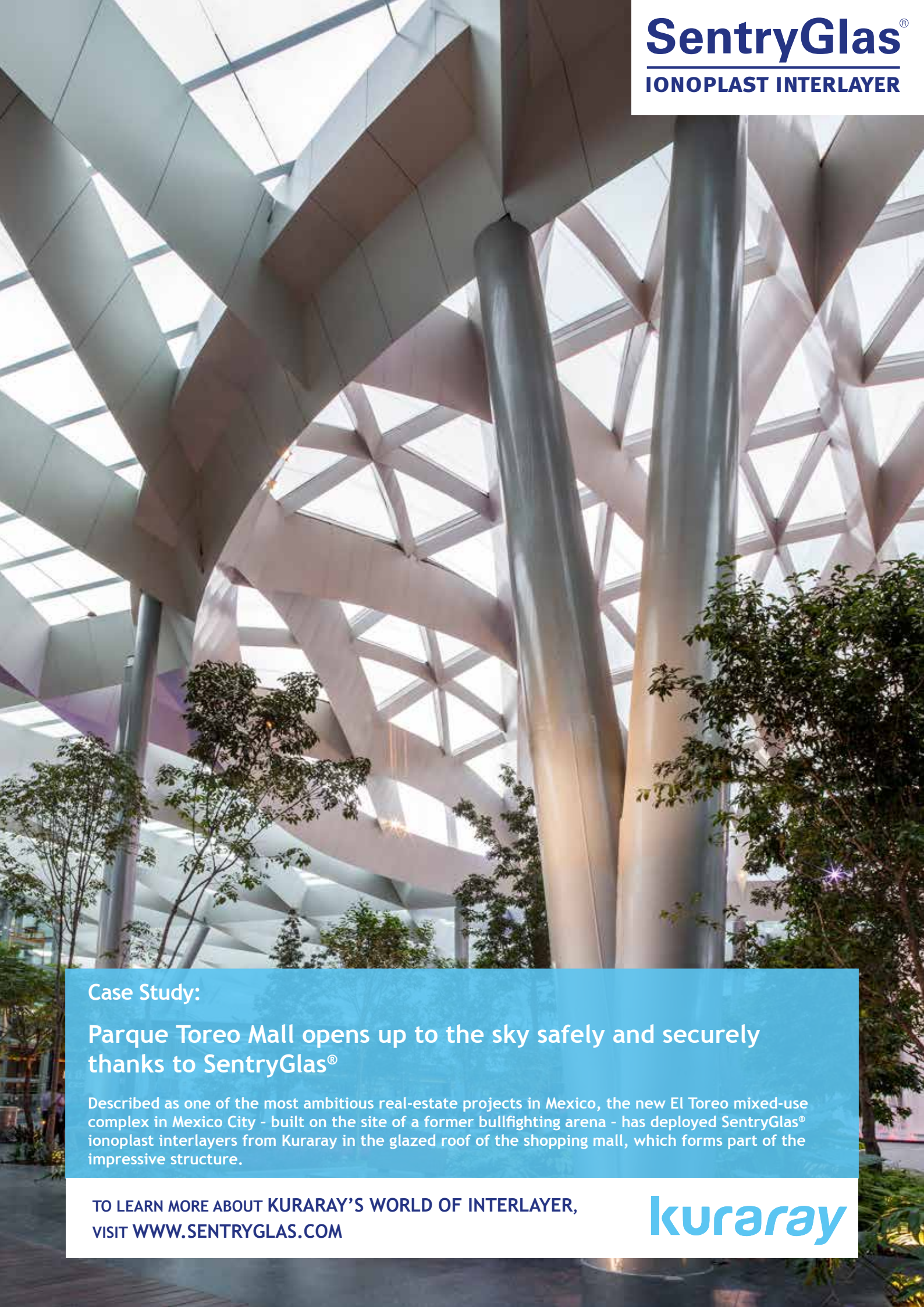

SentryGlas®
IONOPLAST INTERLAYER

Case Study:

Parque Toreo Mall opens up to the sky safely and securely thanks to SentryGlas®

Described as one of the most ambitious real-estate projects in Mexico, the new El Toreo mixed-use complex in Mexico City - built on the site of a former bullfighting arena - has deployed SentryGlas® ionoplast interlayers from Kuraray in the glazed roof of the shopping mall, which forms part of the impressive structure.

TO LEARN MORE ABOUT KURARAY'S WORLD OF INTERLAYER,
VISIT WWW.SENTRYGLAS.COM

kuraray

SentryGlas®
IONOPLAST INTERLAYER

Parque Toreo Mall opens up to the sky safely and securely thanks to SentryGlas®

Comprising a hotel, next-generation cinema, three AAA-level office towers and the 121,750 m^2 (1,310,500 ft^2) five-level Parque Toreo shopping mall, the complex occupies land adjacent to a new 60 km (37.3 mile) long highway, which joins the north and south of the city, making the Mall and the rest of the complex easily accessible to most of the high-income neighbourhoods in the city's metropolitan area.

Overseen by Fibra Danhos, the Construction Manager of Grupo Danhos — the building's owner — and designed by Sordo Madaleno Arquitectos, the Parque Toreo Mall exhibits a striking architectural design, which incorporates a fully glazed roof that offers natural ventilation and views to the sky, while, according to Eva Rodriguez, manager of the Commercial Center, still protecting visitors from rain and excessive solar radiation. In order to make it a more pleasant experience than a typical fully enclosed mall, one of the most prominent features of the Parque Toreo Mall's glass roofline is glass dome, which exhibits a highly transparent diamond pattern glazing construction.

Both the dome over the commercial area and overhead glazing in the lobbies and entrances use the SentryGlas® interlayer, delivering a total laminated glazed area of some 20,000 m^2 (215,278 ft^2) of laminated glass — 18,000 m^2 (193,750 ft^2) for the dome and 2,000 m^2 (21,527 ft^2) for the lobbies and entrances.

With Technical Support from Kuraray, the panels were laminated by Productos de Valor Agregado en Cristal for glazing contractor Grupo Sordo Noriega. In the commercial area, the 1,518 mm (60 in) x 1,265 mm (50 in) panels — two-side supported with free edges along the long edges — were formed from 6 mm (0.24 in) tempered glass + 0.89 mm (35 mil) SentryGlas® + 6 mm tempered glass. Solar-control glass was used for the dome to combat the effects of the

Parque Toreo Mall opens up to the sky safely and securely thanks to SentryGlas®

sun, with temperatures of up to 50 °C being anticipated. In the Lobbies and entrances, 2,500 mm (98 in) x 1,250 mm (49 in) panels were developed — again with two-side support and free edges along the long edges. These comprised 6 mm tempered plain glass + 0.89 mm SentryGlas® + 12 mm (0.47 in) tempered plain glass.

60-mil PVB was originally specified for the project, but it was switched to 35-mil SentryGlas® for two main reasons. First, the higher stiffness available from laminates incorporating SentryGlas® allow the use of longer spans and two-side supported glass. And, as each glass pane is butt-joined with silicone (Sikasil WS-305 cn) to the next glass pane — a regularly seen style of installation due to the excellent compatibility SentryGlas® has with a wide range of glazing sealants — from below, this gives the impression of good transparency with minimal support. The second reason was down to the excellent post-breakage behaviour exhibited by laminates that incorporate SentryGlas®. This was deemed critical because the huge glass roof will require frequent maintenance, and since it is surrounded by three office towers, the chance of falling objects causing breakage was higher than in a regular project. It was also imperative to improve the safety conditions for the workers and the users below. The excellent edge stability offered by SentryGlas® also meant that the glass used in the entrances and lobbies did not need protecting from delamination.

According to the laminators: “SentryGlas® offered greater security in the event of breakage, due to its rigidity and adhesion. It also delivers minimal deflection of the laminate and enhanced safety in the event of fracture, all of which was simulated with pummel tests. Working with SentryGlas® is a good experience because of the advantages that we can offer our customers in these projects versus other laminates, indeed, we have seen the use of SentryGlas® increasing, especially in applications where protection to penetration is vital. Another advantages that is highly valued is that it has better moisture resistance around the perimeter of the laminated units, preventing delamination. Kuraray gave us a great deal of technical advice during the project, especially during the rolling process, the testing and the conditions of the curve autoclave, as well as for the periodic monitoring of operating conditions of the rolling line and in the process of cleaning the parts.”

The El Toreo complex is a hugely impressive structure that is hard to miss, especially with its lattice work external design. The Parque Toreo Mall forms an intrinsic part of the structure, both in terms of design and commercially and has benefitted from the use of contemporary design and building materials. This is another example of modern construction practices really exploiting the functional and aesthetic performance of glazing, which is made even more secure and safe thanks to the use of SentryGlas®.

SentryGlas®
IONOPLAST INTERLAYER

Parque Toreo Mall opens up to the sky safely and securely thanks to SentryGlas®

As well as improved strength and stiffness, other benefits of SentryGlas® include:

- **Safety:** In the event of breakage, glass fragments remain firmly bonded to the interlayer, reducing the chance for injury
- **Security:** SentryGlas® can be used in glazing that withstands bullets, hurricane-force winds and even bomb blasts
- **Durability:** SentryGlas® is extremely durable and resistant to clouding, even after years of exposure
- **Design Versatility:** SentryGlas® can be used in glass manufactured flat or curved, including annealed, toughened, heat-strengthened, spandrel, wired, patterned and color tinted glass
- **UV control:** SentryGlas® is available with or without UV transmittance

Building owner: Grupo Danhos Jorge Gamboa
Fibra Danhos: Construction Manager Sergio González
Commercial Centre Manager: Eva Rodriguez
Architects: Sordo Madaleno Arquitectos
Glazing contractor: Grupo Sordo Noriega – Lic. Jaime Ruiz Alvarez and Arq. Roxana Gonzalez Hernandez
Laminators: Productos de Valor Agregado en Cristal (PVA)
PVA (affiliated company from Vitro): Alejandro Leal García y Antonio Vieyra Tena

REGIONAL CONTACT CENTERS

Kuraray Europe GmbH
Business Area PVB
Mülheimer Straße 26
53840 Troisdorf, Germany
Phone: +49 (0) 22 41/25 55 - 220
E-Mail: trosifol@kuraray.eu

Kuraray America, Inc.
Applied Bank Center
2200 concord Pike, Suite 1100
Wilmington, Delaware 19803
Phone: +1 800 635 3182

For further information about SentryGlas®, please visit

www.sentryglas.com

kuraray