

Research on Natural Lighting Design of Atriums Based on Energy-Saving Aim

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Abstract : An atrium is a place for natural climate exchanging of indoor and outdoor space of buildings, which plays an active role in the overall energy conservation, climate control and environmental purification of buildings. Its greatest contribution is serving as a natural light collector and distributor to solve the problem of natural lighting in large and deep spaces. However, in real situations, the atrium space often results in energy consumption due to improper design in considering its big size and large amount use of glass. Based on the purpose of energy conservation of buildings, this paper emphasizes the significance of natural lighting of atriums. Through literature research, case analysis and other methods, four factors, namely: the light transmittance through the top of the atrium, the geometric proportion of the atrium space, the size and position of windows and the material of the surface of walls in the atrium, were studied, and the influence of different architectural compositions on the natural light distribution of the atrium is discussed. Relying on the analysis of relevant cases, it is proposed that when designing the natural lighting of the atrium, the height and width of the atrium should be paid attention to, the atrium walls are required being rough surfaces and the atrium top-level windows need to be minimized in order to introduce more natural light into the buildings and achieve the purpose of energy conservation.

Keywords : energy conservation, atrium, natural lighting, architectural design

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