

PROCESSING PARAMETERS EVALUATION ON FORMABILITY OF BMGs

G. C. Rocco^{1,*,#}, A. M. J Junior², P. Gargarella²

¹Laboratory of Nanomaterials, Department of Materials Science and Engineering, Federal University of São Carlos, Rodovia Washington Luís 310, São Carlos 13561-905, SP, Brazil.

²Department of Materials Science and Engineering, Federal University of São Carlos, Rodovia Washington Luís 310, São Carlos 13561-905, SP, Brazil.

#Corresponding author: giordanno@ppgcem.ufscar.br ; giordanno@gmail.com

The development of metallic amorphous alloys has been increasing exponentially since the past decades. Bulk metallic glasses (BMG) alloys have been obtained with dimensions up to millimetres and have provided continuous wide source for a lot of academic research, specially regarding processing of BMGs. Once the BMG is on super-cooled liquid region, a good formability of the metal is controlled by factors like temperature-dependant viscosity and the temperature-dependant crystallization time. Finding of the parameters that lead to good process window is usually made by experimental investigation which involve a slow, costly and hard bench work for each composition. Using specific design of experiments techniques and simulation, it is possible to evaluate the sensibility of the factors in order to estimate the processing window based on empirical models that describes the forming and its relation to material properties by simulation. Such techniques were used evaluate the process parameter window for BMG alloys, correlating temperature and time dependant material properties. Further study will be carried to investigate the possible bias and deviation of the simulation model and its correspondent experiments.