivity of the original TCS and offers a pre-weathered initial appearance, which will gradually darken over time. This is a particular advantage in fascia and soffit applications where weathering can be slow.



**Traditional Weathered Appearance**  
**Environmentally Friendly, Lead-Free Alloy**  
**Exceptionally Durable, Thick Coating**



## Technical Data

Coating thickness	20 microns per side
Stainless steel	Austenitic stainless steel to BS EN 10088, 1995.
Weight	3.27kgs/m <sup>2</sup> at 0.4mm.
Proof Stress	250-300N/mm <sup>2</sup>
Tensile Stress	550-600N/mm <sup>2</sup>
Elongation	50%
Thermal Expansion	17.3 x 10 per °C
Thermal Conductivity	16W/mK
Melting Point	1430°C

## Sizes

TCS II is available in coils of 610mm and 914mm wide, in a thickness of 0.4mm. Other sizes are available to special order.



TCS and TCS II are registered trade marks of Follansbee Steel.

# Klassickolors®

## The Colour Coated Terne Metal



### Description

For over 100 years Follansbee have produced terne coated carbon steel for roofing, which required painting on site after the metal was installed. The development of the ZT alloy, with its higher melting point, enabled Follansbee to produce a pre-painted material. This eliminates the labour cost and lack of quality control associated with painting on site. Valspar, the paint manufacturer, tested the ZT alloy coated carbon steel and found it provided excellent paint adhesion. Consequently, the coating will not flake, peel or crack even after forming of the standing seam.



The ZT alloy gives excellent corrosion resistance to the carbon steel. Samples that have been scored through to the carbon steel have shown no corrosion after 5000 hours of salt spray testing, considerably more than the standard 1000 hours quoted for galvanised products.



Klassickolors is a PVDF coating on top of our ZT alloy coated carbon steel. The coating is Valspar's high performance 70% Kynar 500 coating with a 20 year appearance warranty. The SR coating has enhanced solar reflectance and emittance properties to help reduce the heat absorbed by the cladding and so keeping the building cool.

There are 20 colours, including two metallic finishes, in the range and the standard stock colours are stainless and copper patina, with the other colours available to special order.



### Technical Data

Paint thickness	25 microns
ZT Coating	10 microns/side.
Weight	2.88kgs/m <sup>2</sup> at 0.4mm.
Proof Stress	200-250N/mm <sup>2</sup>
Tensile Stress	300-350N/mm <sup>2</sup>
Elongation	30%
Thermal Expansion	13.4 x 10 <sup>-6</sup> per °C
Melting Point	1470°C

# Copper Patina, Stainless, Zinc and other finishes

20 year Appearance Warranty

Excellent Corrosion Resistance

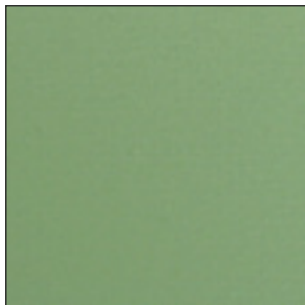
## Colours

### Stock Colours

Stainless



Copper Patina



### Production Range



## Sizes

KlassikKolors are available in coils of 610mm wide and 0.4mm thickness.



KlassikKolors is a registered trade mark of Follansbee Steel.

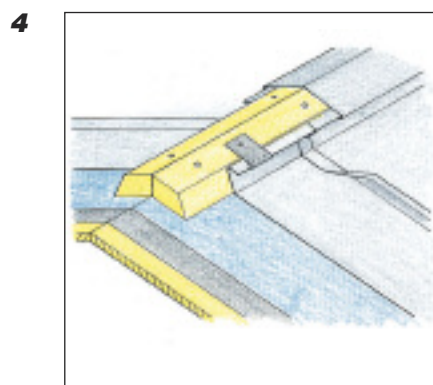
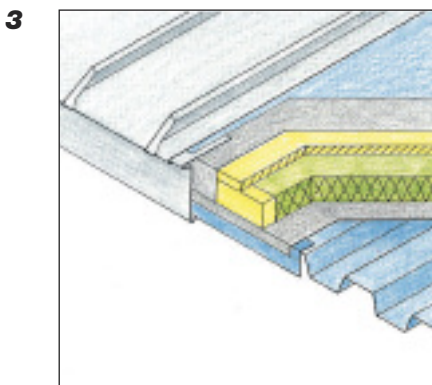
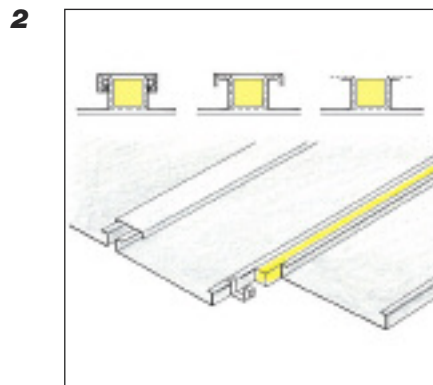
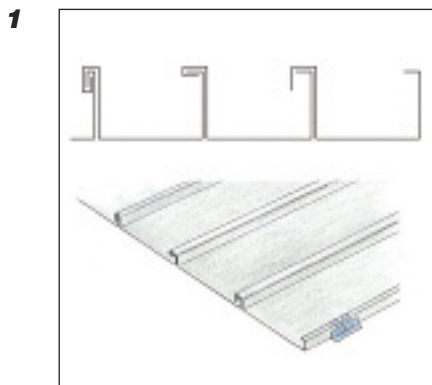
# Installation

Installation is based on long metal trays formed in the factory or on site, which are fully supported by the deck to which they are attached. Attachment is made via fixed and sliding cleats which are mechanically folded into the 25mm high seams, joining the trays together, and secured to the deck with stainless steel

annular ring shank nails. The sliding cleats allow for thermal expansion in the length of the trays and spaces between the trays accommodate lateral movement. The deck is usually 18mm exterior plywood and is covered with a geotextile separation layer before installation of the metal. In the case of a

'warm roof' there will be a sealing layer or breather membrane between the plywood and geotextile, and a vapour barrier below the underlying insulation.

The trays are joined with either a double lock standing seam 25mm high at 535mm centres or a batten roll joint of 38mm high at 550mm centres. The standing seam, which can be used down to pitches of 5° forms a neat crisp line and is quickly formed. The metal capped timber batten is less economic to produce but forms a broad, visual joint that can be used down to 3°. For pitches below 10° in both cases, a secondary waterproofing layer is desirable. Trays can be up to 15m in length and can be curved to fit barrel vault applications. Where roofs exceed this maximum length technical advice should be sought.



Standard details can be downloaded as CAD drawings from our web site [www.follansbee.co.uk](http://www.follansbee.co.uk) or direct from [www.fastrackcad.com](http://www.fastrackcad.com)

**NBS specifications are in section H75 for TCS and H31 for KlassicKolors.**

**FOLLANSBEE**  
*Lifetime roofing metals*

Follansbee, 54 Blacka Moor Road, Sheffield. S17 3GJ Telephone & Fax: +44 (0)114 236 8122  
Website: [www.follansbee.co.uk](http://www.follansbee.co.uk) Email: [sales@follansbee.co.uk](mailto:sales@follansbee.co.uk)

## PHOTO CREDITS

### Front Cover

#### TCS:

Prospect Quay, London – *Conservation Architecture – Broderick Structures*  
Royal Opera House, London – *Dixon Jones – Broderick Structures*  
Guys Hospital, London – *Watkins Grey – Broderick Structures*

#### Klassic Kolors:

Homerton College, Cambridge – *Saunders Boston – Metalex Roofing*  
Byron Street, Newcastle – *Jesmond Group – Roles Broderick*  
Aubyn Square, London – *Devereux – Roles Broderick*

### Page 3

Brompton Road, London – *Broderick Structures*  
Byron Street, Newcastle – *Jesmond Group – Roles Broderick*

### Page 4

Chelsea Art College – *Allies Morrison – Roles Broderick*  
Milestone Road, Hitchin – *Lovell Partnership – Boss Metals*  
RNLI, Bude – *Bazeley Partnership – W. H. Joce*

### Page 5

Neighbourhood Centre, London – *Broderick Structures*  
Look & Sea, Littlehampton – *Broderick Structures*

### Page 6

Manorhead Care Home, Hindhead – *John Robertson – Roles Broderick*  
Dundonald Place, Kilmarnock – *St Andrews Homes – McCormick & Hunter*  
Chester Racecourse – *Donald Insall – Longworth Metal Roofing*

### Page 7

Aubyn Square, London – *Devereux – Roles Broderick*