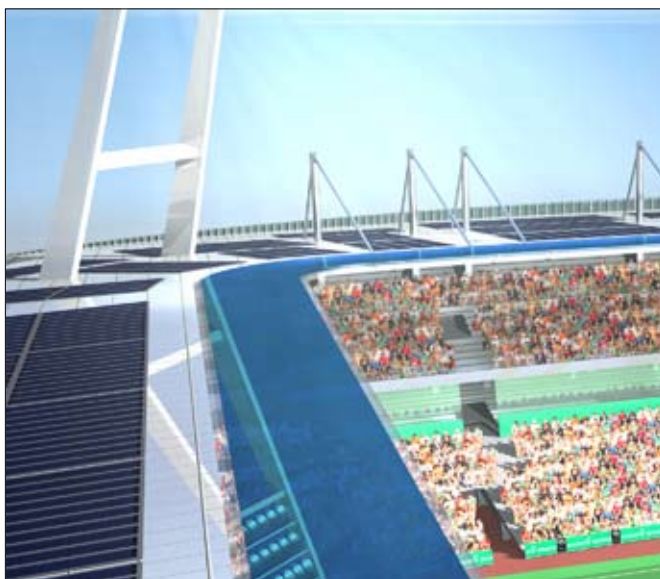




The Weser Stadium in Bremen kicks of the new season with Makrolon® – Sheets combined with photovoltaic cells to utilise solar energy



Project:	Weser Stadium Bremen
Client:	Main Solarstrom GmbH
Location:	Bremen, Germany
Market segment:	Construction
Product:	Makrolon® multi UV 3/16-16 FR 1090 Makrolon® UV, 4 mm, clear 2099
Architects:	ProCon Ingenieurgesellschaft für wirtschaftliches Bauen mbH
Building contractor:	Hans Börner GmbH & Co. KG



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The German Football League is back in action and many stadium operators have made use of the summer break to modernise their facilities. Not least the Weser Stadium in Bremen which has placed its bets on solar energy.

Generating energy has become possible through a combination of transparent Makrolon® sheets and photovoltaic cells. The floating encapsulation of silicon cells embedded between two sheets of plastic means that roof structures are now possible which allow natural lighting during daytime combined with solar energy (manufacturer: sunplastics). Previously these photovoltaic (PV) modules were used primarily for small roofs and façade structures, street furniture, in cars and on boats. However, the Weser Stadium in Bremen is the first to cover its roof of around 2,500 m² with the transparent modules; the objective is to save around 100 W of energy per m². This leading-edge concept meant the architect could incorporate the PV installation into the design as an integrated and eye-catching component of the roof.



The decision to use the innovative PV modules was based on the significant advantages they offered over traditional glass or tin roofs with PV installations mounted on top. The weight of the whole roofing structure in particular was a deciding factor for Bremen in view of the large roof overhang. The plastic modules weigh only 10.5 kg/m² and mean a saving of over 60 % in weight compared to glass. In addition, the 3.5 m² transparent photovoltaic modules offer shelter against wind and rain and also allow sufficient sunlight through. This improves visibility for the fans and also does the grass pitch a lot of good.

The combination of a solid sheet and a triple multi-wall sheet with floating encapsulation of the silicon cells embedded inside offers superior advantages. The 4 mm thick solid sheets made of Makrolon® are shatter-proof and offer excellent protection for the fragile silicon cells against weather damage such as hailstones. The substructure made of 16 mm thick triple multiple wall sheets made of Makrolon® ensures optimum load transfer; the thickness and geometry of the sheets was calculated to adapt them exactly to on-site conditions. In addition, the material complies with all international requirements for fire behaviour of construction materials: they are not pyrophorous and do not transmit fire or represent a danger by burning parts dropping from the roof. In the unlikely event of a fire, practically no additional toxic substances are released; smoke density is low.

The outlook is good

Maximum protection of climate and resources is the slogan of the future. These transparent structures made of Makrolon® sheets mean that the demand for maximum freedom of design can be combined with aesthetic considerations. And finally, features such as higher labour productivity, low construction and maintenance costs, improved recoverability of building components and recyclability all speak in favour of the sheets made of Makrolon®.

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Picture source: Bremer Weser Stadion GmbH GmbH