Heat Treatment and Technology of Surface Coatings

New Processes and Application Experience

Proceedings of 7th International Congress on Heat Treatment of Materials

Volume III

December, 11-14, 1990

Moscow

CONTENTS

1. Heat Treatment Particularities of Aluminum-Lithium Alloys

*Kolobnev N.I., Khokhlatova L.B., Samokhvalov.*

………………………….. 3

2. New Technological Process of Electro stimulated Drawing of

Low-Carbon and Low-Alloy Steels

  *Gromov V.E., Kuznetsov V.A., Zuev L.B., Poltoratsky L.M., Tsellermaer V.Ya., Bashkirova S.A*

 …………………………. 13

3. Autothermal Cyclic Treatment Structure-Formation Control Principles in Strengthening and Reconditioning of Products

*Davydov V.N.*

 ………………………….. 18

4. Rolling Heat Utilizing Heat Treatment: Energy and Metal Saving, Production Continuity, Process Automation and Mechanization

*Brunzel Yu. M., Moiseev B.A., Bashchenko A.P., Gu-revich A.B., Zelichenok B.Yu., Popova T.N., Glu-khovskii E.S., Grechushkin Yu.V.*

………………………….. 25

5. The Large Size Parts Strength Increasing Under the Heat

Treatment with the Help of Heat Frittering

*Rabinovich V.P., Filimonova N.S., Borisov I.A., Zejnetdinov Kh.Kh., Yarkho S.A., Zhigalkin I.G.*

………………………….. 32

6. Energy saving Reduction Technology for the Boiler Drums Heat Treatment

*Tuliakov G., Kovalev I.*

 ………………………….. 39

7. Application of Full-Surface Hardening Method for Parts Made of

Low-Carbon and Low-Alloyed Steels

*Devyatkin V.P., Fedin V.M., Shotashvili Ya.M.*

………………………….. 44

8. On Application of Noise Control in New Methods of Steel Quenching

*Povsten S.G., Kobasko N.I., Moskalenko A.A., Tyl-tin A.A.*

…………………………..53

9. Heat Treatment of Large Rolls by Accelerated Heating and

Controlled Cooling-Process Design

*Karasiuk Y.A., Sorokin V.G., Adamova N.A., Savel-yeva N.V., Grushko Yudin Y.V.*

………………………….. 57

10. A Study of Cooling Conditions for Steels in Water-Based Quenchants

*Bannyk 0.A., Bozhko G.T., Yershov A.A., Izotov G.V.*

………………………….. 64

11. Progressive Know-How Methods of Heat-Treatment of Large sized Die Attachments for Metal Hot-Processing

*Izmailov F.Z.*

………………………….. 69

12. CAD System for Heat Treatment Technologies

*Artinger I., Smoling K., Csikos G.*

………………………….. 76

13. The Transformation Behavior and Proper-ties of the High Strength

Low-Alloyed Steel in Dependence of Heat Treating

 *Cvetkovski S., Novovid-Simovid' N., Vidojevid N., Aeimovid Z.*

………………………….. 81

14. Structure and Properties of Microcrystalline Tool Steels

*Sokolchuk K.Yu., Skrynchenko Yu.M., Vaganov V.Ye.*

………………………….. 87

15. A Bimetal Composite Casting Material for the Tools

*Chekurov V., Mir'salyev M.*

………………………….. 94

16. Structure and Properties of High-Chrome Tool Steels, after

Strengthening Thermal Treatment

*Kaleicheva G., Dilov T., Baharov G., Martovitzkaya N.*

………………………….. 96

17. Technological Solutions in the Field of Thermal Treatment of

Bi-metallic Cutting Tool

*Kosonogova L.G., Gorba N.A.*

………………………….. 101

18. Influence of Initial Austenite State on the Bainite Transformation

*Ivanova R., Christova E.*

 ………………………….. 106

19. Effect of Re Addition on Hot Workability of Cast Semi-Steel

*Wu H.Q., Tian Y.J., Guo J.H., Wang A.R., Wu F.Z., Zhang Y.L.*

 ………………………….. 114

20. The Effect of Noncontinuous Coo-ling on MS Point and the Morphology of Martensite

*Sun Fushen Liu Zeng.*

………………………….. 120

21. A High Temperature Thermomechanical Treatment Process for

Further Improving the Strength and Toughness of Low-Alloy

Medium-Carbon Steel

*Zhifang Peng.*

………………………….. 127

22. Effect of Microstructure on Fatigue Crack Steel Initiation

Resistance and Propagation Rate in 5CrMnMo

*HE Shiyu, LIU Beixing, LIU Jianhong.*

………………………….. 132

23. Grain Boundary Segregation Behavior of Alloy Steel 42CrMo in

Quenched and Tempered States

*Li G.F., Wu R.G., Lei T.C.*

 ………………………….. 137

24. 33SiMnB-A New Sort of Spring Steel for Automobile Industry

*Wu Fan, Ma Mingtu, Mao Zhaowu, Du Yongguo, An Jiaqi-ang, Xiao Zhangli,Li Xianglin.*

………………………….. 143

25. Structure Formation in Nonequilibrium Crystallization and

Properties of Corrosion-Resistant Martensitic Steels

*Krasnikova S.I.*

 ………………………….. 148

26. The Effect of Ultra-High Temperature Austenitizing on

Micro-structure and Mechanical Properties in Martensite-ferrite

Stainless Steel Crl7Ni2(X17112)

*Deng Zhonggang, Liu Ning, Huang Menggen.*

…………………………..154

27. A Study on Hydrogen Induced Embrittlement of Large Cold

Rolled Steel 9Cr2Mo

*Kang Datao, Lu Zhutang, Zeng Jiaqing.*

………………………….. 159

28. The Effect of Long-term Aging on the Microstructure and

Properties of 25Cr2MoV Rotor Steel

*An Yunzheng, Ma Aiguo, Zhao Wenying, Wei Fugao and Pan Jingda.*

………………………….. 168

29. Rational Heat Treatment for Industrial Ni-Cr-Fe-Nb-Al-based Superalloys

*Nosova G.I., Kireev V.B., Makushok 0.V., Novikova E.E.*

………………………….. 176

30. The Influence of Different Ageing Treatment on Precipitation in AlLiCuMgZr Alloy.

*Novitovic C., Rogulic M., Avramovid-Cingara G., Novovc-Simovic N.*

………………………….. 181

31. Quaziequilibrium Alloy Structure

*Zelin M.G., Valiev R.Z.*

………………………….. 187

32. High Resolution Team Study of Al-5wt%Zn-2wt% Mg Alloy During

Continuous Heat Treatment

*Avramovic-Cingara G., Loffler H., Rogulic M., Kakas D.*

………………………….. 191

33. Creation of High-Strength Quasi-Composite Steels and Alloys of a New Class

*Mamian S.G.*

………………………….. 196

34. Cast Steels for Crucial Parts of Machinery of Northern Construction

*Gervasyev M.A., Trop L.A., Vorobyova E.P., Zakharov V.N.*

………………………….. 202

35. Alloying, High-Temperature Corrosion and Mechanical Properties of a Nickel Base Alloy

*Kireev V.B., Kolyasnikova N.V.*

………………………….. 209

36. Physical-Mechanical Properties of the Metallic Oxides Formed on a

Part Surface

*Sedunov V.K.*  ………………………….. 216

37. O-phase in Nitrogen Austenite-Ferrite Stainless Chromium-Manganese

Steels

*Petrowa R.A.*

………………………….. 221

38. Development of Induction Heat Treatment in Saw of China

*Liu Zi-bin.*

………………………….. 227

39. Nitriding Sensor and White Layer Formation

*Klamper-Westkamp H., Hoffmann F., Mayr P.*

………………………….. 233

40. Vacuum Chamber Furnace with a Broadened Range of Application in

Heat Treating

*Sommer H.*  ………………………….. 244

41. Influence of Process Parameter on the Com-ponent Properties in

Nitrocarburizing with and without Post Oxidation

*Wahl G.* ………………………….. 252

42. Volume Thermal Treatment of Large-Size Welded Pressure

Vessels under Assembly Conditions

*Korol'kov P.M.*

………………………….. 259