2015 Transactions of the American Foundry Society

Continuing the tradition, the *AFS Transactions* will feature selected papers presented at the 119th Metalcasting Congress, April 21-23, 2015. The *Transactions* will be published in both print and CD. (Publication date: August 2015)

Aluminum Casting Technology, 3rd Edition

A welcome update to the second edition, published in 1993, the updated *Aluminum Casting Technology* will feature the latest information on aluminum casting alloys, melting practices and furnaces, chemical and physical characteristics, design, casting processes, gating and risering, heat treatment, metallography, and cleaning and finishing. (Publication date: 2015)

Mold & Core Test Handbook, 4th Edition

This is an update to the Third Edition, published in 2000. The Fourth Edition updates nearly all of the tests and remains in the same easy to read format.

New to this edition is the chance to purchase the sections individually. More information will be available closer to the time the handbook will be released. (Publication date: Spring 2015)

For information on these or other publications, contact estoreservices@afsinc.org

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Note: Member discounts are applied to AFS Special Publications, CMI products and certain publications that AFS co-publishes with other organizations. Items and publications from other publishers are generally not available for discount.

AFS & The Institute Education & Training Schedule

(Tentative)

February 2015

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<tbody>
<tr>
<td>Feb. 4-6</td>
<td>Labor Relations &amp; Human Resources Conference</td>
<td>Ft. Lauderdale, FL</td>
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<td>Feb. 18-19</td>
<td>Green Sand Molding 201</td>
<td>Cedar Falls, IA</td>
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<tr>
<td>Feb. 25-26</td>
<td>Casting Defect Analysis</td>
<td>Schaumburg, IL</td>
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March 2015

<table>
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<th>Date</th>
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<tr>
<td>March 10</td>
<td>Aluminum 101</td>
<td>Blacksburg, VA</td>
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<tr>
<td>March 11-12</td>
<td>Aluminum Melting 201</td>
<td>Blacksburg, VA</td>
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<tr>
<td>March 11-12</td>
<td>Iron Melting 201</td>
<td>Schaumburg, IL</td>
</tr>
<tr>
<td>March 25-26</td>
<td>Copper Melting 201</td>
<td>Pittsburg, KS</td>
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Spring Quarter Classes:

- Casting Defect Analysis
- Copper Metallurgy 201
- A Hands-On Introduction to Metalcasting Steel 101
- Permanent Mold Processes
- Casting Supplier Auditing
- Coldbox Coremaking 201

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NEW RELEASES

Best Practices in Aluminum Metalcasting
Respected industry expert Geoffrey Sigworth compiled a lifetime of experience into this one book dedicated to the best practices in aluminum metalcasting, from melting and melt treatment to post solidification processing.

More than 60 technical papers are contained within the CD-ROM included with this publication. In addition, Excel®-based calculators are included to assist with sprue calculations, furnace energy models, etc.

NF1400
Corporate: $150.00 • Personal: $225.00 • List: $300.00

2015 AFS Metalcasting Forecast & Trends
The AFS Metalcasting Forecast & Trends is the annual resource for metalcasters and suppliers. The 2015 edition contains forecasts for all metals groups and shipment projections through 2023, export and import forecasts (by demand and shipments), forecast data by major casting consuming markets and international metalcasting data (casting shipments, labor rates, etc.) 32 pages. Available as download only.

MT1500
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2014 AFS Survey of Wages & Economic Benefits
What’s the current status of wages and benefits in the metalcasting industry in the U.S. and Canada? Compare responses from 124 U.S. plants and nine Canadian plants representing more than 19,000 employees and filter by foundry size, union status and type of metal poured. Twenty-eight job classifications were used as the basis for the wage portion of the study.

NF1400
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Manual de Defectos de Fundición: Aleaciones No-Ferrosas
Casting Defects Handbook: Aluminum & Aluminum Alloys and Copper & Copper Base Alloys
The popular Casting Defects Handbooks, Aluminum & Aluminum Alloys, and Copper & Copper Base Alloys, have each been translated into Spanish and combined into one volume. The common types of casting defects for these nonferrous alloys are presented, with their causes and prevention techniques, many in color. Softcover, 4½ x 7, 264 pages.

GM1401
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Coatings-Related Casting Defects Wall Chart
This full color wall chart is intended to aid in classifying coating defects in metal castings, suggest potential causes and offer various solutions. It is organized with 12 full color photos of the coating defect or imperfection, brush mark, excess coating, scabs/inclusions, orange peel, tear drops, erosion, veining, metal penetration, coating retention, blows, and spalling. Size: 39” x 27”.

CH1400
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CASTING DESIGN & PURCHASING

The metalcasting industry’s first and only complete reference book of casting suppliers in North America, the Casting Source Directory is updated annually and provides complete information on more than 2,000 metalcasting facilities and diecasters in the U.S., Canada and Mexico.

GE1400 ISSN 1523-4371
Corporate $109.00 • Personal $109.00 • List $149.00

Designing & Purchasing of Metal Castings
This book is a one-stop reference resource on how to design and procure metal castings. Information was gleaned from various sources including consultations with expert design engineers and procurement people. This one-of-a-kind reference will come in handy time and time again. An app provides access to the electronic version, allowing readers to see videos, audiocasts, web references, data tables and other unique features that can only be accessed in an electronic format. 342 pages.

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The AFS Metalcasting Forecast & Trends is the annual resource for metalcasters and suppliers. The 2015 edition contains forecasts for all metals groups and shipment projections through 2023, export and import forecasts (by demand and shipments), forecast data by major casting consuming markets and international metalcasting data (casting shipments, labor rates, etc.) 32 pages. Available as download only.

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Iron Castings Engineering Handbook
This book is an extensive revision and upgrade of the former Iron Castings Handbook, issued by the Iron Castings Society Inc., in 1981. This book was prepared under the guidance of the AFS Cast Iron Division (Committee 5-A) and edited by George M. Goodrich and William F. Shaw, director emeritus, Iron Casting Research Institute. There are more than 480 figures, plus 235 tables and 13 chapters. This book is excellent for students, engineers–anyone wanting a complete overview of the process of casting irons. Hardcover, 8 ½ x 11 in., 420 pages.

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Cast Iron Fatigue Properties Database for Modern Design Methods (DVD)
The material in Cast Iron Fatigue Properties Database for Modern Design Methods was developed from ten studies done by Element Materials Technology. The objective of the program was to develop a detailed and well-documented strain-life database for cast iron. The date is presented first by iron (austempered ductile, compacted graphite, ductile, gray and white) and then by Grade (typically ASTM) under each metal.

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Technology for Magnesium Castings: Design, Products & Applications
In Technology for Magnesium Castings, information is provided on melt control, process control, casting and solidification, heat treatment, materials selection and various casting processes such as sand, permanent mold, high pressure die, lost foam, ablation and semi-solid casting. This publication will be of great interest to many individuals involved in the metalcasting industry, especially the casting designer and process engineer. It is also an invaluable tool for students of metallurgy, materials science and metalcasting. Softcover, 6 x 9 in., 314 pages.

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Casting Defects Handbook: Iron & Steel
Technical Editor: George Goodrich
This edition, published in August 2008, combines all of the strengths of the original Casting Defects Handbook with the latest industry updates with a focus on ferrous alloys. New techniques have been added: flaskless molding, vertical molding, high density molding with automatic machines, nobake molding, and the growth of electric melting vs. cupola melting. This is the guide for in-plant use by quality assurance, inspection and other key personnel. The text is formatted in an easy-to-use outline style supplemented with figures illustrating actual casting defects. Softcover, 4½ x 7 in., 232 pages.
Corporate $35.00 • Personal $52.50 • List $70.00

Casting Defects Handbook: Copper & Copper-Base Alloys
Technical Editor: David Neff
Many of the common types of casting defects encountered in the production of copper base alloy castings are presented. These defects are categorized by type with possible causes and, in some cases, prevention techniques. Casting Defects Handbook: Copper & Copper-Base Alloys provides a comprehensive visual atlas of the more common casting defects encountered by copper base foundry personnel, and provides a tool for quick identification. Softcover, 4½ x 7 in., 90 pages, most illustrations in color.
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Casting Defects Handbook: Aluminum & Aluminum Alloys
Technical Editor: David Neff
In Casting Defects Handbook: Aluminum & Aluminum Alloys, many of the common types of casting defects encountered in the production of aluminum alloy castings are presented. These defects are categorized by production method: sandcasting, permanent mold, high pressure diecasting, low pressure, investment, plaster and lost foam, with possible causes and, in some cases, prevention techniques listed. The book provides a comprehensive visual atlas of the more common casting defects encountered by foundry personnel and provides a tool for quick identification. It can also be used to address possible causes and to establish corrective actions. Softcover, 4½ x 7, 170 pages.
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Categorized by an international identification system, International Atlas of Casting Defects identifies 111 casting defects with 283 photos and 137 drawings. Defects are classified based on physical appearance, permitting identification either by direct observation or from a description of the defect involving the shape, location and dimensions. Softcover, 6 x 9 in., 340 pages.
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The AFS Safety Data Sheets (SDS) for Casting Alloys have replaced the outdated MSDS (Material Safety Data Sheet) format and were created to comply with OSHA's revised Hazard Communication Standard to meet the Globally Harmonized System (GHS). All are in ANSI's 16-part format and will include updated information as required by the GHS.
The Safety Data Sheets also meet the requirements of 40 CFR 372.45 [Subpart C “Supplier Notification Requirements” Section 313 of the Emergency Planning and Community Right to Know Act (EPCRA)] that mandates suppliers inform their customers of the presence of toxic chemicals in mixtures and potential reporting obligations with the first shipment of castings every year to each customer.

The Safety Data Sheets will assist metalcasters in continuing to meet their ISO certification, OSHA and GHS, as well as Emergency Planning and Community Right to Know requirements by ensuring that their records are current.

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Managing the Foundry Indoor Air Environment
Robert C. Scholz, P.E., C.I.H, RMT, Inc., Principal Author
This manual expands on an emerging theme in the industry—the need to integrate ventilation design in metalcasting facilities. The most notable change associated with integrated design is the concurrent consideration of air supply and exhaust methods. This integrated approach consists of a “bubble approach” to the in-plant environment and plant emissions. Softcover, 8½ x 11 in., 158 pages

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Compiled by: AFS Safety and Health Committee (10Q); Edited by: Susan P. Thomas
This updated third edition of the PPE Guide for Metalcasting Operations describes the special considerations for the selection and use of personal protective equipment (PPE) and special clothing for work situations that present a risk of exposure to metalcasting hazards. This guide is intended to aid the individual facility’s completion of the required job Hazard Assessment for PPE Selection. This 2012 version supersedes all prior versions of the Guide. Softcover, 8½ x 11, 115 pages.

EC1201 ISBN No. 978-0-87433-393-0
Corporate $12.50 • Personal $18.75 • List $25.00

To order, call 800/537-4237, fax 847/824-7848 or visit www.afsinc.org/estore

AFS Health & Safety Guides
This fourth revision of the AFS Health and Safety Guides was completed under the direction and guidance of the AFS Health and Safety Committee (10-Q) to provide metalcasters with the updated information necessary to determine, evaluate and control potential health and physical hazards in their facilities. This is a must-have book for every safety manager’s shelf. Softcover, 8½ x 11, 250 pages.

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Iron Castings Engineering Handbook

This book is an extensive revision and upgrade of the former Iron Castings Handbook, issued by the Iron Castings Society Inc., in 1981. This book was prepared under the guidance of the AFS Cast Iron Division (Committee 5-A) and edited by George M. Goodrich and William F. Shaw, director emeritus, Iron Casting Research Institute.

There are more than 480 figures, plus 235 tables and 13 chapters. This book is necessary for students, engineers—anyone wanting a complete overview of the process of casting irons. Hardcover, 8 ½ x 11 in., 420 pages.

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Ductile Iron Handbook

This classic book contains information on production practices, metallurgy and properties from industry experts. Chapters include Theory of Solidification and Graphite Growth in Ductile Iron; Engineering Properties, Specifications and Physical Constants of Specific Ductile Irons; Composition of Ductile Irons; Foundry Practices; Heat Treatment; Casting Defects and more. Softcover, 8 ½ x 10 in., 277 pages.

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This graphite-rating chart supplements ASTM specification A 247, and is used to determine graphite form, size and distribution for both gray and ductile iron, illustrated with actual, high-quality photomicrographs. The chart is broken down into the following four categories: distribution examples, graphite forms, flake size class and nodule size class. Chart measures 23 x 32 in.

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Abrasıon-Resistanı Cast Iron Handbook

George Laird, Richard Gundlach and Klaus Röhrig

The ultimate desktop reference on white cast iron, it has been derived from many years of experience, a vast amount of research and many in-plant investigations by more than a generation of metallurgists. Topics include Introduction to A-R Cast Irons, Solidification of A-R Cast Irons, Heat Treatment of A-R Cast Irons, Alloying for Hardenability, and more. Many photos, Hardcover, 8 ½ x 11 in., 222 pages.

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A search for literature on foundry automation led the author, Rhythm S. Wadhwa, PhD, to write this book on automation innovations and the analysis of batch manufacturing and quantitative analysis of foundry system configuration. Implementing Manufacturing Process Automation in Metalcasting Facilities is intended for scientists, practicing manufacturing and automation engineers, foundry managers, and other personnel with knowledge or interest in foundry automation at the manufacturing systems level. Softcover.

GM1400 ISBN 978-0-87433-408-1
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J. G. Kaufman & E.L. Rooy

This book provides property and performance data for all types of aluminum alloy castings and reviews and describes the factors that contribute to and affect those properties, including composition, microstructure, casting process, heat treatment, and quality assurance. Published by ASM and AFS. Hardcover, 8 ½ x 11 in., 340 pages.

NF0405 ISBN 978-0-87170-803-8
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TE1000 ISBN 978-0-87433-384-8 (Spanish)
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Microstructure Development During Metalcasting

John E. Gruzleski

This book is aimed specifically at engineers and technologists working in the metalcasting industry. The book can also be used by metallurgical or foundry engineering students. It concentrates on the processes of solidification in order to provide the reader expanded knowledge of what occurs when a casting freezes. The book can be used by people in either the ferrous or non-ferrous industries. Hardcover, 8 ½ x 11 in., 244 pages.

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*Concise Castings: A Casting Workshop Lecture* is based on a transcript of a workshop, Prof. Campbell held several years ago. In it, he puts forth his views on a variety of casting topics, including entrainment, bifilms and their effect on casting properties, improving casting technology, pouring systems and the ablation casting process.

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- **FC9901** ISBN 978-0-87433-197-4

**Metalcasting Principles & Techniques**

Dr. Yury Lerner, Professor Emeritus of Technology, and Dr. P.N. Rao, Professor of Technology, at the University of Northern Iowa, pooled their many years of teaching and present *Metalcasting Principles & Techniques*, a textbook geared for junior college and college level students. The book is also recommended as an instructional tool for metalcasting facilities to train new employees, for suppliers to learn more about metalcasting, and for libraries as reference material. The material contained in this textbook summarizes known basics and complements them with the latest developments in all areas of metalcasting technique, technology and quality testing. A Lab and Safety Manual was developed to complement the textbook.

- **TE1300** Textbook ISBN 978-0-87433-399-2 (Hardcover)
- **TE1300SC** Textbook ISBN 978-0-87433-428-9 (Softcover)
- **TE1301** Lab & Safety Manual ISBN 978-0-87433-417-3 (Softcover)

**Basic Concepts of Ferrous Metallurgy**

*George Goodrich & John Svoboda*

This book presents and describes basic concepts of metallurgy common to the ferrous metalcasting industry. Ferrous metallurgy students, ferrous operations and personnel who wish to refresh themselves on basic metallurgical principles will find this book invaluable. Chapters include crystallography, solidification and crystallization, phase equilibrium and metallurgical tools. Softcover, 6 x 9 in., 92 pages.

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Michael Schultz, author and photographer of “Foundry Work” and “Foundry Work 2: A Global View” has produced a print that is a great gift for the metalcaster in your life. A 400 ton casting pour is depicted in full color. It is ideal to display in the office or even at home. (18 x 24 unframed).

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*Foundry Work,* by Michael Schultz contains more than 150 full page color images of the spectacular work within large metalcasting facilities in the U.S. and Europe. This book covers molding/pattern work, melting, casting, and finishing. Each scene’s detail is so crisp that it is almost 3-dimensional. It is the perfect gift for any one in the metalcasting industry. Softcover, 10 x 12 in., 150 pages.

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ISBN: 978-0-615-21858-8
Corporate: $60.00 • Personal: $60.00 • List: $60.00

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**Foundry Work Volume 2: A Global View of the Industry**

This second volume of *Foundry Work* expands both the geographical reach and the artistic motifs found within large global foundries. Over the past three years, Michael Schultz has traveled to four continents and visited 30 foundries to bring to readers his images of the men and women who work to produce the large castings showcased in this book. Softcover, 10 x 12 in., 276 pages.

**OS1203**
ISBN: 378-1-4675-0785-1
Corporate: $80.00 • Personal: $80.00 • List: $80.00

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**Man at Work**

*Prof. Klaus Turk*

This hardcover book beautifully details the art collection of Eckhart G. Grohmann, president of Aluminum Casting & Engineering Co., Milwaukee, Wisconsin. With chapters such as “Preindustrial Metalworking Scenes” and “Mining and Metals in the Industrial Age” (containing depictions of metalcasting facilities, forge shops and rolling mills), this book is a great gift for anyone in the metalcasting industry. Published by MSOE Press, Milwaukee. Hardcover, 9 x 11 in., 432 pages.

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