

# BUILDING THE FUTURE

THE ICEHOUSE™ USING SABIC'S LEXAN™ SHEET & SYSTEMS









# ADVANCED BUILDING DESIGN WITH ENERGY EFFICIENT MATERIAL SOLUTIONS FROM SABIC

Created by McDonough Innovation using SABIC's LEXAN™ sheet and building systems, the ICEhouse™ is an elegant structure which hosts guests and members at the 2016 Annual Meeting of the World Economic Forum in Davos, Switzerland.

The ICEhouse (where ICE stands for Innovation for the Circular Economy) is designed to illustrate the value provided by robust technical nutrients such as polycarbonate in combination with advanced architectural design. It is a place to imagine a future of innovation based on the Cradle to Cradle® Design Framework, Innovation for the Circular Economy™ and the Fourth Industrial Revolution - the theme of 2016 Annual Meeting of the World Economic Forum.

# A FUTURE OF HIGH PERFORMANCE MATERIALS

The ICEhouse™ is built using a cutting-edge aluminum frame structure and several forms of SABIC's polycarbonate material LEXAN™ sheets, including high insulating, nanogel filled LEXAN™ THERMOCLEAR™ multi-wall sheet for the translucent wall cladding and ceiling.

The circular economy is based on producing no waste and pollution. It is restorative and regenerative by design in which products, components, and materials are reused in continuous technical and biological cycles.

The ICEhouse is an excellent example of how SABIC's advanced material solutions and innovative designs from a world-leading architect can lead sustainable designs in the construction market, creating 'Chemistry that Matters™'. The multi-wall polycarbonate sheets used as building materials can be recovered and continuously reused. Giving architects the means to benefit society in new ways is an example of how we create value by using chemistry in SABIC.

In addition, the transparent furniture used in the ICEhouse is made with SABIC's polycarbonate LEXAN™ resins. Next to the building and construction industry, SABIC's polycarbonate sheet and resin materials are used across a wide variety of industries, including the aerospace, railway, automotive, electrical and consumer electronics due to their environmental benefits, recyclability, durability, compliance with industry regulations, formability and lightweight.



# ICEHOUSE™

Sustainability is embedded as a strategic foundation of SABIC's business and we actively seek collaboration with thought leaders, such as William McDonough. ICEhouse was created by William McDonough, designed by William McDonough + Partners Architects, and built by WonderFrame, LLC in close collaboration and support of SABIC.

SABIC's polycarbonate LEXAN™ sheet portfolio enables architects and designers to succeed in the emerging sustainable building solutions and have potential to contribute to LEED (Leadership in Energy and Environmental Design) certification by providing natural light, optimizing energy performance, and utilizing recycled content.

## ROOF

LEXAPANEL™ SYSTEM (base sheet is LEXAN™ THERMOCLEAR™ Plus 2UV Sheet in 20mm 5X structure)

## INTERNAL PARTITIONS

LEXAN™ THERMOCLEAR™ Plus 2UV sheet in 20mm and 25mm 5X structure

## WALLS, CEILINGS AND BAR

LEXAN™ THERMOCLICK™ sheet in 40mm filled with an insulating nanogel.

## WINDOWS

Hard coated LEXAN™ MARGARD™ sheet





UP TO  
**50%**  
ENERGY  
SAVINGS

**250**  
TIMES IMPACT  
RESISTANCE

MORE THAN  
**50%**  
WEIGHT  
SAVINGS

**100%**  
RECYCLABLE\*



# LEXAN™ SHEET & SYSTEMS



For the wall cladding, ceiling, windows and roofing of the ICEhouse, different configurations of the LEXAN sheet materials are used. SABIC's advanced materials technologies are playing an increasingly critical role in sustainable building constructions. The company's polycarbonate LEXAN™ sheet portfolio offers single and multilayer materials that are natural fit for sustainable designs by helping architects and builders to meet global environmental and safety standards and to facilitate awe-inspiring green architectural design. With a huge array of colors, finishes, sizes and configurations, SABIC's sheet portfolio opens virtually limitless design possibilities.

## ENERGY SAVINGS

LEXAN multiwall sheet delivers a unique combination of very high thermal insulation and climate control performance to enhance energy conservation, excellent light transmission for enhanced aesthetics and comfort. By allowing natural daylight to enter a building, it creates a more aesthetically pleasing working or living environment, saving on electricity for artificial lighting. Multiwall structure of the material creates air pockets between the exterior and interior of the building while enhancing strength and stiffness. The nanogel filled LEXAN multiwall sheet used on the walls and ceilings of the ICEhouse may offer substantial energy savings of up to 50% compared to mono-layer glass.

**Based on the DIN 4701 standard calculation guidelines, using this specific LEXAN sheet may offer annual saving of an average 37 - 68 liters of oil or 52 - 78 m<sup>3</sup> of gas per m<sup>2</sup> of glazing area.**

## DURABILITY

LEXAN sheet is 250 times more impact resistant than glass and virtually unbreakable. It shows excellent performance from -40°C to +120°C (-40°F to 240°F) even in extreme weather such as windstorm, hail-stones, snowstorms and ice formation. It offers proprietary UV resistance surface which prevents penetration of UVA (long-wave) and UVB (short-wave) sun light radiation. LEXAN sheet products come with a 10 - 15 year limited written warranty

## ENVIRONMENTAL BENEFITS

The energy used to extrude LEXAN sheets is a fraction of that to manufacture glass. During the LEXAN sheet extrusion process, recycled content is used to produce virgin material and LEXAN sheet has the potential to be 100% recycled and re-used where infrastructure exists.

## CONTINUOUS REUSE

LEXAN sheet's durability, light weight and versatility make it an excellent material choice for portable buildings designed for disassembly and reuse, supporting the circular economy.

## LIGHTWEIGHT

LEXAN sheet is 50% lighter than glass, offering significant savings in terms of transportation, handling and installation, and requiring less supporting structure. When compared with 6 mm wired glass, 10 mm LEXAN multiwall sheet offers weight savings up to 85%.

## ENHANCED FIRE SAFETY PERFORMANCE

Complies with the European EN 13501-1 and the North American CC 1 (ASTM D635) and Class A (ASTM E-84) regulation requirements for the most stringent fire standards.

## PROVEN SUCCESS

LEXAN sheet has demonstrated robust performance in more than 50 stadiums and other iconic structures around the world.

## AVAILABILITY

LEXAN sheet materials are available in a huge array of colors, finishes, sizes and configurations

\* LEXAN sheet has the potential to be 100% recycled and re-used where infrastructure exists.

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