

DESIGN AND ANALYSIS OF ANKLE FOOT ORTHOSIS FOR DISABLED CHILDREN

S. Mohamaddan¹, N.Z. Ishak¹, A.M. Aizuddin¹, S. Yamamoto²,
S.Z.M. Dawal³, E.B. Safawi⁴ and H. Khamis¹

¹Department of Mechanical and Manufacturing, Faculty of Engineering
Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia.

²Department of Bioscience and Engineering, College of Systems
Engineering and Science, Shibaura Institute of Technology,
3308570 Saitama City, Japan.

³Department of Mechanical Engineering, Faculty of Engineering,
University of Malaya, 50603 Kuala Lumpur, Malaysia.

⁴Department of Surgery, Faculty of Medicine and Health Science,
University Malaysia Sarawak, Kota Samarahan, Sarawak, Malaysia.

Corresponding Author's Email: mshahrol@unimas.my

Article History: Received 16 August 2017; Revised 25 October 2017;
Accepted 10 December 2017

ABSTRACT: Ankle Foot Orthosis (AFO) is a brace or device that is worn on the lower leg to support and correct the foot and ankle position. AFO is also used to correct the foot drop. In this paper, a new design of AFO is proposed and its analysis using AUTODESK Inventor will be discussed. The design concept was based on the short and long size of pneumatic artificial muscle (PAM). The PAM are custom made in the laboratory with the short and long size are 150mm and 250mm respectively. Single point statics analysis including reaction force and moment at selected points were conducted for both designs. Based on the von Mises stress, displacement, safety factor and PAM experiment result, the long size design is selected for this research. Fabrication and further testing needs to be conducted in order to evaluate the device.

KEYWORDS: *Ankle Foot Orthosis; Brace; Foot Drop; Design*