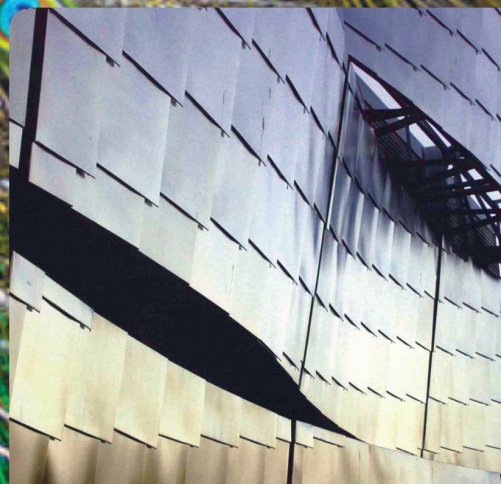
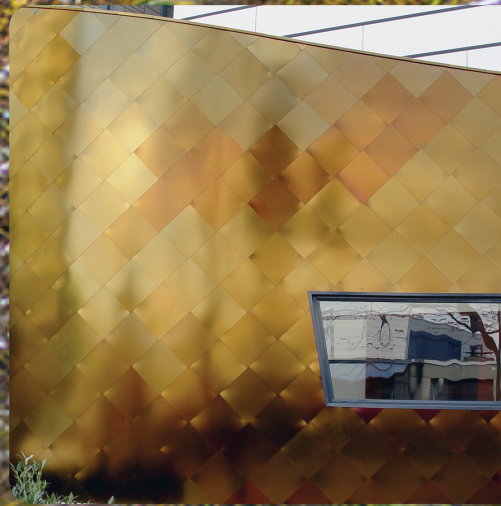


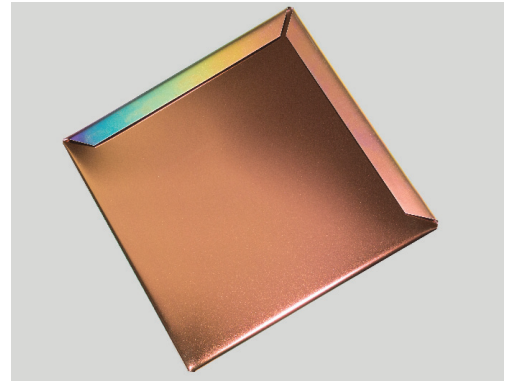


SPECTRA SCHINDEL®

Stainless Steel Roof & Cladding
Shingle in Colour



FEATURE

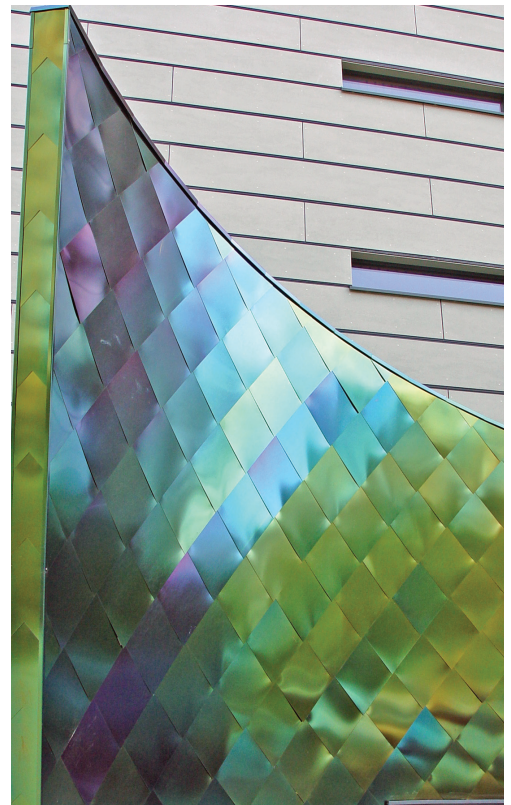


LCP **SPECTRA SCHINDEL**® with light interference technology opens up a broad spectrum of individualised options to architects, planners and site owners looking for creative roofing, ceiling and wall design. It is ideal for a whole range of applications for new and old buildings, providing functionality and avant-garde designs.

All the results from test trials of LCP **SPECTRA SCHINDEL**® under various weather conditions have confirmed that it poses no risk to the environment.

If you are using colour creatively to accentuate a feature, to group areas together or set them apart, or to incorporate details into the construction environment - LCP **SPECTRA SCHINDEL**® offers you a whole range of options for adding colour to architecture.

Wide range of standard and special colours. From shining bright colours (Ti-coated) to prismatic coloured stainless steel - the broad range of LCP **SPECTRA SCHINDEL**® colours has something to satisfy everyone. Colour style is particularly important to create an aesthetic effect.



Watertight and protected. State-of-the-art production processes deliver consistently high quality base material, coating and prismatic treatment. LCP **SPECTRA SCHINDEL**® is sturdy, features corrosion resistance, and is extremely durable. You can be sure of permanent waterproofing and protection for roofs, ceilings and facades.

Even maintaining LCP **SPECTRA SCHINDEL**® is easy - the surfaces are easy to clean using eco-friendly materials.

- No special barrier layers (woven mats/profiled mats) required.
- Good resistant to condensation and bitumen corrosion, no additional corrosion protection needed.



MATERIAL SPECIFICATION

Materials: Materials acc. DIN 17440, DIN 17441 or EN 10088

Tile size: 293 x 293mm (square)
210 x 360mm (rectangular)

Thickness: 0.4mm or 0.5mm

Temperature resistance: We guarantee temperature resistance up to 200°C.
In general: Welding should, be avoided.

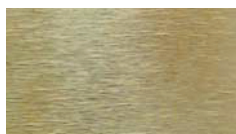
Ductibility: It is possible to bend the parts by 180° around a mandrel of the same size as the part's own diameter (or its thickness) without abrasion occurring on the outer chamfer of the bend point during the abrasion test.

Corrosion resistance: The films produced via the INOX-SPECTRAL® method are highly resistant against corrosion.

Results of the corrosion tests:

- a) 1000 h-SS-DIN 50021
- b) 10-day heat/humidity test acc.
- c) 10-day corrosive gas acc. DIN 41460 Part 72 Section 4.1 Exposure A (10ppm SO₂).
- d) 10-year long-term corrosion test in extremely aggressive sea climates.

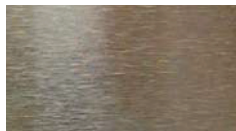
Note: Other shingles size and thickness, please check with LCP Building Products Pte. Ltd.



Champagne



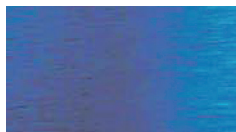
Gold



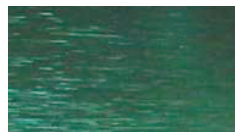
Bronze



Steelblue



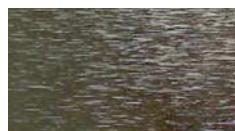
Cobaltblue



Green



Red



Black

Eight standard colours at a glance

This is the standard selection of all of the colours which can be produced with the INOX-SPECTRAL® - process:

- champagne
- gold
- bronze
- steelblue
- cobaltblue
- green
- red
- and the special colour: black

Other shades are possible. Minimum quantities have to be ordered due to production requirements. In spite of sophisticated reproduction technology, the colours shown may not be exact. Sample cards with original samples are available.



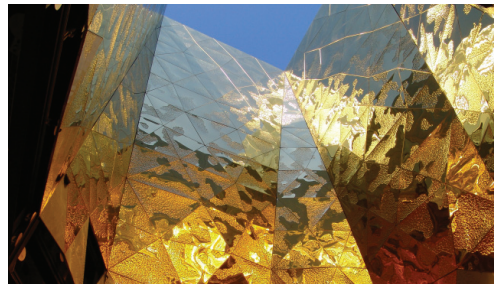
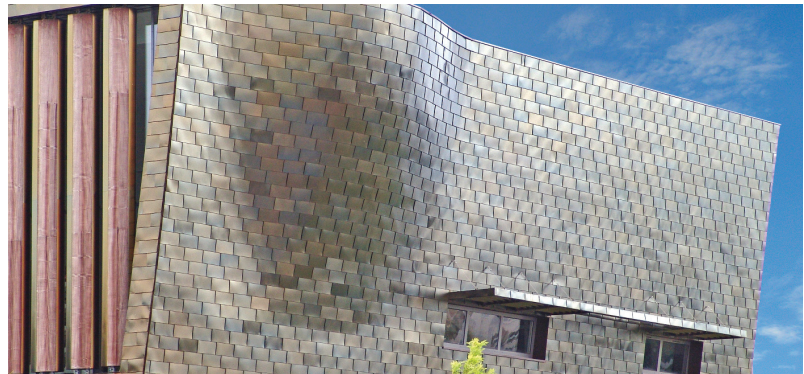
Sophisticated architecture

can be recognised by its classic form and the use of high quality materials.

Surfaces of stainless steel which are coloured by using the INOX-SPECTRAL® process have all of the qualities which modern architecture needs: functionality, efficiency and aesthetics.

Coloured surfaces made of stainless steel make individual designs possible which enable dynamic colour scenarios and therefore create various perceptions and moods.

Some advantages offered by coloured stainless steel are as follows: there are hardly any subsequent costs and it maintains the original optic, form and function. The refined material is one hundred percent recyclable. It saves cleaning, replacement and restoration costs over a very long period, like no other material.



The INOX-SPECTRAL®-process

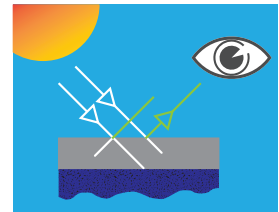
The process

Electrochemical process: the INOX-SPECTRAL®-process is a computer-controlled electrochemical process; the colour or pigment is not applied, the transparent chromium oxide film is built up.

Interference effect: the interference effect is used; different colour effects unfold depending upon the thickness of the applied chromium oxide film, the

composition of the light spectrum and the perspective.

Stainless steel character: due to the low degree of thickness of the chromium oxide film, the structure of the coloured surface is not hidden; not only the functional material characteristics are maintained but also the unique visual quality of stainless steel.



The principle of light interference

Durability of coloured stainless steel surfaces

Resistance against corrosion: the corrosion resistance of the base material is decisive. The chromium oxide film which is built up during the colouring process is generally an improvement from a corrosion point of view, but the material quality should be selected to suit the expected level of wear and tear.

Light, weather and age resistance: coloured stainless steel surfaces do not age, split or flake off and are not bleached out by the sun.

Temperature resistance: the coloured surface is consistently resistant against temperatures up to 200° Celsius. Short-term temperature excesses of around 100° Celsius can generally be endured but permanent discolouration can occur if excess temperatures persist.

Mechanical durability: the chromium oxide film which is built up during the colouring process is physically attached to the base material and is elastic. Deformations (warping, edges, indents and presses) which do not impair the actual base material do not damage the surface.

Cleaning and maintenance of coloured stainless steel

Just like all high quality objects, parts made of stainless steel should also be regularly cleaned. How regular it is cleaned depends on the level of dirt and your own personal requirements. The relation between the maintenance and cleaning efforts and the roughness of the surface is straightforward: the rougher the surface, the easier it is for deposits (from normal dirt to bacteria) to find places to settle, making cleaning more difficult and more complex. The INOX-SPECTRAL® - process produces a transparent interference film on the surface which, in connection with an electrical polish as a pre-treatment, has a "sealing" effect:

- Grinding and brushing grooves are sealed
- The surface gets sealed.

Maintenance begins with processing the coloured steel sheets: the protective film which covers all coloured sheets is durable but not indestructible. Careful manufacturing process is required to avoid

scratches or damages to the colour film. Local repairs are not possible.

Cleaning

Stainless steel surfaces which are coloured by using the INOX-SPECTRAL® - process are water and dirt repellent. They can be easily cleaned with all non-abrasive cleaning agents.

Usually the wiping with clean and soft towel is sufficient. Water with usual dishwashing-detergent, or first with pure detergent and with richly water, removes all contaminations.

The following cleaning agents are not suitable:

- All types of abrasive cleaners (they scratch the surface)
- Chrome, silver and brass cleaning products (they dissolve oxide)
- Furniture polish and other "polishers" (a waxy film can change the colour)

TECHNICAL SPECIFICATION

Material No. 1.4301 to EN 10 088-2

Chemical composition (in % by weight)¹⁾

	C	Cr	Ni	Mn
minimum	-	17.0	8.0	-
maximum	0.07	19.5	10.5	2.0

Mechanical properties (transverse samples) at room temperature to EN 10 088-2

Dimensions range	R _{p0.2} (0.2% yield strength) N/mm ²	R _{p1.0} (1.0% yield strength) N/mm ²	R _m (tensile strength) N/mm ²	A ₅ (elongation) %	A ₈₀ (elongation) %
Cold-roll strip s ≤ 8mm	≥ 230	≥ 260	540-750	≥ 45	≥ 45
Hot-roll strip s ≤ 13.5mm	≥ 210	≥ 250	520-720	≥ 45	≥ 45

Material No. 1.4404 to EN 10 088-2

Chemical composition (in % by weight)¹⁾

	C	Cr	Mo	Ni	Mn
minimum	-	16.5	2.0	10.0	-
maximum	0.03	18.5	2.5	13.0	2.0

Mechanical properties (transverse samples) at room temperature to EN 10 088-2

Dimensions range	R _{p0.2} (0.2% yield strength) N/mm ²	R _{p1.0} (1.0% yield strength) N/mm ²	R _m (tensile strength) N/mm ²	A ₅ (elongation) %	A ₈₀ (elongation) %
Cold-roll strip s ≤ 8mm	≥ 230	≥ 260	540-750	≥ 45	≥ 45
Hot-roll strip s ≤ 13.5mm	≥ 210	≥ 250	520-720	≥ 45	≥ 45

¹⁾ Special arrangements may be made within the analysis limits depending on the properties required.



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