Enamelled steel

The timeless material for contemporary architecture

Enamel has been part of human life for thousands of years. Jewellery and metalwork enamelled by ancient civilisations still looks as beautiful today as when it was first made centuries ago.

Today architects, artists and designers have the opportunity to realise exceptional architectural designs which will last through the ages. Using ArcelorMittal's range of enamelling steels, they can create striking structures which will endure for 50 years and more. Even after half a century, the steel substrate will not show any signs of corrosion and the enamelled surface will remain as it was on day one.

The unique properties of enamelled steels include:

- A wide array of colours and finishes
- Excellent resistance to abrasion and scratching
- Outstanding resistance to corrosion and ultraviolet (UV) light
- Resistance to the effects of atmospheric pollution

Outstanding resistance to corrosion and UV

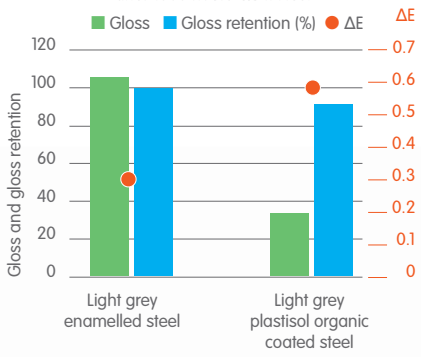
As well as providing a range of colour and finish options, enamelled steel panels will resist:

- Atmospheric pollution (including sulphur dioxide and nitric oxide)
- Rain
- Salt-laden marine atmospheres
- Sudden changes in temperature
- Ultraviolet radiation
- Weather – enamelled panels are insensitive to extreme cold (-50°C) and very hot temperatures (above 50°C)

No other material on the market today can match the quality of ArcelorMittal's enamelling steels for both indoor and outdoor applications. Add to this an almost infinite range of long-lasting colours, patterns and textures with a gloss, semi-matt or matt finish. Colour stability can be kept up to 50 years, ensuring the panel will remain as vivid for decades, even in the harshest environments.

Enamelled steel keeps its aesthetics

Gloss, gloss retention and colour change after 1000 hours QUVA test



Artistic decoration of the enamelled panels is also possible. Almost any creative idea can be reproduced on the panels with extreme accuracy using serigraphy (silkscreen printing) or decalcomania (transfer of engravings or prints). Four-colour CMYK printing can also be used to create wave forms, curved profiles and other special shapes.

Excellent resistance to abrasions and scratches

With almost the same hardness as a diamond, enamelled surfaces are able to resist extremely abrasive conditions including sandstorms. Scratches, impacts and wear have no influence on enamelled steels.
Enamelled steels are also resistant to damage from flames or other sources of heat and have an A1 fire resistance rating. Even when heated, enamelled steels do not release any toxic fumes.

Pollution-resistant

Modern-built environments are extremely susceptible to the effects of corrosive atmospheric pollution. However, enamelled steels have no pores or cracks. This stops bacteria, dust and pollution from gaining a foothold in the enamel.
Enamelled surfaces are very easy to clean.
Most commercially available solvents can be used without affecting the colour or finish. Even graffiti can be easily removed from the enamelled surface.

Solfer® range meets all architectural requirements

ArcelorMittal's Solfer® steels are the best solution for enamelled architectural projects. Solfer® grades provide:

- Perfect flatness of the facade envelope thanks to its limited deformation, even after multiple enamel firings
- A surface free of any defects after enamel firing

Solfer® grades are available in the following dimensions:

- Standard thicknesses range from 0.5 to 2 mm
- Standard widths range from 1,250 to 1,500 mm

Characteristics of enamelled steels

The intimate combination of steel and enamel has delighted artists for millennia. With enamelling steels architects and designers also have their chance to create enduring colourful designs for contemporary architectural projects.
In addition:

- The combination of 100% recyclable steel and enamel (made from glass and pigments) can fulfil both the aesthetic and sustainability aspirations of modern architecture.
- Steel provides mechanical strength and formability, while enamel adds durability and a unique glossy finish.
- ArcelorMittal's enamelled steel grades are already adapted to the various processes used in enamelling.
  For example, one or more layers of enamel can be fired at high temperature (between 780 and 850 °C) on the steel substrate.

ArcelorMittal can advise you on the most suitable grade to fit your project budget and the level of quality required.

Recommendations for use

Deformed parts such as profiles and cassettes can be made with ArcelorMittal's adapted steel grades including Solfer®. As well as being ready for enamelling, these grades can be assembled like other facade products.
The long-term maintenance of enamelled panels is simple. During renovations it is easy to perfectly colour-match panels as there should be no noticeable differences between old and new panels.

Other applications for enamelled panels include:

- Facade envelopes
- Interior design
- Public transport buildings such as airport terminals, railway and subway stations
- Sunscreens
- Tunnels
- Special projects

We are here to support you

ArcelorMittal has developed powerful computational tools which can simulate the vitreous enamelling process and help you to design your facade elements. Computational simulation techniques are especially useful for defining the right shape and thickness of panels.
Do not hesitate to consult our technical or R&D experts for more information.
To find out more about ArcelorMittal's range of enamelling steels and our services, visit us at industry.arcelormittal.com or e-mail flateurope.technical.assistance@arcelormittal.com

Our webpage industry.arcelormittal.com/enamellerslist also contains a list of enamellers by country.

You can visit ArcelorMittal's steel construction website constructalia.arcelormittal.com as well.

HC300EK – the new generation of enamelling steels for architecture

ArcelorMittal developed a new steel grade which is specifically adapted for enamelled architectural projects. Known as HC300EK, the new grade provides:

- Perfect flatness of the facade envelope thanks to its guaranteed minimum yield strength after enamel firing
- Cost savings of up to 30% due to the reduced thickness of the steel substrate (for example, existing 1.5 mm panels can be produced in 1 mm). The mechanical properties of the steel remain the same after 5% deformation and enamel firing
- Easy handling of the panels and cassettes on site thanks to the lower weight

HC300EK is available in the following dimensions:

- Standard thicknesses range from 0.5 to 2 mm. Thinner panels (to 0.32 mm) can be produced in consultation with ArcelorMittal
- Standard widths range from 1,250 to 1,500 mm

Credits

Images: Signaux Girod, Philippe Vandenameele

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