

# Thermal Insulation and Solar Control of Architectural Glass

Glass is the only envelope material that will provide direct energy gains. Learn how to exploit the sun energy to ensure the best possible human experience and optimal energy consumption. This course teaches the fundamentals of heat transfer, how the electromagnetic spectrum influences interior temperatures and personal comfort, and how materials, glazing methods, and coatings can yield significant changes in the insulation. Further, this course explores the effect of coating types, thicknesses, colour and how these attributes influence solar transmission through the window. An understanding of these characteristics will better allow architects to factor them into design to control interior temperatures, light transmission, solar heat gain, and UV radiation for building occupants, thereby increasing overall enjoyment and productivity while limiting harmful factors.

## HSW Justification:

Solar Control and Thermal Efficiency have a great effect on a variety of systems within an interior space. Windows, and their performance characteristics, directly influence overall occupant comfort, occupant productivity and equipment protection.

## Learning Objective 1:

Fundamentals of thermal efficiency a. Convection, conduction, and radiation b. Materials c. Electromagnetic spectrum d. How these terms interact with buildings and the human body.

## Learning Objective 2:

Thermal Insulation a. Understand glazing evolution towards better thermal insulation b. What these elements mean for the interior temperature control of a building for both personal comfort and monetary HVAC benefits

## Learning Objective 3:

Understanding surface temperature and its effect on occupant comfort

## Learning Objective 4:

Solar Control a. Light and energetic factors b. How to decrease the solar factor while maintaining a high level of lighting c. How these elements affect the overall well-being of building occupants by providing the right amount of light transmission, while limiting damaging factors to body, furniture, and equipment through solar heat gain and UV degradation

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