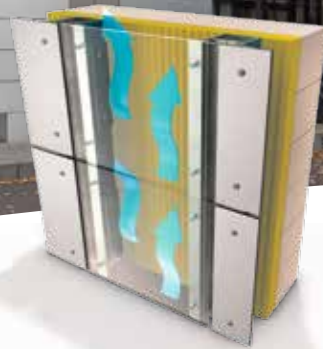


Reynobond®
Architecture

Reynolux®
Building



Renovation of facades, interiors and accessories

Energy efficiency and
aesthetic solution.





Offices Pensionskasse Hoechst Cologne, Germany

Project Office building of the employee pension fund of the Hoechst Group VVaG Architect: Gatermann + Schossig

Fabricator NR Metallbau

Year of renovation 2009

Product Reynobond® Architecture
Brushed Aluminium Natural

Project description

Revitalisation of this 60's-vintage administration complex meant entirely stripping the existing building and installing a new climate control concept. The facades were entirely removed and replaced with a heating and cooling system in the parapet. Large-format panels of brushed aluminium now run in horizontally and vertically oriented rows, evoking interesting, changing effects as the light of day changes.



After the renovation



Before the renovation



College Wilhelm Leuschner Niestetal, Germany

Project Wilhelm-Leuschner College

Architect RSE Planungsgesellschaft mbH

Fabricator Holzbau Hellmuth

Year of renovation 2008

Product Reynobond® Architecture

Project description

The renovation of the comprehensive school built in 1978 resembled a general overhaul. Nearly every part of the building was updated, down to the shell. One focus was laid on an improved energy management. The heating and sanitary facilities, electrical and fire safety systems and even thermal insulation are now state-of-the-art. But the school's improvement wasn't just from an energy standpoint but from a visual perspective as well. Aluminium facades in bright orange and green now provide the schoolchildren with additional motivation.



After the renovation



Before the renovation



Residential towers “Herriot et Suisse” Le Mans, France

Project Six “Herriot et Suisse” residential towers

Architect Nomade Architectes

Fabricator Inter-Pliage

Year of renovation 2012

Product Reynolux® Building 1.47 mm, in three special colours: “champagne”, “gold” and “bronze” at 30% gloss

Project description

An enormous renovation plan launched by the city of Le Mans and the social property managers aimed at transforming the image of a social residential district by proposing a contemporary architecture and integrating a process of sustainable development. These two objectives were achieved thanks to the installation of exterior thermal insulation covering the existing facades of the six towers. In order to break with the monotony and repetitiveness of the prefabricated concrete facades, the architects chose Reynolux® Building cladding of high-gloss coated aluminium. Two colour tones are arranged randomly in vertical strips to offer the facade a dynamic aspect.



After the renovation (For the perforation contact the technical service.)



Before the renovation



Social centre Endesa Barcelone, Spain

Project Symbolic renovation of a historical building

Architect Alotark Arquitectos & Consultores

Fabricator Truque, Carpinteria Aluman

Year of renovation 2012

Product: Reynobond® with EcoClean™

Project description

The Spanish power company has selected an old hydroelectric power plant in Barcelona as its new headquarters. A complete renovation is making this historic structure one of the most symbolic buildings in the city. In addition to its outstanding energy efficiency, the 37,000 m² building is also notable for its extraordinary architecture. It combines the traditional facade of the former power plant with a modern, colourful aluminium-glass facade. The special feature: One part of the building was cladded with the new Reynobond® with EcoClean™ self-cleaning and air-cleaning panels.



After the renovation



Renovation associating the ancient and the modern: older part renovated

The ventilated facade

A solution for external thermal insulation.

The Reynobond® Architecture ventilated facade creates a second skin around the building, influencing many criteria of energy performance considered in the Kyoto Protocol. It is today's highest-performance insulation solution for improving the energy balance of the building.

Thermal inertia

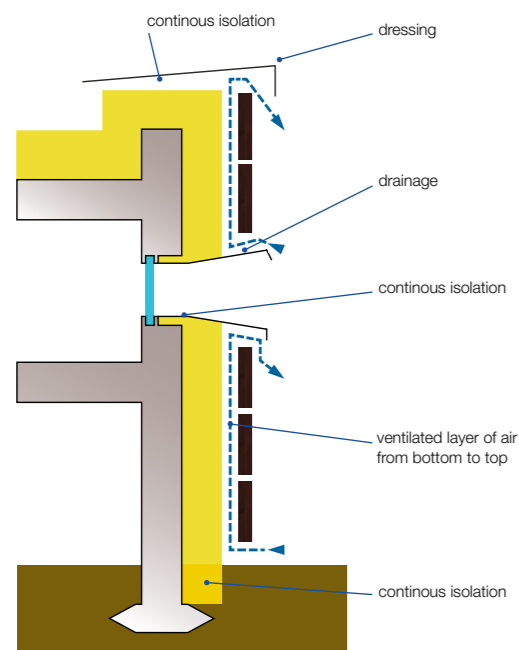
The principle of facade ventilation and the presence of insulation moderate the changes in heat and cold over time (thermal phase difference) as well as the amplitude of the changes. This thermal performance contributes to summer comfort, a criterion used in the RT 2102, the French thermal regulation, to limit the use of air conditioning, for example.

Reduction in structural thermal bridging

This double skin permits continuous, homogeneous thermal insulation along the opaque walls. For interior (ITI) or divided thermal insulation, the global performance of building walls is affected by discontinuities in construction (low, intermediate, high floors, partition walls ...). ITI permits 33 % losses, in sharp contrast with the mere 10 % loss when using exterior thermal insulation (ETI). As a result, only a ventilated facade makes maximum use of the building's thermal inertia.

Thermal performance

Adapt the thickness of the insulation according to the thermal performance desired.



The advantages

■ Reduction in energy consumption

The three points defining the concept of the Reynobond® Architecture ventilated facade all work together for a better insulation! The result is a reduction in energy consumption of the building in terms of heating and air conditioning. A ventilated facade is thus an ideal solution for reducing CO₂ emissions.

■ Protection against rain and weather

The Reynobond® Architecture ventilated facade protects the load bearing structure and insulation from rain and weather.

■ Lasting protection of investment

Exterior insulation permits the interior to be preserved on the one hand (both aesthetically and in terms of space), while still permitting upgrade of a weathered facade to a modern one. Renovation using Reynobond® Architecture ventilated facade permits rehabilitation of old structures into a healthy, durable building.

■ Protection from humidity

Water vapour on the wall is rapidly evacuated by ventilation of the layer of air between the Reynobond® Architecture panel and the insulation. The insulation thus retains its effectiveness over the long term, and the building stays sustainably sane. Thermal inertia generated by the facade simultaneously reduces the problems of condensation induced by temperature fluctuations.

■ Acoustic performance

A ventilated facade can improve the acoustic insulation index by 8 to 14 dB, depending on the thickness of the insulation and the number of open joints.

Source: Aspects et faits concernant les façades ventilées – www.sifn.ch

Something to keep in mind

The construction quality of the building plays a major role in improving the general thermal performance of buildings.

Reynobond® Architecture

An environmentally friendly solution.

The Reynobond® Architecture ventilated facade contributes greatly to improving the energy performance of buildings and to achieving the objectives defined by the HQE (High Quality Environmental) approach and specific labels such as HPE (High Energy Performance) and Effinergie as well as for passive houses and renovation projects.

Eco-construction goal

Natural design

Colours and textures that can be integrated perfectly into the environment of the construction, for example references to wood and earth, as well as other uniform or metallic tones.

Durability and maintenance

The smooth surface of Reynobond® limits dirtying and can be cleaned with water or with current maintenance products. Well-maintained, the panel has a very long lifetime; it is guaranteed to hold its colour for 20 years.

Environmental quality

Our research and development service is always looking for ways to reduce the consumption of energy resources needed to manufacture Reynobond® panels. The environmental qualities of the product as well as its life cycle analysis are documented in the Reynobond® EPD (Environmental Product Declaration) file.

Waste reduction

Panel formats optimised to minimise construction waste. Cutting and punching work is done at the fabricator's factory. The construction site stays clean and work is rapid, which limits the consumption of resources.

Eco-management goals

Thermal performance of the construction is optimised thanks to the principle of the ventilated facade and its insulation, reducing overall energy consumption.

Comfort goals

Thanks to the ventilation in the layer of air in the facade, **hygrothermal comfort** is considerably improved. **Acoustic comfort** can also be improved by 8 to 14 dB.

Environmental data available upon request

EPD – Europe

The EN15804-compliant EPD (Environmental Product Declaration) files for Reynolux® and Reynobond® are based on the ISO 14040 standard. They list the environmental qualities of the product as well as its lifecycle analysis (LCA): ecological footprint, lifecycle, recycling of the product ... This European document is based on the requirements of the German DGNB certification.

LEED – USA

The LEED certification is the American system for the evaluation of environmental structures. Reynobond® and Reynolux® are helpful to support projects with the maximum two points. Certification is currently in progress.



Radisson Blu Hôtel | Göteborg | Sweden | Reflex Arkitekter AB | Staticus LEED project



Coca Cola | Madrid | Spain | De Lapuerta + Asensio | ROMGOM, S.L.U. | LEED project | ventilated facade

Controlled French manufacturing

Reynobond® Architecture panels are all made in France. Alcoa Architectural Products have ISO 14001 certification, indicating their voluntary engagement in reducing the impact of their activity on the environment at all levels: water, energy or waste.



Metal and environment

■ Material economy

The high resilience of aluminium permits it to support significant loads with less material, or to serve as a framework for other materials.

■ Freedom in design

The high rigidity of metals offers greater freedom in creative design.

■ Durability

Reynobond® metal construction products resist bad weather, earthquakes, corrosion and UV all at once. This is an indication of a very long service life without deterioration.

■ Recycling

Metals are recycled without changing their quality, because metallic bonds are re-established after re-solidification – even after being recycled multiple times. Even today, over 92% of metal products used in European buildings are recovered over the course of their lives. The energy needed to recycle aluminium is about 5% of the energy needed for primary production.



Source : Les métaux dans le bâtiment – www.metalsforbuildings.eu

Environmental option: Reynobond® | Reynolux® with EcoClean™.

Reynobond® | Reynolux® with EcoClean™

Reynobond® | Reynolux® with EcoClean™ facades are the first aluminium materials (aluminium sheet metal or composite panels) that are both cost-effective and environmentally friendly. Using sunshine and the humidity, particles of dirt and smog are rendered harmless. This is how the EcoClean™ coating contributes to self-cleaning of the facade and to removing pollution from the surrounding air.

The advantages of EcoClean™

■ Protecting the environment

1000 m² of EcoClean™ destroys as much atmospheric pollution as about 80 trees. This is equivalent to the daily emissions of four cars.

■ Improvement of image

The facade remains beautiful and clean over the long term.

■ Cost-effectiveness

The self-cleaning feature of Reynobond® | Reynolux® with EcoClean™ considerably reduces the costs of cleaning and maintenance. Over half the costs of cleaning and scheduled maintenance on the facade can be saved.

How the EcoClean™ coating works



Under the influence of sunlight, a photoelectric effect in the titanium dioxide layer results in the creation of available energy from electrons. This energy from electrons creates free oxygen superanions and hydroxyl radicals that lead to the breakdown of organic substances.



The superhydrophilic properties come from the increase in surface energy caused by the electrons. The surface attracts humidity with the result that no drops are formed, but a thin layer instead. The harmful substances that have been broken down slide off this smooth surface or are simply washed to the bottom by rain.

Application

EcoClean™ is applied to walls exposed to rain and sunshine.

Availability

EcoClean™ is applied onto matte or satin finish, with the exception of the darker satin colours in DURAGLOSS® 5000.

Additional information

To find out more about EcoClean™, you can retrieve information, videos or brochures on our Website www.excellence-in-innovation.com, on the EcoClean™ tab.

Reynobond® Architecture and Reynolux® Building

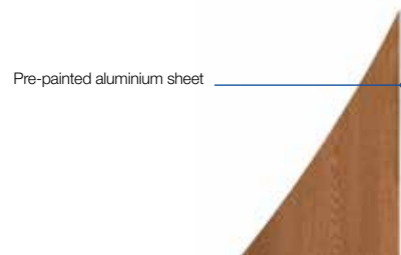
Two economical, ecological and durable solutions.

Reynolux® Building is a pre-painted aluminium sheet with a finish extremely resistant to UV and corrosion. Reynobond® Architecture is a pre-painted composite aluminium panel. It is composed of a coated core along with a pre-painted Reynolux® Building aluminium sheet. Coming from the same manufacturing plant, the two products can be obtained in identical colours and combined in the same project. The possibilities for architectural creation are vast – and yours to make use of!

Reynolux® Building

Transformation
Bending, profiling

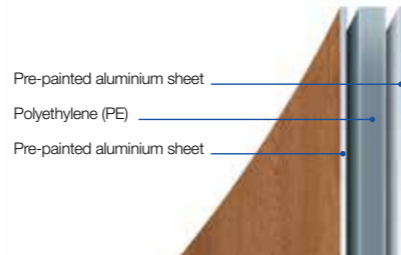
Application
Clapboards
Trapezoidal sheets
Cassettes
Sandwich panels



Reynobond® Architecture

Transformation
Bending, profiling

Application
Cassette systems
Riveted or screwed systems



The advantages

■ Light and perfectly flat

■ UV resistance

Due to the paint DURAGLOSS® 5000 the retention of colour in outdoor use can be guaranteed up to 20 years.

■ Resistance to wind pressure

Its rigidity permits it to resist bending under wind pressure. Reynolux® Building is less resistant than Reynobond® Architecture, but different procedures (reinforcement, more rigid metal ...) can make Reynolux® Building suitable for most projects.

■ Durability

The material is corrosion resistant, water-repellent and cannot rot! This material will never develop moisture and is also insensitive to heat, freezing and rain.

■ Quality

Our 50 years of experience in lacquering sheet aluminium allows us to handle the most prestigious projects in the world today (airports, opera houses, museums, office and residential buildings, stadiums ...).

■ Minimal expansion

Changes in temperature cause only slight dimensional variation.

■ Economical, cost-effective and easy to maintain

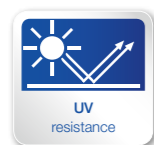
Reynobond® Architecture and Reynolux® Building are easy and quick to install. They are characterised by a long service life and require little maintenance. Their smooth surface limits dirtying and can be cleaned with water or with current maintenance products.

■ Freedom in design

A great flexibility in transformation lets you implement unusual shapes.

■ Accessories

Reynolux® Building and Reynobond® Architecture can be transformed and combined as desired to make accessories in the same colour, for example angles, acroteres, windowsills, starting profiles, lateral stops with spoilers, crests, joining profiles or radiators.



Facility and flexibility of fastening and transformation

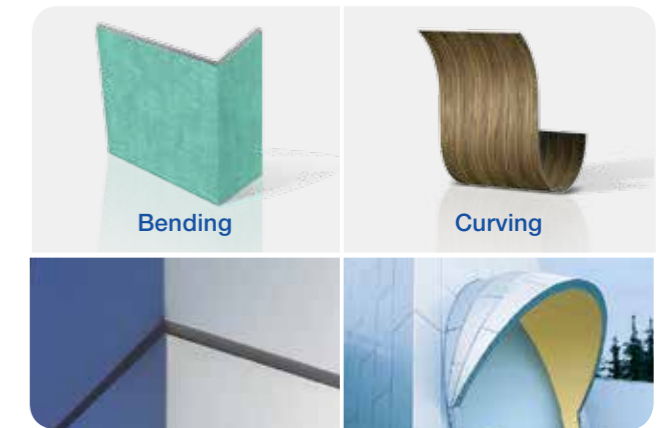
Visible or invisible fastening

Reynobond® can be fastened using a cassette system for invisible fastening using rivets, screws or adhesive. Visible riveted or screwed fastening reduces your machining costs and installation time. You can find assorted coloured fasteners from your provider: SFS Intec.



Flexible transformation

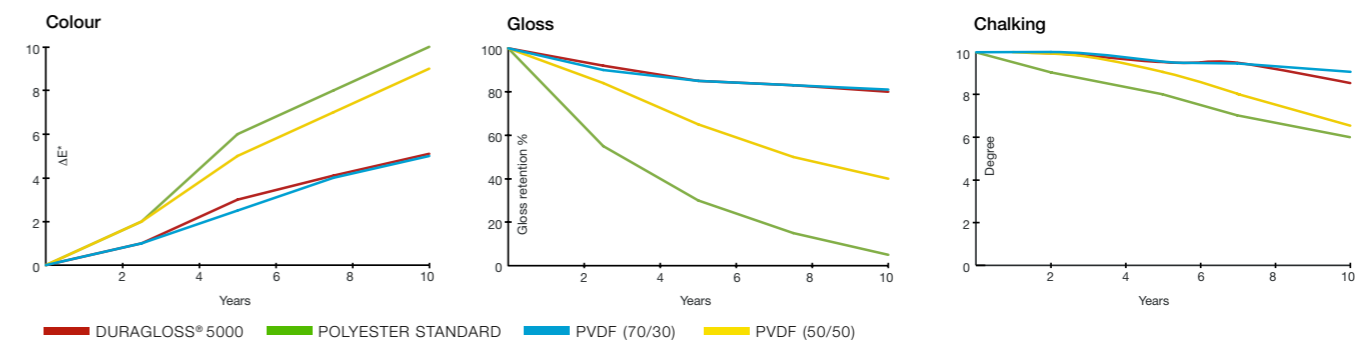
Easy to transform and to install. Punch, fold and bend Reynobond® Architecture panels for a fluid, homogeneous facade with no angled joints, for example.



DURAGLOSS® 5000: The choice of a coating par excellence

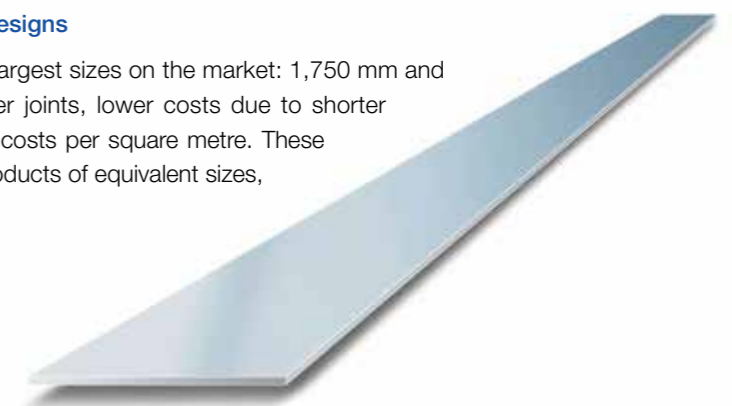
We offer DURAGLOSS® 5000 and PVDF 70/30 coating. DURAGLOSS® 5000 and PVDF 70/30 are of the same level of quality, but DURAGLOSS® 5000 has a greater range of

brightness and colours from 3 % mat. This is an innovative concept capable of meeting higher aesthetic needs and longer life requirements at the same time in an optimum manner.



Reynobond XXL: The ideal dimension for your creative designs

Reynobond® Architecture and Reynolux® Building offer the largest sizes on the market: 1,750 mm and 2,000 mm! Your projects gain aesthetic value due to fewer joints, lower costs due to shorter installation times as well as less processing and installation costs per square metre. These XXL sizes can also be combined ideally with other facade products of equivalent sizes, such as curtain walls.



Technical data Reynobond® Architecture et Reynolux® Building.

Composition of Reynobond® Architecture panels

	3	4	6
Panel thickness			
Coated aluminium sheet thickness (±0.1 mm)		0.5 mm	
Alloy & temper		3005 H46	
Core		PE or FR* (*fire-retardant)	
Front side finish		DURAGLOSS® 5000 (35 µm) or PVDF 70/30* (25 µm) and anti-corrosion treatment	
Reverse side finish		Washcoat and anti-corrosion treatment	

Characteristics of Reynobond® Architecture panels

		1,000 mm/1,250 mm/1,500 mm/ 1,750 mm/2,000 mm	
Width (-0/+3 mm)			
Lenght (< 4 m: -0/+3 mm > 4 m: -0/+6 mm)		2,000 mm up to 6,050 mm	
Weight in FR	6.1 kg/m²	7.7 kg/m²	11.1 kg/m²
Weight in PE	4.6 kg/m²	5.5 kg/m²	7.4 kg/m²
Tolerance in squareness		≤ 3 mm	
Tolerance in bow		≤ 2 mm/500 mm on the width and the length	

Performance of Reynobond® Architecture composite panels

Bond integrity	PE: ASTM D1876 FR: ASTM D903	4.37 N/mm (mini) or 25 lbs/inch		
Tensile strength	ASTM D6 38-82a	46.26 Mpa		
Moment of inertia (Rm)		0.31 cm⁴/m		
Tensile yield		44.16 Mpa		
Stiffness (EI)	CSTB, DIBT	0.125 kN/m²/m	0.242 kN/m²/m	0.242 kN/m²/m
Flexural modulus	ASTM C393 (& ASTM D790)	41,400 Mpa		
Surface coefficient of heat transfer U		5.7 W/m²K	5.6 W/m²K	5.4 W/m²K
Thermal expansion		2.4 mm/m for a temperature variation of 100°C.		
Sound attenuation (Rw)	ASTM E90 ASTM D6 38-82a	25 dB	26 dB	27 dB
Temperature resistance		-40 °C/+80 °C		
Maximum allowable deflection		L / 30 (allows higher wind pressure or bigger sized elements)		

Performance and durability of pre-painted Reynolux® Building aluminium sheet

Specular gloss	En 13523-2 ASTM D 523	DURAGLOSS® 5000: from 3% to 80% PVDF* 70/30: from 25% to 30%
Durability class	NF EN 1396	Class 4: Severe industrial - extreme conditions / very severe costal marine (less than 3,000 m from the sea) / high UV plus severe conditons
Pencil hardness	EN 13523 - 4	HB - F
Resistance to cracking on rapid deformation	En 13523 - 5	No cracking, no loss of adhesion
Adhesion after indentation	En 13523 - 6	100% of adhesion
Resistance to cracking on bending	En 13523 - 7	Very good flexibility: 0.5 T
Acetic salt spray fog resistance	En 13523 - 8	1,000 h
Water immersion resistance	En 13523 - 9 AAMA 620	3,000 h
Humidity resistance	ASTM D 2247 AAMA 620	3,000 h
Mortar test	AAMA 620	No effect
Acid resistance	AAMA 620 ASTM D 1308	Nitric acid: ΔE < 5 units except some blue and metallic colours Hydrochloric acid: No effect
Detergent resistance	AAMA 620	No effect
Color fastness on natural weathering	5 years 45° SouthFlorida	Color variation: 5 to 10 units (ΔE) depending on color
Resistance to chalking on natural weathering	5 years 45° SouthFlorida	Rating ≥ 8

* This document provides the results for two-sided PVDF.

Reynolux® Building:

For Reynolux® Building, the project and your expectations in terms of design will determine the metal to use: alloy from 3000 to 5000 and thickness from 0.7 to 2 mm. See "Performance of prelacquered aluminium sheet" part in the Reynolux® Building technical data.

Fire resistance:

Reynolux® Building pre-painted aluminium sheet allows you to meet the strictest of fire codes: the product does not burn.

Technical service:

Our service is at your disposal to help with static wind resistance calculations, panel cutting optimisation and advice in the details of installation on specific parts of the building.

CAD files and 3D objects:

You can find all the CAD system files for riveted and screwed installation as 3D objects in electronic form on our website at www.reynobond.eu.

Reynobond® Architecture and Reynolux® Building certifications.

Reynobond® Architecture certifications in Europe

France	Cassette: cCSTBc 122-47-36 Riveted/screwed: cCSTBc 22- 47-37
Germany	ÜZ-3/837/06
Poland	ITB - 1592/W Atest Higieniczny HK/B/0665/01/2007

Fire certificates for Reynobond® Architecture

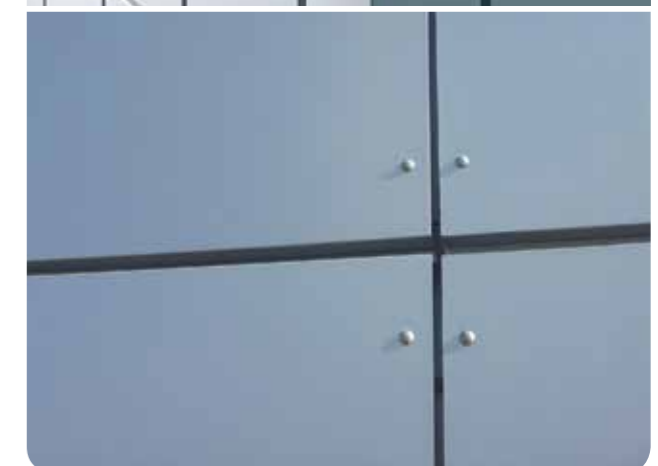
Europe	EN 13501	FR: B-s1-d0
France	NF P 92-501	PE & FR: M1 Combustible non-inflammable
Germany	DIN 4102	PE: B2 - FR: B1
Switzerland	Directive VKF	PE: 4.2 - FR: 5.3
Great Britain	BS476 part 6 & 7	PE & FR: Class 0
Poland	PN-90/B-02867	FR: NRO
USA	ASTM E 84	Meets requirements
Austria	ÖNORM 3800	PASS
Russia	TR	FR: G1

Fire certificates for Reynobond® Building

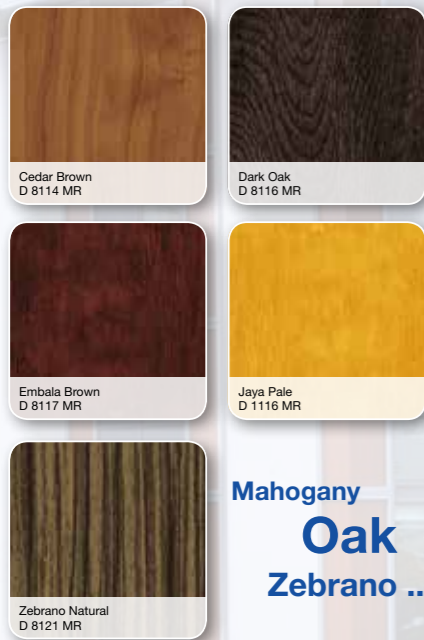
Europe	EN 13501	A1
France	NF P 92-501	M0 incombustible

Mechanical certifications for Reynobond® Architecture systems in Europe

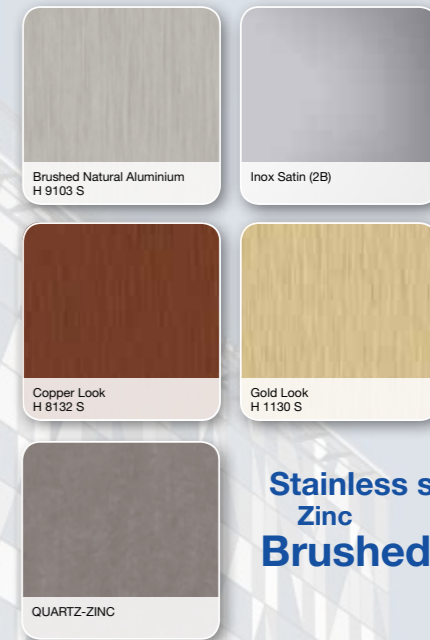
France	Avis technique système cassette	2/11-1440
France	Avis technique système riveté et vissé	2/11-1442
France	Avis technique système vissé ossature bois	2/12-1497
Germany	Allgemeine bauaufsichtliche Zulassung	Z-33.2-1012
Poland	Aprobata Techniczna	AT-15-3524/2006
Spain	Sistema de revestimiento de fachadas	DIT 485
Russia		TC/TO-3739-12
Great Britain	BBA agreement	BBA 08/4510
Czech Republic	Certificaci	č. 216/ C5a/2012/0093



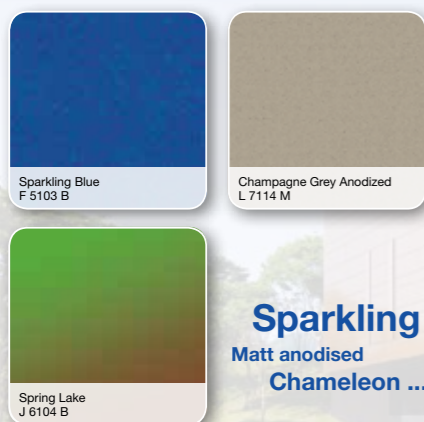
WOOD Design colour chart



METALS & BRUSHED colour chart



EFFECTS colour chart



STANDARD colour chart

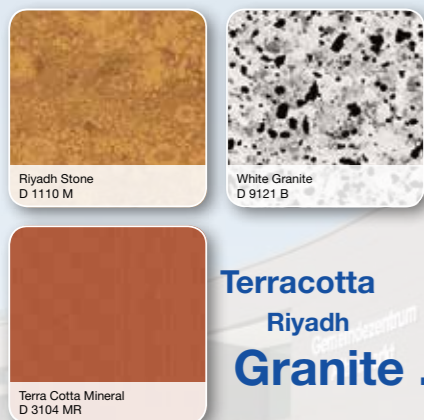


Reynobond® | **Reynolux®**
Architecture | Building

Our colour charts are available online or upon request.

Standard RAL, NCS or custom colours are available upon request.

NATURAL Design colour chart



Mirror



 **excellence in innovation**

With **excellence in innovation**, Reynobond® Architecture and Reynolux® Building are your partners for more creativity, more versatility and more reliability. As innovation leader in our market segment we offer you:



excellence in innovation is at the same time an aspiration and a challenge. It not only relates to our products, but also involves responsible management of our natural resources. And it is our benchmark ensuring we always provide you with the best available solution for your very particular requirements. Find out more at www.excellence-in-innovation.eu.

About Reynobond® Architecture and Reynolux® Building

Reynobond® Architecture and Reynolux® Building are trademarks of Alcoa Architectural Products based in Merxheim, France – a subsidiary of Alcoa, the market leader in aluminium. In Reynobond® aluminium composite panels and Reynolux® aluminium sheets, we offer you a wide range of products for architecture and building projects. What's more, they come with

all the solid virtues you would expect of a global company. This means, for example, that you get a warranty of up to 20 years on our DURAGLOSS® surfaces. Member of the ECCA (European Coil Coating Association), our company is certified according to the international standards ISO 14001 and 9001 and OHSAS 18001.

