

Evaluation of wearable airbags for elder fall-protection

J-H. WANG, J-L. LIN. **Evaluation of wearable airbags for elder fall-protection.** *Gerontechnology* 2014;13(2):298; doi:10.4017/gt.2014.13.02.281.00 **Purpose** Recently, airbag simulations have been commonly used for vehicular applications. The inflation of airbags and resultant interactions with an occupant have been successfully investigated in previous studies¹⁻³. However, few studies have been conducted on a wearable airbag designed to provide fall-protection for older people. **Method** In this study, we propose an air inflation model for an optimally designed wearable airbag for older people. *Figure 1* shows an air-inflated model that is used for the prediction of the inflating process of a wearable airbag with respect to the mass flow rate, the inflating volume and the inflating temperature. **Results & Discussion** *Figure 2* shows the experimental results of the inflation process of the wearable airbag. The advantage of numerical airbag simulations is that they shorten the design process and reduce the number of experiments that are needed to develop to a reliable and safe product. The airbag model results were in reasonable agreement with the experimental observations. Therefore, this study presented is a promising method for optimal design of wearable airbags.

References

1. Lakshminarayan V, Lasry D. SAE Technical Paper 1991; doi:10.4271/912904
2. Lasry D, Hoffmann R, Protard JB. SAE Technical Paper 1991; doi:10.4271/910150
3. Khalil TB, Wasko RJ, Hallquist JO, Stillman DW. SAE Technical Paper 1991; doi:10.4271/912906

Keywords: mobility & transport, wearable airbag, elder fall-prevention, inflation model

Address: Industrial Technology Research Institute, Hsinchu, Taiwan

E: junghao@itri.org.tw

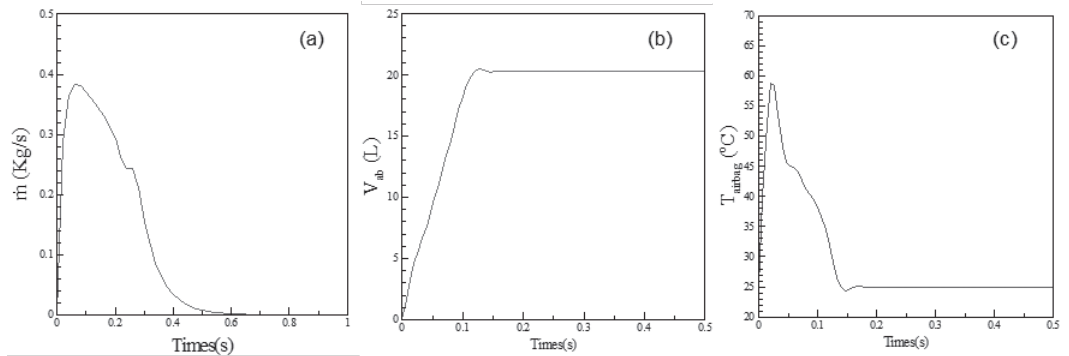


Figure 1. Air inflating model is used to predict for the inflating process of the wearable airbag with respect to (a) mass flow rate; (b) inflating volume and (c) inflating temperature



Figure 2. Experimental observations on the inflating process of the wearable airbag