Three-Dimensional Numerical Analysis of Rotary Piercing Process

Koji Yamane*, Kazuhiro Shimoda[†] and Akihito Yamane[‡]

* Research and Development, Process Research Laboratories
Nippon Steel and Sumitomo Metal Corporation
1-8 Fuso-Cho, Amagasaki, Hyogo, 660-0891, Japan
E-mail: yamane.6nq.kohji@jp.nssmc.com , Web page: http://www.nssmc.com

[†] Same as the above
E-mail: shimoda.he3.kazuhiro@jp.nssmc.com

[‡] Same as the above
E-mail: yamane.bq3.akihito@jp.nssmc.com

ABSTRACT

Three-dimensional numerical analysis of the rotary piercing process was performed by the rigid plastic finite element method. Rotary piercing, also known as the Mannesmann piercing process, is a hot rolling process that manufactures seamless tubes. In this process, the heated round billet is rotated by the rolls and pierced by the plug as an internal tool. Numerical analysis was conducted to investigate the deformation behaviour during rotary piercing and redundant shear deformation specific to this process. This paper discusses the effect of various rolling parameters on redundant shear deformation.

REFERENCES

[1] C.Hayashi and T.Yamakawa , Influences of Feed and Cross Angle on Rotary Forging Effects and Redundant Shear Deformations in Rotary Piercing Process , *ISIJ Int.* , (1997) **37**: 146-152.
[2] C.Hayashi and T.Yamakawa , Comparison of Double and Single Piercing Process in Seamless Steel Tube Manufacture , *Materials Science Research International* , (1997) **3**: 143-150.