Preface

A close cooperation between the Institute of Metal Physics in Kiev, Ukraine, and the Chair of Materials Technology at the Ruhr University Bochum, Germany, has been going on now for more than 20 years. During the first decade the joint effort centered on high nitrogen steels (HNS) and the partners published a book on this subject in 1999. Already then they had shown that combined alloying of martensitic stainless steels with carbon + nitrogen considerably improved structure and properties. These findings were transferred to the hardenable stainless bearing steel CRONIDUR® used, e.g., in aviation and to SolNit® which allows case hardening of stainless steel with nitrogen instead of carbon.

The second decade of partnership was dedicated to extending the beneficial C+N concept to new stainless austenitic grades called high interstitial steels (HIS). The results compiled in the present book have two major targets. On the scientific side the structure/ property relation starts at the electron structure and is carried on to the macroscale explaining the superior performance of HIS. The engineering aspects cover major steps of industrial manufacture and possible applications. Compared to similar HNS the new HIS do without costly pressure or powder metallurgy. Thus the contents are of interest to materials scientists working in R&D but also to engineers in design, manufacture, and materials selection.

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