

Lexan* sheet helps set the stage

SABIC Innovative Plastics helps a Belgian concert hall set the stage with beautiful, energy-saving lighting panels

Light-emitting diodes (LEDs) offer significant advantages over incandescent and compact fluorescent bulbs. They last far longer and use only a fraction of the wattage compared to these other technologies. However, because LEDs are highly focused, it is usually necessary to use a diffusion mechanism to soften their effect.

Architect Bart Dehaene from Dial Architects office, sought to use LEDs for overhead lighting and planned to install decorative panels that would provide light diffusion for the renovation of the concert hall in Kortrijk, Belgium. A local thermoformer, Clem N.V. was engaged to create custom ceiling panels. Because of a longstanding relationship with SABIC Innovative Plastics, the thermoformer was aware of a new optical-quality grade of Lexan polycarbonate (PC) sheet designed for optimal diffusion and transmission of LED light and recommended it for the ceiling panels.



Challenge Diffusing LED lights to create uniform illumination

As an environmentally responsible lighting solution, LEDs are becoming increasingly popular. Their long lifespan and low wattage help save energy and reduce the costs of electricity and maintenance. In public spaces, LEDs offer a safety advantage – they don't typically burn out like traditional lighting, but instead gradually decrease in light output. The main drawback of LEDs is their bright, highly focused output, which typically requires diffusion when used for ambient lighting.

To keep energy costs down and avoid frequent bulb changes, the architect decided to use LEDs in overhead lighting for the main auditorium of the theater. To diffuse the light from the LEDs, the builder decided to install them behind custom ceiling panels that would diffuse and soften the lighting.

These panels presented several challenges. The builder wanted a dramatic, geometric design, which required a material that was easy to form and fabricate. The panels also had to be lightweight due to their large size [13.6 x 4.5m] made out

of 81 large panels, hanging on the stage and the seating area. From a safety standpoint, the material had to meet local regulations for flame retardance and provide high impact resistance. However, the most important criteria was related to optical performance. The material had to combine excellent diffusion properties with high transmission so that the LED light would be spread evenly but not excessively dimmed, creating a pleasant ambiance for theater-goers.

Solution Lexan SG305-OB sheet for optical brightness and diffusion

Because Clem N.V. already had experience with our sheet products, and had recently been introduced to a new grade of Lexan PC sheet specifically designed for illuminated fixtures and signage, the thermoformer selected this material for the ceiling panels.

"We were very impressed with Lexan SG305-OB sheet because it met all the client's requirements, and was easy for us to vacuum form and fabricate to produce these large, complicated panels," said Marc Marichal, general manager of Clem NV, in Kortrijk. "Although PMMA was a possibility, we

Case Study

Lexan* SG305-OB sheet / Kortrijk theatre

quickly ruled it out due to its flammability and lack of impact resistance.” Further, PMMA (polymethyl methacrylate) delivers only about 25 percent light transmission.

Based on tough, impact-resistant Lexan resin, Lexan SG305-OB grade is an opal white, extruded PC sheet that features a matte finish on its outward-facing side to reduce reflections. It offers uniform light diffusion of up to 85 percent to eliminate LED “pinholes,” as well as excellent light transmission of up to 50 percent so that fewer LED bulbs are needed.

“We created this material to help customers create new lighting solutions that are beautiful as well as environmentally responsible,” said Hans Pierik, Europe product and marketing manager for Specialty Film & Sheet at SABIC Innovative Plastics. “It’s exceptionally easy to fabricate into complex shapes that turn a simple lighting fixture into a work of art. Now buildings such as the Kortrijk theatre can combine practicality with drama in their lighting.”

Benefits

Lexan SG305-OB sheet panels take a curtain call

The use of Lexan SG305-OB sheet for ceiling panels is enabling the new theater to take full advantage of the energy and cost savings of LED bulbs while providing an attractive environment for patrons. Long-lasting LEDs will help reduce routine maintenance, while the impact-resistant Lexan sheet helps to prevent damage from vandalism.

For Clem-Kortrijk, this new material opens the door to fresh design ideas for lighting fixtures and signage. Marichal stated, “We are excited about the possibilities offered by this versatile material. It’s easy to form and fabricate, looks great and performs beautifully.”

For more information on Dial Architects go to their website at www.dial-architects.be

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