



# KKU ENGINEERING JOURNAL

Vol.43 No.3 July – September 2016

ISSN 0125-

Index in:

DOAJ DIRECTORY OF  
OPEN ACCESS  
JOURNALS

ASEAN  
CITATION  
INDEX

TCI  
Thai-Journal Citation Index Center

VOL 43, NO 3 (2016)

TABLE OF CONTENTS

ORIGINAL RESEARCH

A grey relational analytical approach to orange peel filler particulates for tapped density experiments of green composite reinforcements

*Sunday Ayoola Oke*

Improvement of solar ethanol distillation using ultrasonic waves

*Jaruwat Jareanjit*

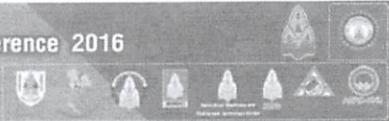
จำหน่ายด้วย



108-119



120-126



1 **Development of Computer-Aided Design Module for Automatic Gemstone Setting on**  
2 **Halo Ring**

3 Somlak Wannarumon Kielarova\*, Prapasson Pradujphongphet and Chokenithi Nakmethee  
4 iD3 -Industrial Design, Decision and Development Research Unit, Department of Industrial  
5 Engineering, Faculty of Engineering, Naresuan University, Phitsanulok, 65000, Thailand.

6 \*Corresponding author. Tel.: +66-5596-4223; Email address: [somlakw@nu.ac.th](mailto:somlakw@nu.ac.th)  
7 [somlakwk@gmail.com](mailto:somlakwk@gmail.com)

8

9

10 **Abstract**

11 This paper proposes computer-aided design modules for automatic setting and arranging of  
12 gemstones and diamonds on the head of a halo ring. These modules are able to automatically  
13 set the center stone, side stones, and accent stones by using a set of inputs from user. To  
14 develop the mentioned modules, the authors have studied several key parameters: sizes and  
15 cuts of center stones, side stones, and accent stones, distances between stones, sizes and  
16 shapes of prongs, including shrinkages and metal loss during production process. Those  
17 parameters were taken into account to derive their relationships in terms of mathematic  
18 models. These mathematic models were further used in the development of the computer-  
19 aided design modules based on RhinoScript Platform in the Computer-Aided Design (CAD)  
20 software named Rhinoceros. The module was developed for assisting CAD designers to  
21 automatically generate gemstone rings and to set and arrange center stone, side stones, and  
22 accent stones on parts of the rings. It was developed using data and information about jewelry  
23 ring design from jewelry designers and a manufacturer, as well as, collaborating with the  
24 manufacturer for testing the developed module. The proposed module can help CAD designer  
25 to reduce gem setting and arrangement time by about 67-70% in comparison to the manual  
26 method. The results and details of the development of the module and the development of the  
27 proposed generative design system were included in this paper.

28 **Keywords:** Geometry tolerance, Jewelry design, Automatic design, Computer-aided design, ...  
29 Volumetric shrinkage.

30

จำนวนถูกต้อง