

Preface

Failure of welded components can occur during service as well as during fabrication. Most common, analyses of the resistance of welded components against failure are targeted at crack avoidance. Such evaluations are increasingly carried out by modern weldability studies, i.e. considering interactions between the selected base and filler materials, structural design and welding process. Such weldability investigations are particularly targeted to prevent hot cracking, as one of the most common cracking phenomena occurring during weld fabrication.

To provide an international information and discussion platform to combat hot cracking, an international workshop on Hot Cracking Phenomena in Welds has been created, based on an initiative of the Institute for Materials and Joining Technology at the Otto-von-Guericke University in Magdeburg and the Division V.5 – Safety of Joined Components at the Federal Institute for Materials Research and Testing (BAM) in Berlin, Germany. The first workshop was organized in Berlin under the topics mechanisms and phenomena, metallurgy and materials, modelling and simulations as well as testing and standardization. It consisted of 20 individual contributions from eight countries, which were compiled in a book that found a very ready market, not only in the welding community. As a consequence of increasing interest, it has been decided to establish the Workshop on Hot Cracking Phenomena in Welds as a regular event every three years embedded in the International Institute of Welding (IIW). Attached to the IIW Commission IX and II Spring intermediate meetings, the second workshop was organized in March 2007.

The present book assembles 22 papers from 10 different countries, which have again been published without any length restrictions on individual contributions. The authors have attached great importance to highlight the very recent developments and thus, the present book particularly compiles the major worldwide hot cracking research advancements of the latest years. In recent years, the research interest is increasingly attracted to elucidation of the mechanisms, which differ widely with the type of hot cracking. The book has thus been divided correspondingly to the workshop sessions into chapters referring to the

various types of hot cracking, i.e. solidification cracking, liquation cracking and ductility dip cracking.

It can only be emphasized that in combination with the previous book, this edition represents a helpful tool for metallurgical, materials and mechanical engineering students of higher semesters. For all welding scientists and experts who want to get acquainted to the subject, the state of knowledge can very easily be drawn from the various chapters instead of gathering the necessary information piecewise from elsewhere.

The editors convey their sincere gratitude to all authors, session chairs and participants of the second workshop for their engaged contributions and for establishing a regular forum for exchanging the major research advancements in hot cracking phenomena of welds. Special thanks go to Ms. A. Cichon and Ms. I. Schülke for the tremendous work in organizing the workshop.

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