Data sheet: C 1.4

Chromadek® for Roofing Applications

Pre-painted hot-dip galvanised steel sheet

Introduction

CHROMADEK® is Mittal Steel South Africa's trade name for a range of colour coated sheet products. It is produced by coating sheet on a sophisticated coil coating line, where steel substrate surfaces are thoroughly chemically cleaned before a primer coat is applied to either one or both sides of the sheet. After elevated temperature curing, the top coat is applied, to either one or both sides and again cured in the gas fired furnaces.

This coil coating process allows accurate control, in a controlled factory environment, of the important parameters for application of paint coatings, such as cleaning, pre-treatment, paint application and curing conditions.

The CHROMADEK® range of products has been developed for a range of different end uses:

- **Exterior applications** such as roofing, cladding, signboards and garage doors, for less corrosive as well as marine environments (covered in this Data Sheet)
- **Interior applications** such as cool room panels, ceiling strips and light fittings (Data Sheet C1.6)
- **Domestic appliances**, such as fridges, freezers, geyser wrappers and air conditioning units. (Data Sheet C1.7),

Other coated products processed on Mittal Steel South Africa's colour coating unit includes CHROMAPREP® (See Data Sheet C1.8) and TEXTRADEK® (See Data Sheet C1.6)

General description

Over and above its aesthetic attributes, CHROMADEK® paint coatings are designed to provide superior corrosion protection under conditions where the performance of unpainted galvanised sheeting may prove inadequate. Furthermore, the coatings exhibit excellent formability and elasticity to facilitate roll profiling and bending operations without damage to the paint coating.

Excellent paint adhesion is achieved and corrosion resistance enhanced by careful preparation of the steel surface prior to paint application. Rigid quality control testing is carried out on each coil to ensure conformance to specification.

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The atmospheric conditions to which the CHROMADEK® sheeting will be subjected, will determine which of the following paint systems should be specified:

Standard CHROMADEK® is intended for use under rural, mildly chemically polluted or moderate marine conditions, and is composed of Z275 hot-dip galvanised substrate pre-primed with an epoxy/chrome free primer (dry film thickness (DFT) of 4-6 microns) and finished with a final paint coat (DFT 20-22 microns) on the top surface. A single backing coat (DFT 8 microns) is normally applied to the reverse side of the sheet.

CHROMADEK® PLUS is intended for heavy industrial or marine conditions, and is composed of Z275 hot-dip galvanised substrate, pre-primed with a primer with DFT of 20-25 microns (4-times thicker than the standard CHROMADEK® primer coat) and finished with a final coat (DFT 20-22 microns) on the top surface, giving a total coating thickness of 40-47 microns.
The bottom surface can either be coated with the CHROMADEK® top surface paint system i.e. 4 micron primer and 22 micron topcoat, or the CHROMADEK® PLUS top surface paint system.

Properties

CHROMADEK® is produced in a range of 14 standard colours, which were selected after consultation with both Specifiers and Architects. Special pigments are used to ensure that the paint will withstand extended outdoor exposure under the harsh S.A. conditions (high UV-radiation).

The availability of other colours for large projects is subject to enquiry.

Standard colours

Table 1. Standard colours

Name	Colour	% Gloss at 60° (± 5 %)	Mittal Steel SA Reference number
Fish Eagle White	White	30	N14128
White Lion	White	30	N15010
Gemsbok Sand	Dark Beige	30	N15366
Sandstone Beige	Beige	30	N15365
Kalahari Red	Red-Brown	30	N06541
Buffalo Brown	Brown	30	N09412
Traffic Green	Green	30	N03002
Aloe Green	Light Green	30	N03283
Umhlanga Wave	Turquoise	30	N02103
Azure Blue	Blue	30	N01109
Kingfisher Blue	Light Blue	30	N01029
Dove Grey	Light Grey	30	N13637
Dark Dolphin	Dark Grey	30	N13030
Charcoal Grey	Dark Grey	30	N13012

Note:
For an indication of the colours, refer to Data Sheet: CHROMADEK®, Standard Colours (file reference C1.9).

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Table 2. Paint system properties

Property	Test conditions	Method	Typical values	
			Chromadek	Chromadek Plus
Resistance to colour change	QUV-B	ASTM G53 ISO 7724/1/2/3 + ISO 3668	After 500 hrs: $\Delta E < 5$	After 1000 hrs: $\Delta E < 6$
Resistance to chalking	QUV-B	ASTM G53 ISO 4628-6	After 500 hrs: Rating 1 - 2	After 1000 hrs: Rating 1 - 2
Resistance to corrosion: - Edge creep - Blister size	Salt Spray	ISO 7253 ASTM D1654 ISO 4628/2	After 500 hrs: 5mm max 2-S2	After 1000 hrs: 5mm max 2-S2
Flexibility: T-bend test		ASTM D4145	3T No adhesion loss	2T No adhesion loss
Flexibility: Reverse impact		ISO 6272	No cracks No adhesion loss	No cracks No adhesion loss
Pencil Hardness		ISO 15184	F - H	F - H
Scratch Hardness		ISO 1518	25 - 40 N	25 - 40 N
Dry Film Thickness		ISO 2808, 5B	23 µm minimum inclusive of primer	38 µm minimum inclusive of primer
Specular Gloss at 60°	At time of coating	ISO 2813	25 - 35%	25 - 35%

Mechanical properties

The substrate used for CHROMADEK® can be produced to any of the galvanised steel specifications listed in Table 1 of Data Sheet: Galvanised: Availability and Properties (File Ref C1.1)

Dimensions

The nominal thickness includes the zinc coating, but excludes the paint system.

Table 3. Standard sizes

Nominal Thickness (mm)	Nominal Width (mm)
0.50	925, 1225
0.58	925, 1225
0.80	925, 1225

Tolerances

Shape and dimensions

Tolerances on shape and dimensions are given in the data sheet: Galvanised Sheet Tolerances (File Ref C1.2)

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Chromadek® coating systems

Figure 1. Chromadek®

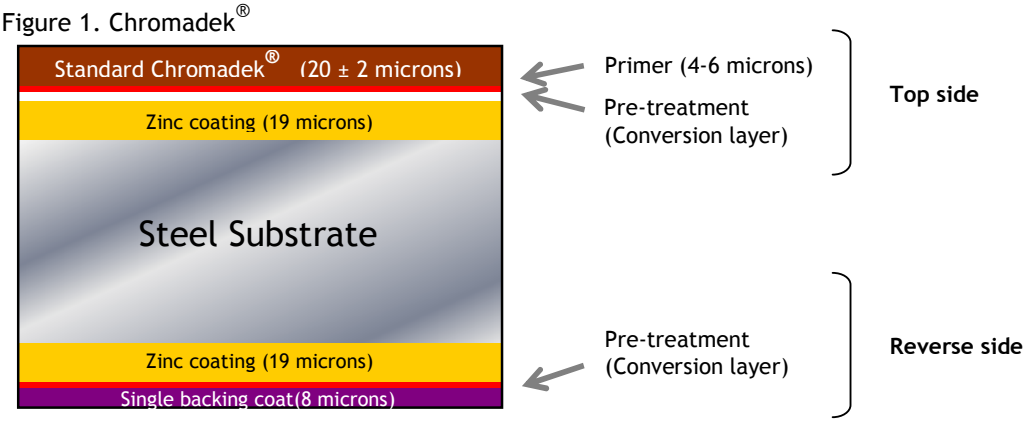
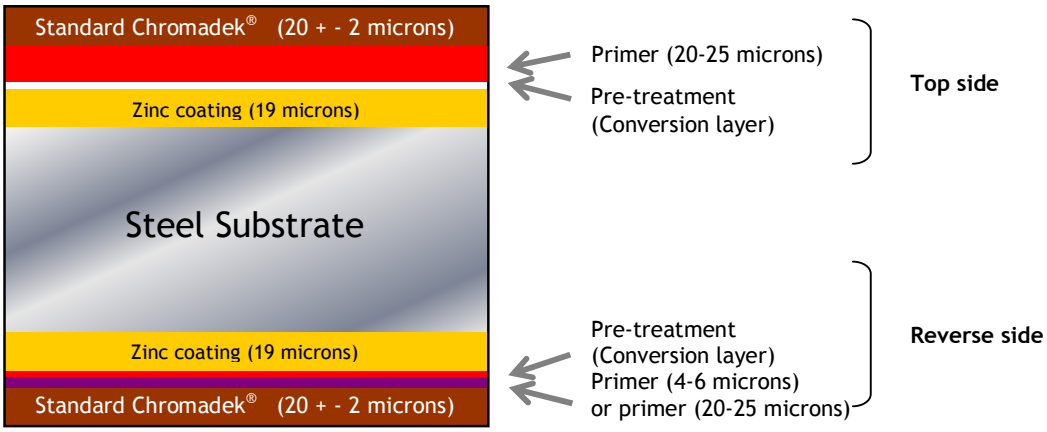


Figure 2. Chromadek® Plus



Design considerations

In areas with frequent rain followed by long periods of relatively high humidity, the following design factors must be addressed:

- Overlapping of sheeting (end laps) is to be avoided if possible, as waterproofing of lapped areas is seldom successful in the long term. The use of full-length sheets is recommended.
- In a marine climate, sheltered areas such as undersides of roof overhangs, canopy type roofs and loading bay canopies could result in accelerated corrosion from the under side. Sea salts or aggressive contaminants tend to accumulate on these surfaces, as they are not periodically washed down by rain. Designers should avoid this type of design or allow for additional protection in coastal or highly polluted industrial areas by means of light ceilings or specifying a full paint coat on the reverse side of the sheet.
- CHROMADEK® is not recommended for application in marine environments within the salt spray zone (generally within 5 km from the sea) or exposure to the industrial environments where there is an accumulation of strong acidic vapours. The CHROMADEK® PLUS system is recommended for these conditions.

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Handling

During decoiling the coil should not be allowed to unwind freely, as scuffing of interleaving surfaces could lead to paint pick-off in these areas. No paint pick-off complaints will be entertained if tension control is not kept with a pinch roll before the strapping is cut during decoiling. Decoiling tension must be lower than the coiling tension.

Forming

1. Roll-forming

Roll-forming rather than press braking is recommended for the forming of sections and components from pre-painted steel sheet, since there is less chance of damaging the paint coating. A multitude of sections can be roll-formed provided the necessary adjustments are made in roll clearances.

Bend diameters should also be larger than the bend to which the material was subjected to during Quality Control Testing.

2. Lubricants

The organic coatings used for CHROMADEK® usually act as excellent dry film lubricants. Where lubricants are needed, the water-soluble types are recommended. If emulsified compounds are used, it is important that they are removed as soon as possible, in order to prevent staining of the paint coating.

Touch up and maintenance

Air-drying touch-up paints, such as a water based acrylic roof paints, are recommended for over-painting. However, the ultraviolet resistance of air-drying touch up paints is generally lower than the oven-cured CHROMADEK® finishes. Accordingly, touching-up of scratches should be undertaken with a thin paintbrush to minimise unnecessary over-painting. Slight scratches which may occur during erection or handling can generally be left as is, because they will not be visible from a distance, while the galvanised substrate will offer adequate protection against corrosion.

Anyone walking on roofing panels must wear soft-soled rubber shoes. Such traffic across the roof must be restricted to a minimum. It is recommended that soft material of some form be used to protect the paint coat temporarily in areas of traffic.

Abrasive cutting or trimming of CHROMADEK® sheeting on top of roofs should be avoided. However, if unavoidable, the iron particles must be timeously removed from the roof surface by means of a bristle brush or broom, as it is not easily washed down by rain. If left on the roof the iron particles will start to rust, tarnishing the CHROMADEK® paint surface.

The recommended method of cutting sheets on site is by using a sheet nibbler, which gives a clean edge and does not damage the sheet and coating. It is imperative that all swarf and other debris are removed as roof erection proceeds, since it can cause damage, discoloration or corrosion. All loose particles, objects and dust from the building process must be removed from the roof surface timeously.

Compatibility

Most materials used in contact with traditional galvanised steel can be safely used with CHROMADEK®. However, run-off water from COR-TEN®, lead or copper products may cause staining and should not be allowed to come into contact with the painted surface.

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Edge protection

Generally cut edges on CHROMADEK® sheets do not present a corrosion problem, even in coastal areas, as the zinc of the galvanised substrate will cathodically protect the exposed edge. Small traces of white deposits on cut edges should therefore not be a reason for concern.

Warranty

Mittal Steel South Africa guarantees the prime quality of the product, but cannot accept liability for scratches or other damage to the material sustained during and after profiling, transport to or storage at the building site or after erection.

For warrantee purposes Mittal Steel South Africa may be approached for a:

- provisional warranty (warranty of intent) during the tendering stage; and
- warrantee of the material on the building after erection.

Quality Assurance

A quality assurance system that complies with SANS ISO 9001 is in operation throughout the manufacturing process. The galvanised substrate used for CHROMADEK® has been awarded the SABS certification (quality) mark.

Supply conditions

CHROMADEK® is supplied in terms of Price Lists 145 and 147 with Mittal Steel South Africa's General Conditions of Sale.

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