

## THICKNESS OPTIMISATION OF INFLATED PREFORMS BY VARYING INFRARED HEATING COEFFICIENTS

**M. Bordival, Y. Le Maout, F. Schmidt**

*Ecole des Mines d'Albi-Carmaux, Route de Teillet*

81013 Albi CT Cedex 09 (France)

### **ABSTRACT:**

Injection blow moulding process [1] is basically a two steps process where a cold preform is warmed above glass transition temperature and then stretch-blown in a bottle mould. The heat conditioning step is crucial, because it allows to design the temperature distribution of the preform before forming. Longitudinal temperature distribution has a strong influence on the final thickness distribution of the bottle while thickness temperature distribution influences more the mechanical properties.

In this study, we have developed a coupled optimisation procedure [2] where the coefficient of the interpolated temperature are modified in order to achieve the best blown bottle. The objective function used for optimal design of the bottle is the thickness uniformity of the bottle. Validations have been performed by comparison with simple blown bottle and computed one. ABAQUS® commercial software has been used for ISBM.

[1] Rosato D.: Blow Molding Handbook, Hanser Publishers, New-York (1989)

[2] *Maxime Bordival, Fabrice Schmidt, Yannick Le Maout, "Optimization of Preform Temperature Distribution for the Stretch-Blow Moulding of PET Bottles", 11th ESAFORM CONFERENCE ON MATERIAL FORMING, 23-25 April 2008, Lyon (France)*