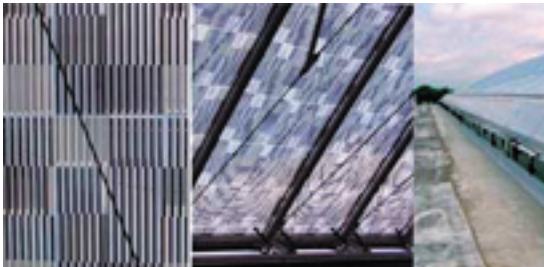


Architonic.com; *Material Research*; 2005

LIGHTING

Light has always played a major role in architecture. Either by manipulating the incoming daylight or by highlighting certain areas through artificial lighting, which is normally bound to lighting objects. Today there is a new movement towards integrating light more and more into existing architectural elements such as walls, floors or facades. The amount of daylight can be adjusted through layering of the outer shell or coating technologies.



ETFE Pneumatic Roofing

ETFE (Ethylene-tetra-fluoroethylene) or Teflon is a product that was originally designed for use in the Space industry. It is an extremely light-weight transparent foil material that combines the fact that it has high light transmission values and high insulation properties with strength and durability. It functions as an ideal and highly versatile material for the building industry. Teflon can be particularly effective as transparent roofing, working as a substitute for glass or other plastics. It is suitable for large spans and areas due to the fact that it is extremely light-weight in comparison with more traditional materials. It is also very versatile and can be designed as a system made up of layers and printed to allow for different light transmission qualities if desired. Through printing or layering of ETFE, solar control can be achieved. Generally ETFE is installed as a system of pneumatic cushions restrained in aluminium extrusions with the possibility that they can be inflated with air. One such example of this type of system is the variable skin roof at the recently completed Kingsdale School project in Dulwich, South London, UK. The roof for this project is the world's largest ETFE or Teflon variable skin roof and the first variable skin roof of its kind to be installed anywhere in the UK. The variable skin roof at Kingsdale School was designed to open and close to allow for variable light transmission. This is achieved by allowing a Teflon cushion system consisting of three layers of ETFE, two of which are printed with a pattern, to be inflated or deflated as required. When more light is required the ETFE cushions are inflated with air, allowing the central, printed layer of material to fall away from the top printed layer towards the bottom clear layer of the ETFE cushion, thus allowing greater light transmission. When less light is required, the cushions are deflated, causing the middle and top layers of the cushion closer together thus restricting light transmission. Theoretically this and other types of Teflon system could be utilised with any type of print pattern, allowing for the creation of many varied and exciting naturally lit environments. The realities are however, that limitations in the ETFE printing technology exist which reduce these possibilities. Progress is being made to improve possibilities, and research is being carried out into a whole wealth of new cross-over Teflon technology solutions for roofs inclusive of the following - systems with integrated photovoltaic cells, systems with integrated LED digital displays, systems that can change colour in accordance with data gathered from heat or movement sensors and systems that can potentially be filled with inert gases such as neon and charged with electricity to produce giant luminaries! The Teflon system overall offers enormous new potential in architectural

and natural lighting design.



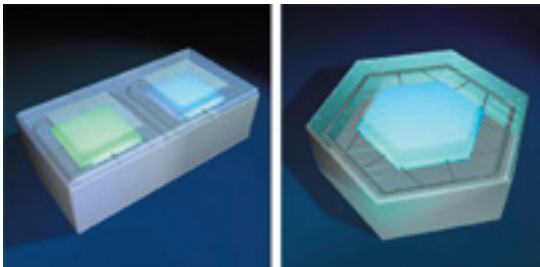
Color-Changing Glass

Glowing glass with adaptable color and light intensity. Light is sent into the material from the LED lit edges, the glass itself has a special white dotted grid imprinted which reflects the colored light, leaving the glass itself appear transparent. The RGB - LED's are able to create all kind of color shades.



Transparent LED Panel

New technology consisting of LED's with double-sided emitted lighting on completely transparent conductive track structures inside laminated glass with wireless supply of electrical energy. The signal transmission and the power supply is executed via the transparent conductive coating and is therefore an invisible function of this high tech glass. Light spots seem to float with this new technology, going along with complete transparency.



Solar-Energy Lighting

These products consist of solar cells, LED's and an energy storage device that enables the lighting devices to be used in any environment without maintenance for more than 10 years. Solar energy is converted into electricity through solar cells and stored in the daytime and the inviting soft glow light using LED is turned on in the nighttime automatically. Full charge takes 1 hour under direct sunlight and 6 hours under shade and the light is "on" more than 12 hours with fully charged energy device. This lighting is very useful for exterior lighting, street lighting or facades, that should be lit at night.



Light Tiles

Ceramic tiles with integrated LED lighting. Each tile is connected to the electronic supply via a cable.

The low built-in height of the LED tiles corresponds with regular tiles so they can be easily laid next to normal tiles from the collection. Floors and walls can be installed including lighting system without extra costs for fittings in advance. The lighting tiles have very low energy consumption, using a low-tension current, a long life and low heat production.