TATA STEEL

TATA

Colorcoat™ for agricultural buildings

Metal building envelopes

TATA STEEL AND COLORCOAT ™

About Tata Steel

Tata Steel is one of Europe's largest steel producers. We serve many different and demanding markets worldwide, including aerospace, automotive, construction, energy and power, and packaging. Our primary steelmaking operations in the UK and the Netherlands are supported by a global sales and distribution network.

Innovation and continuous improvement are at the heart of our performance culture. We aim to create value by offering a sustainable and value-added steel product range supported by unrivalled customer service. By working in partnership with you, we find the best solutions to meet your needs and help your business to perform.

Colorcoat™ Brand

We are able to offer a wide range of products and services specifically developed for the construction market, these include Colorcoat™ pre-finished steel products.

Colorcoat™ is the internationally recognised mark of quality and metal envelope expertise exclusively manufactured by Tata Steel at Shotton Works in North Wales. It covers a range of pre-finished steel products specifically developed for roof and wall cladding systems for the building envelope.

BES 6001 approved

Colorcoat™ products made in the UK are certified to BES 6001 Responsible Sourcing standard, the first steel envelope products in the world to achieve this, reinforcing our commitment to sustainability.

We have been developing and manufacturing the Colorcoat™ range of technically leading products since 1965. These products are supported by a range of services, including comprehensive guarantees and technical advice.

Born and bred in the UK for a lower carbon footprint

BES 6001 Responsible Sourcing
www.greenbooklive.com

Pre-finished steel building envelopes

Easy to construct, strong, low cost and low maintenance, pre-finished steel is an ideal material for agricultural building envelopes. Manufactured off-site, into long length cladding systems that can cover ridge to eaves in one sheet, it is quick and easy to install, and is flexible in design to allow for extensions.

Why Colorcoat™ pre-finished steel?

The Colorcoat™ range provides high quality, cost effective pre-finished steel for long lasting agricultural buildings. Colorcoat™ pre-finished steel products are produced on state of the art manufacturing lines to the highest quality standards.

All Colorcoat™ products are backed by over 50 years of innovation, extensive product testing and manufacturing excellence.

Colorcoat™ products are fully REACH compliant and free of chromates.

As part of our commitment to the agriculture industry, we are a member of the Rural and Industrial Design and Building Association (RIDBA) in the UK.

RIDBA
Rural & Industrial Design & Building Association

Which Colorcoat™ products are suitable for agricultural buildings?

Colorcoat™ products offer agricultural building manufacturers a range of cost-effective choices that meet modern day demands as well as future requirements. They range from those suitable for general storage to those for more demanding environments such as poultry housing. For advice on which Colorcoat™ product to use, see our product selector on page 7.

Colorcoat™ pre-finished steel products are light and easy to install, have excellent spanning performance, are robust, and are available in a variety of options to ensure a long building life.

At the end of the buildings life, cladding systems can be refurbished, reused or fully recycled in line with environmental legislation.

Benefits of Colorcoat™ pre-finished steel cladding:

To ensure the best performance of Colorcoat™ products, we recommend that buildings are constructed following the principles outlined in the latest edition of the UK RIDBA Farm Buildings Handbook. Local legislation and regulations should be followed regarding active/passive ventilation in relation to animal welfare and environmental emissions. Good building design and operation will support improved animal health and wellbeing and therefore improved growth and yield.

All aspects of agricultural buildings need to be considered, from planning through to fit-out of all types of buildings, buildings for livestock production, storage and other purposes and buildings for diversification. This also includes legislative requirements for animal welfare in certain geographic locations which may require the use of air washers.

The air wash installation must be installed according to the manufacturers recommendations. Service and maintenance for air washer units should be carried out to ensure the efficiency of such unit. Any deterioration in performance of the unit should be addressed immediately as it could affect the adjacent pre-finished steel.

The benefits of Colorcoat™ pre-finished steel include:

- **Easy to fix, fast construction.**
- **Available in long lengths - from ridge to eaves in one sheet.**
- **Excellent spanning capability reducing the number of purlins required.**
- **Low maintenance and easy to repair.**
- **Adaptable.**
- **Fully recyclable.**
- **Range of Colorcoat™ products to suit building requirements.**
- **Superior quality, performance and service.**
- **Unrivalled colour choice for external.**
- **Easy to integrate renewable energy solutions.**
- **Colorcoat HPS200 Ultra™ and Colorfarm™ certified to EN 10169:2010 CPI5 resistance to humidity.**

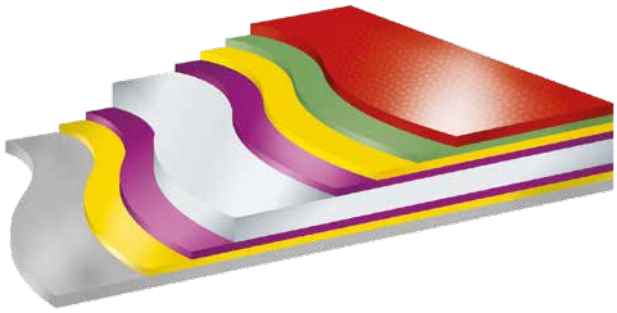
What do I need to consider when choosing which Colorcoat™ product to use?

When choosing which product to use you should consider where the building is, for example will it be prone to damage, how long will you want your building to last, any internal considerations such as resistance to specific chemicals and what the buildings use will be. Each Colorcoat™ product is made up of a number of layers which perform different functions as detailed below.

External topcoat:
The topcoat provides the abrasion and UV resistance, and also the final appearance. In terms of abrasion resistance, the thicker the top coat the better, therefore of the pre-finished steel products in table 1 Colorcoat HPS200 Ultra™ is the most robust. The UV resistance is dependant on the product. Colorcoat HPS200 Ultra™ has been designed to be the most resistant to UV light and will retain its colour and gloss for longer. The topcoat also provides the surface finish. Embosses such as the Scintilla™ and leathergrain embosses are best for areas prone to damage as they tend to be better at 'hiding' scratches as opposed to smooth finishes.

Backing coat:
We use a high performance backing coat as standard for all of our Colorcoat™ products which also provides some corrosion resistance. A double sided product should be used if extra protection is required.

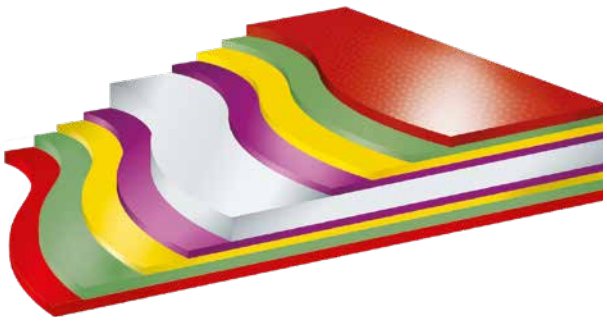
Figure 1. Diagram of typical layers for a single sided Colorcoat™ pre-finished steel



Key

Topcoat	Primer	Pre-treatment
Metallic coating	Substrate	Backing coat

Figure 2: Diagram of typical layers for a double sided Colorcoat™ pre-finished steel



Key

Topcoat	Primer	Pre-treatment
Metallic coating	Substrate	Topcoat

Metallic coating:

The metallic coating plays an integral role in the corrosion protection of the cladding products. We use two types of metallic coating in the UK namely hot dip galv (HDG) with Zinc, and our unique Galvalloy™ metallic coating which is a special mix of 95% Zinc and 5% Aluminium. Both provide sacrificial protection and the thicker the HDG, i.e. the higher coating weight, the more protection this offers. Galvalloy™ offers a combination of increased barrier and sacrificial protection, which both inhibits and slows the rate of corrosion in comparison with conventional HDG coatings and provides unrivalled corrosion resistance protection.

Corrosion resistance:

The rating of corrosion resistance is a function of the whole pre-finished steel, and is a measure of the durability of the pre-finished steel.

Guarantee:

Tata Steel can provide a warranty on a project by project basis for standard roof and wall cladding applications. The factors which influence the warranty period are product choice, geographic location, colour choice, the building environment and use and whether the application is roof or wall.

Table 1. Comparison of Colorcoat™ products suitable for agricultural building envelopes

	Colorcoat HPS200 Ultra™	Colorfarm™ 15 single sided (for internal environments)	Colorfarm™ 15 double sided (for single skin applications)	Colorcoat™ PE 25
Topcoat	200µm coating with Scintilla™ emboss	35µm high build smooth polyester coating	Colorcoat™ PE 25 (for external)	25µm smooth polyester coating
Backing coat	High performance backing coat or 200µm coating with Scintilla™ emboss	High performance backing coat	35µm high build smooth polyester coating (for internal)	High performance backing coat
Metallic coating	Galvalloy™	Galvanised	Galvanised	Galvanised
Warranty	External and/or internal functional warranty available on a project by project basis	Up to 15 year internal functional warranty on a project by project basis	Up to 15 year internal functional warranty on a project by project basis	Not applicable
No. of colours	20	8	8	On request

Notes: Health and datasheet for these products are available on request from the Colorcoat Connection™ helpline.

Choice of Colorcoat™ product by building use

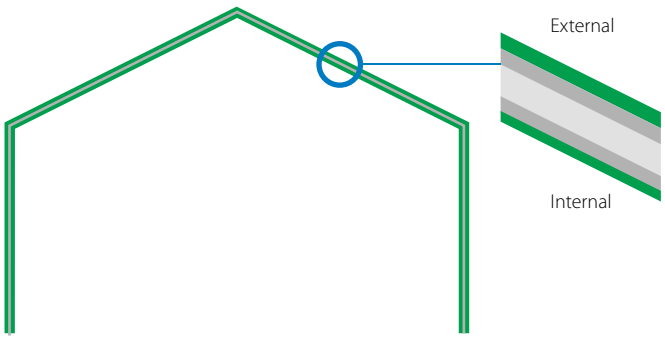
Table 2. Colorcoat™ product selector

Building type	Uninsulated single skin	Insulated composite panels/built-up system
High levels of ammonia, high humidity e.g. livestock and poultry housing	Double sided Colorfarm™ 15	**External:** Colorcoat HPS200 Ultra™ **Internal:** Colorfarm™ 15
Low levels of ammonia, temperature controlled, high humidity e.g. Vegetable stores	Double sided Colorcoat HPS200 Ultra™ Double sided Colorfarm™ 15	**External:** Colorcoat HPS200 Ultra™ **Internal:** Colorfarm™ 15
Low levels of ammonia, controlled low humidity, cool environments e.g. crop storage with no direct contact	Double sided Colorcoat HPS200 Ultra™ Double sided Colorfarm™ 15	**External:** Colorcoat HPS200 Ultra™ **Internal:** Colorfarm™ 15
Relatively low pollutants, low humidity e.g machinery stores, general storage	Colorcoat HPS200 Ultra™ (Single sided for use externally with standard backer for internal use or double sided available)	**External:** Colorcoat HPS200 Ultra™ **Internal:** Colorcoat™ PE 15

Notes:

1. Colorfarm™ 15 is the only product available that provides a standard guarantee for the interior of the building.
2. Internal and external product selection depends on guarantee duration requirement.
3. Single sided products are not recommended for canopies.
4. If a building has a food safe requirement Advantica™ L Control and Advantica™ CL Clean are fully tested and certified. Please refer to **www.colorcoat-online.com** for more information.

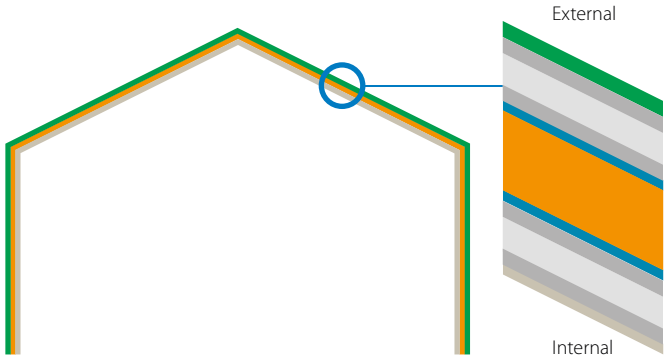
Figure 3. Single skin system e.g. Grain and vegetable stores



Key

- Steel substrate
- Colorfarm™ 15 (double sided) or Colorcoat HPS200 Ultra™ (double sided)
- Metallic coating
- Colorfarm™ 15 (double sided) or Colorcoat HPS200 Ultra™ (double sided)

Figure 4. Insulated system e.g. Poultry housing



Key

- Steel substrate
- Colorfarm™ 15 (Single sided)
- Metallic coating
- Standard backing coat
- Colorcoat™ product
- Insulation

Table 3. Comparison of Colorcoat™ products suitable for agricultural building envelopes

Test	Test standard	Colorcoat HPS200 Ultra™	Colorfarm™ 15	Colorcoat™ PE 25
Nominal organic coating thickness	EN 13523-1	200µm	35µm	25µm
Gloss (60º)	EN 13523-2	10 – 40%	30 - 40%	30 - 50%
Scratch resistance	EN 13523-12	> 5000g	> 3000g	> 2500g
Abrasion resistance (Taber, 250 rev, 1 kg)	EN 13523-16	< 12mg	< 15mg	< 30mg
Flexibility: Reverse impact Adhesion (cross hatch) Min. bend radius	 EN 13523-5 EN 13523-6 EN 13523-7	 ≥ 18J 100% Pass 0T at 16°C 1T at 0°C	 16J 100% Pass 4 T at 16°C	 9J 100% Pass 3 T at 16°C
Corrosion resistance: Salt spray Humidity	 EN 13523-8 EN 13523-26	 1000 hours 1500 hours	 1000 hours 1500 hours	 360 hours 1000 hours
Max. continuous operating temp.	Tata Steel	60°C	100°C	100°C
Internal classification resistance to humidity.	EN 10169:2010	CPI5	CPI5	

Notes:

1. The figures contained in this table are typical properties and do not constitute a specification. These figures relate to the topcoat and solid colours. For details on test methods see **www.colorcoat-online.com**
2. The printed colours shown on the following pages are for guidance only. For true representation of colour and effect, please obtain product samples from the Colorcoat Connection™ helpline.

Colorcoat HPS200 Ultra™

For farm buildings that are built to stand the test of time Colorcoat HPS200 Ultra™ is the ideal choice. It provides dramatically improved colour stability and gloss retention.

The standard colour range for Colorcoat HPS200 Ultra™ is made up of 20 colours. These include natural colours and tonal shades that can help your farm buildings blend with their environment.

We recommend the use of double sided Colorcoat HPS200 Ultra™ for single skin farm buildings to provide increased abrasion resistance and for humid environments.

Colorcoat HPS200 Ultra™ is used in all construction sectors due to its excellent corrosion protection in acidic, alkaline and salty environments, combined with its high robustness and excellent UV resistance. However when ammonia concentrates are high e.g. inside stables with the presence of livestock and manure, we would recommend Colorfarm™ 15 for internal applications.

For availability of colour combinations please contact the Colorcoat Connection™ helpline on **+44 (0) 1244 892434.**

Key attributes

- 200µm durable, abrasion-resistant topcoat.
- Colorcoat HPS200 Ultra™ exceeds the requirements of Ruv4 and RC5 as per EN 10169:2010 proving outstanding colour retention and corrosion resistance for the whole colour range.
- Unique Scintilla™ emboss so you can rest assured that your pre-finished steel has full traceablility and is protected with the highest quality from Tata Steel.
- Optimised Galvalloy™ metallic coating to EN 10346:2015 for unrivalled corrosion resistance and cut edge protection.
- Available with a project based warranty on a case by case basis.
- BBA certified for durability in excess of 40 years.
- Certified to EN 10169:2010 CPI5 resistance to humidity.

Colour range

Order the Colorcoat HPS200 Ultra™ colour card from the Colorcoat Connection™ helpline to see the complete colour range and emboss effect.

Colorfarm™ 15

Colorfarm™ 15 has been designed specifically to meet the demands of agricultural buildings including a high resistance to ammonia and fertilisers, and can be provided with an up to 15 year internal functional performance guarantee on a project basis. It suits any farming purpose, including livestock housing and crop storage and has been tested in contact with a number of chemicals commonly found in agricultural environments. During the tests Colorfarm™ 15 was exposed to vapour, liquid, or paste, depending on the chemical being tested.

When used for a single skin building a double sided option with Colorcoat™ PE 25 external topcoat and Colorfarm™ 15 for the internal is recommend. Single sided can be used for the internal liner of insulated buildings, using built-up or composite panel systems.

Colour range

Chalk White RAL 9002


Goosewing Grey BS 10A05


Reseda Green RAL 6011


Juniper Green BS 12B29

Light Ivory RAL 1015


Slate Grey RAL 220 30 05


Slate Blue RAL 5008


Millstone Brown BS 08B29

The printed colours shown for Colorfarm™ 15 are for guidance only. For true representation of colour and effect, please obtain product samples from the Colorcoat Connection™ helpline.
Note: For double sided option Chalk White is obligatory for the reverse side.

The backing coat should be installed facing the insulation. Here the exposed side of the internal cladding is protected by the high build Colorfarm™ 15 pre-finished steel, whilst the unexposed side is supplied with our high performance backing coat. Colorfarm™ 15 provides good levels of resistance against many chemicals found in internal agricultural environments, and with appropriate maintenance its overall life will be considerably extended.

Key attributes

- 35µm internal layer for good chemical resistance.
- Supplied with a Galvalloy™ metallic coating to EN 10346:2015 for excellent corrosion resistance.
- Available in 8 colours, specifically developed to harmonise with the rural environment.
- Up to 15 year internal functional performance guarantee on a project basis.
- Certified to EN 10169:2010 CPI5 resistance to humidity.

Table 4. Exposure of Colorfarm™ 20 to common chemicals after 1000 hours

	Performance		
Test reagent	Excellent resistance	Good resistance	Limited resistance
Fertiliser 10% Phosphate	*		
Fertiliser Amn. Phosphate	*		
Fertiliser NPK 25:5:5	*		
Fertiliser NPK 5:24:15	*		
Antiseptic drench	*		
Wood preservative	*		
Weed killer	*		
Hydrochloric Acid (10%)			*
Sulphuric Acid (10%)			*
Phosphoric acid (10%)			*
Acetic acid (10%)			*
Butyric Acid (10%)			*
Lactic acid (10%)		*	
Sodium Hydroxide pellets			*
Ammonia (High concentration 75%)		*	
Sodium Hypochlorite		*	
Ammonium Nitrate			*
Ammonium Phosphate	*		
Sodium Carbonate	*		
Sodium Chlorate	*		
Sodium Nitrate	*		
Formalin (40%)	*		
Urea	*		
Water	*		
Carbon Dioxide	*		

Notes:
Colorfarm™ 15 is available in a choice of 8 colours.
Single sided products have a standard high performance backing coat.
With double sided Colorfarm™ 15 the external topcoat is Colorcoat™ PE 25 which provides a colour range which will blend in with the external landscape and simulate those of traditional building materials.
Double sided products have an obligatory Chalk White Colorfarm™ 15 internal finish.

Colorcoat™ PE 25

Colorcoat™ PE 25 is an economic product suitable for undemanding roof and wall applications particularly in dry and non-aggressive climates where there are no high demands for corrosion protection.

Key attributes

- Smooth 25µm polyester coating.
- Supplied with a galvanised substrate produced to EN 10346:2015.
- Available in the most popular cladding colours.
- High performance reverse side backing coat specially formulated for use in construction applications.

Technical advice on meeting building requirements

Designing to eliminate condensation

Condensation can be a problem in agricultural buildings, however it is essential to understand the cause and design accordingly.

Condensation occurs when moist air comes into contact with a surface which has a temperature below the dew point. When this happens the air is no longer able to hold as much water vapour and the water is released as condensation on the surface.

The main priority has to be to reduce the relative humidity of the air inside the building by good building design to ensure adequate ventilation. This is particularly important in animal housing as inadequate ventilation and associated warm damp air are a major contributor to animal respiratory infection with associated treatment costs and loss of yield.

The RIDBA farm handbook gives guidance on ventilation rates for different livestock and how to achieve this through correct design of ridge vents and wall cladding.

As well as having a negative impact on livestock, the condensation resulting from poor building design can lead to damage to the building structure and fabric.

For insulated buildings such as poultry housing, best practice should be observed to avoid cold bridging through the insulation layer which could lead to localised condensation spots.

Where timber purlins are used, a separation barrier such as a PVC strip should be used between the purlin and the pre-finished steel. This is to avoid contact with wood treatment chemicals, which can absorb condensation and create localised aggressive corrosion conditions.

Cleaning and maintenance

Avoid prolonged, direct contact with aggressive chemicals such as silage, slurry, fertilisers and animal waste.

Technical advice

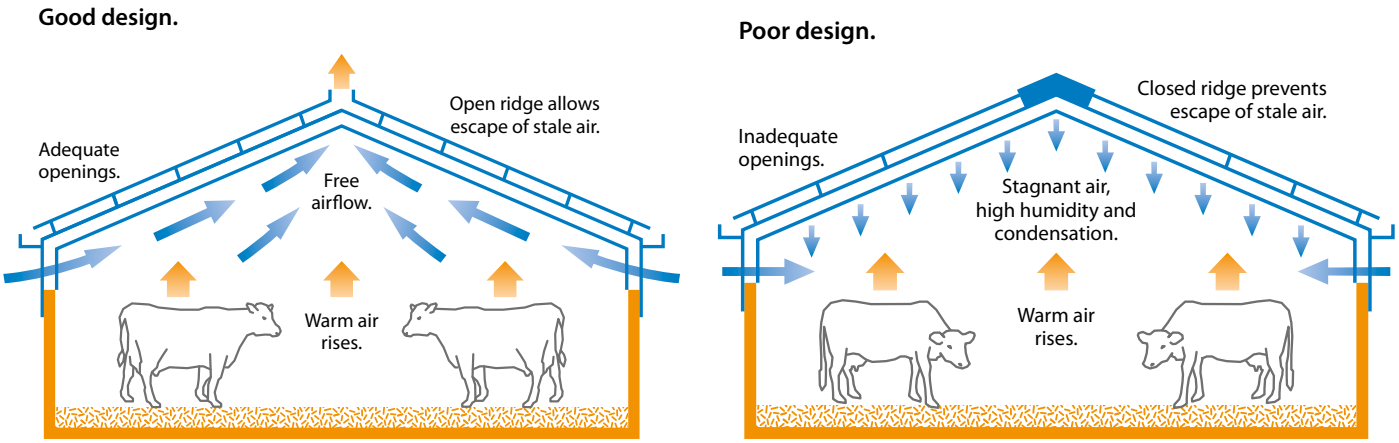
Keep the bottom edge of wall sheeting out of continuous contact with damp materials and soil including concrete.

The exposed cut edges of roof sheets must be protected with a suitable touch up paint if the building is subject to salt spray or if it is less than 2 Kilometres from the sea. In addition those areas of sheeting not exposed to the natural effects of washing by rain water e.g. under eaves, should be washed regularly with fresh water to prevent the accumulation of salt.

Use the system manufacturers recommended fasteners and fixings.

Refer to the storage and handling best practice guidelines as per the system manufacturer.

Figure 5. Good farm building design (BS Farm Building Guide)



Fire Performance

For product specific fire performance information please contact Tata Steel.

Designing to meet gauge specifications

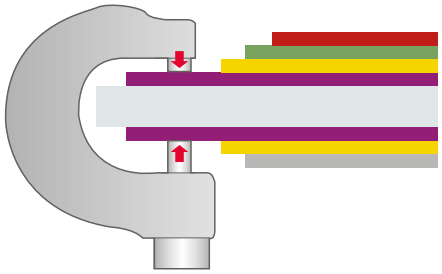
The gauge of the pre-finished steel coil or sheet plays a vital role in the physical properties and performance of the wall or roof cladding that is manufactured from it. Incorrect specification may, in the worst cases, have safety implications such as roof fragility. The European standard EN 10143:2006 defines the tolerances for different grade, width and gauge material for normal and special tolerance categories.

Tata Steel are able to supply pre-finished steel to normal and special tolerances according to EN 10143:2006 and tighter tolerances, subject to commercial agreement, to ensure that the cladding performs as designed. Incorrectly specifying gauge or gauge tolerances can affect:

1. Structural performance; including in-use loads and purlin spacings as well as safety implications during construction and maintenance.

2. A buildings visual appearance; lighter gauge material is more prone to damage during installation, and distortion of the profile around fasteners due to slight misalignment of the primary/secondary structure.

Figure 6. Measurement of gauge



Key

- Topcoat
- Pre-treatment
- Substrate
- Primer
- Metallic coating
- Backing coat

Colorcoat™ services

The Colorcoat™ brand is recognised as the exclusive mark of quality and metal envelope expertise and is supported by a comprehensive range of services, technical advice and guidance

Colorcoat™ technical support team

Our dedicated team can offer you advice on a range of metal building envelope systems to ensure you get the right solution for your building. Visit **www.colorcoat-online.com** to find out who the representative is for your region.

Metal hand samples

Metal hand samples are available for all colours. For a truer representation of colour and effect, please obtain metal hand samples online at **www.colorcoat-online.com/samples**

Colour support

Colour consistency

If tonal consistency is critical, all cladding for a single elevation should come from the same production batch.

Matching components

If accessories made from other materials are to be colour-matched to the roof or wall cladding, the best reference is the actual profiles or panels delivered to site, or material from the same batch.

www.colorcoat-online.com

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