SWISSPEARL®

PREMIUM

SWISS QUALITY

FAÇADE SYSTEMS

FOR HIGH-END

ARCHITECTURE

90% of the **raw material** originates from sources in the vicinity of the production plant (10 – 60 km).

60% of the **electrical energy** consists of renewable energy. The CO^2 emission was reduced by 20% by changing the energy carrier from oil to natural gas in the past 3 years, at the same time eliminating the emission of colloid dust.

Coloration in the cement mass

The cement mass is usually coloured with anorganic colour pigments.

Cement production

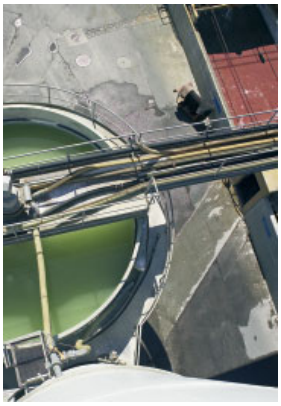
20% of the energy required for production consists of alternative fuels (waste material). Since mid-2007 the chrome (IV) content of our cement conforms with the EU regulations 2003/53/EG.

Reinforcement fibres

High quality polivinylalcohol synthetic organic fibres serve as reinforcement and ensure the required solidity and longevity of the product.

Cellulose

This additional natural fibre ensures a smooth production process. Share is lower than 6% to ensure an optimal panel stability.



Primary production

The raw material processing cycle is closed, i.e. edge cuttings and imperfect sheets return to the material cycle immediately after dissolving in water.

Within the factory, panels are only transported by electric lifting trucks, - i.e. no colloid dust.

Curing

The panels are temporarily stored in conditioning premises for 4 weeks for hardening and drying.

This slow, natural curing of the base sheets contributes to the high quality of the cement core.

Coating

The coating material consists of high quality pure acrylate. It contains neither solvents or any metallic components.

With the use of the curtain technology, the waste of coating material is reduced from 30 to 2 % as compared to spraying technology.

The panels are also coated on the back in order to minimize deformation.

Palletising

The company specific optimisation programme determines the best possible yield of the basic panels to avoid waste of material. If requested, the panels are palletised in the order needed for assembly to avoid waste of time on the job site.

The cut and drilled panels are dispatched ready for assembly, which allows quick and precise installation with-out any waste of material on the building site, ensuring economical and ecological conditions.

Transport

The panels are stacked on special robust pallets, and various safety measures are taken to protect them against all possible danger during transport in order to ensure that they arrive at the building site just as they left the factory.

Installation

The different layers of the ventilated façade are installed successively. Depending on job site organization, several teams can work at the same time on the assembly of the different elements of the system.

The SWISSPEARL panels supplied ready-to-install allow easy and straightforward progress on the job site.

Photo 2006
of building installed 1978

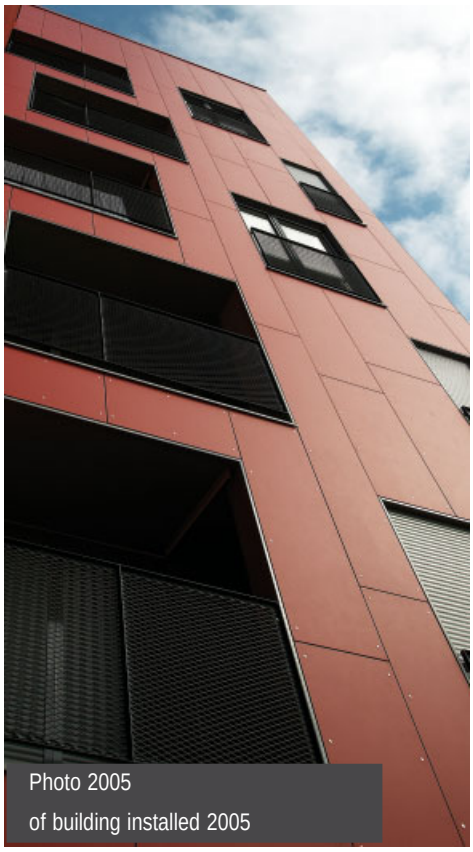


Photo 2005
of building installed 2005

Maintenance

Over 40 years life.

The surface of the panels is not prone to electrostatic charging and resulting soiling.

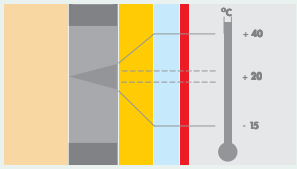
Dismantling

Since no elements of the system are stuck together, efficient dismantling and appropriate sorting are problem-free. Façades are "deconstructed", and the various parts are recycled or dumped.

Recycling, depository

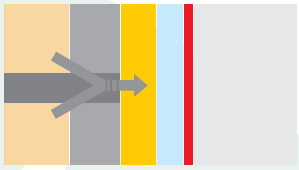
The manufacturer uses a tried-and-tested process for the utilization of composite cement in cement kilns. Cement composite is a high value raw material for the cement production.

Should reutilization in cement kilns not be possible, composite cement can be stored on a inert material depository (according to the European waste catalogue-waste cipher 170101 [concrete]).



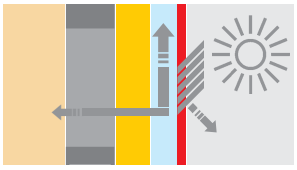
Protection of support walls

The support structure is protected against outside temperature changes by the thermal insulation layer. The risk of crack formation is much reduced. The thermal insulation applied on the outside improves the security and long life span of the structural support wall.



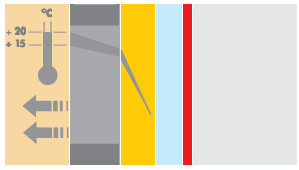
Heat protection during summer

Functional ventilation between the thermal insulation and the cladding prevents heat accumulation. Furthermore, it assists in making temperature changes (e.g. day and night) less noticeable.



Heat protection during winter

Thermal insulation applied to the outside of the structural support wall permits continuous insulation without thermal bridges (e.g. ceiling face sides, separating walls).



Protection of heat of room

The heat of the room is retained in the wall structure.

Ventilated façade system with SWISSPEARL

The ventilated façade allows - among other things - important reduction in costs for energy needed for heating or cooling buildings compared to buildings with traditional wall construction. It is therefore also an energetically sound façade system.

- In hot climates the cladding function as a heat shield (no direct sun on the construction wall) together with the permanent ventilation provide natural air-conditioning and prevent heat build-up regardless of colour of the cladding panels. And this contributes to make changes in temperature (e.g. day and night) less noticeable. This principle works in the same way when outside temperatures are low.
- The difference in temperature between outside panel and construction wall corresponds to 15 to 20 °C, in summer and in winter.
- This reduces the impact of the outside conditions onto the interior living space and so the energy needed to heat or cool the rooms.
- With appropriate construction, all thermal bridges are eliminated, which also reduces energy consumption
- All these effects can even be considerably increased with an insulation layer in appropriate thickness
- Swiss Construction Authorities testify that the SWISSPEARL façade panels have a life expectancy of at least 40 years
- Despite higher construction costs, Swisspearl ventilated façades have proved to be very cost-effective over the long term, given the benefits of the system's longevity (including longer life expectancy of the building structure), structural separation of materials, energy efficiency and low-cost maintenance.

Environmental pollution of Manufacturing and Transport of SWISSPEARL Panels

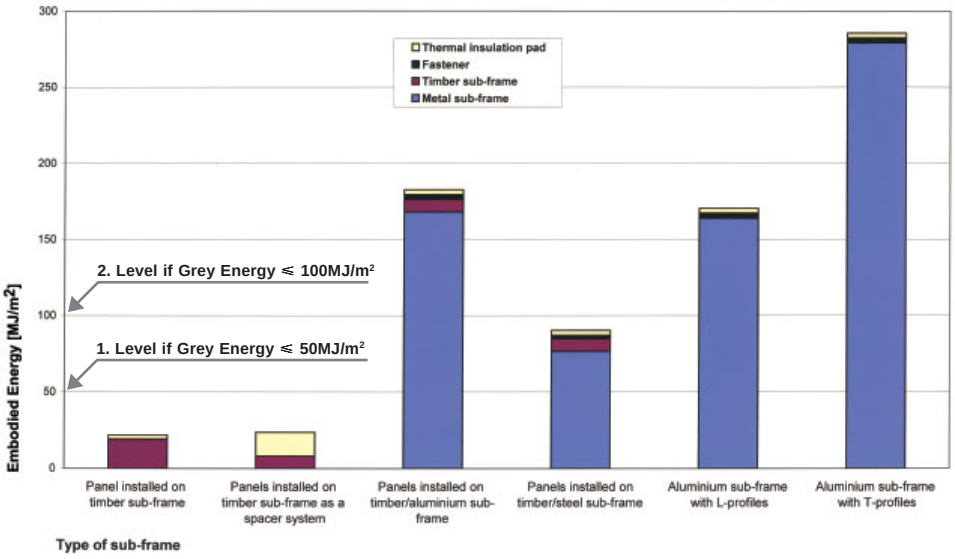
Criterion	Extraction of raw material and manufacturing	Transport	Total
CO_2 – Equivalent values (g/kg)	764	151	**915**
SO_2 – Equivalent values (g/kg)	3.20	2.52	**5.72**
Consumption of primary energy (MJ/kg)	9	2.7	11.7

The testified life expectancy is 40 years, the actual life span is much higher.

Explanation

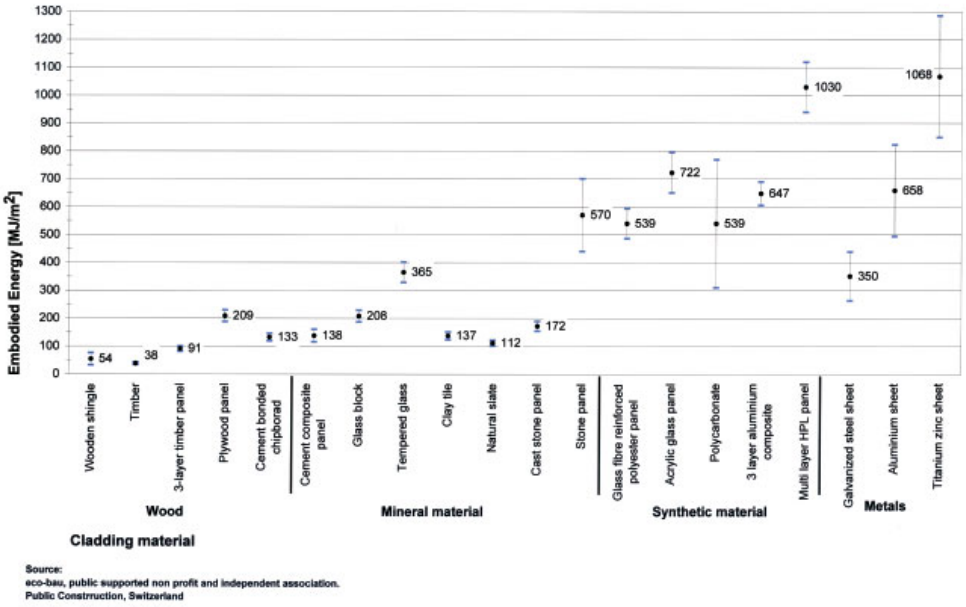
The greenhouse effect and the acidification are caused by different gases, which are converted with so called equilibrum factors into the leading substances CO_2 – equivalent value and SO_2 – equivalent value.

SWISSPEARL®



Source:
eco-bau, public supported non profit and independent association.
Public Construction, Switzerland

Embodied energy of sub-frames



Source:
eco-bau, public supported non profit and independent association.
Public Construction, Switzerland

Embodied energy of cladding material [panels without fastener and sub-frame]

SWISSPEARL®

] Colours: **stability** [

Swisspearl panels have excellent colour stability and homogeneous ageing.

The Delta E value measured for 2000 hours corresponds to approximately 5 years of normal exposure, the Delta E value for 5000 hours to approximately a 12 years' use of the panels.

In countries with higher solar exposure, for instance between ~40° latitude North and ~30° latitude South or due to particular local conditions, the ageing process may be accelerated. According to general knowledge, colours are for instance anticipated to fade twice as fast in tropical areas as in temperate Continental/European regions.

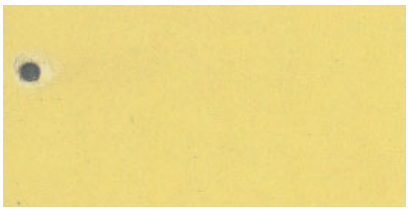
For façades in such sunny countries preference should therefore be given to the shades and textures with the best Delta E performance, such as the Onyx, Coral, Topaz series or the Reflex range.

On request, custom colours with even more UV-resistant top finishing may be proposed.

Autumn Leaves 9270 **Original**

Exposed 2500 hours

Amber 7083 **Original**



Exposed 3000 hours

Free weathering installation in Miami

Delta E values are measured values for colour differences of two samples (i.e. non-exposed / exposed to sunlight).
The value Delta E of the non-exposed samples is zero.
Colour differences can result in Delta E values of up to more than 100

The Xenon Arc test simulates sunlight and is a standardized method to simulate outdoor weathering in the laboratory. The effect of the exposure is normally measured as a colour difference (Delta E).

A test duration of 2000 hours is believed to simulate an exposure of five years.

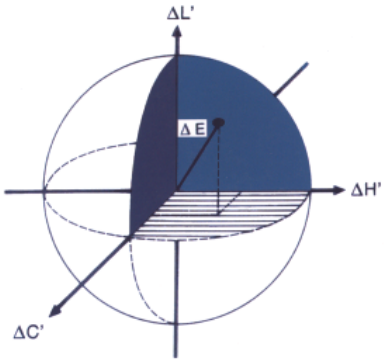
Delta E is the result of three variations

on the axis of lightness (L)	black to white
on the axis of hue (H)	blue - green - red - yellow
on the axis of saturation (C)	pale to intense

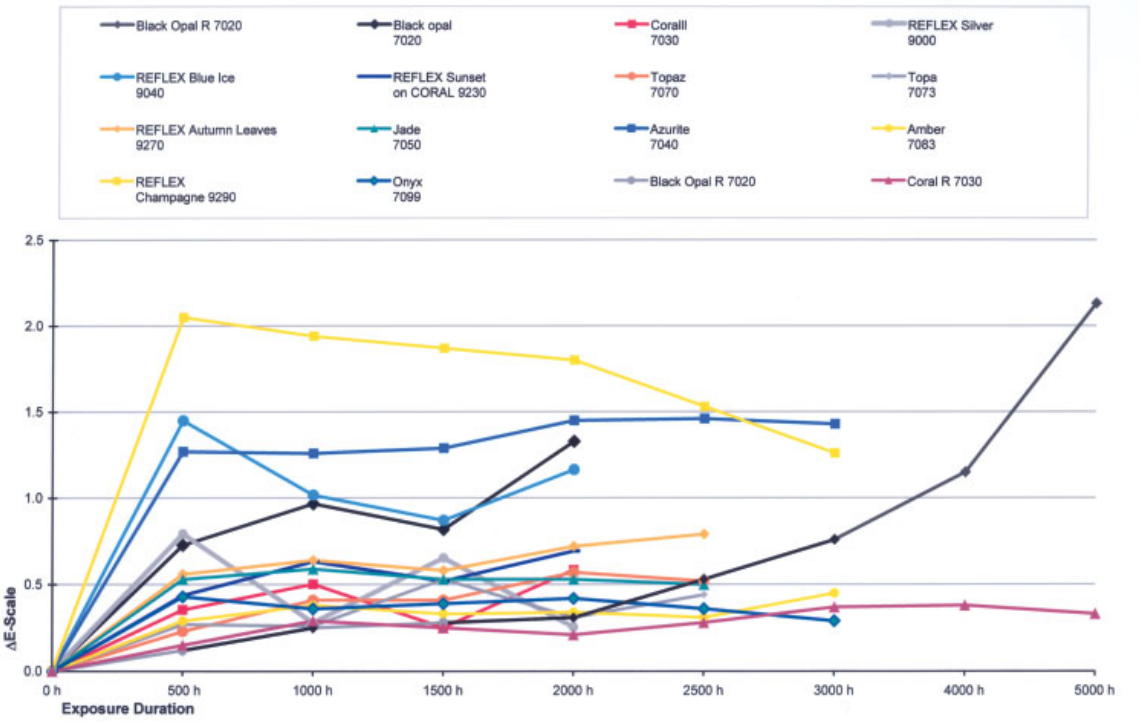
Delta E	**0 to 1**	**not visible or scarcely visible to the human eye with direct comparison of two samples**
Delta E	**1,5 to 2,5**	**visible to the human eye in direct comparison of two samples side by side**
Delta E	**3 to 4**	**minimal change in colour perceptible without sample for comparison**

Every colour changes with time.
But it is important that the change occurs evenly over the full façade

If Delta E is 3 or higher, colour of new delivery must be matched to existing façade when panels are required for adjacent elements.



Explanation of **Delta E Values**



ΔE values
After > 2500 hours exposition/weathering Xenon ASTMG115-00

CARAT	
Amber	ΔE 0.45
Azurite	ΔE 1.43
Black Opal	ΔE 1.33
Black Opal R	ΔE 2.10
Coral	ΔE 0.58
Coral R	ΔE 0.30
Jade	ΔE 0.50
Onyx	ΔE 0.29
Sapphire	ΔE 1.11
Titanium	ΔE 1.10
Topaz	ΔE 0.52
REFLEX	
Autumn	ΔE 0.79
Blue Ice	ΔE 1.16
Champagne	ΔE 1.26
Silver	ΔE 0.25
Sunset	ΔE 0.69

UV Xenon Arc Light **Accelerated Weathering** ATI York USA, CARAT Panels - Average values

SWISSPEARL®

SWISSPEARL®

Authorized Distributor

www.swisspearl-architecture.com

PREMIUM

SWISS QUALITY

FAÇADE SYSTEMS

FOR HIGH-END

ARCHITECTURE

Eternit (Schweiz) AG
CH 88867 Niederurnen
Phone +41 (0)55 617 13 07

www.eternit.ch
liliane.blin@eternit.ch
Fax +41 (0)55 617 12 71