

IIT-I develops smart electronic curtain glass for energy efficient bldgs

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Indore: The temperature has crossed 40 degree C, the sun beats down hard and aloo singes the skin. The home too begins to heat up. Dread this? Just let the glass on your window not only cut out the sun but let as much heat filter in as you wish to.

This would be reality soon, with Indian Institute of Technology, Indore (IIT-Indore) developing an "electronic curtain glass" for smart homes and eco-friendly buildings that

light and heat when needed, or let it in when it's cooler outside. This smart adjustment helps save energy by reducing the need for air conditioning or artificial lighting," said Rajesh Kumar. "Right now we are testing small glass samples to see how fast they change colour, how clear they look, and how well they perform under sunlight, heat, and other everyday conditions," he added.

The team employed spray-coating and dip-coating methods for POP coating onto glass surfaces. To commercialise the smart curtains, IIT-I collaborated with industry partners to produce the curtains using existing factory setups and product lines. The preliminary findings of this advancement have been featured in the publication – ACS Applied Materials and Interfaces. It is yet to be patented. IIT-I director Suhas S Joshi said, "We are dedicated to transforming academic research into technologies that benefit society. The smart glass project is a fine example of interdisciplinary collaboration aimed at achieving sustainability and national progress." "By integrating material science and applied physics, we've created a responsive glass solution that not only works in the lab but is also fit for industrial use. This has the potential to replace traditional window systems in future," Rajesh Kumar said.

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can control the amount of light and heat passing through it by applying an electric current.

Researchers at IIT-I have utilised a viologen-based porous organic polymer, also known as POP, to create the "curtain." It's also low cost, ensures longevity, and ensures ease of large-scale production. The development was led by Sayantan Sarkar of the department of chemistry, under the guidance of Suman Mukhopadhyay of the same department and Rajesh Kumar of the department of physics. "What makes these curtains special is the use of POP. With their quick response to electricity, these curtains can change colour and alter its transparency, which allow them to block sun-