

The Müngersdorfer Stadium becomes the Rhein-Energie Stadium



Project: Roofing Stadium for
Soccer World Cup 2006

Client: City of Cologne

Goal: An attractive design with
the highest possible safety
standards

Market Segment: Construction

Product: Makrolon® multi UV triple wall
sheet FR

Architect: gmp architekten, Aachen

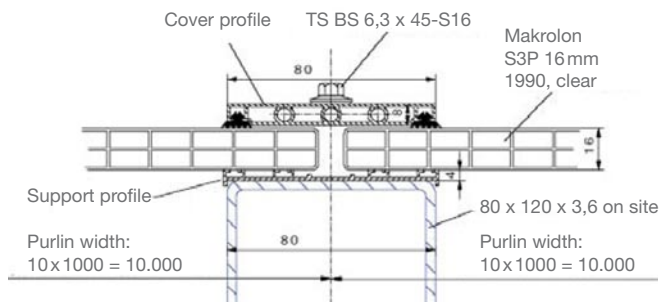
Construction Company: Max Bögl Bauservice
GmbH & Co. KG

The Müngersdorfer Stadium becomes the Rhein-Energie Stadium

As of December 2001 the Müngersdorfer Stadium has, during two and a half years, gradually been rebuilt into the Rhein-Energie Stadium. After all, the Stadium shouldn't only meet the requirements of the FIFA in consideration of the organization of the World Cup in 2006, but it should also meet the requirements of the German WC-organizing committee and the requirement of the city Cologne to give the venue a modern look.

An unusual design

The architects came up with a design that had never been realised in a stadium before: inspired by cable suspension bridges, the roofs were installed above the seating areas and held in place by two supporting square-shaped pylons at each corner of the pitch. The square-shaped 5 x 5-meter pylons are 72 meters high and strutted with metal. Attached to these are large roofs (15,000-square meters) that are suspended over the four tribunes – a design not requiring any massive supporting structure. This was possible by the use of the lightweight and sturdy Makrolon® multi UV triple wall sheets.



Transparency

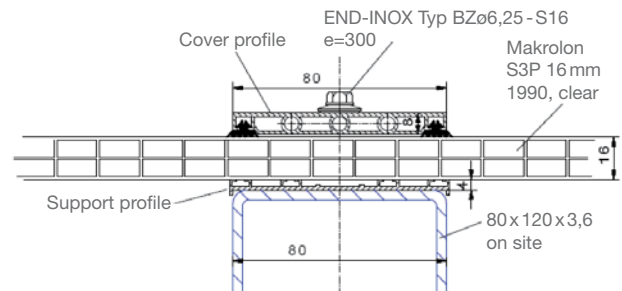
To meet the FIFA requirements for international sports competitions, the number of seats had to be increased by 5,000. Therefore, the existing track-and-field area between the seating areas and the field had to be removed. Extending the roofing to the field increased the risk of too much shade underneath a part of the turf, which could lead to a yellowing of the turf as a result of inconsistent exposure to light. Using transparent Makrolon® multi triple wall sheets solved the problem: they have a light transmission rate of more than 75%, which ensures that enough light passes through the roof.

A mobile cleaning cabin takes care of the thorough cleaning of the sheets at regular intervals – all optimal conditions to make the polycarbonate sheets look good even after many years.



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Beaming from within

The architects wanted the stadium also to stand out at night. To achieve this, they designed a special lighting system that is integrated in the supporting pylons of the suspended roofs. The pylons were equipped with an unusual lighting concept of light steles made of Makrolon® polycarbonate sheets. When the steles are lit up, the light is reflected by the polycarbonate sheets of the façade and spread from there, making the inside (equipped with rainwater- and drainpipes of the roofs, lightning cables, cables for the loudspeakers, ...) almost invisible and maintenance work in the inside can be done at any time.

Cost-cutting

The material was calculated precisely beforehand, cut on site and fit exactly into the metal construction, thus making efficient use of the material and creating a benefit for architects and building owners alike. This flexibility in production led to an overall cost reduction of 15 to 17 percent.

Decision standards

- Lightweight material
- Easy to install
- The sheets can be formed with simple tools and by cold bending
- Outstanding impact- and break resistance
- Resistant to heavy physical impact, such as storms, hail or heavy loads of snow piling up on the roofs
- High stability
- Good fire safety

Permanently temperature resistant from -100 to +120°C, not affected by intensive sunlight or the heat emitting from the stadium lighting fixtures, non-flammable according to DIN 4102, stays beneath the allowed maximum standard for flue gas toxicity and does not form burning drops in full scale test under real circumstances.

- Transparency and light transmission
- UV-coating protects the sheet from yellowing

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