

November 3, 2008

## Environmental Declaration

for

### Lexan\* Polycarbonate Sheet for Building Applications

#### **Introduction:**

SABIC Innovative Plastics is a leading manufacturer of Lexan\* Polycarbonate sheet in Multiwall as well as Solid sheet form, produced in different manufacturing facilities across the world.

All of these manufacturing facilities have implemented SABIC Innovative Plastics' world-class Environmental, Health, Safety and Security (EHS&S) program. The foundation and core principles of our EHS&S programs are based on the goals of 100% compliance, safe operations, minimizing environmental impact, healthy employees and maintaining strong security systems. These programs tie in closely with our strong governance and integrity policies as well as with international policies and regulations.

Our business has implemented a global Environmental Management System (EMS) at all our manufacturing facilities, and the Lexan\* Polycarbonate sheet production sites are certified according to EN ISO 14001: 2004.

SABIC Innovative Plastics is committed to improving the energy efficiency of our operations and is implementing projects that will reduce our Greenhouse Gas (GHG) emissions.

To date, more than 100 energy efficiency and GHG reduction projects were implemented with a combined impact of more than 380,000 metric tons of GHG emissions (CO<sub>2</sub> equivalents).

When working with Lexan Polycarbonate sheet, and assessing the environmental impact of the product, we can make a distinction between the different phases of the life cycle of a Lexan Polycarbonate sheet:

- Lexan Polycarbonate resin as the main ingredient of polycarbonate sheet
- Production process of Lexan Polycarbonate sheet by means of extrusion
- Transportation of Lexan Polycarbonate sheet from manufacturing location to final customer
- Lexan Polycarbonate sheet during use in a building
- Recycling of Lexan Polycarbonate sheet at end-of-life

#### **Lexan Polycarbonate resin:**

Lexan Polycarbonate resin is a transparent thermoplastic polymer. It possesses unusually high impact strength and toughness, even at low temperatures. It also has low moisture absorption, good heat and electrical resistance and good thermal and dimensional stability.

Lexan\* Polycarbonate resin, as used to make Multiwall and Solid sheet does not contain any halogens, softeners, stabilisers or plasticizers and does not emit any toxins such as VOC's, HCFC's or CFC's. Lexan Polycarbonate resin as used in our sheet products is an inherently flame retardant material that will not propagate fire and will not emit toxic gases during burning.

**Lexan Polycarbonate sheet extrusion process:**

Lexan Polycarbonate resin is converted into Lexan\* Thermoclear\* Multiwall or Lexan\* ExellD\* Solid sheet by means of a sheet extrusion process. Typical operating temperatures during the sheet extrusion process are in the 240°C range. Therefore the energy use during the extrusion process in which Lexan Polycarbonate resin is converted into Lexan Polycarbonate sheet, is typically a fraction of the energy levels needed to manufacture flat glass that go into the same Building & Construction applications. During the Lexan Polycarbonate sheet extrusion process, up to 15% of post-industrial recycle content is used to produce virgin material.

**Transportation of Lexan Polycarbonate sheet to final customer:**

The majority of Lexan Polycarbonate sheet products are shipped to the final customer by truck. A smaller quantity is shipped over water in containers to overseas customers. Since the weight of Lexan Polycarbonate sheet is very low per square meter compared to other products, truck loadings can be optimized and the full space of the truck can be utilized. This may result in optimised transportation with reduced CO2 emissions.

The (non hardwood) wooden pallets that are used to transport the Lexan Polycarbonate sheet on, are reused by the final customers and/or by the distribution partners and/or by ourselves.

Next to the pallets there is (recycle based) cardboard and PE film that is used as packaging material for Lexan Polycarbonate sheet.

**The Use of Lexan Polycarbonate sheet in a building application:**

Lexan Polycarbonate sheet has been widely used in the Building & Construction industry in a wide variety of roofing, cladding and glazing applications for over 40 years. Lexan Polycarbonate sheet allows natural daylight to enter into a building, and thereby can create a more comfortable and productive working or living environment. Allowing natural daylight into a building saves on (electrical) energy costs for artificial lighting. Lexan Polycarbonate sheet also offers the possibility to combine natural daylight transmission with excellent thermal insulation through the multi-layer configuration of the sheets.

These excellent thermal insulation properties of Lexan Polycarbonate sheet can bring substantial heating energy savings (natural gas, heating oil or electrical heating) during cold periods and substantial air conditioning energy savings (electrical energy) during hot periods compared to other glazing products such as glass panels. With Lexan Polycarbonate Multiwall sheet, U-values as low as 0.89 W/m<sup>2</sup>K (acc. ISO 10077) can be reached. These values cannot be reached by any type of (gas filled) double pane glass panels. Lexan Polycarbonate sheet is a light-weight product, that is at least 5 times lighter than a glass panel with the same thermal insulation value. Therefore the complete construction of the roofing, cladding or glazing application may be carried out with lighter weight glazing bars and substructures, while no concessions on wind and other loads have to be made. This lighter weight construction again saves energy during the production, transportation and installation of such construction.

The Lexan\* Polycarbonate sheet performance is backed up by a limited written product warranty of at least 10 years, and the expected lifetime of Lexan Polycarbonate sheet in outdoor applications is generally at least 25 years in intended end-use applications and when proper maintenance is provided.

**End-of-life Recycling of Lexan Polycarbonate sheet:**

Lexan Polycarbonate sheet is a recyclable material that has good property retention after recycling and therefore can be used in a whole range of other applications as well in a closed loop system back into a new Lexan Polycarbonate sheet. Because of its thermoplastic nature, Lexan Polycarbonate sheet may be recycled thereby reducing the need for incineration or landfill of the material. SABIC IP is also considering to develop a program to take back post-consumer Lexan Polycarbonate sheet in order to make full use of the recycling possibilities of the product.

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