

ISSN NO: 2249-7455

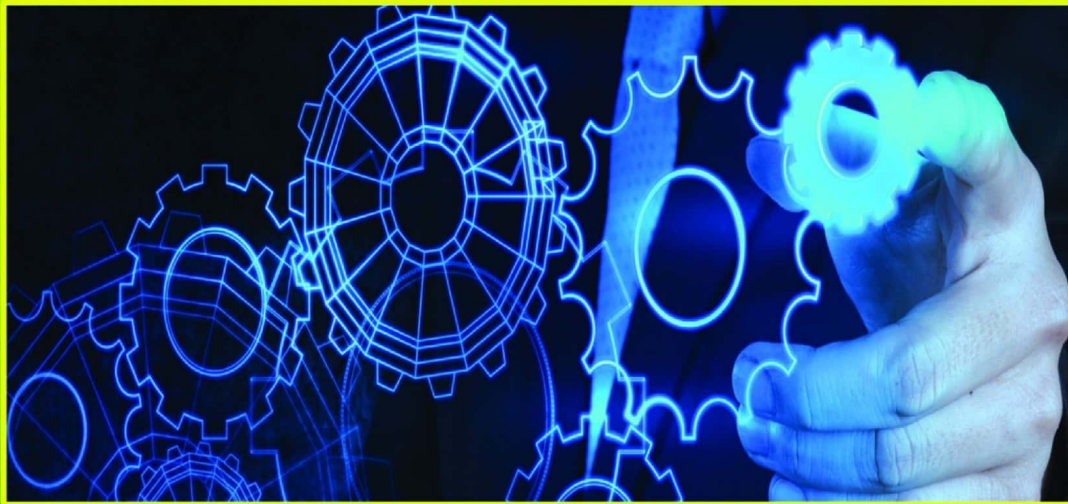
# IJMTE

International Journal of Management,  
Technology And Engineering

A Peer Reviewed/ Referred Journal

An ISO 7021 : 2008 Certified Journal

ISSN NO: 2249-7455



Volume 8, Issue IX,  
SEPTEMBER 2018



Edited By  
International Journal of Management, Technology And Engineering  
[www.ijamtes.org](http://www.ijamtes.org)

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# Life Cycle Analysis of a curtain wall glass assembly using high performance glazing and aluminium support system

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## ABSTRACT

Curtain walls with glass infill are being extensively preferred for their aesthetic properties by the designers for contemporary building envelopes in India. However it becomes necessary to consider the environmental impacts of curtain wall envelopes throughout their life cycle when it comes to the selection of various types of glazing panel infills and framing materials since green buildings have become a prime necessity of time to combat global environmental challenges like climate change. The study consists of life cycle analysis of curtain wall assembly with glass panels and aluminum support system. Different glazing assemblies for high performance have been compared and analyzed for their performance based on the parameters like Solar Heat Gain Co-efficient.(SHGC), Shading Co-efficient (SC), Energy Absorption (EA), Energy Reflectance (ER), Direct Energy Transmission.(DET), U – value, Relative heat gain, Visible Light Transmittance (VLT) and thermal performance. The paper also discusses life cycle analysis of parts of curtain wall assembly viz. glass infill, aluminium frame and sealant, the discussion parameters being environmental impacts during raw material extraction and manufacturing, embodied energy, performance and maintenance, possibility of recycling and reuse, energy conservation, waste generation and other human, environmental impacts.

**Keywords :** curtain wall, environmental impacts, high performance glazing, , life cycle analysis , thermal performance.

## 1.INTRODUCTION

There is a rapid transformation in the envelop materials used for the buildings in India from conventional bricks, stones and concrete to contemporary glazing. Curtain wall assemblies with glazing panels are extensively preferred by architects due to their aesthetic properties and the visual connection it offers between the interiors and the exteriors. However every material used for the building construction has certain environmental impacts throughout its life cycle, from raw material extraction, processing, performance up to their disposal. Buildings account for 40% of material extraction. [1]. Hence it becomes necessary to consider these environmental impacts so as to reduce them by consciously choosing the materials in the designing of building envelopes. There has been an intense research and advancement in the glazing technologies that offers an array of high performance glass infill in curtain walls. In this paper life cycle analysis of curtain wall assembly with glass panels and aluminum support system has been studied.