

CONTENTS

ix Foreword by J. Barford

SESSION 1 Physical metallurgy

- 1 *Invited paper: Physical metallurgy of Fe–Cr–Ni austenitic steels*
by D. R. Harries
- 15 *Design, development, structure and properties of some new stainless steels for high-temperature use*
by R. P. H. Fleming
- 22 *Heat treatment procedures for control of grain boundary precipitation and segregation in austenitic alloys*
by R. A. Carolan and R. G. Faulkner
- 30 *Stress relief of austenitic weldments: microstructural and mechanical property effects*
by R. G. Thomas and S. R. Keown
- 39 *Hot mechanical properties of 316L stainless steel with boron and nitrogen additions*
by M. Ceccarelli, R. Santucci, and A. Bennani
- 47 *Dynamic mechanical properties at high temperature of austenitic stainless steels for nuclear applications*
by C. Albertini and M. Montagnani
- 51 *Effects of titanium and silicon additions on creep behaviour of TiN-dispersion-strengthened 20Cr–25Ni stainless steel*
by A. C. Roberts and H. E. Evans
- 58 *Effect of cold working on creep behaviour of TiN-dispersion-strengthened 20%Cr–25%Ni austenitic steel*
by E. G. Wilson
- 66 *Time-dependent changes in microstructures and mechanical properties of Type 316 steel and weld metal*
by C. A. P. Horton, P. Marshall, and R. G. Thomas

- 73 *Aging of Type 316 stainless steel and its effect on creep and fatigue behaviour*
by M. S. Dean and W. J. Plumbridge
- 81 *Effects of minor elements on long-term creep-rupture properties of 316 austenitic stainless steel at 550–700°C*
by H. K. Grover and A. Wickens
- 88 *Creep behaviour of AISI 304 and 316 stainless steels and influence of cold working*
by L. Bernard, E. Campo, and S. Quaranta
- 94 *Small-angle neutron scattering investigation of creep damage in AISI 304 stainless steel*
by A. Boeuf, R. Coppola, F. Rustichelli, F. Zambonardi, S. Melone, and P. Puliti
- 99 *Creep of austenitic stainless steels at low stresses*
by T. Sritharan and H. Jones
- 106 *Relationship between structure and creep properties of a predeformed austenitic steel*
by V. Guttman and J. Timm
- 113 *Fatigue crack initiation and propagation in stainless steels subjected to thermal cycling conditions*
by D. J. Marsh
- 122 *Creep rupture properties of 20%Cr–25%Ni–Nb stainless steel in region 870–1320°C*
by B. D. Clay
- 129 *Effect of microstructure and tensile dwell on growth of short fatigue cracks in 316 steel at 625°C*
by R. P. Skelton
- 136 *Creep–fatigue interactions in 316 stainless steel under torsional loading*
by Ke Wei and B. F. Dyson
- 141 *Role of point defects in formation of radiation-induced structural changes in stainless steel alloys*
by W. Schüle and R. Scholz

(Paper added to programme, forming introduction to next session)

SESSION 2 Irradiation effects

- 149 *Invited paper: irradiation creep in austenitic stainless steels*
by K. Ehrlich
- 157 *Irradiation-induced embrittlement and precipitation in Nimonic PE16*
by R. M. Boothby and D. R. Harries
- 165 *Irradiation-induced point defects in austenitic Fe–Cr–Ni alloys*
by C. Dimitrov and O. Dimitrov
- 172 *Influence of helium embrittlement on post-irradiation creep rupture behaviour of austenitic and martensitic stainless steels*
by C. Wassilew

SESSION 3 Constitutive equations

- 182 *Invited paper: Creep mechanisms in stainless steel castings*
by G. Bernasconi, W. Nicodemi, and R. Roberti
- 190 *Modelling of fatigue crack growth in austenitic stainless steels at elevated temperature*
by J.-Y. Guinemer
- 194 *Relating high-temperature flow stress of AISI 316 stainless steel to strain and strain rate*
by S. Matteazzi, G. Piatti, and D. Boerman
- 203 *Biaxial low-cycle fatigue failure of 316 stainless steel at elevated temperatures*
by F. A. Kandil, M. W. Brown, and K. J. Miller
- 210 *Constitutive relations for stainless steels*
by A. M. Goodman and I. W. Goodall

SESSION 4 Design

- 218 *Invited paper: Designing for elevated temperatures*
by G. A. de Boer
- 224 *Creep fatigue in AISI stainless steel welded structures*
by A. Del Puglia, E. Manfredi, and E. Vitale
- 233 *Method of evaluating creep–fatigue interaction for elastic analysis*
by M. Weisz, P. Petrequin, B. Rezgui, and J. Tortel
- 238 *Mechanical properties data needs in Type 316 steel for fast reactor application*
by D. S. Wood
- 243 *Creep rupture strength extrapolation methods of four countries for AISI 316
stainless steel*
by G. Brunori, S. Cappellato, S. Vacchiano, and F. Gugliemi
- 249 Author index
- 251 Subject index