## Accepted Manuscript

Design optimization and manufacture of hybrid glass/carbon fiber reinforced composite bumper beam for automobile vehicle

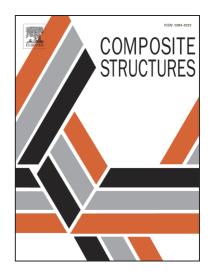
Do-Hyoung Kim, Hyun-Gyung Kim, Hak-Sung Kim

 PII:
 S0263-8223(15)00492-4

 DOI:
 http://dx.doi.org/10.1016/j.compstruct.2015.06.028

 Reference:
 COST 6527

To appear in: *Composite Structures* 



Please cite this article as: Kim, D-H., Kim, H-G., Kim, H-S., Design optimization and manufacture of hybrid glass/ carbon fiber reinforced composite bumper beam for automobile vehicle, *Composite Structures* (2015), doi: http://dx.doi.org/10.1016/j.compstruct.2015.06.028

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

## ACCEPTED MANUSCRIPT

Design optimization and manufacture of hybrid glass/carbon fiber reinforced composite bumper beam for automobile vehicle

Do-Hyoung Kim<sup>1</sup>, Hyun-Gyung Kim<sup>2</sup> and Hak-Sung Kim<sup>1, 3\*</sup>

 Department of Mechanical Convergence Engineering, Hanyang University, Haengdangdong, Seongdong-gu, Seoul, 133-791, South Korea
 Department of Advanced Trim Engineering, Hyundai Motors, Hwaseong-si, Gyeonggi-do, 445-706, Korea

3. Institute of Nano Science and Technology, Hanyang University, Seoul, 133-791, Korea \*Corresponding Author: <u>kima@hanyang.ac.kr</u>, 82 2 2220 2898(Tel)

## Abstract

In this study, the hybrid glass/carbon composite bumper beam was designed and manufactured via the design optimization process combined with the impact analysis. The glass/carbon mat thermoplastic (GCMT) composite was devised to substitute for the conventional glass mat thermoplastic (GMT) for reducing the weight of bumper beam. For the design optimization, the mechanical properties of GCMT were predicted and the optimal design of bumper beam was performed with the impact simulation. Based on the final design, the real bumper beam was manufactured and its impact performances were measured. It was found that the optimally designed GCMT bumper beam had 33% less weight compared to the conventional GMT bumper beam while having the improved impact performances.

*Keywords:* Fiber reinforced composite, Hybrid glass/carbon fiber composite, Impact simulation, Finite element analysis, Optimal design.

Download English Version:

## https://daneshyari.com/en/article/6706777

Download Persian Version:

https://daneshyari.com/article/6706777

Daneshyari.com