

Prepainted metal

The ECCA - French Group newsletter

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14

Special issue on
Coatings

EDITORIAL



The colour that creates value and personalisation constitutes the most powerful element of a decor.

Its capacity to transform architecture and our urban environment is unrivalled.

Its many applications in decoration, design, everyday objects as well as in housing and public equipment bear this out.

As a veritable "flagship", it is often the signature of

principal contractors and architects. However, no mistakes should be made with the quality of the coatings applied! Architecture is not poor quality clothing that loses its colour every time it is washed...

Preparation of this edition has taught us that, in spite of very numerous regulations, restrictive for manufacturers and designers alike, imagination and daring are still at the forefront. Coil coated metal professionals know how to integrate and, if necessary, circumvent constraints by developing new technology. For their part, designers are able to seize upon them to take up new architectural challenges.

Mario PALERMO
CEO of ECCA - French Group



Quality of Coatings

Since the Forties, metal has offered architects and principals a material for architectural expression and unique integration into the urban environment. Coil coated steel or aluminium consists of a cluster of technology that covers and protects buildings.

Designers often opt for a mix of materials to give buildings a strong identity. In the same vein, coil coated metal enables surface and finish aspects to be mixed giving them an undisputed personality.

Special treatment applied to the coil coated metal allows remarkable performance to be achieved, paving the way for all sorts of architectural possibilities.

Depending on your needs and budget, you can opt for a complete system, combining metal, the primer, the finish and the reverse side. This equation will thus determine the quality and long-term viability of your building.

Whether made of steel or aluminium, the alloy guarantees mechanical flexibility and the reliability of the metal when facing adverse weather conditions and aggression. The choice also allows for stamping, folding, profiling and embossing, according to the case. A wide range of supports enables all requirements to be met.

Printing on coil coated metal (ARCELOR MITTAL)



Metal coating on steel

Steel substrate is responsible for the mechanical performance and fatigue resistance of the part to be manufactured. The metal coating helps to protect it from corrosion.

Available in several qualities:

- **Galvanised (the most frequent type used):** Its zinc coating protects the steel from corrosion by a barrier effect and above all by its cathodic protection leading to the consumption of zinc by a sacrificial effect.
- **Cold laminate:** This is only used when the risk of corrosion is low, notably for interior use.
- **Electroaluminised:** It can be proposed to replace lightweight galvanised steel according to the capacities available.
- **Galfan:** This coating (95% Zn / 5% Al) has excellent corrosion resistance and its microstructure gives it great formability.
- **Alusi and Aluzinc:** These are only used in very special cases due to their very high performance in terms of temperature and/or corrosion resistance.
- **Zinc Aluminium Magnesium alloy:** An innovative zinc-based metal coating with magnesium (Mg) and aluminium (Al) added. It offers excellent protection from corrosion and helps to preserve the environment thanks to the reduced thickness of the zinc coating.

Aluminium alloys containing Magnesium (5000 series) or Manganese (3000 series) give excellent corrosion resistance results in aggressive environments without additional metal coating.

Surface treatment

Surfaces are treated at the level of the metal/paint interface. Treatment always starts with a degreasing operation: by an aqueous process (alkaline, acid, etc.), using a solvent or a mechanical system (furnace).

It ensures a uniform link between the metal and paint to improve the bonding of the paint system and corrosion resistance.

Organic coatings

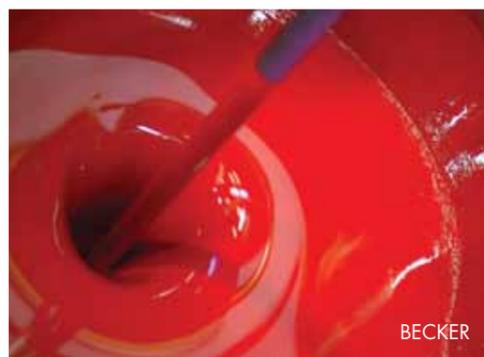
Primer :

The thickness of primers and choice of formulation determine the corrosion resistance, as well as the bonding of the finishing coat. It offers forming possibilities thanks to the elasticity of the coating even including embossing. The standards to be complied with are NFP EN 10169 for steel substrate and NF EN 1396 for aluminium substrate. They guarantee exterior resistance performance in highly aggressive environments.

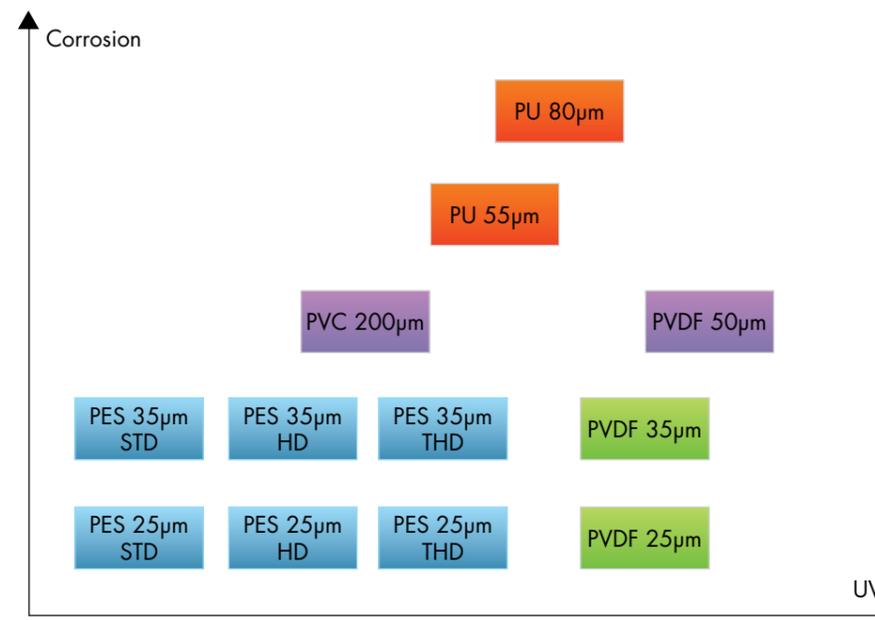
Finishing coats:

Manufacturing colours is within everyone's scope. The difficulty is getting them to harden and achieve uniform, producible ageing. The high quality of paint is obtained by respecting specific formulations that avoid chalking, washed-out colour and the appearance of corrosion. For companies, the colour is a strategic choice. The symbol of a brand, it is the distinctive sign that will personalise the building. Long-term durability of colours is therefore of prime importance.

With coil coated metal, the chromatic possibilities are extensive and unique compared with other construction solutions. A wide range of colours is available to concept developers, designers and architects. Several levels of gloss are proposed, from lacquer (extremely shiny) to practically a mat finish. Designers can also play with pearlescent, metallic and interferential finishes (shades that change with the light and viewing angle). The latter offer interesting contrasts on façades.



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Quality of finishing coats

- **25-micron polyester** (normal environments (and 35-micron (saline and industrial atmospheres) or 60-micron powder (for external exposure).
- **PVC** : Very thick polyvinyl chloride for increased service life.
- **Polyuréthane** : high chemical resistance
- **PVDF** : 30-micron high-resistance polyvinylidene fluoride.

PES : Polyester
 PU : Polyuréthane
 STD : Standard
 HD : High Durability
 THD : Very High Durability
 PVC : Polyvinyl chloride
 PVDF : Polyvinylidene fluoride

The reverse side of strips

The reverse side is made of polyurethane foam, formulated for perfect adherence and the capacity to bond with other insulation materials and anti-condensation products. As a result, it enables high-quality construction systems to be produced, combining insulation with finish - "2-in-1" (phonic/thermal insulation + aesthetic appearance).

Temporary protective film

The finished aspect and quality of coil coated steel must be protected, from the lacquer application through to the final user, irrespective of the transformations undergone in the meantime.

To keep coil coated surfaces intact until the end of work on site, they are protected with plastic film which supports all the mechanical transformations, assembly operations, transportation and installation, etc. Protective film may be colourless transparent (for quality control) or opaque - there are versions suitable for all kinds of finishes (smooth, metallic, grained, structured, mat, etc. The protective film has an exterior resistance guarantee that amply covers the assembly and installation period and is therefore the last element to be removed before site acceptance procedures.



NOVACEL

The functions of coatings

- **Anti-graffiti capability:** Additives to be mixed with the paint can be proposed or the addition of a very fine finishing varnish.
- **Façade dirt resistance:** 3 solutions allow major savings to be made on the life of the building and enter into the requirements for High Quality Environmental buildings:
 - Dirt-resistant coatings
 - Self-cleaning coatings
 - "Easy-clean" coatings
- **Reflective paint:** This reflects part of the infra-red rays to save energy in line with RT2012.
- **Grained and structured paint:** this offers an original aesthetic appearance and high resistance to impact and scratching. For some applications, such as roofs made of coil coated tiles, the grained aspect is particularly appreciated.
- **Pink-jet printed paint:** this technique, similar to photographic ink-jet printing enables buildings to be customised with a spectacular result; printing of landscapes, logos or advertising visuals on façades.

With coil coated metal, the chromatic possibilities are extensive and unique compared to other construction solutions. A wide range of colours is offered to concept developers,



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designers or architects. Several levels of gloss are proposed, ranging from lacquer (very shiny) to a virtually mat finish. Concept developers can also play with pearlescent, metallic and interferential aspects (shades that change according to the light and viewing angle). The latter offer interesting contrasts on façades.

Innovation and R&D are at the core of the issues at stake for the future to offer designers and principals increasingly effective solutions. It will therefore be possible in the near future to use photovoltaic paint, anti-condensation paint, paint that captures UV rays to air-condition and heat buildings.

Special issue on Coatings



RVA Agency, Fresnes Project

So, care needs to be taken with choices! It is up to the architect to create the area of application of the suitable material and not misuse it. Since coil coated metal is a product that opens up a new field of possibilities, every project becomes a laboratory for our teams. We give ourselves the means to develop the best conditions for its implementation within the context of the project.

MP : Do you encounter reticence from your project owners?

PV : We are seeing a change in apprehension towards coil coated metal by principals as metal is beginning to be accepted by occupants. But everyone has their own prerogatives and missions. At the start of the project, with his partners, an architect must provide accurate answers regarding pertinence, durability, wear, cleaning, modularity, maintenance, etc. and price! As for the principal, it is up to him to organise the successful encounter between the population and an architectural object, with our confident assistance. We cannot allow ourselves to propose a project that becomes a designation tool rejected by the population, particularly with housing projects, all the more so in suburbs. It is not a question of producing what a population expects but of giving it a pleasant surprise.

In view of all this, coil coated metal calls for specific cultural work and an architect must be the advocate of this for deciders and the population. Building something special is only possible when considerable thought has been devoted to a project. An architect is not there to systematically cause a stir but to contribute a project that is federative and powerful if possible, according to both geography and history.

A major cultural change occurred at the start of the years two thousand, and a new phase of architectural creation had to be devised to meet the challenges involving the environment and thermal performance of buildings. The formal cultural certainties of the past were shattered by these new requirements. It is certain that thermal insulation from the exterior stimulates designers and manufacturers into proposing new products and concept developers into using them but the population and backers need to accept them as new criteria for quality of life. Nearly two decades ago we started to rethink the way we live and pave a path taking into account requirements for ethical responsibility in terms of protection for our species, our biotope - what we are starting to call the "resilient city".

MP : Thank you.

Programme for the renovation of Fresnes

“ Building something special is only possible when considerable thought has been devoted to a project. ”

Philippe VIGNAUD, Architect/Town Planner partner, RVA Agency.

Mario PALERMO, ECCA : Philippe, how would you define your commitment as an architect?

Philippe VIGNAUD : I consider architects have extensive social responsibility for the construction of cities in the 21st century, in line with active, efficient public policies as a basis and, in my mind, taking ethics and solidarity into consideration.

MP : Why choose coil coated metal (steel or aluminium)?

PV : Every project is a special adventure. The choice of material must satisfy a complex equation: is it the right solution in this location at this specific point in time? It is the result of extensive consideration from an aesthetic, environmental and economic standpoint. This action is guided by ethics and a responsibility to economise on resources.

dealing with a large building. They enable shades to be created; to give life to the material, observe reaction to light and therefore to tackle complex structures.

The integration of coil coated metal is fully mastered: if we wish it can be a real collective project involving all the professional sectors concerned, ranging from production to installation (paint manufacturers, application technicians and installation companies). Here, an architect controls the construction, there is no room for excuses! He can have samples made that will be Exactly the same as the real thing and therefore refine his choice taking his project to successful completion. All materials have their own elegance and faults: wood is warm but not long lasting, concrete supports loads but is often not popular, stone does not support loads well and coil coated metal can be perceived as cold, cutting and aggressive.

RVA Agency, Fresnes Project



When we work on large-size buildings, the technical and aesthetic elements are both as important as one another. We must propose a building that is socially and culturally acceptable, without renouncing our own innovative action for all that. From this point of view, an architect has a specific responsibility: a building is neither a canvas that can be turned over nor a sculpture that can be masked or avoided. In addition to its unavoidable position in a city, a building demands specific long-term viability, at least for the period over which the loans needed for its construction are to be paid off! Coil coated metal meet these requirements fairly broadly: modernity, long-term durability and mechanical precision in particular.

But also from a visual standpoint thanks to its colour flexibility, the possibilities are tremendous and enable us to do high-accuracy work. For these reasons, it is undoubtedly one of the richest materials. In addition, the shiny or mat varnishes are particularly appreciated when



RVA Agency, Fresnes Project

RVA Agency:

The RVA Agency was set up in Les Lilas in 1994. It is headed by Dominique RENAUD and Philippe VIGNAUD and consists of fifteen or so architect/town planners and landscapers who divide their work between three main areas that constitute our living environment: town planning, architecture and the landscape.

The programme:

The Toit et Joie building in the "living unit" family contains a model of the reversed duplex type of housing which will be upgraded in an external outer skin containing effective thermal insulation, as well as shutter systems for bay windows and balconies.

“ One of the particularities of our approach is to combine originality, innovation and sustainable development ”

Joan TARAGON, Head of the Wine Civilizations City at Bordeaux, X-TU Agency.

Mario PALERMO, ECCA : How would you define your approach as an architect?

Johan TARAGON : One of the particularities of our approach at the X-TU Agency is to combine originality with innovation and sustainable development. As architects, we are constantly seeking new forms to create original buildings that fit well into their environment. At the same time, as “researchers” we implement new types of technology to create lively, eco-responsible façades. The fruit of our research and achievements is intended to be made available to as many people as possible, it is our wish to “share”.

MP : Could you explain to us the origin of the Wine Civilizations City at Bordeaux.

JT : We sought to integrate the City to fit perfectly into the wild banks of the River Garonne. The landscape is both very fluid and wild with numerous bends and, at the same time there are industrial installations. To develop a building such as this, we had to respect and reveal these particularities and contrasts. We therefore combined a very symbolic, “simplistic” approach with a very “futuristic” vision by creating a lively façade to extend beyond wine and the imagination. The originality of our interpretation of vine stock and a decanter comes from the movement created and the liquidity of the façades.

MP : Why did you choose coil coated metal for this building?

JT : We wanted to use the reflections you see in the colour of a good wine to get visitors to seek out its complexity and richness. To create a very fluid façade with movement as if the form of the wine’s “robe” was imperceptible, we chose coil coated metal not only for cost reasons but also for its richness. Coil coated metal is the only material that allowed us to produce reflections with considerable variation in

implementation and flexibility, something we did not manage to find in glass, such as the liberty of curving and transformation on site, an immense choice of colour that gives you every subtlety imaginable. The ochre and golden shades chosen harmonise perfectly with the colours and iridescence of the bed of the River Garonne. The use of interferential paint offers a wide variety of colours, depending on the viewing angle, and plays with the shafts of light. The palette of processes corresponds closely to our search for new experiences.

MP : What do you require of coil coated metal coatings?

JT : On a building developed like the Wine Civilizations City at Bordeaux, requirements are necessarily even more stringent and varied:

- The complexity of the façade calls for a technical solution that can only be achieved by coil coated metal. Its ease of use, extensive curving liberty, uniformity, reproducibility and constant quality as opposed to post-coating, the wide choice of colour shades, etc., all these elements contributed to our choice.

- The long-term viability of the Centre and its maintenance are vital for the principal as for us, its designers. The use of interferential paint could be risky but the application of 3 coats (primer, finish and reverse side), the 10-year warranty and stability of shades, which comes with a 20-year warranty, are reassuring elements.

- Finally, to meet the requirements of HQE buildings: no on site nuisance, easy maintenance, etc.

MP : Thank you.



X-TU Agency

Wine Civilizations City at Bordeaux

The X-TU Agency:

- Symbiotic architecture and town planning (industrial ecology, urban ecology, urban metabolism, circular economy)
- Passive or positive-energy buildings (bio air conditioning, geothermy, symbiotic thermal exchange, pooling, etc.)
- Planted or organic wall systems (microalgae, medicinal plants, urban agriculture, planted concrete, roof or façade greenhouses)
- Urban spaces of the future (sustainable, carbon-free, symbiotic, hybrid cities, etc.)



X-TU Agency

X-TU Agency

New ECCA France site

A new Internet site for Eccca France; offering more local content, news and information.

Find out about coil coating metal professions, the expertise of its members, the training given by its members and all our news and views. Check out the site: www.ecca.asso.fr



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New tailor-made solutions with exceptional customer service

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For further details: www.myriad.fr

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MIRABUILD® is available in new collections: pearlescent and frosted finishes to give the special aspects available on the market a fresh new look.

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Alcoa Architectural Products in Merxheim/France is a subsidiary of ALCOA, world leader on the aluminium market. 61,000 employees in 31 different countries make and distribute products ranging from composite panels to aluminium ingots.

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