

METAL FORMING PLASTICITY

International Union of Theoretical and Applied Mechanics

Symposium Tutzing/Germany, August 28 - September 3 1978

Editor H. Lippmann

Springer Verlag 1979

Contents

PREFACE V

PARTICIPANTS IX

J.L. BASSANI, J.W. HUTCHINSON and K.W. NEALE: On the Prediction of Necking in Anisotropic Sheets 1

A. BALTOV, N. BONTCHEVA, R. KAZANDJIEV, I. RADOVANOV and ST. VODENICHAROV: On the Theoretical and Experimental Description of the Mechanical Behaviour of Metals during Metal Forming Processes 14

R.A.C. SLATER: Spin-Forging of Sheet Metal Cones Having Various Cone Angles from 70/30 Brass and Commercially Pure Aluminium 27

K. SAITO and Y. SHIMAHASHI: Residual Stresses in Deep Drawn Cups and Sunk Tubes 53

B. KAFTANOGLU: On the Complete Numerical Solution of the Axisymmetrical Deep-Drawing Problem 66

T. BEDNARSKI: Application of the Stereophotogrammetric Methods to the Analysis of the Kinematics and Dynamics of Shells 80

P. LE NEVEZ: Deformations finies en coordonnees locales et application a un probleme d'emboutissage 104

O. BRUHNS and TH. LEHMANN: Optimum Deformation Rate in Large Inelastic Deformations 120

N. CRISTESCU and S. CLEJA: New Trends in Tube and Bar Processing 139

Y. YAMADA, A.S. WIFU and T. HIRAKAWA: Analysis of Large Deformation and Stress in Metal Forming Processes by the Finite Element Method 158

E.H. LEE, R.L. MALLETT and R.M. McMEEKING: Stress and Deformation Analysis of Metal Forming Processes 177

T.Z. BLAZYNSKI: Inhomogeneity of Deformation and Tool Design 190

D.Y. YANG, M.U. KIM and C.H. LEE: A New Approach for Generalized Three-Dimensional Extrusion of Sections from Round Billets by Conformal Transformation 203

O. RICHMOND, H.L. MORRISON and M.L. DEVENPECK: Ideal Metal Forming 223

I.F. COLLINS: The Application of Singular Perturbation Techniques to the Analysis of Forming Processes for Strain-Hardening Materials. 227

P.L.B. OXLEY: Allowing for a Variable Flow Stress in the Analysis of Metal Working Processes 244

W. KLIE: Plastic Deformations with Free Boundaries - A Finite Element Approach 260

S.I. OH, N. REBELO and S. KOBAYASHI: Finite Element Formulation for the Analysis of Plastic Deformation of Rate-Sensitive Materials in Metal Forming

L. DIETRICH and H. PETRYK: Theoretical Solutions of Some Plastic Working Processes in the Light of Experimental Evidence 292

S. SHIMA, K. MORI and K. OSAKADA: Analysis of Metal Forming by the Rigid-Plastic Finite Element Method Based on Plasticity Theory for Porous Metals 305

N.N. MALININ: Mechanics of Creep in Metal Forming 318

J.A. SCHEY: Modeling of the Tool-Workpiece Interface 336

J.F. BRATT: Drawing of Fiber Reinforced Tubes 349

O. PAWELSKI and W. RASP: Stresses and Strains in Deformation of Clad Metals 363

H. KUDO and S. MATSUBARA: Joint Examination Project of Validity of Various Numerical Methods for the Analysis of Metal Forming Processes - Report Given and Comments Made at the Round Table Discussion of the Symposium .378

The consecution of papers in this volume corresponds to the sequence of presentation during the Symposium.