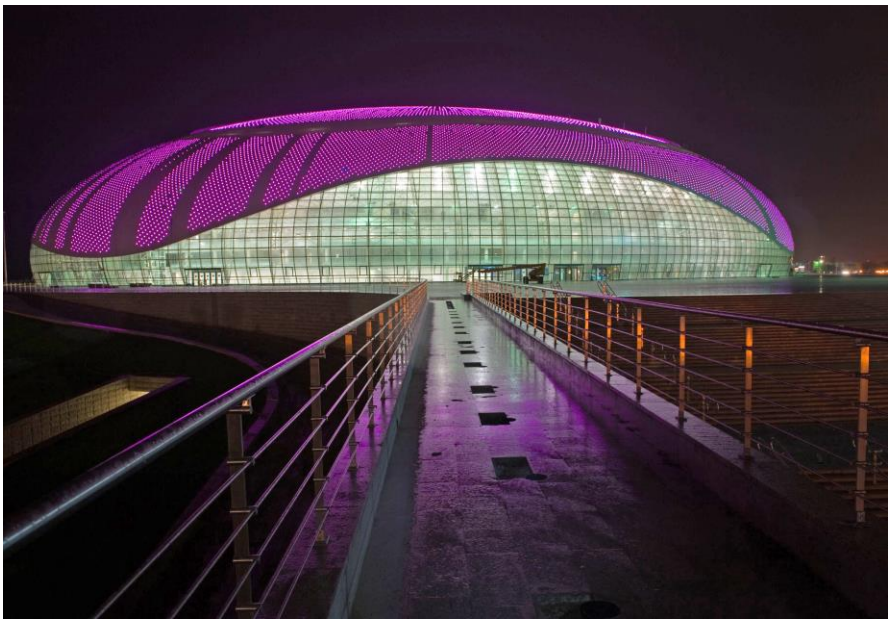
## BOLSHOY ICE DOME, SOCHI

## KALZIP LIMTED



More than 22,000 square metres of tapered Kalzip aluminium standing seam sheets were used to create the weatherproof building envelope of the spectacular 12,000-seater Bolshoy Ice Dome that was used for the 2014 Winter Olympic Games at Sochi in Russia. Designed and built by SIC Mostovik, this giant domed structure has a maximum span of 193 metres, a height of 40 metres and a total surface area of nearly 32,000 square metres.

Located on the Imeretinskaya Plain which nestles between the Caucasus Mountains and the shores of the Black Sea, the Sochi Olympic Park comprises a coastal cluster of 11 new purpose-built venues specially constructed for the 2014 Winter Games.

Created to host the ice hockey events, the Bolshoy Ice Dome is widely considered to be the most impressive and complex of these venues. After the Games, the arena now serves as an ultra-modern, world-class, multi-purpose sports and entertainment centre.

Inspired by the Russian's iconic Fabergé egg, the innovatively designed external envelope of the Bolshoy Ice Dome can change its colour like a chameleon. Although the Fabergé egg was the main creative criterion, the design concept of the dome also emulates a frozen water droplet, according to Alexander Knyazev from the Russian architect SIC Mostovik. He explains, "We decided on a clear elliptical basic form with a dome-shaped superstructure. The exterior design was to allow different plays of colour with the use of LED technology. Depending on needs, both Fabergé-like and arbitrary patterns can be generated. Of course, single-colour or white lights can also be projected, so that the building then appears very puristic and clean."

This ever-fascinating dome gains its spectacular appearance from the shape which is formed by the Kalzip aluminium roof which is overclad with pearl-coloured aluminium composite panels studded with LEDs to produce a 'glowing' envelope that reflects both the environment and the continual changes of daylight.

Bolshoy Ice Dome's complex three-dimensional roof structure consists of multiple layers; firstly a sub-construction of perforated steel trapezoidal decking sheets mounted on steel girders. This was topped with a Kalzip VCL, two layers of Kalzip compressible mineral wool insulation and a tubular substructure of Kalzip Flexicon RR 80 onto which the Kalzip roofing sheets were affixed.

Kalzip senior engineer, Robert Thiebes explains, "This flexible tubular substructure is particularly suitable for accommodating tolerances and minor variations in the height of the supporting steel structure to ensure the required level of the Kalzip outer skin. With such a sophisticated building geometry as this structure, it's most important that the Kalzip system is mounted in the appropriate plane to achieve the dome's complex shape."

To ensure the complete integrity of the Kalzip roof, a great deal of intricate welding work was necessary at the sheet joints, particularly around the ridge area. A series of aluminium top hat section supports mounted on angle brackets were then attached to Kalzip FA seam clips fastened to the standing seam without penetrating the Kalzip. The aluminium composite panels with their integrated LED technology were then affixed to the network of T-section supports to complete the impressive rainscreen overcladding.

Employing this type of construction technique means that an infinite variety of creative design options are available to architects by using the Kalzip standing seam system to insulate and weatherproof the building envelope and carry virtually any type of rainscreen overcladding as an aesthetic façade.

**www.kalzip.com**