



**ENGINEERING  
COMPOSITES**

**PROPERTIES  
& APPLICATIONS**

EDITOR | **Mohd Sapuan Salit**



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First Print 2014

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UPM Press is a member of the Malaysian Book Publishers Association (MABOPA) Membership No.: 9802

Perpustakaan Negara Malaysia      Cataloguing-in-Publication Data

ENGINEERING COMPOSITES PROPERTIES & APPLICATIONS / editor

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Includes index

ISBN 978-967-344-396-3

1. Composite materials    2. Engineering.    I. Mohd Sapuan Salit.  
620.118

Cover Design: Md. Fairus Ahmad  
Typesetting: Sarwani Padzil  
Type face: Times New Roman PS  
Type size: 11/14.5 pt

*Direct orders to*  
Universiti Putra Malaysia Press  
43400 UPM, Serdang  
Selangor Darul Ehsan

*Printed by*  
Univision Press Sdn. Bhd.  
Lot 47 & 48, 49, 50 Jalan SR 1/9  
Jalan Serdang Raya  
Taman Serdang Raya  
43300 Seri Kembangan  
Selangor



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## Chapter 15

# Materials Selection for Lightweight Automotive Composite Hand Operated Parking Brake Lever Design with a Weighted Property Index Method

M.R. Mansor and S.M. Sapuan

### INTRODUCTION

In a typical modern vehicle where the components may rise up to 15,000 parts, the task to select the appropriate material to best suit a required function or application is not an easy task. It is more complicated when the designers is faced by the challenged of having overwhelming information on various materials available at the market to choose from to match the required component function. Thus, the need for a systematic and quantitative material selection process is very important to aid the task in choosing the optimum material which gives the maximum benefits to the component such as in function, cost and reliability. One of the solutions is through a systematic material selection process called the weighted property index method. In this exercise, the weighted property index method is applied in the design of an automotive component. The aim is to identify a new material for the construction of a lightweight automotive hand operated parking brake lever based on the performance requirements set for the component.

Findik and Turan (2012) recently made a case study on the selection of the best candidate material for a lighter train wagon design using weighted property index method (WPIM). In their study, the current train load wagon wall was selected to be optimized in term of reducing the component's weight, increasing the stiffness of the component, reducing the cost of the component as well as maintaining good reliability and