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Bearing Steel Technologies: 11th Volume

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Editor:
John M. Beswick

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Bearing Steel Technologies: 11th Volume, Progress in Steel Technologies and Bearing Steel Quality Assurance

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Foreword

THIS COMPILATION OF Selected Technical Papers, STP1600, *Bearing Steel Technologies: 11th Volume, Progress in Steel Technologies and Bearing Steel Quality Assurance*, contains peer-reviewed papers that were presented at a symposium held November 16–18, 2016, in Orlando, Florida, USA. The workshop was sponsored by ASTM International Committee A01 on Steel, Stainless Steel and Related Alloys, and Subcommittee A01.28 on Bearing Steels.

Symposium Chairperson and STP Editor:

John M. Beswick
Montfoort, The Netherlands

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Overview

The ASTM International bearing steel technologies symposium, Progress in Bearing Steel Technologies and Bearing Steel Quality Assurance, was held on November 16–18, 2016, at the Renaissance Orlando at Sea World Orlando, Florida, USA. This bearing steel symposium was the eleventh; the first under the auspices of ASTM A01 having been held in Boston in 1974. However, in 1946, ASTM held a symposium on bearing testing. See the following list of symposia:

The ASTM symposia typically have an international character serving the global rolling bearing industry as the premier bearing steel technology event.

Name	Topic	Year	Location	Chairman	STP
49th ASTM Meeting	Symposium on Testing of Bearings	1946	Buffalo	—	70
1	Rating of Nonmetallic Inclusions	1974	Boston	Joe Hoo	575
2	Roller Contact Fatigue Testing	1981	Phoenix	Joe Hoo	771
3	Effect of Steel Manufacturing Processes on the Quality of Bearing Steels	1986	Phoenix	Joe Hoo	987
4	Creative Use of Bearing Steels	1991	San Diego	Joe Hoo	1195
5	Bearing Steels: Into the 21st Century	1996	New Orleans	Joe Hoo & Bill Green	1327
6	Sixth International Symposium on Bearing Steels	2001	Phoenix	John Beswick	1419
7	Advances and State of the Art in Bearing Steel Quality Assurance	2005	Reno	John Beswick	1465
8	Developments on Rolling Bearing Steels and Testing	2009	Vancouver	John Beswick	1524
9	Advances in Rolling Contact Fatigue Strength Testing and Related Substitute Technologies	2011	Tampa	John Beswick	1548
10	Advances in Steel Technologies for Rolling Bearings	2014	Toronto	John Beswick	1580
11	Progress in Steel Technologies and Bearing Steel Quality Assurance	2016	Orlando	John Beswick	1600

The motivation for the ASTM symposium is to bring together the world's leading bearing steel technology practitioners for presentation and exchange of technical information on rolling bearing steel technologies. Without presenters and participants from outside the United States, the symposia would not have been possible.

Some of the presentations from the symposium have been compiled as peer-reviewed papers for publication as ASTM selected technical papers (STP1600). The peer-review process has been rigorous, as befits a reputable technical publication, and the STP editor expresses his gratitude to all the people involved. The reader will be impressed with the technical content, and experience has shown that the STPs are a valued reference and source of inspiration for bearing steel technologists. The authors and their respective companies should be wholeheartedly congratulated for their commitment to this publication.

The symposium had 34 presentations and 122 people registered for the event. The symposium comprised the following sections:

- Advances in Bearing Steel "Clean Steel" Steelmaking and Processing
- Advances in Rolling Contact Modeling, Functional Life Prediction, and Rolling Contact Testing
- Steel Alloy–Heat Treatments Relationships
- New Steel Technologies for High Demanding Rolling Bearing Applications
- Improved Methodologies for Bearing Steels Quality Assurance
- Advances in Nonmetallic Inclusion Knowledge

The A01.28 subcommittee is responsible for bearing steel specifications, and the evidence from the bearing steel presentations is overwhelming that it is not the inclusions that are important but the inclusion/matrix bonding characteristics! Is it therefore time to challenge the established bearing steel test procedures and related specifications with respect to steelmaking, micro cleanliness, and segregation/hot workability control? Could this be a theme for a follow-up workshop for the Subcommittee A01.28?

The future of rolling bearings in aerospace applications will need improved ring steel technologies to utilize the high load capacities in hybrid bearings. In civil aeroengines the primary requirement is debris damage tolerance and for military engines, tolerance to spall propagation, higher temperature, and higher load capability and standstill corrosion resistance is required in some applications.

The STP editor is indebted to Pat McDonough, the ASTM A01.28 subcommittee chairman, for supporting the the symposium arrangements and to ASTM International for fostering the continuation of the symposia series. The following organizations provided financial support to the symposium; many thanks for the sponsorship:

Amsted Rail Company Brenco Inc.	USA
Böhler Edelstahl GmbH	Austria
Foerster Instruments Inc.	USA
Gerdau Special Steel North America	USA
Saarstahl AG	Germany
Sanyo Specialty Steel Co., Ltd	Japan
Scana Energy AB	Sweden
SKF B.V.	The Netherlands
TimkenSteel Corporation	USA

Steel is a fantastic material and steel rolling bearings will continue to be produced in large quantities. Change is inevitable and the future of the ASTM bearing steel symposia, in the current format, needs to be considered. Are the margins in rolling bearing manufacture sufficient to support significant research and development and related publications?

Whatever the future holds, it has been the symposium chairman's delight to have, on behalf of ASTM International, prepared the program, chaired the symposium, and edited STP1600.

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