



NRC-CNRC

*Institute for
Research in
Construction*

Bringing quality
to the
built environment

Translucent Fibreglass Glazing System for Daylighting: Effects on Health and Task Performance

Objectives

To study the satisfaction, mood, and performance of people working in an office with a translucent fibreglass sandwich panel glazing system and to compare the lighting and heating energy use with that in a room with conventional glass windows.

Background

People spend over 90% of the time indoors, but research suggests that a higher light exposure could improve health and well-being. To be sustainable, however, these light exposures need to come from energy-efficient sources, of which daylight is one. Controlling direct sunlight is an important aspect of successful daylighting. Translucent fibreglass daylight sandwich panels are one potential solution, offering the potential for high levels of diffuse light without glare from direct sunlight, and with additional thermal insulation.

Statement of Work

An experiment was conducted in IRC's Daylighting Facility, a suite of two identical side-by-side enclosed offices with SSE-facing windows. One office was glazed with the translucent daylight sandwich panel; the other had conventional double-glazing (with a neutral tint of 31% transmittance) and a perforated roller blind. Both rooms had daylight-linked dimming systems for electric lighting that adjusted the electric lighting based on the available daylight. Participants spent a day in each room, working on office-related tasks and completing questionnaires about their mood, satisfaction, and opinions of the lighting and environmental conditions.

Results

Highlights of the results:

- The room with the translucent panel installation consumed 29% less energy for lighting than the room with the regular window and perforated roller blind. Energy use for heating was also reduced as would be expected given the additional thermal insulation.
- Light levels in the translucent panel room were 2.6 times greater on average than in the window room, and light exposure in the 450-470 nm range of the spectrum (thought to be the key wavelengths for circadian regulation) was approximately eight times greater.
- People rated a window with a wider view of outdoors as more satisfactory than a more restricted view.

Outcomes

- Report containing the results and implications for daylighting practice
- A scientific journal article and a conference paper

Partners

Kalwall Corp.

Start/Completion Dates

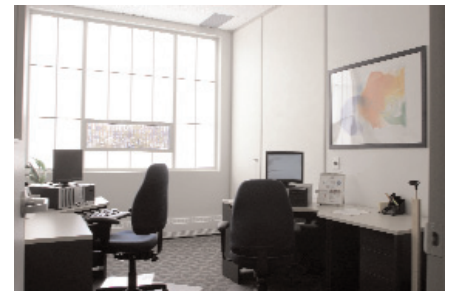
The project began in October 2003 and was completed in March 2005.

Project Manager

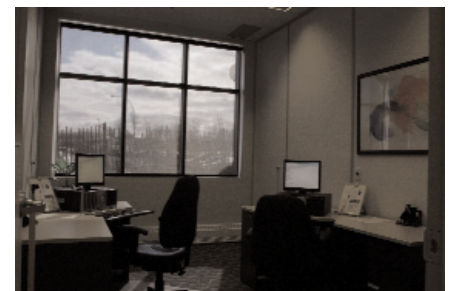
Dr. Jennifer A. Veitch: 613-993-9671; Jennifer.Veitch@nrc-cnrc.gc.ca

For more information, see http://irc.nrc-cnrc.gc.ca/ie/lighting/daylight/glazing_e.html

Factsheet 42, May 2005



Office with translucent panel.



*Office with window and roller blind.
Both photos taken at noon on clear sunny day.*



National Research
Council Canada

Conseil national
de recherches Canada

Canada