

Case study

Skyway Mont Blanc, Courmayeur (IT)

Client:

Funivie Monte Bianco AG, Courmayeur (IT)

Architect:

STUDIO PROGETTI

Architect Carlo Cillara Rossi, Genua (IT)

General contractor:

Doppelmayr Italia GmbH, Lana

Project completion:

2015

Products:

FalZinc®, foldable Aluminium
with a pre-weathered zinc surface





Mont Blanc, or 'Monte Bianco' in Italian, is situated between France and Italy and stands proud within The Graian Alps mountain range. Truly captivating, this majestic 'White Mountain' reaches 4,810 metres in height making it the highest peak in Europe. Mont Blanc has been casting a spell over people for hundreds of years with the first courageous mountaineers attempting to climb and conquer her as early as 1740. Today, cable cars can take you almost all of the way to the summit and Skyway Mont Blanc provides the latest and most innovative means of transport. Located above the village of Courmayeur in the independent region of Valle d'Aosta in the Italian Alps Skyway Mont Blanc is as equally futuristic looking as the name suggests. Stunning architectural design combined with the unique flexibility and understated elegance of the application of FalZinc® foldable aluminium from Kalzip® harmonises and brings this design to reality.

Fassade und Dach harmonieren in Aluminium

Projekt der Superlative

Skyway Mont Blanc was officially opened mid-2015, after taking some five years to construct. The project was developed, designed and constructed by South Tyrolean company Doppelmayr Italia GmbH and is operated by Funivie Monte Bianco, a company under the authority of the independent region of Valle d'Aosta.

Located on the Italian side of the border, at the foot of the mountain, Skyway Mont Blanc replaces the former cable car system from the 1940s/50s and spans a total length of 4.3 kilometres, reaches an altitude of 2,140 metres connects the tourist resort of Courmayeur with the highest station level Punta Helbronner. The cable car journey

commences at the Pontal d'Entrèves valley station at 1,300 metres above sea level. From here visitors are further transported up to 2,200 metres to the second station, Mont Fréty Pavilion, and then again to reach, to the highest station of Punta Helbronner at 3,500 metres. This terraced top station, with the combination of its cantilevered structures and quality finishes of the chosen internal and external materials, creates a truly spectacular contrast against the breathtaking backdrop.

General Contractor Doppelmayr Italia GmbH, invested approximately 120 million Euros on the project, which included sourcing the cable car cabins from the Austrian manufacturer, Carvatech Karosserie- & Kabinenbau. The Karosserie- & Kabinenbau. Mit einer Geschwindigkeit von 9 m/s braucht die Seilbahn vom Start bis zur Ankunft nur 19 Minuten.

cabins have panoramic glazing and rotate 360° degrees whilst travelling and with a speed of 9 metres per second the cable car journey takes just 19 minutes from start to finish.

From its circular panoramic terrace, some 14 metres in diameter, this highest vantage point offers the visitor exceptional 360° views of some of the 'four-thousanders' or highest mountains in the Western Alps; Mont Blanc, Monte Rosa, Matterhorn, Gran Paradiso and Grand Combin. Inside the station there is a Crystal Exhibition, a self-service restaurant and a multimedia information centre where several screens enable visitors to learn more about the history of their surroundings.

The Challenge

Buildings constructed in the alpine highlands must be able to withstand the extremes and changeable nature of the weather conditions that are typical in such locations. The design brief needed to meet demanding design criteria and technical requirements in order to be a success, therefore as a result, experienced engineering firm, Holzner & Bertagnolli Engineering GmbH from Lana, was awarded the contract for both the structural and steel construction design of all three stations, including the cable car supports.

Some of the biggest challenges faced by the team were the combination of ensuring accurate yet cost-effective calculations for the concrete and steel components in some of the toughest conditions and highest altitudes. Furthermore, the team had to ensure that the structures were fully optimised to meet the technical demands of the cantilevers and the cable car which, even with the combined site logistics and organisation of the various professions, required consistent, effective interaction between the engineers and the project architect.

“We wanted to offer people a new way of conquering the mountain. Now, you can enjoy the landscape from an enclosed space, and everyone from old to young, can travel up to 3,500 metres in comfort. From the top, you can enjoy a unique perspective, thanks to the alpine architecture, which is aligned to the best vantage point on the mountain. You can experience powerful emotions and feel connected to the mountain there. That feeling stays with you, even when you are back home.” After extensive testing of several alternative materials the architect selected FalZinc® for both the roof and façade to help bring this design to life. FalZinc® foldable aluminium was a perfect fit for the planning and design concept as it was possible to successfully combine the understated elegance and appearance of pre-weathered zinc with all the inherent benefits of aluminium.

The Solution

By using the patented PEGAL process, a zinc surface is applied to a core of seawater-resistant aluminium alloy (EN AW-3105) to DIN EN 573-3 standards, and then weathered.

The excellent formability of the material thereby complies with all the requirements of DIN EN 507 „Roofing products made from sheet metal“ with specifications for fully supported roofing products from sheet aluminium. FalZinc® also has the highest resistance to corrosion, already demonstrated on many occasions through testing to DIN 50017

KFW and HCT-Test standards. Even under the toughest conditions at such alpine altitude, FalZinc® is unaffected by very low temperatures and can still be easily utilised and handled allowing precise handling and fixing whilst maintaining their environmental and sustainability credentials. On a design level, the standards for the cladding of the façade are, naturally, higher than those for roofing. For design reasons, the architects decided to do something different for the top station and adopted the same structural design for both the façades and the roof. Due to local requirements and the selected shape, the supporting structure here consists of a reinforced concrete substructure. Except where of a steel and glass construction, the façades and roof are covered all the way round with insulation.



A Kalzip vapour control barrier was glued onto this. Finally, the visible exterior was finished in angled standing seam roofing, using 0.7 mm thick FalZinc® aluminium sheets. In total, around 7,000 m² of FalZinc® aluminium profiles were installed on the project.

FalZinc® - the sustainable choice

The sheets were prepared from special coil widths of between 500 and 600 mm. This resulted in sheet widths of between 430 to 530 mm. The adhesives were fixed by screwing into metal rails embedded into the wooden substructure. Finally, snow and ice guards were fixed on to the folds.

FalZinc® is 100% recyclable and although the three station buildings were all created differently and consequently required different FalZinc® sheet formats, only minimal material waste resulted.

This also met the requirements Main Contractor, Funivie Monte Bianco AG, for sustainable and efficient building. It was also an important criteria that the material was classified as "Hard Roofing" as per DIN 4102-4 and therefore successfully fulfilled the Class A1 Building materials fire protection requirements.

Summary

With the decision to universally use FalZinc®, the main contractor succeeded in reconciling his requirements for a spectacular design with efficiency and sustainability. Skyway Mont Blanc is a unique installation. Combining energy-efficient, high quality materials with photovoltaic and heating systems and even at such an extreme location still achieves the standard of a zero-energy building.



The valley station in Pontal d'Entrèves even fulfils "Active House" criteria, since here more energy is generated than is used. Given the architecture and the high-tech facilities, some experts are tempted to refer to it as the "Eighth Wonder of the World".

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