POLYVANTIS

THE GREENEST GRASS GROWS UNDER LEXAN™ SHEET

THREE DECADES OF PROVEN PERFORMANCE IN STADIUM ROOFING



LEXAN™ SHEET



THREE DECADES OF PROVEN PERFORMANCE IN STADIUM ROOFING

Many demands are placed upon new sports stadiums and arenas. Spectators expect state-of-the-art facilities for comfortable viewing in all weather conditions.



Municipalities and other organizations making the large investment in these facilities are concerned about construction, maintenance, and utility costs, as well as durability and safety – particularly in view of recent extreme weather events. And architects need materials that can enable bold new designs, such as sliding roofs and larger roofing expanses, as well as beautiful surfaces. One way to meet all these requirements is to utilize high-performance engineering thermoplastics to construct stadium and arena glazing systems. The popularity of plastics for construction glazing is driving development of new materials that can address virtually any challenge – from thermal control to self-cleaning to special tints and effects.

Thermoplastics deliver a unique combination of advantages in roofing for large, complex structures like stadiums. Compared to traditional glass, plastic glazing is significantly lighter and highly impact-resistant for safety. It can be formed into complex shapes that are difficult to achieve with glass. These materials can be engineered with a variety of special coatings and tints for excellent weathering performance, enhanced light transmission, and easy maintenance.

Today's sports stadiums and arenas combine unique design concepts, with tough requirements for safety, weatherability and code compliance. LEXAN PC sheet delivers the clarity of glass without its drawbacks of weight and fragility, enabling award-winning and unique designs and a safe, satisfying experience for attendees. Our materials are playing a critical role in the construction of public buildings because they combine outstanding performance, environmental responsibility and aesthetics.



FIFA World Cup™ Stadiums

16,000 m^2 of LEXAN Sheet

Thousands of fans gathering at the FIFA World Cup™ 2010 matches, held from June 11 – July 11, 2010 in South Africa, are in for a brilliant new experience – courtesy of POLYVANTIS high-performance LEXAN™ polycarbonate (PC) sheet. LEXAN EXELL D™ sheet, a lightweight, high-impact and UV-resistant monolithic material, was chosen to create the roofing, façades and stairway glazing for the stunning new Soccer City Stadium in Soweto, Johannesburg, where this year's opening and closing FIFA matches will be played. LEXAN EXELL D sheet was also selected for the building joints of the Moses Mabhida Stadium in Durban, and LEXAN THERMOCLEAR multiwall sheet was chosen for roof glazing at the Peter Mokaba Stadium in Polokwane for the upcoming FIFA World Cup games. These amazingly tough, lightweight and transparent PC materials offer spectators an excellent viewing experience along with superior comfort, safety and aesthetics vs. traditional options like glass, and are the top choice of architects to create the world's largest and most impressive structures. POLYVANTIS has long been a major player in the building & construction industry with a robust and growing portfolio of proven, sustainable, high-end products designed to help customers succeed.

LEXAN SHEET SCORES BIG WINS WITH STADIUMS



SOCCER CITY STADIUM

The unique design of the Soccer City Stadium in Johannesburg was inspired by a calabash, a hollowed-out gourd used as a raditional African cooking pot. Durable LEXAN EXELL D sheet roofing, which represents boiling water flowing over the top of the pot and down the sides, protects up to 95,000 spectators from changing weather conditions. As glazing for the stadium's stairways, LEXAN EXELL D sheet admits natural light for pleasant ambiance and safety. The POLYVANTIS' sheet covers a total of 14,000 m^2 (150,000 ft^2).

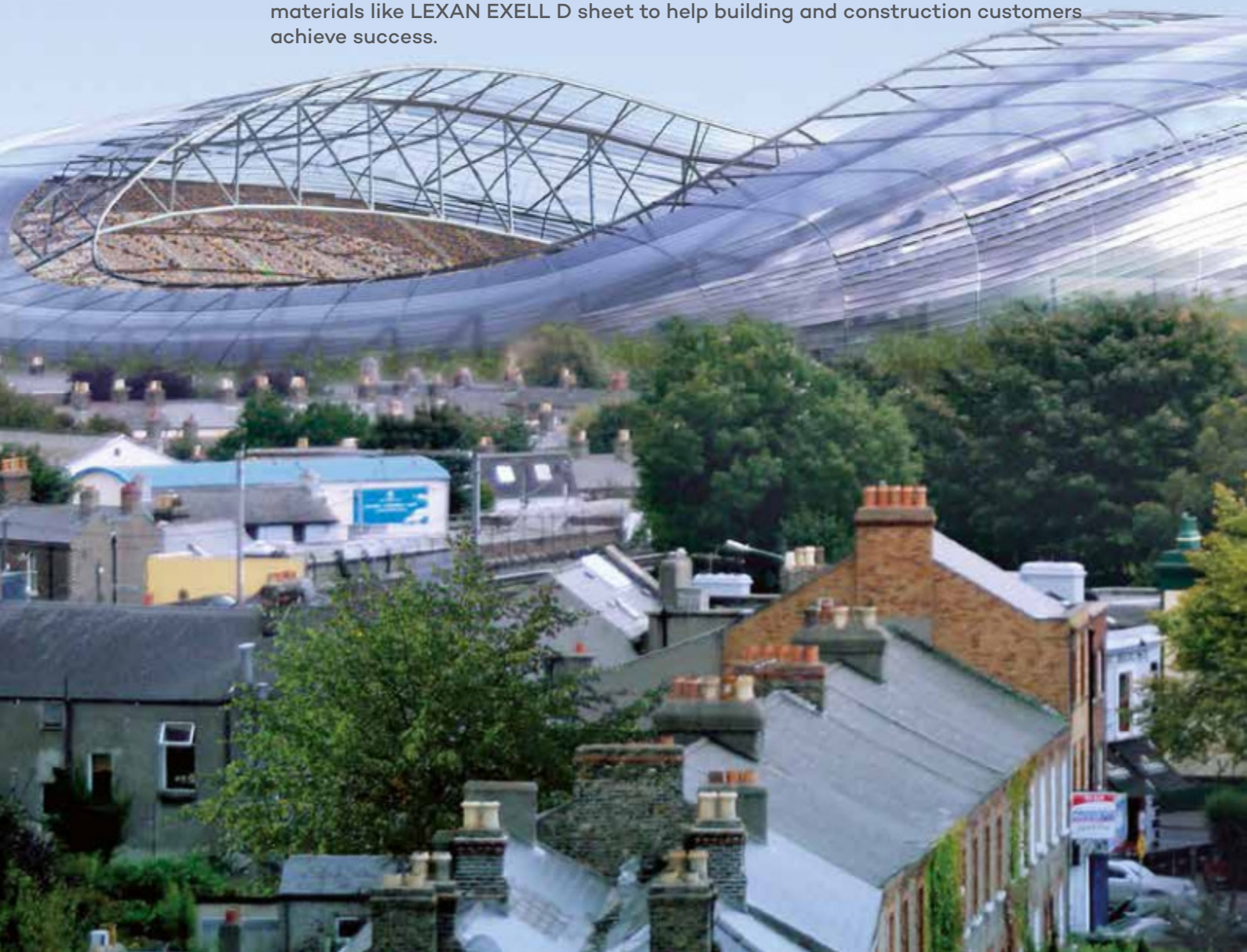


EPSE

Best Project and Innovation Award for Dublin's Aviva Stadium

Rugby and football enthusiasts at Dublin's new Aviva Stadium may find their attention focused on the structure instead of the score. The stadium's transparent, curvilinear walls are constructed from POLYVANTIS' tough and virtually unbreakable LEXAN™ EXELL D™ polycarbonate (PC) sheet, which adds incredible elegance, high performance and environmental benefits. Recognizing the strategic contribution of LEXAN™ sheet technology to the stadium, the European Polycarbonate Sheet Extruders (EPSE) honored POLYVANTIS with its 2009 Best Project and Innovation Award.

This is the second EPSE award for POLYVANTIS. In 2008, the company won the Best Innovation category for the Metro Station Carmes in Toulouse, France – whose roof is also made from LEXAN EXELL D sheet. POLYVANTIS continues to invest in new materials like LEXAN EXELL D sheet to help building and construction customers achieve success.





EMPHASIS ON THE ENVIRONMENT

The 50,000-seat Aviva Stadium, due to open in the summer of 2010, was designed by Populous with Scott Tallon Walker Architects Dublin, an international stadium design firm, and engineered by Buro Happold of London. The LEXAN sheet installation was done by Williaam Cox of Dublin. The building utilizes cold line bended LEXAN EXELL D sheet in the sweeping walls. LEXAN sheet louvers help support the air ventilation requirement of the stadium. The material has a polished finish on the exterior and incorporates a proprietary ultraviolet (UV) protection layer and absorbs harmful UV radiation.

LEXAN EXELL D sheet is an important contributor to the green initiatives at Aviva. By allowing daylight to stream into the stadium, the material helps to reduce energy usage; sensors keep artificial lighting turned off when there is sufficient natural light. Weighing only half as much as glass, LEXAN EXELL D sheet reduces the amount of material required for structural supports.

The polycarbonate sheet also provides high impact strength (250 times that of glass) and flame retardance (compliant with the European fire standard EN 13501-1) for safety, and complies with glazing security impact resistance according to Pr EN 356. Other key properties are dimensional stability; ease of handling and installation; and resistance to yellowing, graffiti and breakage.





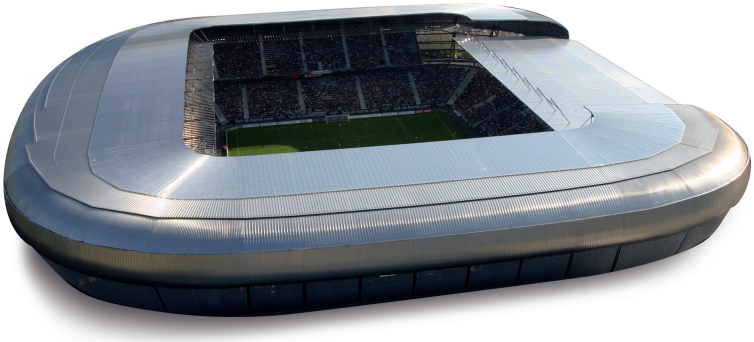
FREEDOM TO DESIGN

Wörthersee Stadium in Klagenfurt

11,000 m^2 of transparent roof is made of
LEXAN™ THERMOCLEAR™ 25mm 6RS Sheet
up to 18.5 meter length

Architect:
Albert Wimmer

Installer:
PORR AG







EXCEPTIONAL PERFORMANCE

Salzburg Wals-Seizenheim Stadium in Salzburg

17,000 m^2 of transparent roof is made of
LEXAN™ THERMOCLEAR™ 16mm 3X sheets
up to 16.5 meter length

Architect:
Schuster Architekten
Albert Wimmer

Installer:
Dachbau, Piesendorf





PROVEN QUALITY

Tivoli NEU Stadium in Innsbruck

Partially transparent roof made with
LEXAN™ THERMOCLEAR™ 16mm 3X sheet.

Architect:
Niclas Tuering





ACTICAL MATTERS: MAINTENANCE, SAFETY AND COST

Stade de Suisse Wankdorf Stadium in Bern

4,000m^2 of transparent roof is made of
LEXAN™ THERMOCLEAR™ SunXP 16mm 3X sheet
with 15 years limited written warranty

Architect:
Luscher Architekten

Installer:
Ediltechnica







UEFA EURO 2004™

Football Championship Stadiums in Portugal

More than 74,000m^2 LEXAN THERMOCLEAR sheet has been used for the roof glazing in of 6 stadiums that hosted the UEFA Euro 2004™ in Portugal.

WE ARE THE
CHAMPIONS

A well-designed arena provides a high-quality experience for spectators, including temperature and light control. LEXAN™ THERMOCLEAR™ sheet offers protection against UV light, heat, cold, wind, and weather. The Aveiro Municipal stadium in Portugal was completely reconstructed for UEFA Euro 2004™ football championships to accommodate 30,000 spectators. LEXAN THERMOCLEAR Plus sheet, 25mm thick, was used to cover the roof of the complete seating area. This grade provides high stiffness and double-sided UV protection for sunny climates. The material can also be produced with a translucent effect to diffuse strong sunlight. In cold climates, the hollow construction of THERMOCLEAR multi-wall sheet products provides excellent insulation characteristics with significantly lower heat losses than with mono-wall glazing materials.

The massive program of investment and rebuilding of stadiums for the UEFA Euro 2004 tournament spans six stadiums in Portugal, including:

LISBON, LUZ STADIUM

Luz is Portugal's biggest stadium with a fully covered seating capacity of 65,000 spectators. It incorporates a series of high quality facilities and has been specially designed to withstand long-term exposure to sunlight and harsh weather conditions.

PORTO, DRAGÃO STADIUM

The opening game of the tournament was held at the Dragão stadium. It has a 50,000-seat capacity, incorporates 280 tonnes of metal in its structure and has an array of pillars to support its translucent roof.
The roof incorporates 35,200m^2 of LEXAN THERMOCLEAR X-structure sheet.

LEIRIA, DR MAGALHÃES PESSOA STADIUM

The seating capacity at this stadium has been increased from 11,000 to 30,000. The architect's product of choice to cover this new seating area is LEXAN THERMOCLEAR sheet and more than 10,000m^2 of the 25mm-thick sheet has been installed.



AVEIRO, AVEIRO MUNICIPAL STADIUM

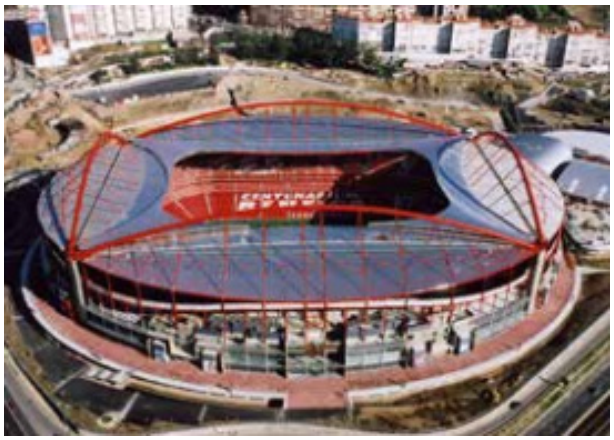
The Aveiro Municipal stadium has been completely reconstructed in a breathtaking design to accommodate over 30,000 spectators. More than 7,600m^2 of LEXAN THERMOCLEAR Plus sheet, 25mm thick, has been used to cover the complete seating area.

LISBON, JOSÉ ALVALADE STADIUM

This new stadium has capacity for 52,000 spectators. Its modern design incorporates 9,000m^2 of LEXAN THERMOCLEAR sheet to glaze the roof area and provides complete cover for all seated fans.

PORTO, BESSA STADIUM

The Bessa stadium is integrated within a sports complex that is under development. A roof covers all the seating areas and the use of LEXAN THERMOCLEAR X-structure sheet has been able to fulfill all the rchitectural requirements for transparent glazing.



Stadiums around the world

feature LEXAN™ sheet

LEXAN sheet products are the materials of choice for sports stadiums in many nations. For example, LEXAN THERMOCLEAR sheet was specified for more than 50 stadiums throughout the world, including the Sydney Olympic Stadium in Australia, Chongqing Olympic Stadium in China, and the UEFA European Football Championship Euro 2008™ and Euro 2004™ stadiums in Austria, Switzerland and Portugal.



Over 50 Stadiums with LEXAN™ sheet roofing and counting...

Beginning with its first application in a stadium in Split, Croatia in 1979, LEXAN THERMOCLEAR sheet has been selected for several Olympic arenas, including the Barcelona and Sydney facilities, as well as stadiums that hosted the FIFA 2010, UEFA Euro 2004™ and 2008™ football championship.









Split,Croatia	1979
Bilbao,Spain	1981
Swansea,UK	1983
Zagreb,Croatia	1986
Roma,Italy	1990
Barcelona,Spain	1992
Edinburgh,Scotland	1992
Madrid,Spain	1992
Lillehammer,Norway	1992
Liverpool,UK	1992
Adelaide,Australia	1992
SanSebastian,Spain	1992
Manchester,UK	1993
Liverpool,UK	1993
Eindhoven,Holland	1993
Silkeborg,Denmark	1994
Paris,France	1995
Rotterdam,Holland	1995
Dublin,Ireland	1995
Amsterdam,Holland	1996
Trondheim,Norway	1997
Sydney,Australia	1999
Leiria,Portugal	2003
Aveiro,Portugal	2003
Porto,Portugal	2003
Lisbon,Portugal	2003
Bessa,Portugal	2003
Lisbon,Portugal	2003
Celje,Slovenia	2003
Ried,Austria	2003
Stavanger,Norway	2004
Salzburg,Austria	2004
Qatar,Doha	2005
Chongqing,China	2005
Bern,Switzerland	2005
Maribor,Slovenia	2006
Innsbruck,Austria	2007
Klagenfurt,Austria	2007
Dublin,Ireland	2008
Johannesburg,SouthAfrica	2008
andmanyothers	



SAFETY
COMFORT
DURABILITY
AND DESIGN

POLYVANTIS LEXAN™ sheet is used for the roofs of four renovated or newly built stadiums for the UEFA Euro 2008 football championship.

With the start of the 2008 UEFA European Football Championship (Euro 2008™), the largest football event in the world following the World Cup, Europe's stadiums are set to host thousands of eager fans. POLYVANTIS' high performance LEXAN™ THERMOCLEAR™ sheet is used for the roofs of four renovated or newly built stadiums for the UEFA Euro 2008 football championship, taking place in Austria and Switzerland from June 7 to 29, 2008. These include the Tivoli NEU Stadium in Innsbruck, Salzburg Wals-Seizenheim Stadium in Salzburg, Wörthersee Stadium in Klagenfurt, all three based in Austria, and Stade de Suisse Wankdorf stadium in Bern, Switzerland.



Building on a legacy of leading-edge products, POLYVANTIS continues to push forward with state-ofthe-art materials designed to further help our customers to achieve competitive differentiation through new designs, safety, durability and comfort.



Maintenance, Safety and Cost

To avoid high maintenance and replacement costs for glazing, many architects and builders select different LEXAN™ sheet products for their resistance to yellowing, graffiti, scratching, and breakage. To help minimize maintenance costs, LEXAN™ THERMOCLEAR™ Easy Clean sheet products feature a patented hydrophobic coating that offers self-cleaning properties: when the material comes in contact with water, the coating reduces surface tension and increases the contact angle of the water on the sheet, causing the formation of large droplets that wash away dirt and leave a virtually spotless finish. Also, its lightweight, multi-wall X-structure configuration provides excellent stiffness and high impact strength. This POLYVANTIS product glazes the rooftops of several stadiums around the world, including Chongqing Stadium, which accommodates 60,000 spectators, and Celje Stadium in Maribor, Slovenia.



Stadium owners concerned about heating and cooling costs can find a solution with LEXAN Solar Control IR solid and multi-wall sheet grades, which reduce heat build-up by blocking near-infrared radiation while allowing abundant natural light into the facility. The ArenA in Amsterdam, whose 20,000-sq.-meter sliding roof is glazed with LEXAN THERMOCLEAR polycarbonate sheet, also features one of the first commercial applications for LEXAN Solar Control IR sheet. Its four escalators are enclosed in the material, which helps absorb infrared (IR) and near-IR radiation from the sun, potentially reducing interior heat buildup by up to as much as 40 percent.

Further, LEXAN sheet glazing materials can help to deliver measurable return on investment through ease of installation; lower insurance costs through resistance to break-ins, weather damage, and vandalism; and less need for replacement due to UV degradation, weathering, and breakage. Most of these products are covered by a minimum 10-year limited written warranty against excessive yellowing, loss of light transmission, and loss of strength due to weathering.

Of course, safety is paramount in any public building. Impact-resistant thermoplastic roofing reduces the risk of breakage from wind, hail, and other extreme weather, as well as vandalism.



LEXAN™ EXELL D™ monolithic sheet is a transparent PC sheet with proprietary UV protection on both sides, offering excellent weathering properties. It offers flame retardance that complies with the European fire standard EN 13501-1 for safety, and complies with glazing security impact resistance according to EN 356. LEXAN EXELL D sheet can be easily cold-formed into gentle curves, which makes it a good choice for skylights, covered walkways and barrel vaults. It is thermoformable into the desired geometry while retaining its UVresistant coating. This material is backed by a 10-year limited written warranty against yellowing, loss of light transmission and breakage.

LEXAN THERMOCLEAR™ multiwall sheet products are a versatile thermoplastic glazing material that has been used in arena roofing and other glazing for more than 30 years and delivers a unique combination of advantages in roofing for large, complex structures. Compared to glass, LEXAN THERMOCLEAR sheet is significantly lighter in weight while offering high stiffness and more than 250 times the impact resistance to reduce the risk of breakage from wind, hail, and other extreme weather, as well as vandalism.

LEXAN sheet glazing materials can help to deliver measurable return on investment through ease of installation; lower insurance costs due to weather damage; and less need for replacement due to UV degradation, weathering, and breakage.

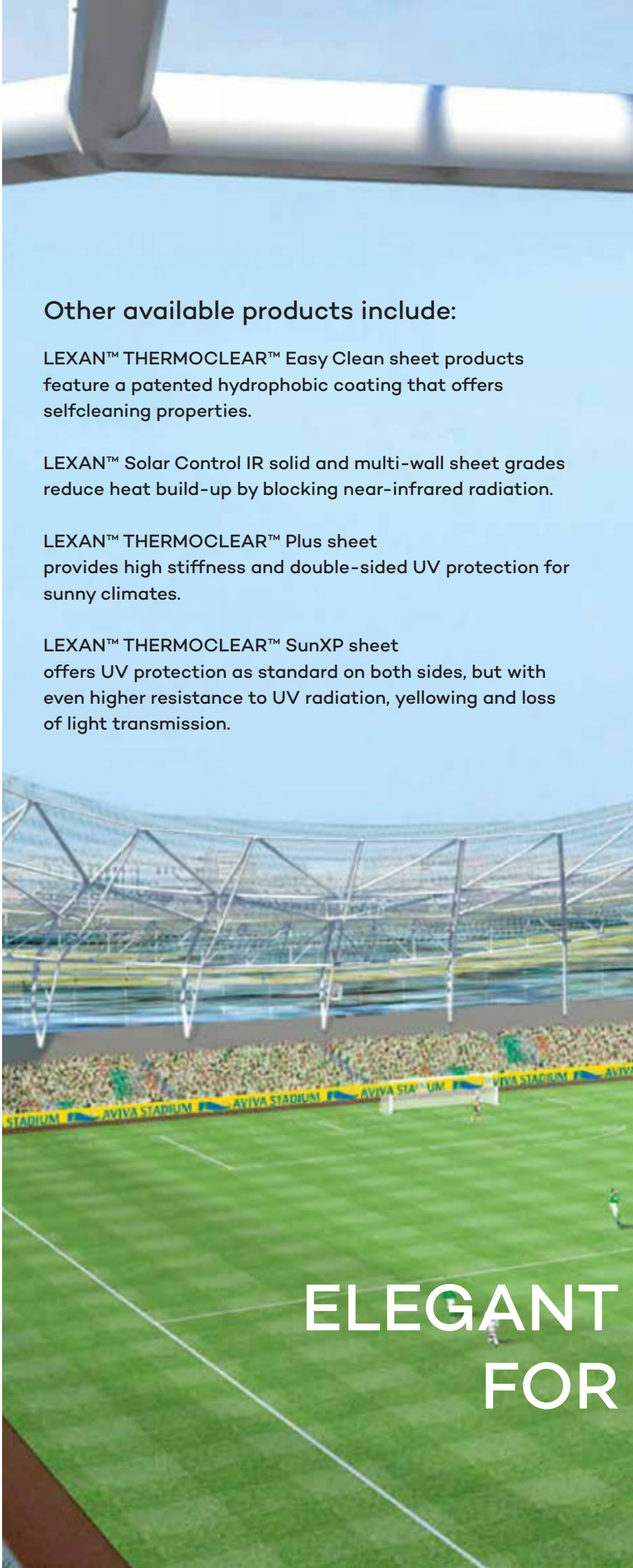
Other available products include:

LEXAN™ THERMOCLEAR™ Easy Clean sheet products feature a patented hydrophobic coating that offers selfcleaning properties.

LEXAN™ Solar Control IR solid and multi-wall sheet grades reduce heat build-up by blocking near-infrared radiation.

LEXAN™ THERMOCLEAR™ Plus sheet
provides high stiffness and double-sided UV protection for sunny climates.

LEXAN™ THERMOCLEAR™ SunXP sheet
offers UV protection as standard on both sides, but with even higher resistance to UV radiation, yellowing and loss of light transmission.





SOLUTIONS
COMPLEX PROJECTS

Global Company with Local Services & Supply



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