Rio Tinto Metal Powders is proud of its accomplishments over the last 50 years and it remains fully committed to the further advancement of the industry.

We contribute through ongoing Research & Development, and by collaborating closely with our customers, research institutions & industry associations.

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WHO’S WHO IN PM

2020
APMI INTERNATIONAL MEMBERSHIP DIRECTORY
(Includes MPIF Membership)

Every effort has been made to verify the accuracy of all listings. The publisher can assume no liability for error or omission. Any inaccuracies should be called to the publisher’s attention promptly.

Sincere appreciation is expressed to the members of APMI International and MPIF for the information they have provided and to the advertisers who support this publication.

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APMI International
105 College Road East
Princeton, New Jersey 08540 U.S.A.
TEL: (609) 452-7700 FAX: (609) 987-8523
E-MAIL: apmi@mpif.org
apmiinternational.org
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Global leaders in Aluminum, Copper and Titanium for Additive Manufacturing and Powder Metallurgy
WHAT IS APMI INTERNATIONAL?

APMI International is a “non-profit professional society” formed by the Metal Powder Industries Federation to promote the advancement of powder metallurgy as a science.

Its purpose is to provide for the dissemination and exchange of information pertaining to powder metallurgy through publications, conferences, and the Powder Metallurgy Technologist (PMT) Certification Program.

Membership in APMI International is on an individual basis. Corporate or company memberships are not available. Members include metallurgists; materials, design, and mechanical engineers; teachers; students; businessmen; and anyone else whose job requires them to keep up-to-date with new developments and advances in materials technology and engineering applications.

Benefits of membership include:
- subscription to the quarterly International Journal of Powder Metallurgy, in print and electronic versions
- annual Who's Who in PM membership directory
- receive access to select manuscripts
- reduced rates for registering at technical conferences, short courses, seminars, etc.
- discounts on all powder metallurgy publications
- employment assistance
- reduced examination fees for the Powder Metallurgy Technologist (PMT) Certification Program

For further information on membership contact APMI International, 105 College Road East, Princeton, N.J. 08540-6692. Telephone: (609) 452-7700, Fax: (609) 987-8523, E-Mail: apmi@mpif.org, Website: apmiinternational.org

APMI Board of Directors

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Contact Robert Lando
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The committee is responsible for technically reviewing all manuscripts submitted for Journal publication.

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- Remington Arms Company
- Antonios Zavaliangos
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APMI INTERNATIONAL LIAISON COMMITTEE

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- Gopal Shankar Upadhyaya
  - India
- David Whittaker
  - United Kingdom

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  - JENS Solutions LLC
- William R. Gasbarre, FAPMI
  - Gasbarre Products, Inc.
- Thomas F. Murphy, FAPMI
  - Hoeganaes Corporation

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- Josh Parslow, Vice Chairman
  - Gasbarre Furnace Group
- Andy Wright, Treasurer
  - Atlas Pressed Metals
- Tyler Cuneo, Secretary
  - Horizon Technology

APMI LEGAL COUNSEL

- Thomas R. Trowbridge, III

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- Roy E. Blue ........................................... 1959–1962
- George G. Karian .................................. 1962–1964
- Jerome F. Kuzmick .................................. 1964–1966
- Peter V. Schneider .................................. 1968–1970
- Walter V. Knopp .................................... 1972–1976
- Samuel Bradbury .................................... 1976–1980
- Donald A. Gustafson ................................. 1988–1992
- Nicholas T. Mares .................................... 2006–2010
- Dean Howard, PMT .................................... 2010–2014
- Bruce Lindsley .................................. 2014–2018
- Thomas W. Pelletiers ................................. 2018–
EXCELLENCE IN METALLOGRAPHY AWARD

Recognizing individual(s) responsible for metallography used to support and provide evidence for the ideas set forth in a conference technical paper.

“The Use of Metallography to Identify Common Problems in PM Steels”
Thomas F. Murphy, FAPMI ................................................................. 2009

“Gas-Atomized Chemical Reservoir ODS Ferritic Skinless Steels”
Joel R. Fieken, Iver E. Anderson, FAPMI and Matthew J. Kramer ........................... 2010

“Copper Strengthening of Steel Parts”
Fabrice Bernier, Maxine Gauthier, Philippe Plamondon and Gilles L’Esperance, FAPMI ........................... 2011

“Microstructural and Mechanical Properties of PM Steels Alloyed with Silicon and Vanadium”
Chris Schade, Tom Murphy, FAPMI, Alan Lawley, FAPMI and Roger Doherty ................................................................. 2012

“A Metallographic Examination into Fatigue-Crack Initiation and Growth in Ferrous PM Materials”
Tom Murphy, FAPMI, Bruce Lindsley and Chris Schade ................................................................. 2013

“Diffusion Behavior and Microstructural Transformations in PM Steels Containing Silicon”
Tom Murphy, FAPMI, Chris Schade, Alan Lawley, FAPMI and Roger Doherty ................................................................. 2014

“Evolution of Strain-Induced Precipitates in a Molybdenum-Base Mo-Hf-C Alloy”
David Lang, Jürgen Schatte, Wolfram Knabl, Roland Daßlinger, Helmut Clemens and Sophie Primig ................................................................. 2015

“Enhanced Powder-Processed Alnico Magnets by Thermal Gradient Control”
Emma M.H. White, Aaron G. Kassen, Kevin W. Dennis, Andriy Palasyuk, R. William McCallum and Iver E. Anderson, FAPMI ................................................................. 2016

“Production Experience with High-Consistency FC-0208 Material Made Using Advanced Bonding Technology”
Suresh Shah, Gerry Wexler, PVT, Christopher Faller, PMTII, Bridget Reider, Francis Hanejko and Kylan McQuaig ................................................................. 2017

“Comparison of SS-316L PM Material Processed via Binder Jetting with SS-316L Powder Processed by Pressing and Sintering”
Alexander Zwieren, Thomas F. Murphy, FAPMI ................................................................. 2018

“Metallographic Characterization of Porous Low- Alloy Steel Samples Manufactured Using Both Press-and-Sinter and Additive Manufacturing Techniques”
Thomas F. Murphy, FAPMI, Christopher T. Schade, and Kerri M. Horvay ................................................................. 2019
PMT Certification Program

The Powder Metallurgy Technologist (PMT) Certification Program was created by APMI International to recognize individuals who have demonstrated a comprehension of a specified body of knowledge encompassing the broad field of powder metallurgy. The following people have passed the PMT Level I and Level II Exams and are now eligible to use the PMT or PMTII designation after their names. For more information regarding PMT Certification visit apmiinternational.org.

POWDER METALLURGY TECHNOLOGISTS LEVEL I

Dennis E. Abbeg
Christopher T. Adam
James Aiello
Bandar AlMangour
Ronald E. Arble
Richard M. Armstrong
Koji Ashida
Leonora B. Asparuhova
Paul Attoe
Sunil Badwe
Stephen G. Baker
Neil Belanus
Todd A. Bequette
Sudip Bhattacharya
Eric S. Bono
James J. Brancho
Dustin Brewer
Timothy M. Britton
Robert Brooks
Daniel Byroade
Vincent J. Caggiano
Julie Campbell-Tremblay
Don Carswell
William Childs
Jason Chiles
Denis Christopherson
Frederick A. Cocchiola
Michael Corazzo
Paul A. Crawford
Kevin Cummings
Joseph C. Davis
Wendy R. Davis
Matthew Devine
Tim Dhuse
Brian T. Dodge
Matt Downey
Jason M. Dozor
William L. Edwards
Mihai Faroga
Bill Farr
Luis Cabajal Figueroa
Dan Finet
Jason R. Forster
Michael A. Frank
Tom Freemer
Jason Gabler
Jeremy M. Gabler
Fred Geisser
Pamela Gerarge
Mike Geske
Daniel L. Gibbon
Joshua Gifford
Nicola M. Gismondi
Phillip Goodwin
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Tyson Griffin
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Mark R. Haas
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Timothy J. Hokkanen
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Eric Koczulab
Heather J. Lander
Thomas W. Lavis
Joe Leiterman
Adam LePine
David W. Letang
Yingming Li
Mark Ligon
James Lingenfelter
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Mark A. Maslanka
Jared Matuseski
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Robert Moore
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Robert J. Parulo
Somayeh Pasebani
Clayton Paulin
Douglas L. Pease
Jordan Pedler
Ronaldo Pegoraro
David L. Pendrak
Amy Popielksi
Kenneth P. Porter
David A. Prior
Gang Qin
Samuel Raju
Paul Reintert
Eric T. Riley
Tim Robinson
Adam Rose
Matthew W. Ryan
Robert Sachs
Harvinder Singh Saini
John P. Saunders
Jeffrey A. Schilling
Gilbert Schulterman, Jr.
Samuel Schulterman
Raymond Serafini
Peng Shen
William H. Shropshire
David Shore
William Shugarts
Justin Simko
Steven K. Smith
Iulia Solomon
Puneet Sonii
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Joseph R. Spirk
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Jerome Stubbe
John F. Sweet
Brad J. Swogger
James Theys
Mark C. Thomason
Constance Thompson
Peter J. Thorne
Amber Tims
Trevor N. Towns
Nick D. Tripathi
Don Trumpie, Jr.
Nicholas W. Tischler
Valter Unterberger
Jeffrey S. Vannucci
Nicola Veloff
R. K. Viswanadh
Ken Watson
Bryan Webster
Ed Wellfield
Gregory Thomas West
Gerald Wewers
Joe Wheeler
Brian White
Tim Wills
David E. Wilson
Jeffrey L. Wood
Maryann Wright
Stephen Yuenger
Yonggang Zhang
Tony L. Zimmerman
Frank A. Zore
Thomas M. Zwitter

POWDER METALLURGY TECHNOLOGISTS LEVEL II

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Lane H. Donoho
Jerry Falleur
Robert W. Fox
LeRoy J. Henkel
Todd M. Jensen
Maher Malek
Juan Manuel Manso Ortega
Saeed Marzvaan
Anthony Miller
Leander F. Pease III, FAPMI
Michael L. Rector
Robert E. Rector
Raymond P. Rupprecht
Steven M. Saxion
Kai Xu
Bylaws of APMI International, Incorporated

Article I
NAME
The name of this corporation shall be APMI International, Incorporated, hereinafter referred to as APMI.

Article II
SCOPE AND PURPOSES
APMI is a membership corporation, formed pursuant to the Membership Corporations Law of the State of New York, the scope and purposes of which shall be:
1. To engage exclusively in scientific, literary and technological information activities directed toward the advancement of the science of powder metallurgy and the related arts and sciences.
2. To hold meetings for the reading and discussion of scientific and technical papers.
3. To publish and circulate works of literature, science and art which pertain or are related to the science of powder metallurgy.
4. To engage in any other activities necessary, suitable and proper for the fulfillment of the scientific, literary and technological informational scope and purposes of APMI, within such limitations as are provided by law.

Article III
MEMBERSHIP
1. Any individual interested in the science of powder metallurgy and related activities shall be eligible for membership in APMI.
2. A charter member shall be any member who joined the predecessor organization, American Powder Metallurgy Institute; prior to April 25, 1960.

Article IV
CHAPTERS
1. Chapters of APMI may be established by members of APMI wherever the interest in powder metallurgy and related activities is sufficient to support group activities at the local level.
2. A Chapter of APMI shall be formed by contacting APMI's headquarters and requesting a petition. The founding or charter members of the Chapter shall be those individuals who signed the Chapter's founding petition. The petition shall be reviewed and accepted voted on by the Board of Directors.
3. The membership of Chapters shall consist of regular members.
4. A regular member of a Chapter shall be a member of APMI and shall be entitled to all rights and privileges accorded to such members. He shall be eligible to vote in Chapter activities and to hold office therein. Members may participate in the activities of one or more Chapters.
5. Activities of Chapters shall be in accordance with the scope and purposes and the Bylaws of APMI.
6. Founder or charter members of a Chapter shall be those individuals who signed the Chapter's founding petition.

Article V
MANAGEMENT
1. The management of APMI shall be vested in a Board of Directors which shall consist of the President of APMI, the Executive Director of APMI, the President of the Metal Powder Industries Federation, ("MPIF"), an appointed representative from the MPIF Board and five members elected from the membership of APMI. All board members shall serve a two-year term, no more than two consecutive two-year terms may be served. The Board of Directors shall serve without compensation.
2. The Board of Directors shall meet at least once each year at the Annual Meeting of APMI. It shall be held during the second half of each year on a date to be determined by the Board of Directors, usually coinciding with the annual MPIF Presidents’ Conference. At which time, in addition to taking such actions as may be necessary to carry out the activities of APMI, it shall appoint an Executive Director and Treasurer, each of whom may succeed himself in this position. The same individual may serve in both capacities.
3. For the election of APMI President and five elected directors, a nominating committee shall be appointed and chaired by the incumbent President if he is ineligible to succeed himself or by the immediate past president of APMI. The committee shall consist of the Executive Director of APMI, the incumbent President of the MPIF, and if available, two past presidents of APMI.
   a. This committee shall recommend its nomination for President in a ballot mailed to the MPIF Board of Governors, at least 30 days prior to the Annual Presidents' Conference. Upon approval of the nominations for President by the MPIF Board, the President nominated by the nominating committee, shall be submitted to the membership for election by letter ballot. The President of APMI shall serve as Chairman of the Board. The President may succeed himself, however, for no more than one additional two-year term. The President's term of office begins at the conclusion of the MPIF Annual Meeting.
   b. The nomination for the elected director positions shall be submitted to the membership for election by letter ballot. All terms of office begin at the conclusion of the MPIF Annual Meeting.
4. In the event of the inability of the President or the Executive Director and Treasurer to serve, a successor or successors shall be appointed within sixty (60) days by the Board of Directors to fill the remaining portion of the unexpired term. In the event of the inability of a member or members of the Board to serve, an election or elections shall be held as soon as possible to fill the vacancy or vacancies for the remaining portion of the unexpired term; provided, however, that if a vacancy remains unfilled for six (6) months after it occurs, the Board may appoint a replacement.
5. The Executive Director, under the direction of the Board of Directors, shall be the chief administrative officer of APMI. He shall be in general charge of APMI, its operating staff and all its activities. He or such member of the staff of APMI as he from time to time may designate, shall act as Administrative Director of APMI.
6. A majority of the entire Board of Directors shall constitute a quorum.
7. A. The general membership of APMI shall vote by letter ballot in elections for President and/or Directors of APMI, and on special issues deemed appropriate by the Board of Directors. At least thirty (30) days shall be allowed for the return of ballots. In all cases a majority of the ballots cast shall be required for passage of any issue.
   b. The Board of Directors shall have authority to vote on all matters on behalf of the membership of APMI with the exception of elections as noted above. Passage of any issue will be by a majority vote of the entire Board of Directors.

Article VI
MEETINGS
1. A meeting of the officers of each Chapter as duly elected representatives of the membership of APMI shall be convoked at least once annually for the transaction of any activities of APMI; provided, however, that if it's not feasible to assemble in a particular year, the activities of the annual meeting may be conducted by letter ballot.
2. At least thirty (30) days written notice shall be provided to call an annual meeting or for voting on a letter ballot. A majority of the entire membership of APMI shall constitute a quorum for any vote taken among the members of APMI; provided, however, that in any vote taken by letter ballot, members not recording their votes within the voting period shall be deemed to have voted in the affirmative.
3. Such other special meetings of the members of APMI as may be necessary to carry out the activities of APMI may be held from time to time upon at least ten (10) days written notice. Special meetings may be called by the Board of Directors or by the members of APMI to cast ten (10) percent of the votes of the membership of APMI.

Article VII
COMMITTEES
The Board of Directors may create regular or special committees from among the members of APMI as may be necessary to carry out the activities of APMI. The members of such committees may be appointed by the President or its Executive Director. A quorum of any such committee shall be a majority of its members.

Article VIII
DUES
1. The annual dues for members shall be determined by the Board of Directors and subject to annual review by the Board and the Executive Director.
2. Membership shall become effective upon payment of annual dues.
3. All services and privileges of membership shall be suspended for members whose dues are not paid within sixty (60) days of the issuance of statements by APMI.
4. The dues may be revised by the Board of Directors but such revisions shall not apply retroactively or to any application submitted prior to the adoption of any revision.
5. In addition to regular dues, overseas members shall pay a fee to defray the cost of providing member services. The fee shall be determined by the Board of Directors and shall be subject to review.
6. Full time students may join APMI at a reduced rate, as determined by the Board of Directors.
7. Retired persons, no longer gainfully employed who have been regular members may become members at annual dues as determined periodically by the Board of Directors.

Article IX
DISSOLUTION
In the event of dissolution of APMI, the Board of Directors shall dispose of its net assets, exclusively for the purposes of APMI in such manner and to such publicly supported organizations organized and operated exclusively for charitable, educational or scientific purposes as are described in Section 501(c)3 of the Internal Revenue Code. The determination of the Board of Directors shall be subject to the approval and order of a Justice of the Supreme Court of the State of New York.

Article X
FISCAL YEAR
The fiscal year of APMI shall be the calendar year.

Article XI
AMENDMENTS
These Bylaws may be altered, amended, or repealed, in whole or in part, and new ones adopted, by a vote of three-fourths of the entire Board of Directors. In each case, at least thirty (30) days written notice of the proposed changes, or repeal shall be given.
MPIF is a “not-for-profit trade association” formed by the PM industry to advance the interests of the metal powder producing and consuming industries. It is a federation of trade associations, all concerned with some aspect of powder metallurgy, metal powders, or particulate materials—Powder Metallurgy Parts Association, Metal Powder Producers Association, Powder Metallurgy Equipment Association, Metal Injection Molding Association, Refractory Metals Association, and Association for Metal Additive Manufacturing

Membership in any of the associations is on a company or “corporate” basis—individuals are ineligible to belong. Members of any of the above trade associations:
• participate in and influence the activities of the federated associations
• receive confidential information prepared by and for the federated associations, i.e. statistics, survey reports, etc.
• receive all Federation publications such as standards, conference proceedings, manuals, technical books, etc. at substantially reduced rates. Some are issued free of charge
• participate in PM short courses, workshops, clinic conferences, annual conferences and educational seminars at reduced rates
• organize and serve on Federation committees, i.e. Standards, Technical, Marketing, etc.
• attend the Federation’s Annual Management Conference
• are entitled to exhibit at the Federation’s trade shows at a substantially reduced space rental fee
• are represented in various government agencies

Companies that belong to any of the above trade associations have a direct commercial interest in the welfare of their respective industries and in the advancement of powder metallurgy, both as an industrial technology and as a business investment.

Eligibility, rules, costs and services for corporate membership in any of the federated associations may be obtained by contacting Dora Schember
Metal Powder Industries Federation
105 College Road East, Princeton, N.J. 08540-6692
Telephone: (609) 452-7700 Fax: (609) 987-8523
E-Mail: dschember@mpif.org Website: mpif.org

MPIF Board of Governors

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Dean Howard, PMT
President
North American Höganäs Co.

PMPA President
Rodney Brennen
VP/CFO
Metco Industries, Inc.

MPPA President
Jill Spaulding
Plant Manager
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PMEA President
Gregory Wallis
Chief Executive Officer
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MIMA President
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Business Unit Director
Norwood Medical

RMA President
Stacy Garrity
VP Business Units A&D, P&E
Global Tungsten & Powders Corporation

AMAM President
Michael Marucci
Vice President Sales
Ametek Specialty Metals

APMI President, FAPMI
Thomas W. Pelletiers
VP New Business Development
Kymera International

MPIF Executive Director/CEO
James P. Adams
Metal Powder Industries Federation
### MPIF Past Presidents

<table>
<thead>
<tr>
<th>Name</th>
<th>Years</th>
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<tbody>
<tr>
<td>George A. Roberts</td>
<td>1957–1961</td>
</tr>
<tr>
<td>Robert C. Burgess</td>
<td>1962–1963</td>
</tr>
<tr>
<td>Earl Lowe</td>
<td>1963–1965</td>
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<tr>
<td>Carl G. Johnson</td>
<td>1965–1966</td>
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<tr>
<td>Earl Lowe</td>
<td>1966–1967</td>
</tr>
<tr>
<td>Jess F. Helsel</td>
<td>1969–1971</td>
</tr>
<tr>
<td>Stanmore V. Wilson</td>
<td>1971–1973</td>
</tr>
<tr>
<td>Philip V. Tarr</td>
<td>1973–1975</td>
</tr>
<tr>
<td>Peter A. Guercio</td>
<td>1975–1977</td>
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<tr>
<td>Myron I. Jaffe</td>
<td>1977–1979</td>
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<tr>
<td>Jack E. Williams</td>
<td>1979–1981</td>
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<tr>
<td>Armour Swanson</td>
<td>1993–1995</td>
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<tr>
<td>Arian J. Clayton</td>
<td>1995–1999</td>
</tr>
<tr>
<td>Thomas E. Friday</td>
<td>1999–2001</td>
</tr>
</tbody>
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*completing unexpired term of C. G. Johnson

### MPIF Association Board of Directors*

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rodney Brennen, President</td>
<td>Metco Industries, Inc.</td>
</tr>
<tr>
<td>Denis Christopherson, PMT</td>
<td>Federal-Mogul</td>
</tr>
<tr>
<td>Christopher Doughty</td>
<td>Capstan Atlantic</td>
</tr>
<tr>
<td>Jill A. Spaulding, President</td>
<td>Kymera International</td>
</tr>
<tr>
<td>Carlo Coscia</td>
<td>Rio Tinto Metal Powders</td>
</tr>
<tr>
<td>Alex Gasbarre</td>
<td>Gasbarre Products, Inc.</td>
</tr>
<tr>
<td>Gregory Wallis, President</td>
<td>Dorst America, Inc.</td>
</tr>
<tr>
<td>Eric Reinert</td>
<td>Bronson &amp; Bratton</td>
</tr>
<tr>
<td>Raymond Serafini</td>
<td>Messer North America</td>
</tr>
<tr>
<td>Lane H. Donoho, PMTII</td>
<td>Advanced Metalworking Practices LLC</td>
</tr>
<tr>
<td>Stefan Joens</td>
<td>Elink Systems, LLC</td>
</tr>
<tr>
<td>Robert Kuhle</td>
<td>Hoeganaes Corporation</td>
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<tr>
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<td>Marko Maetzig</td>
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<td>Michael Wiseman</td>
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<td>Michael Stucky, President</td>
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<tr>
<td>Wiley Abner</td>
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<tr>
<td>Jeff Blazek</td>
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<td>Brendan Hickey</td>
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<tr>
<td>Robert Scott</td>
<td>H.C. Stark Canada, Inc.</td>
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<tr>
<td>Todd Leonhardt, Past President</td>
<td>Rhenium Alloys, Inc.</td>
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<tr>
<td>Stacy Garrity, President</td>
<td>Global Tungsten &amp; Powders Corp.</td>
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<tr>
<td>Uli Blankenstein</td>
<td>H.C. Starck, Inc.</td>
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<tr>
<td>Michael Marucci, President</td>
<td>Ametek Specialty Metals</td>
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<tr>
<td>Christopher Adam, PMT</td>
<td>Valmet Inc.</td>
</tr>
<tr>
<td>Animesh Bose, FAPMI</td>
<td>Desktop Metal</td>
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<tr>
<td>Stuart Jackson</td>
<td>Renishaw, Inc.</td>
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<tr>
<td>Juha Kotila</td>
<td>EOS Finland</td>
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<tr>
<td>Ashley Nichols</td>
<td>Aerojet Rocketdyne/3DMT</td>
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<tr>
<td>Timothy Pierce</td>
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<td>Matt Sand</td>
<td>3DEO, Inc.</td>
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<tr>
<td>Katie Jo Sunday</td>
<td>Hoeganaes Corporation</td>
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*The MPIF Executive Director/CEO, James P. Adams, serves as a member on each trade association’s Board of Directors*
## MPIF TECHNICAL BOARD

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<thead>
<tr>
<th>Name</th>
<th>Company/Position</th>
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<tbody>
<tr>
<td>Blaine A. Stebick</td>
<td>Chairman, Phoenix Sintered Metals LLC</td>
</tr>
<tr>
<td>Animesh Bose, FAPMI</td>
<td>AMAM Representative, Desktop Metal</td>
</tr>
<tr>
<td>Robert J. Dowding</td>
<td>Liaison, U.S. Army Research Laboratory</td>
</tr>
<tr>
<td>John Engquist, FAPMI</td>
<td>CPMT Representative, JENS Solutions LLC</td>
</tr>
<tr>
<td>William R. Gasbarre, FAPMI</td>
<td>Conference Committee Chairman, Gasbarre Products, Inc.</td>
</tr>
<tr>
<td>W. Brian James, FAPMI</td>
<td>IJPM Editor, PMtech</td>
</tr>
<tr>
<td>John L. Johnson, FAPMI</td>
<td>Roadmap Chairman, Elmet Technologies, LLC</td>
</tr>
<tr>
<td>Thomas Jewett, RMA Representative</td>
<td>Global Tungsten &amp; Powders Corporation</td>
</tr>
<tr>
<td>Andrew Klein, AMAM Representative</td>
<td>ExOne</td>
</tr>
<tr>
<td>Chantal Labrecque, MPRA Representative</td>
<td>Rio Tinto Metal Powders</td>
</tr>
<tr>
<td>Roger Lawcock, FAPMI</td>
<td>PMRA Representative, Stackpole International</td>
</tr>
<tr>
<td>Bruce Lindsey, MPRA Representative</td>
<td>Hoeganaes Corporation</td>
</tr>
<tr>
<td>Nicholas T. Mares, FAPMI</td>
<td>APMI Representative</td>
</tr>
<tr>
<td>Timothy J. McCabe, MIMA Representative</td>
<td>OptiMIM</td>
</tr>
<tr>
<td>John Meyer</td>
<td>Member-at-Large, Carpenter Technology Corporation</td>
</tr>
<tr>
<td>Thomas W. Pelletiers II, FAPMI</td>
<td>Professional Development Chairman, Kymera International</td>
</tr>
<tr>
<td>Daniel P. Reardon</td>
<td>PMEA Representative, Abbott Furnace Company</td>
</tr>
<tr>
<td>Eric J. Reinert</td>
<td>PMEA Representative, Bronson &amp; Bratton, Inc.</td>
</tr>
<tr>
<td>Michael T. Stawowy</td>
<td>RMA Representative, H.C. Stark, Inc.</td>
</tr>
<tr>
<td>Michael Stucky</td>
<td>MIMA Representative, Norwood Medical</td>
</tr>
<tr>
<td>Virendra S. Warke</td>
<td>Member-at-Large, Entegris, Inc.</td>
</tr>
<tr>
<td>James P. Adams</td>
<td>Metal Powder Industries Federation</td>
</tr>
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## MPIF TECHNICAL BOARD CONFERENCE COMMITTEE

<table>
<thead>
<tr>
<th>Name</th>
<th>Company/Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>William R. Gasbarre, FAPMI</td>
<td>Chairman, Gasbarre Products, Inc.</td>
</tr>
<tr>
<td>Carl Blais</td>
<td>WorldPM2020 Co-chair, Laval University</td>
</tr>
<tr>
<td>John M. Blauer</td>
<td>Member-at-Large, Gasbarre Precision Tooling</td>
</tr>
<tr>
<td>Scott Davis</td>
<td>Industry Development Board, Hoeganaes Corporation</td>
</tr>
<tr>
<td>Gregory G. Falleur, PMITII</td>
<td>POWDERMET2019 Co-chair, Abbott Furnace Company</td>
</tr>
<tr>
<td>Thomas W. Pelletiers II, FAPMI</td>
<td>PMRA Representative, Kymera International</td>
</tr>
<tr>
<td>Virendra S. Warke</td>
<td>POWDERMET2019 Co-chair, Entegris, Inc.</td>
</tr>
<tr>
<td>James P. Adams</td>
<td>Metal Powder Industries Federation</td>
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## MPIF INDUSTRY DEVELOPMENT BOARD

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<tr>
<th>Name</th>
<th>Company/Position</th>
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<tbody>
<tr>
<td>Scott Davis</td>
<td>Chairman, MPRA Representative, Hoeganaes Corporation</td>
</tr>
<tr>
<td>Pedro Cotait</td>
<td>MPRA Representative, Rio Tinto Metal Powders</td>
</tr>
<tr>
<td>Philip Dommel</td>
<td>AMAM Representative, Renishaw Inc.</td>
</tr>
<tr>
<td>Jon-Pierre Guibor</td>
<td>PMEA Representative, CM Furnaces, Inc.</td>
</tr>
<tr>
<td>Heath Jenkins</td>
<td>PMEA Representative, Gasbarre Products, Inc.</td>
</tr>
<tr>
<td>Stefan Joens</td>
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</tr>
<tr>
<td>Mary Kate Johnston</td>
<td>MIMA Representative, Sandvik Osprey</td>
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<tr>
<td>Jeff Julian</td>
<td>MPRA Representative, Asbury Carbons</td>
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<tr>
<td>Steven Madill, PMIT</td>
<td>PMPA Representative, Nicholas Portland LLC</td>
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<tr>
<td>David Parsons</td>
<td>PMPA Representative, Catalus Corporation</td>
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<tr>
<td>JoAnne Ryan</td>
<td>PMPA Representative, Alpha Precision Group</td>
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<tr>
<td>Trevor N. Towns, PMT</td>
<td>MPRA Representative, North American Höganäs Co.</td>
</tr>
<tr>
<td>Kayla Varicalli</td>
<td>PMEA Representative, GKN Sinter Metals</td>
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<tr>
<td>James P. Adams</td>
<td>Metal Powder Industries Federation</td>
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## MPIF STANDARDS COMMITTEE

<table>
<thead>
<tr>
<th>Name</th>
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<tbody>
<tr>
<td>W. Brian James, FAPMI, Chairman</td>
<td>PMtech</td>
</tr>
<tr>
<td>Peter Bauer</td>
<td>Eastern Sintered Alloys, Inc.</td>
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<tr>
<td>Thomas Burdick</td>
<td>Phoenix Sintered Metals LLC</td>
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<td>Hoeganaes Corporation</td>
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<td>Shirley Davis</td>
<td>Royal Metal Powders Inc.</td>
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<td>Wayne K. Daye</td>
<td>Kymera International</td>
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<td>Ian Donaldson, FAPMI</td>
<td>GKN Sinter Metals</td>
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<tr>
<td>Jason R. Forster, PMT</td>
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<tr>
<td>Rich Hexemer</td>
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<td>Joseph R. Hinchliffe</td>
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<td>Robin Hofrichter</td>
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<td>Jessu Joys</td>
<td>United States Metal Powders Inc.</td>
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<td>Jeremy R. Koth, PMIT</td>
<td>Federal-Mogul</td>
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<td>James Lingenfelter, PMIT</td>
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<td>Roger A. Neyman, PMIT</td>
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<td>Sunil Patel</td>
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<tr>
<td>Thomas Pfingstler</td>
<td>Atlas Pressed Metals</td>
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<td>Stackpole International</td>
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<td>Logan Smith</td>
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<td>Leander F. Pease, III, FAPMI, PMITII</td>
<td>Ex Officio</td>
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<tr>
<td>Eric J. Reinert</td>
<td>PMEA Representative, Bronson &amp; Bratton, Inc.</td>
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### MPIF PM ALUMINUM STANDARDS SUBCOMMITTEE

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<td>D. Paul Bishop, Ex Officio</td>
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### MIMA STANDARDS COMMITTEE

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<tr>
<td>Michael Stucky, Chairman</td>
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### MPIF AWARDS COMMITTEE

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<td>Michael E. Lutheran, Chairman</td>
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<td>Metal Powder Industries Federation</td>
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### MPIF FINANCE COMMITTEE

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<td>Richard Pfingstler, Chairman</td>
<td>Atlas Pressed Metals</td>
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<td>Rodney Brennen</td>
<td>Metco Industries, Inc.</td>
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<tr>
<td>John Camele</td>
<td>North American Höganäs Co.</td>
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<tr>
<td>Thomas G. Gasbarre</td>
<td>Gasbarre Products, Inc.</td>
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MPIF AWARDS

KEMPTON H. ROLL PM LIFETIME ACHIEVEMENT AWARD

To recognize individuals with outstanding accomplishments and achievements who have devoted their careers and a lifetime of involvement to the field of powder metallurgy and related technologies. Visit mpif.org for complete rules.

Arian J. Clayton ................................................................. 2008
Alan Lawley, FAPMI ....................................................... 2012
William F. Jandeska, FAPMI ........................................... 2016
Randall M. German, FAPMI ............................................. 2020

Recipients

POWDER METALLURGY PIONEER AWARD

To recognize outstanding individuals in all aspects of the broad fields of powder metallurgy who have been constructive in the pioneering development and advancement of the industry. By calling public attention to the importance of the work of the recipient of the Award, others will be encouraged to devote their talents and careers to the PM industry. Visit mpif.org for complete rules.

Roland P. Koehring .......................................................... 1961
Andrew J. Langhammer ................................................. 1962
Gregory J. Comstock .................................................... 1964
Everett J. Hall (posthumously) ............................................ 1964
Gerhard Naeser ............................................................. 1965
Lawrence H. Bailey ........................................................ 1966
Joseph E. Drapeau .......................................................... 1968
Virgil T. Price, Sr ............................................................ 1968
John S. Fisher ................................................................. 1969
Samuel K. Wellman ....................................................... 1969
Burnie L. Benbow .......................................................... 1970
William D. Coolidge ...................................................... 1970
John Haller .................................................................... 1973
Don O. Noel ................................................................. 1975
Per Egon Gummeson ...................................................... 1976
Gerhard Zapf ................................................................. 1980
Henry H. Hausner .......................................................... 1984
Fritz V. Lenel ................................................................. 1984
Sven I. Hulthen .............................................................. 1988
Kempton H. Roll ............................................................ 1992
P. Ulf Gummeson .......................................................... 1996
Jerome F. Kuzmick ........................................................ 2000
Peter K. Jones ............................................................... 2004

Recipients

PM INDUSTRY VANGUARD AWARD

To recognize outstanding individuals in all aspects of the broad fields of powder metallurgy who have been constructive in the pioneering development and advancement of the industry. By calling public attention to the importance of the work of the recipient of the Award, others will be encouraged to devote their talents and careers to the PM industry. Visit mpif.org for complete rules.

Robert Dowding ............................................................ 2014
Chad Spore ................................................................. 2018

Royal Metal Powders, Inc. located in Maryville, Tennessee, U.S.A. is a manufacturer of high-quality copper-based powders. Royal produces air and water atomized copper powders, offering a wide product range to serve the needs of its customers worldwide. Royal products include: copper, brass, bronze, bronze premix, infiltrating, nickel/silver, copper phosphorus, and tin powders. Applications include: powder metallurgy, MIM, friction, brazing, chemicals, filtration, and numerous industrial applications. In addition, we also offer specialty alloys for additive manufacturing. Royal has full R&D capabilities and offers a full technical service department to support our customers.

+1-865-268-8453
Sales@royalmetalpowders.com

Royal Metal Powders, Inc.
An American Chemet Company

International Organization for Standardization
DISTINGUISHED SERVICE TO POWDER METALLURGY AWARD

The purpose of this award is to recognize persons who devote the major part of their working careers to one or more segments of the field of powder metallurgy and whose long-term contributions and achievements are such that, in the minds of their peers, they deserve this special recognition for outstanding and distinguished service. Visit mpif.org for complete rules.

Recipients

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John Hallen
Harry H. Hauser
Ernest H. Klein
Norbert K. Koebel
Fritibert L. Neon
Earl Lowe
Charles C. Neighbors
Dorothy M. Neighbors
Don O. Noll
Thomas L. Robinson
William R. Toepelz

1969
Alexander L. Alves
Joseph L. Bonanno
Morris Brown
Claus G. Goetzelt
Jerome F. Kuzmick
Thomas R. Moore
Richard D. Ponemon
William A. Reich
Frederick N. Rhines
Peter V. Schneider
John D. Shaw
Harlan M. Webber

1972
Samuel Bradbury
Francis H. Clark
Charles E. Hanson
Sylvester J. Horner
Gilbert J. Hoehn
Charles E. Hanson
Frances H. Clark

1979
Norbert A. Arnold
Byron B. Belden
Robert C. Burgess
Per Ulf Gummesson
John Haertlein
Myron I. Jaffe
Walter V. Knopp
George Otto
Getulio J. Perelli
David Veit

1982
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Joseph I. Farmer
John A. Gerzina
Edward F. Grady
Harold T. Harrison
Jess F. Helsel
Ross Holmes
O. W. Reen
J. Herbert Speck
Alfred C. Wu

1985
Harry D. Ambros
Eugene Andreotti
George Hay
Louis W. Baum, Jr.
William A. Buerkel
Kenneth M. Gieszer
Robert D. Ponemon
William A. Reich
Charles C. Neighbors
Harold T. Harrison
Edward F. Grady
John A. Gerzina
Joseph I. Farmer
John W. Caputo

1988
Arthur B. Backensto
Calvin J. Bloom
Leonard L. Confer
Kenneth G. Gerg
Peter A. Guercio
Donald A. Gustafson
Roy S. Jamison
Herbert S. Khalis
Frank L. Leone
John A. Roberts
R. William Rosenquest
Robert R. Van Valkenburg

1991
K. S. Narasimhan, FAPMI
Thomas J. Jesberger
Shiz Kassam
Lou Kreffel
K. S. Narasimhan, FAPMI
Richard P. Mason
John E. Miller Jr.
Ronald C. Mowry
Mark C. Paulin
Thomas Philips
Louis G. Roy
John D. Stierbank
Tom L. Stuart

1993
Harb S. Nayar
James G. Marsden
Randall M. German
Franklynn S. Bankovich
Stephen H. Clench
Howard W. Ficke
F.H. "Sam" Fros
Randall M. German
W. Brian James
James G. Marsden
Harb S. Nayar
Vernon C. Potter
Peter M. Tiemissen

1995
John E. Anderson
Alan D. Canan
Frank W. Hek
George G. Karian
Carl J. Landgraf
G. Russell Lewis
Thomas G. Mulcaige
Donald Paulin
Raymond Piperini
Lee Sampinias
Howard I. Sanderow
William J. Ullrich

1999
Stanley Ackowitz
Terry M. Cadle
William E. Eisen
Howard Ferguson
Thomas G. Gasbarre
William F. Jandeska, Jr.
Peter K. Johnson
William H. Michael
Alan J. Moses
Dale Peterson
John Porter

2001
Larry W. Adams
Maurice E. Bridgman
Al Dornisch
Thomas J. Jesberger
Shiz Kassam
Lou Kreffel
K. S. Narasimhan, FAPMI
Charles L. Rose
John A. Shields, Jr.
Thomas L. Stockwell, Jr.
Ted A. Tomlin
Robert Unkel

2003
Eduard M. Daser
John E. Davidson
Bryan T. Dodge, PMT
Eugene Gleixner
Peter K. Jones
Kishor M. Kulkarni
Robert A. McKotch
Albert J. Neupaver
Yves Trudel
Donald L. Woods
Karl J. Zuerg

2005
George A. Abbott
Alexander (Sandy) Alves
Kevin R. Couchman
Cynthia Freeby
William R. Gasbarre
Robert V. Howard
Prabhat Kumar
William R. Morsner
Thomas F. Murphy
Joel Poirier
Alfred C. Torretti

2007
Ian S.R. Clark
John Engquist
Francis J. Hanejko
Harold C. (Bud) Lanzel
Richard P. Mason
John E. Miller Jr.
Ronald C. Mowry
Mark C. Paulin
Thomas Philips
Louis G. Roy
John D. Sterbank
Tom L. Stuart

2010
Animesh Bose, FAPMI
David R. Connelly
John W. Hallen
Dennis Poor
Prasan Samal, FAPMI
Blaine Steck
S.K. Tam
John von Arx

2013
Susan M. Abikowtiz
Robert T. Biemel
Russell A. Chernenoff
Mark S. Greenfield
Paul A. Hauck
Roger Lawcock, FAPMI
Gilles R. Egrencote, FAPMI
Michael E. Lutheran
Nicholas T. Mares
James J. Oakes
Richard Pfleister
Joseph Tunick Straus

2015
François Chagnon
Robert J. Dowding
Ulf Engström
Howard A. Kuhn
Thomas J. Miller
César Molins, Jr.
James H. Neil
Craig C. Paulin
Thomas W. Pelletiers II
Dennis Poor
Prasan Samal, FAPMI
Biane Steck
S.K. Tam
John von Arx

2017
Iver Eric Anderson, FAPMI
Diran Apelian, FAPMI
Sherrin R. Bürger
Matthew Bulger
Dean Howard, PMT
Mark D. Kesterholt
Sydney H. Luis
Glen Moore
Thomas J. Pontier
JoAnne Ryan
Rohith Shivanath
John Sweet, PMT

2018
Teresa F. Stillman

2019
Denis Christopher, PMT
Zhigang (Zak) Fang, FAPMI
Robert M. Gasior
Ryucho Goto
William A. Heath, PMT
Stephen J. Lanzel
Deepak Madan
David Miligan
Thomas Pfleister
Daniel P. Reardon
Christopher T. Schade
Michael Stucky
C. James Trombino

PM INDUSTRY LANDMARK AWARD

To recognize PM products, production processes, equipment systems and/or materials, which represent a well-established application that has made a significant impact in PM usage and/or the design of which represents a significant PM innovation.

Recipients

1990
Orthodontic Appliances Fabricated via MIM

2009
PM Variable Valve Timing (VVT) System

2013
Powder-Forged Automotive Connecting Rod
OUTSTANDING TECHNICAL PAPER AWARD

The MPIF Outstanding Technical Paper Award was established in 1993 to recognize authors of manuscripts for excellence in scientific and technical written communications from those papers presented and submitted for publication from the annual technical conference organized by the Metal Powder Industries Federation and APMI International; to enhance the quality of technology transfer in the PM literature by increasing the professional level of papers submitted for the annual technical conference; and, to enhance and promote the science and technology which is fundamental to powder metallurgy products, processes and materials. Visit mpif.org for complete rules.

Recipients

“Speeding Technical Solutions in Particulate Technology with Design of Experiments and Related Statistical Methods”
Charles I. Whitman ................................................................. 1993

“High Density Processing of High Performance Ferrous Materials”
Howard G. Rutz and Francis G. Hanejko .................................. 1994

“High Performance Microencapsulated Powders for Various P/M Applications”
David E. Gay ........................................................................... 1995

“Investigations into High Temperature Creep of Microcrystalline Dispersion Strengthened Copper Alloys”
Christa Sauer, Thomas Weissgaerber, Wolfgang Puesche, Gerhard Dehm, Joachim Mayer and Bernd Kieback ...................... 1996

“Developing P/M Gear Tooth and Bearing Surfaces for High Stress Applications”
Peter K. Jones, Keith Buckley-Golder and Derrick C. Sarafianchyan ................................. 1997

“Grain Growth Inhibition in Liquid Phase Sintering Nanophase WC/Co Alloys”

“In Situ Strength Evolution of P/M Compacts in Response to the Combined Effects of Time and Temperature During Sintering”
Gregory A. Shoaales and Randall M. German ................................ 1999

“Dense Nanoscale Single- and Multi-Phase Ceramics Sintered by Transformation Assisted Consolidation”
James Colazzi, William E. Mayo, Bernard H. Kear and Shih-Chieh Liao ........................................................................ 2000

“Effect of Porosity on the Hardenability of P/M Steels”
Suleyman Saritas, Roger D. Doherty and Alan Lawley ..................... 2001

“Design for Rolling Contact Fatigue”
Klaus Lipp and Gottfried Hoffman .............................................. 2002

“Finish-Turning of Hardened Powder Metallurgy Steel Using Cryogenic Cooling”
Zbigniew Zurecki, John H. Frey and Ranajit Ghosh ....................... 2003

“Fatigue Crack Growth of Fe-0.85Mo-2Ni-0.6C Steels with a Heterogeneous Microstructure”
Nikhilesh Chawla, George B. Piotrowski, Xin Deng, Kalathur S. Narasimhan and Michael L. Marucci ..................................... 2004

“Rolling Contact Fatigue of Surface Densified Gears”
Roger Lawcock ......................................................................... 2005

“Dimensional Control in Cu-Ni Containing Ferrous PM Alloys”
Bruce Lindsley and Thomas F. Murphy ...................................... 2006

“High Frame Analysis of the Spray Cone Geometry During Close-Coupled Gas Atomization”
Andrew M. Mullis, Robert F. Cochran, Zabeada Aslam, Ian McCarthy and Nicholas J. Adkins ......................... 2007

“Development of a Dual-Phase Precipitation-Hardening PM Stainless Steel”
Chris Shade, Thomas F. Murphy, FAPMI, Alan Lawley, FAPMI and Roger Doherty ................................................................. 2008

“Influence of Chemical Composition and Austenitizing Temperature on Hardenability of PM Steels”
Peter K. Sokolowski and Bruce A. Lindsley ................................... 2009

“On the Development of an Aluminum P/M Alloy for “Press-Sinter-Size” Technology”

“Ultrahigh-Strength Sinter-Hardening MIM Alloy Steels”

“Characterization of the Formation of Nickel-Rich Areas in PM Steels and Their Effect on Mechanical Properties”
Bernard Tougas, Carl Blater, Maude Larouche, Francois Chagnon and Sylvain Pelletier .......................................................... 2012

“The Influence of Silicon on the Mechanical Properties and Hardenability of PM Steels”
Chris Schade, Tom Murphy, FAPMI, Alan Lawley, FAPMI and Roger Doherty ................................................................. 2013

“Effect of Copper Precipitation on Mechanical Properties at Operating Temperature of Materials Used to Manufacture Powder-Forged Connecting Rods”
Edmond Ilia, P.M.T ................................................................. 2014

“Liquid-Phase Diffusion Bonding: Temperature Effects and Solute Redistribution in High-Temperature Load-Free Composite Solders”
Stephanie M. Choquette and Iver E. Anderson, FAPMI ................... 2015

“Consolidation of Aerospace-Grade Aluminum 7055 Powder via Sinter-Forge Processing”

“Deformation Processed Al/Al₃Ca Nano- filamentary Composite Conductors”
Charles Czahor, Trevor Riedemann, Alan Russell and Iver Anderson, FAPMI ............................................................... 2017

“Monitoring of Powder Homogeneity During Double-Cone Mixing”
Alex Wartenberg, Sierra Mirtes, Christopher T. Schade and Sarah Ackermann ......................................................... 2018

“The Support Effect and Its Impact on the Design of Complex-Shaped Sintered PM Parts”
Markus Schneider and Virgiliu A. Savu ..................................... 2019

AMPM OUTSTANDING TECHNICAL PAPER AWARD

The AMPM Outstanding Technical Paper Award is chosen from papers presented and submitted for publication at the annual technical conference.

Recipients

“Metallographic Testing of Titanium Parts Made by Additive Manufacturing”
Thomas F. Murphy, FAPMI and Christopher T. Schade ....................... 2016

“Direct Metal Laser Sintering (DMLS)/Selective Laser Melting (SLM) of Tungsten Powders”
Ravi K. Enneti, Rick Morgan, Thomas Wolfe, Arshad Harooni and Scott Volk ................................................................. 2017

“Using Light and Electron Microscopy, Computed Tomography, and Light Scattering to Evaluate Additive Manufacturing Powders and Parts”
Thomas F. Murphy, FAPMI, Christopher T. Schade and Alexander D. Zwieren ............................................................... 2018

“Tantalum (Ta) and Niobium (Nb) Containing Alloy Powders for Application in Additive Manufacturing”
Ilka Kaczmarek, Markus Weinmann, Melanie Stenzel and Christoph Schnitfter ............................................................... 2019
BEST PAPER AWARD—TUNGSTEN, REFRACTORY & HARD MATERIALS
The Best Paper is chosen from papers presented and submitted for publication at the technical conference.

Recipients

“Potassium-Doped Tungsten: Beyond Incandescent Lamp Wires”
Andreas Hoffmann and Ingmar Wesemann ............................................ 2011

“Fracture and Fatigue Behavior of Cemented Carbides: 3D Focused Ion Beam Tomography of Crack-Microstructure Interactions”
Jose María Tarragó, Emilio Jiménez-Piqué, Miquel Turón-Viñas, Lorenzo Rivero, İhsan Al-Dawery, Ludwig Schneider and Luis Llanes ............ 2014

AUTOMOTIVE ACHIEVEMENT AWARD
To recognize individuals contributing to the expansion of automotive powder metal applications.

Recipients

William D. Hall & Stanley Mocarski
Ford Motor Company ................................ 1990
John Cenko
General Motors Corporation .......................... 1991
J. Charles Webster
Ford Motor Company .................................. 1992
Peter Verna
General Motors Research Laboratories ... 1993
Howard Schmidt
Chrysler Corporation .................................. 1994
William F. Jandeska, Jr.
GM Powertrain Headquarters ........................ 1995
Joginder S. Khanuja
Ford Motor Company .................................. 1998
Young S. Kim
GM Powertrain Group ................................. 1999
Jean C. Lynn
DaimlerChrysler Corporation ..................... 2001
Walter D. Badger, PMT
Allison Transmission .................................... 2004
David A. Yeager
Ford Motor Company .................................. 2005

AUTOMOTIVE INNOVATION AWARD
To recognize innovative PM products, designs, processes and/or materials used in automotive applications.

Recipients

1996 Recipient—Main Bearing Cap
Ford Motor Company
Quebec Metal Powders Limited
Zenith Sintered Products, Inc.

1997 Recipient—P/M Ignition Coil
Cincinnati Incorporated
Delphi Automotive Systems/Seixel Portugual Operations
General Motors International Operations
Hoeganaes Corporation

2000 Recipient—One-Way Clutch
Ford Motor Company
Hoeganaes Corporation
Means Industries
Metal Powder Components
QMP

2002 Recipient—Stainless Steel Exhaust System Parts
Ametek, Inc.
Arvin Meritor Exhaust Systems
Bentler Automotive
CalsonicKansei North America
Faurecia Exhaust Systems
Ford Motor Company
General Motors Corporation
HazenTLC
Hoeganaes Corporation
OMG Americas
SSI Sintered Specialties
Tenneco Automotive

2003 Recipient—Transmission Carrier
Borg Warner, Inc.
Borg Warner Powdered Metals, Inc.
DaimlerChrysler
Ford Motor Company
General Motors Global Powertrain Group
GKN Sinter Metals
Hoeganaes Corporation
Keystone Powdered Metal Company
New Venture Gear
QMP
Stackpole Ltd.
The competition is sponsored each year by the Metal Powder Industries Federation to recognize outstanding applications of PM parts. The following MPIF-member companies and parts received awards:

**GRAND PRIZES**

**Automotive—Transmission**  
Stackpole International and customer General Motors—clutch backing plate & pressure apply piston

**Automotive—Engine**  
Capstan—compact brushless DC actuator gear

**MIM Automotive—Engine**  
Indo-MIM Pvt. Ltd.—turbo charger vane

**MIM Automotive—Chassis**  
Indo-MIM Pvt. Ltd.—latching plate

**Lawn & Garden/Off-Highway**  
ASCO Sintering Co.—miniature planetary gear carrier set

**MIM Hand Tools/Recreation**  
Indo-MIM Pvt. Ltd.—ski boot bindings

**Industrial Motors/Controls & Hydraulics**  
ASCO Sintering Co.—hydraulic valve actuator mechanism

**MIM Hardware/Appliance**  
Indo-MIM Pvt. Ltd.—door hinge keeper/ramp

**MIM Medical/Dental**  
Indo-MIM Pvt. Ltd.—K mount for surgical camera

**AWARDS OF DISTINCTION**

**Automotive—Transmission**  
GKN Powder Metallurgy and customer Ford Motor Company—park range sensor control bracket

**Automotive—Engine**  
Catalus Corporation—access hole cover

**Automotive—Engine**  
Nichols Portland—rotor vane

**MIM Automotive—Engine**  
Indo-MIM Pvt. Ltd.—valve poppet

**Automotive—Chassis**  
FMS Corporation and customer Kit Masters Incorporated—fan clutch assembly

**Hand Tools/Recreation**  
FMS Corporation and customer Polaris Industries, Inc.—cam shaft & water pump sprocket

**Hardware/Appliance Award of Distinction**  
Webster-Hoff Corporation and customer Humanscale—ratcheting lock

For Information Contact:  
Dora Schember, Metal Powder Industries Federation  
105 College Road East, Princeton, NJ 08540  
dschember@mpif.org
Our Staff Has Over 30 Years Experience

Premier Metal & Recycling, Inc.

POWDER METAL SCRAP

Purchasing
sintered parts, belts, muffles, floor sweepings,
green parts and powders

Selling
Remill non ferrous powder

1013 DeLaum Road ~ St. Marys, PA 15857
Phone: 814-834-1239 ~ Fax: 814-834-1546
mike@premiermetalinc.com
www.premiermetalandrecycling.com
MPIF/APMI Headquarters Staff

The Metal Powder Industries Federation and APMI International are administered by the same headquarters staff. This informal guide will help acquaint you with staff responsibilities.

James P. Adams (jadams@mpif.org)
Executive Director/CEO for the Metal Powder Industries Federation and APMI International and serves as Secretary/Treasurer for the Center for Powder Metallurgy Technology. He is also publisher of the International Journal of Powder Metallurgy. Jim joined MPIF in 2004 and held a variety of management positions before being named executive director/CEO in 2017. During his tenure at MPIF, he directed MPIF’s publications, professional development, and technical programming departments; administered numerous associations; and directed the affairs of APMI. Jim continues to administer the activities of PMPA, MPPA, and is the treasurer for CPMT. Jim is a graduate of Hennepin Technical College and has worked in the PM industry since 1985.

Jillaine Regan (regan@mpif.org)
Vice President, Finance and Administration. Jill is responsible for MPIF, APMI, and CPMT finances. She is also responsible for human resources, general office administrative services, and information systems. Jill earned her BS in Commerce and Finance from Rider College.

Paul Sedor (psedor@mpif.org)
Vice President, Member and Industry Relations. Paul is responsible for industry marketing, membership, government relations, association statistics, and administers the activities of MIMA, RMA, and the Tungsten Industry Conflict Minerals Council (TICMC). He serves as the staff liaison to industry consortiums and government agencies. Paul earned his MBA from Binghamton University and a BA in Public Administration with a minor in Economics from Indiana University of Pennsylvania. Paul has 36 years of sales & marketing experience, 26 of those in manufacturing, with the last 16 years in the PM industry.

William (Bill) Edwards, PMT (bedwards@mpif.org)
Director, Technical and Member Services. Bill is responsible for the overall technical direction of MPIF technical programs, products and services, and to engage members to participate in advancing PM as a technology. He is also the administrator for AMAM and CPMT. He brings over 30 years of powder metallurgy engineering experience to the MPIF team.

Diane Haggerty, CMP (dhaggerty@mpif.org)
Director, Events, Exhibits and Advertising. Diane is responsible for coordination of the annual PowderMet, AMPM, and MIM conferences, including exhibits, as well as meeting planning for all educational programs, seminars and meetings. She is also the administrator for PMEA, and is responsible for advertising sales for the International Journal of Powder Metallurgy and Who’s Who in PM Directory. Diane graduated from Pennsylvania State University with a BA in Corporate Communications.
Lisa Lester (llester@mpif.org)
Communications Director. Lisa works on MPIF’s and APMI’s communications, including website development, copyediting of the International Journal of Powder Metallurgy and online member communications and newsletters. She also maintains the MPIF, MIMA, AMAM, APMI, CPMT, PickFM, & TI-CMC websites. Lisa has a BA in English with a minor in Professional and Technical Communications from Shippensburg University and an AAS in Web and Multimedia Technology from Hagerstown Community College.

Turner Abbott (tabbott@mpif.org)
Manager, Office & Technical Services. Turner is responsible for MPIF publications fulfillment and development of educational programs, seminars, and short courses. Turner also administers APMI activities, including the development of Regional Technical Programs.

Debby Stab (dstab@mpif.org)
Communications Manager. Debby serves as graphics coordinator for MPIF/APMI. She is responsible for the art production of the International Journal of Powder Metallurgy & the Who’s Who in PM Directory, as well as the design of all printed communications. Debby also assists in the development of the technical programs for PowderMet, AMPM, and MIM conferences.

Dora Schember (dschember@mpif.org)
Manager, Member Services & Standards. Dora works closely with MPIF’s member, marketing, statistics, standards, and industry relations programs, as well as TI-CMC. She serves as Managing Editor for the International Journal of Powder Metallurgy.

Sherry Henry (shenry@mpif.org)
Sherry handles general bookkeeping functions for MPIF, APMI, and CPMT.

Stacy Kalokitis (skalokitis@mpif.org)
Systems Administrator. Stacy is responsible for information management and data processing, including database development. She is also responsible for website services and maintenance.

Debby Stab (dstab@mpif.org)
Communications Manager. Debby serves as graphics coordinator for MPIF/APMI. She is responsible for the art production of the International Journal of Powder Metallurgy & the Who’s Who in PM Directory, as well as the design of all printed communications. Debby also assists in the development of the technical programs for PowderMet, AMPM, and MIM conferences.

In addition to the headquarters staff, the following individuals serve MPIF and APMI as independent consultants:

Matthew Bulger (AMAM@MPIF.org)—Consultant for the Association for Metal Additive Manufacturing and Metal Injection Molding Association

W. Brian James, FAPMI (wbrianjames@comcast.net)—Editor-in-Chief, International Journal of Powder Metallurgy

Peter Johnson (pkjohnsonpm@aol.com)—Business News Editor for MPIF and APMI’s news publications as well as Contributing Editor for the International Journal of Powder Metallurgy

Stacy Kalokitis (skalokitis@mpif.org)
Systems Administrator. Stacy is responsible for information management and data processing, including database development. She is also responsible for website services and maintenance.

Debby Stab (dstab@mpif.org)
Communications Manager. Debby serves as graphics coordinator for MPIF/APMI. She is responsible for the art production of the International Journal of Powder Metallurgy & the Who’s Who in PM Directory, as well as the design of all printed communications. Debby also assists in the development of the technical programs for PowderMet, AMPM, and MIM conferences.

Lisa Lester (llester@mpif.org)
Communications Director. Lisa works on MPIF’s and APMI’s communications, including website development, copyediting of the International Journal of Powder Metallurgy and online member communications and newsletters. She also maintains the MPIF, MIMA, AMAM, APMI, CPMT, PickFM, & TI-CMC websites. Lisa has a BA in English with a minor in Professional and Technical Communications from Shippensburg University and an AAS in Web and Multimedia Technology from Hagerstown Community College.
Need Information?

Visit our websites
apmiinternational.org or mpif.org

or for further information, below are the names of staff you can contact for specific information on MPIF/APMI services and activities. Call (609) 452-7700. For your convenience, staff member's e-mail address and direct extensions are also listed.

IF YOU HAVE A QUESTION ON........................................... CONTACT

MEMBERSHIP SERVICES
APMI Member Services...................................................... Stephanie Schember ................. sschember@mpif.org.............. ext. 114
(dues renewal, address changes, PMT Certification, etc.)

MPIF General Membership ............................................ Dora Schember ......................... dschember@mpif.org ............. ext. 110
(address changes, company profiles, etc.)

Association Administration
PMPA, MPPA ............................................................... James Adams ......................... jadams@mpif.org.................... ext. 117
MIMA, RMA ............................................................... Paul Sedor ................................. pseedor@mpif.org .................... ext. 112
PMEA ........................................................................ Diane Haggerty, CMP ....................... dhaggerty@mpif.org ............... ext. 103
AMAM, CPMT ............................................................. William Edwards, PMT .................... bedwards@mpif.org ................ ext. 101

MEETINGS
Registration ................................................................. Stephanie Schember ................. sschember@mpif.org.............. ext. 114
(conferences, seminars/courses, association meetings, CPMT, etc.)

MARKETING/ADVERTISING
Exhibit Opportunities .................................................... Diane Haggerty, CMP ....................... dhaggerty@mpif.org ............... ext. 103
(PowderMet AMPM, MIM conferences, etc.)

Advertising—Print and Digital........................................... Diane Haggerty, CMP ....................... dhaggerty@mpif.org ............... ext. 103
(Journal, Who’s Who, website banners, etc.)

Internet Classified Listings ............................................ Dora Schember ......................... dschember@mpif.org ............. ext. 110

TECHNICAL ACTIVITIES
Books, Proceedings, and Standards Sales ...................... Turner Abbott ......................... tabbott@mpif.org .................... ext. 108

Programming
Conferences ............................................................... Debby Stab ................................. dstab@mpif.org .................... ext. 111
Seminars and Courses ..................................................... Turner Abbott ......................... tabbott@mpif.org .................... ext. 108

Standards Development .................................................... Dora Schember ......................... dschember@mpif.org ............. ext. 110
(International Journal of Powder Metallurgy)

INQUIRIES
General Industry Information ........................................ James Adams ......................... jadams@mpif.org ................. ext. 117
Technical ................................................................. William Edwards, PMT ..................... bedwards@mpif.org ................ ext. 101
Communications/Website ............................................. Lisa Lester ................................. llester@mpif.org ...................... ext. 119

All other inquiries ................................................................................................................................................. info@mpif.org
Member Companies of the Metal Powder Industries Federation

Including KeyContacts

(Listing as of March 1, 2020)
## METAL POWDER PRODUCERS ASSOCIATION

### Advantage Metal Powders, Inc.
4 Spleen Road
Ridgway, PA 15853
Jason Gabler
814-772-5363
advantagempi.com

### CNPC Powder North American Inc.
2991 32nd Ave W
Vancouver, BC V6L 2B8
Canada
Abigail F. Vazquez
902-388-8679
cnpcpowder.com

### Asbury Carbons
405 Old Main Street
P.O. Box 144
Asbury, NJ 08802
Jeff Julian
908-537-2155
asbury.com

### Hoeganaes AB
Moskauer Strasse 25
DE-40227 Düsseldorf
Germany
Shashi Shukla
46-4 233-8000
hoganas.com

### Höganäs AB
1001 Taylors Lane
Cinnaminson, NJ 08077-2017
Robert Kuhle
856-829-2220
hoeganaes.com

### Jet Metals, Inc.
P.O. Box 907
St. Marys, PA 15857
Tom Wright
814-781-7399

### Jiangsu Mengda Materials Technology Co. Ltd.
No. 88 Haixin Road
Dab'gan Science & Technology Park
Binhaiyuan District
Nantong 226400
China
Yaping Zhang
86-513-819-0555
shmengda.cn

### Kobe Steel, Ltd.
Steel Powder Division
9-12, Kita-Shinagawa 5-chome
Shinagawa-ku
Tokyo 141-8688
JAPAN
Tetsuya Sawayama
81-03-5739-6222
kobelco.co.jp

### Kymera International
Global Headquaters
2601 Weck Drive
Research Triangle Park, NC 27709
Barton White
919-544-8090
kymerainternational.com

### Lonza, LLC
412 Mt. Kemble Ave. Suite 200C
Morristown, NJ 07960
William G. Dietzold
973-338-6500
lonza.com

### Mako Metal Powders (UK) Ltd.
Buckley Road
Rochdale Lancashire OL12 9DT
United Kingdom
Jonathan Hood
201-316-9200
makin-metals.com

### North American Höganäs Co.
111 Hoganas Way
Hollspole, PA 15935-6416
Dean Howard, PMT
814-479-3532
nah.com

### Oerlikon Metco (US) Inc.
1101 Prospect Avenue
Wesbury, NY 11590
Greg Mercer
248-288-1200
oerlikon.com/metco

### Pometon S.p.A.
Via Circonvallazione 62
Martellago, Venice 30030
Italy
Stefano Roda
(39) 041-2903673
pometon.com

### Royal Metal Powders Inc.
An American Chemet Company
457 Continental Drive
Maryville, TN 37804-5432
Michael Lutheran
865-268-8431
royalmetalpowders.com

### Sarda Industrial Enterprises
F-790B, Road No. 13, VKI Area
Jaipur, Rajasthan 302013
INDIA
Manish Sarda
(91) 946-161-8289
sardaindustrialenterprises.com

### U.S. Metal Powders, Inc.
2115 Little Gap Road
Palmeton, PA, 18071
Canada
Jessu Joys
610-826-7020
usmetalpowders.com

### Yuntie Ltd.
23 Sheppard Ave East, Ste 2509
Toronto, Ontario, M2N 0C8
Canada
Fan Shi
800-746-0068
yuntieltd.com

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### POWDER METALLURGY EQUIPMENT ASSOCIATION

### Abbott Furnace Company
1068 Trout Run Road
P.O. Box 967
St. Marys, PA 15857
Da Reardon
814-781-6355
abbottfurnace.com

### Abtec Corporation
89 Main Street
P.O. Box 188
Dresden, NY 14441
D. Mark Fultz
315-536-7403
abtex.com

### Air Products & Chemicals
7201 Hamilton Blvd
Allentown, PA 18195-1501
Lisa Mercando
610-481-5184
airproducts.com/metals

### Allegheny/Pamlico Coatings
P.O. Box 186
224 River Road
Ridgway, PA 15853
Stephen J. Quinn
814-772-3850
alleghenyc coatings.com

### Blasch Precision Ceramics
580 Broadway
Albany, NY 12204
Phil Geers
518-436-1263
blaschceramics.com

### Bronson & Bratton, Inc.
220 Shore Drive
Burr Ridge, IL 60527
Eric J. Reinert
630-570-4851
brons.com

### Cincinnati Incorporated
7420 Kilby Road
Harrison, OH 45030
Troy Robinson
513-967-7100
e-ci.com

### Consarc Corporation
PO Box 156
100 Indel Ave
Rancocas, NJ 08073
Michael Lister
609-267-8000
consarc.com

### CM Furnaces, Inc.
103 Dewey Street
Bloomfield, NJ 07003
James H. Neill
973-338-6500
cmfurnaces.com

### Dorst America, Inc.
64 South Commerce Way
Bethlehem, PA 18017-8915
Gregory D. Wallis
610-317-2000
dorst.de

### Elcan Industries
20 Marbledale Rd
Tuckahoe, NY 10707
Bob Grotto
914-381-7500
elcanindustries.com

### Elementar Analysensysteme GmbH
Elementarstrasse 1
Langenselbold Hesse 63505
Germany
Ivo Nemetz
(49) 6184-3993 0
elementar.de

### Erowa Technology, Inc.
North American Headquarters
2535 South Clearbrook Drive
Arlington Heights, IL 60005
Chris Norman
847-290-0295
erowa.com
Global Tungsten & Powders Corporation  
3 Hawes Street  
Towanda, PA 18848-2134  
Stacy Garrity  
570-268-5175  
globaltungsten.com

H.C. Starck Canada Inc.  
933 Vidal Street South  
Sarnia, Ontario  
Canada N7S 0B2  
Robert Scott  
519-346-4300  
hcstarck.com

H.C. Starck, Inc.  
1250 E. 222nd St.  
Euclid, OH  44117-1117  
Mike Stawowy  
216-692-6933  
hcstarck.com

Hyperion Materials & Technologies  
691 N Squirrel Road  
Auburn Hills, MI 48326  
Jeff Green  
248-370-5800  
hyperionmt.com

Kennametal Inc.  
1600 Technology Way  
P.O. Box 231  
Latrobe, PA 15650-0231  
Lane H. Donoho, PMTII  
724-539-6852  
kennametal.com

Mi-Tech Tungsten Metals LLC  
4701 Massachusetts Avenue  
Indianapolis, IN 46218  
A.J. Bir  
317-549-4290  
mi-techmetals.com

Rhenium Alloys, Inc.  
38683 Taylor Parkway  
P.O. Box 245  
North Ridgeville, OH 44035  
Todd A. Leonhardt  
440-309-2072  
rhenium.com

The Chem-Met Company  
P.O. Box 819  
Clinton, MD 20735-0819  
Brendan Hickey  
301-868-3355  
chem-metco.com

Advanced Powder Products, Inc.  
301 Enterprise Drive  
Philipsburg, PA 16866  
Donald F. Heaney  
814-342-5898  
app.com

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Mike Stucky  
937-228-4101  
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Mike Stucky  
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<td><strong>Ahmad, Faiz</strong></td>
<td>Professor, University of Technology Petronas, Malaysia</td>
<td>Perak, 31750, Malaysia. Phone: +605 368-7148, Fax: +605 365-6461. Email: <a href="mailto:faizahmad@up.edu.my">faizahmad@up.edu.my</a></td>
</tr>
<tr>
<td><strong>Ahmad, William O</strong></td>
<td>Owner, Allread Products LLC</td>
<td>745, CT 06766-6212, USA. Phone: +605 359-3566, Fax: +605 582-5804. Email: <a href="mailto:woallread@allreadproducts.com">woallread@allreadproducts.com</a></td>
</tr>
<tr>
<td><strong>Almeida, Oswaldo</strong></td>
<td>Sales Manager, North America, Rio Tinto Metal Powders</td>
<td>1655 Marie-Victorin Rte Sorel-Tracy, QC J3R 4R4, Canada. Phone: +40 746-5019, Fax: +40 746-7952. Email: <a href="mailto:Oswaldo.almeida@riotinto.com">Oswaldo.almeida@riotinto.com</a></td>
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<tr>
<td><strong>Allen, Curt</strong></td>
<td>Buyer, Hydro-Gear</td>
<td>1414 S Hamilton St Sullivan, IL 61951-2265. Email: <a href="mailto:callen@hydro-gear.com">callen@hydro-gear.com</a></td>
</tr>
<tr>
<td><strong>Allen, Bradley J</strong></td>
<td>Manufacturing Engineer, Metco Industries, Inc.</td>
<td>1241 Brusselles St, St. Marys, PA 15857-1901, USA. Phone: +605 781-3530, Fax: +605 781-6035. Email: <a href="mailto:banderson@metycopm.com">banderson@metycopm.com</a></td>
</tr>
<tr>
<td><strong>Andrews, Gary L</strong></td>
<td>VP Engineering &amp; Research, Keystone Powdered Metal Company</td>
<td>269 Eberl St, Ridgway, PA 15853-7110. Phone: +605 776-5700. Email: <a href="mailto:anderso@clarionsintered.com">anderso@clarionsintered.com</a></td>
</tr>
<tr>
<td><strong>Anderson, Ross</strong></td>
<td>Sr. Research Tech, Ames Laboratory</td>
<td>311 Iowa State University, Ames, IA 50011-0001. Phone: +515 294-5747. Email: <a href="mailto:rtanders@ameslab.gov">rtanders@ameslab.gov</a></td>
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<tr>
<td><strong>Ando, Teichiro</strong></td>
<td>Professor, Northeastern University</td>
<td>360 Huntington Ave, Boston, MA 02115-5005. Phone: +617 373-3811. Email: <a href="mailto:tandos@coe.neu.edu">tandos@coe.neu.edu</a></td>
</tr>
<tr>
<td><strong>Andreescu, Daniel</strong></td>
<td>Research Associate Professor, Clarkson University</td>
<td>8 Clarkson Ave # 5814, Center for Advanced Materials PR, Potsdam, NY 13676-1401. Phone: +315 268-7652. Fax: +315 268-2391. Email: <a href="mailto:dandrea@clarkson.edu">dandrea@clarkson.edu</a></td>
</tr>
<tr>
<td><strong>Andrews, Caleb</strong></td>
<td>Drexel University</td>
<td>3141 Chestnut St, Philadelphia, PA 19104-2816. Email: <a href="mailto:calebandreww101@gmail.com">calebandreww101@gmail.com</a></td>
</tr>
<tr>
<td><strong>Andrews, Greg</strong></td>
<td>Area Sales Manager, Radwell International, Inc.</td>
<td>255 Driffield Rd, Willingboro, NJ 08046-1000. Phone: +800 332-4336. Email: <a href="mailto:gandrews@radwell.com">gandrews@radwell.com</a></td>
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President  
Tsukimura Engineering Inc.  
2-3-26 Nakagawa-chuoh, Tsuzuki-ku  
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JAPAN  
(81) 459-50012  
Fax: (81) 459-50013  
tsu@tsukimura.co.jp  

Tuescher, PMT, Nicholas W  
Process Engineer  
SSI Technologies, Inc.  
3330 Palmer Dr  
P.O. Box 5002  
Janesville, WI 53546-2305  
(608) 373-2884  
wnt@ssitech.com  

Tummala, Rajesh  
Matals & Metallurgical Engineer  
1 Rock Island Arsenal Bldg 210  
Rock Island, IL 61299-5000  
(309) 782-0996  
rajesh.tummala2.civ@mail.mil  

Twarek, Cameron  
Advanced Engineer  
Flor Marine Propulsion  
814 Pittsburgh McKeebssport Blvd  
West Mifflin, PA 15222-2849  
cameron.twarek@gmail.com  

Ulyan, Michael P  
Customer Service Manager  
Basic Carbide Corporation  
900 Main St  
Lowber, PA 15660  
(724) 446-1630  
Fax: (724) 446-1655  
n.ulyan@basiccarbide.com  

Uplinger, Jerry  
Tool Design Engineer  
Gasbarre Products, Inc.  
159 McKee Rd  
Olanta, PA 16863-8229  
(814) 335-8872  
Fax: (814) 236-3651  
juplinger@gasbarre.com  

Vadlamudi, Raghu  
Research and Technology Director  
Donatelle  
501 County Road E2 Ext  
New Brighton, MN 55112-6860  
(651) 746-2917  
raghu.vadlamudi@donatelle.net  

Vaitkus, Bryan T  
Process Engineer  
Bronson & Bratton, Inc.  
220 Shore Dr  
Pm Tooling Division  
Burr Ridge, IL 60527-5820  
(630) 986-1915  
Fax: (630) 570-4866  
ba.vaitkus@brons.com  

Varela, Jaime  
Research Assistant  
University of Texas, El Paso  
14363 Wood Sugar Ct  
El Paso, TX 79938-5136  
(915) 422-2256  
varela11@miners.utep.edu  

Vegahpipatk, Ratanachai  
Director  
Thai Carbon & Graphite Co., Ltd.  
105/4 Soi Prachan Petchkasem 28  
Petchkasem Road  
Pakkhlong, Pasicharoen  
Bangkok, 10160  
THAILAND  
Fax: 457 1857  
ratanachai@thaicarbon.co.th  

Vega, Lua  
R&D Engineer  
Arcelormittal Innovación Investigación e Inversion  
Residencia La Granda s/n  
La Granda - Gozón,33418  
SPAIN  
lucia.laviada@arcelormittal.com  

Vega, Sid  
Dev Eng  
Ethicon Inc.  
4545 Creek Rd  
Blue Ash, OH 45242-2803  
ivega2@its.jnj.com  

Veloff, PMT, Nicola  
Sales  
EA Metal Powders LLC  
237 Sheringham Rd  
Columbia, SC 29212-8680  
(704) 780-1484  
Fax: (704) 780-1724  
n.veloff@eametalpowders.com  

Venskytis, Frank J  
108 Namath Ct  
Clayton, NC 27527-3948  
(919) 553-8050  
frankvenskytis@gmail.com  

Verdonik, Trevor W  
Ph.D. Student  
Lehigh University  
27 Memorial Dr W  
Bethlehem, PA 18015-3027  
(973) 223-8684  
twv213@lehigh.edu  

Vergallito, Mark T  
Director of Operations  
Ametek Specialty Metal Products  
1085 Route 519  
Specialty Metal Products Divisi  
Eighty Four, PA 15330-2813  
(724) 250-5168  
Fax: (724) 225-6622  
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Abrasive Technology, Inc.  
1175 Bowes Rd  
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(847) 888-7112  
yvernik@abrasive-tech.com  

Viant, Bret  
VP of Engineering Development  
Webster-Hoff Corporation  
704 E Fullerton Ave  
Glendale Heights, IL 60139-2918  
(630) 858-8030  
Fax: (630) 858-4993  
bviant@webster-hoff.com  

Viant, Bret  
VP of Engineering Development  
Webster-Hoff Corporation  
704 E Fullerton Ave  
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<td>Tungsten Parts Wyoming</td>
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<td>Juan Alfonso Naranjo Simarro, Engineer</td>
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<td>Carlos Arturo Rojas Beltran, Marketing and Sales Consulting Engineer</td>
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- Brasuell, Russell D
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www.tempstab.com
TempTabs provide documentation of the sintering process’ consistency and reproducibility. The easy to use product is available to monitor process tempera-
tures between 850–1750 °C and can be used in both batch and continuous furnaces. TempTabs act as an independent, early warning device that will alert users if something in their thermal process is changing.

**OSTERWALDER, INC.**
www.osterwalder.com
OSTERWALDER develops and manufactures state-
of-the-art serve-electro, hydraulic and mechan-
ical-hydraulic powder compacting presses which can be equipped with multiple-patent capabilities, cross hole/ side pressing systems and part handling systems. The wide product range offers system solutions for pressing iron, tungsten carbide, ceramic and other special materials into sophisticated structural parts of unequalled quality. OSTERWALDER AG provides user-friendly press technology and customer support exceeding today’s requirements.

**QUALA-DIE, INC.**
www.quala-die.com
Quala-Die, Inc., is the leader in powder metal tooling and precision machining. From design through production Quala-Die can provide you with superior service and quality.

**SACMI USA**
www.powdermetalpresses.com
SACMI offers comprehensive and cutting-edge prod-
ucts for the powder metal industry. Our CNC hydrau-
lic presses with quality control features and API ensure operation and process stability. Automation products include pick-and-place, brushing/weighting, palletizing (Cartesian or 6-axes robots), and rapid adaptor/die-set changeover with set-up stations. Furnaces feature carbon restoration and fast cooling, suitable for all standard to high-temperature processes. If you’re looking for powder metal equipment partners, SACMI has the experience necessary.

**SELEE CORPORATION**
www.selee.com
SELEE Corporation, a member of the Powair Group, manufactures high-temperature, low-mass kiln furni-
ture in seven different ceramic compositions to meet your application’s specific needs. We make both open-cell foam kiln furniture as well as micro-porous kiln furniture. We are also a distributor for ferro pro-
cess temperature control rings. Our manufacturing facility is located in the beautiful Blue Ridge Moun-

**SHAPE-MASTER TOOL COMPANY**
www.shapemastertool.com
Shape-Master Tool Company manufactures Poly-
-crystalline Cubic Boron Nitride (PCBN) cutting tools for PM machining. With a metallurgical engineer on staff, Shape-Master understands PM and the nuances of PM machining optimization. We don’t offer a single solution for all PM alloys because it’s simply not possible. Shape-Master utilizes over twelve differ-
ent PCBN grades for PM due to differences between Fe-C, Fe-Cu, Fe-Ni, low-alloy, as-sintered, hard-
ened, sinterhardened, copper-infiltrated, steam-
treated and powder-formed components.

**SUNROCK CERAMICS CO.**
www.sunrockcereamos.com
Sunrock Ceramics Company is an industrial ceram-
ics manufacturer located in Broadview, Illinois, (out-
side Chicago) focused on specialty alumina refractory such as pusher plates, setter flies, hearth plates, muffle and furnace linings for the sintering needs of the high-temperature powder metallurgy market. Sunrock’s pusher plates, pressed with HPA-CG material, are used in some of the most demanding applications in the industry. High-purity alumina refractory brick made with HPA-99, a 99.7% alumina formulation, are designed for hot-face lining in reduc-
ing atmosphere and Sunrock’s 99.8% bubble alumina insulation bricks provide the insulation. Sunrock can also make a wide variety of specialty shapes on quick turnaround to provide comprehensive sintering solutions.

**THE FURNACE BELT COMPANY LTD.**
www.furnacebeltco.com
A custom belting manufacturer specializing in high-temperature powder metal sinter-
ing applications. Round or flattened wire belt specifi-
cations include; balanced, double balanced, rod reinforced, compound and many others, in friction or chain-drive configurations. Industries served include; copper brazing, metals heat treating, food handling & processing, foundry, agriculture, mines, packaging & pharmaceuticals. Full range of flat wire belting.

**THE MODAL SHOP, INC.**
www.ndt-ram.com
The Modal Shop, Inc., is a leader in the field of dynamic quality instrumentation offering industrial grade, resonant inspection non-destructive test sys-
tems for the powder metal industry. With no part preparation or special fixturing required. Resonant Acoustic Method NDT uses a simple impact and resulting acoustic resonance to test parts as fast as one part per second. NDT-RAM detects defects such as cracks, chips, braze quality, missed processes and porosity on 100% of manufactured parts.

**VIRTO GROUP/CUCOLINI SRL**
www.virtogroup.com
VIRTO-CUCOLINI is the synthesis for innovation and tradition in the field of separation technology. Our Group, starting from the experience of the Italian Cucolini Srl and thanks to the recent technology added by Virto, can count on a wide product range: from traditional vibrating sieves to patented-protected multi-frequency vibrating screens, fit for a variety of industrial applications, from safety and control screening and classification to high performance heavy industry screening.

**METAL POWDER PRODUCERS**

**ADVANTAGE METAL POWDERS**
www.advantagempi.com
Advantage Metal Powders provides a full product line of magnetic and non-magnetic powders including, but not limited to, iron, prealloyed, sinter-hardening and soft magnetic materials. In addition to virgin pow-
der blends, Advantage offers remill powder and remi-
ll/virgin composite blends that meet MPIF’s Std. 35 specification. Advantage also purchases green scrap and will process customer-supplied green scrap. They have a state-of-the-art laboratory with testing and R&D services available.

**AMETEK SPECIALTY METAL PRODUCTS | EIGHTY FOUR**
www.powderclad.com
AMETEK Specialty Metal Products (SMP) at Eighty Four is a long established leader in the design, develop-
ment and manufacture of atomized metal stainless steel and high-alloy powders as well as roll-bonded clad products.

AMETEK SMP is certified to ISO 9001 in accordance with strict quality standards and verified as a pre-
ferred supplier of metal powders for applications where ultimate quality is critical and solutions for corrosion, wear and abrasion, magnetic properties, permeabi-

ty or high temperatures are required. Structural stain-
less steel powders are typically used in press and sintering applications (PM). Specialty powders are for a variety of markets and applications including ther-
mal spray/surface coatings as well as plastic compo-
ounding, metal injection molding (MIM), polyester spinning and sintered filters.

AMETEK SMP uses roll bonding technology to met-
allurgically bond dissimilar metals to make clad plate. Typical applications include platens for commercial cooktops and grills, and pressure vessel plate used in chemical processing and heavy industry applica-
tions. Standard clad materials include stainless steels, Inconels, nickels, aluminum, and titanium.

**AMERICAN CHEMET CORPORATION**
www.chemet.com
American Chemet Corporation, founded in 1946, is a manufacturer of copper powder, cuprous oxide, cupric oxides and zinc oxide. Chemet’s reduced copper powders excel in applications such as: friction materials, iron powders addition for PM, MIM, lubricants, brazing, sintered tungsten, diamond cutting tools, carbon brush and catalyst. American Chemet’s subsidiary, Royal Metal Powders, Inc., produces air and water atomized copper, brass, bronze, infiltrant, and tin powders.

**FREEPORT COBALT**
www.freeportcobalt.com
Freeport Cobalt is a leading producer of high-quality cobalt based powders and chemicals located in Kokkola, Finland. With more than 30 years of experience in cobalt powders, Freeport Cobalt serves the needs of many industries including but not limited to hardmetals, diamond tools, PM, thermal spray and magnet. The company serves a wide variety of sec-
tors, including rechargeable batteries, electronic devices, cutting tools, petrochemical catalysts, elec-
tronics manufacturing, industrial coatings, defense, aerospace, and medical devices.

**HUNTER CHEMICAL LLC**
www.hunterchem.com
Hunter Chemical is an ISO9001:2015 certified supplier of nickel, cobalt, and chrome-based raw materials. We have available a full line of nickel pow-

der and flake products for many industrial applica-
tions. This includes our new products conductive grade AH55C suitable for EMI applications, and Grade AH45 characterized by filigramary morpholo-

gy and low density. Grade AH50 is a well-established carborund nickel powder suitable for standard PM. Oth-
er products suited for MIM, AM, and other applica-
tions are available also. Small quantity and secondary sourcing inquiries are welcome. In addition, Hunter Chemical offers hydrogen-reduced nickel powders for various applications.
KYMERA INTERNATIONAL
www.kymerainternational.com
Kymera International™ is the global leader in copper and aluminum powder metallurgy and true “Pioneers in Material Science™.” We provide our customers with a wide array of material options including aluminum/aluminum alloys copper/copper alloys, copper oxide, electrolytic copper, lead, magnesium, plain bearing alloys, tin, silver coated, zinc, specialty alloys, and ultrafine powders. Our operations in seven countries can manufacture products in powders, pastes, flake, preforms, and granules.

LONZA INC.
www.lonza.com
Lonza is the premier lubricant supplier for the powder metal industry for over 35 years, supplying a high quality and effective product, Acravax®. C. Manufactured in Williamsport, Pennsylvania, product is supplied globally through local sales offices. Lonza supplies to and has expertise in many other markets, and has expertise in corrosion inhibition and oleochemical chemistries, as well.

NORTH AMERICAN HÖGANÅS, CO.
www.hoganas.com
North American Höganäs AB, a subsidiary of Höganäs AB, is a supplier of iron-based metal powders and stainless steel powders designed for a broad spectrum of applications, including components, friction, welding, brazing, thermal coating, soft magnetic composites, electro photographic and numerous chemical applications. Production takes place in four strategic locations: Stony Creek Plant, located in Hollsopple, PA, is the world’s most integrated production resource for atomized iron and steel powders. St. Marys Plant, located in St. Marys, PA, is a mixing facility which is capable of producing small to large custom mixes. Niagara Falls Plant, located in Niagara Falls, NY, produces a comprehensive range of products ranging from friction materials, powder metallurgy and soft magnetics, to food additives and general chemical use. Johnstown Plant, located in Johnstown, PA, produces a broad range of products including stainless steel powders, iron-alloy powders, nickel-alloy powders, electrolytic iron powders and chips, manganese and silicon powders, and GLIDOC® dispersion-strengthened copper products.

NOVATEM
www.novatemcorp.com
For over 40 years, Novatem Specialty Products has been producing and providing a wide range of products including variousmorphologies of tightly-sized nickel powders, metallic flakes, coated materials of varying substrates and coatings as well as specialty nickel oxides. Using its industry-leading knowledge of nickel based applications, the experienced technical staff of Novatem makes precision engineered and customized products to the most exacting specifications and requirements in multiple applications.

POMETON S.p.A
www.pometon.com
For almost 80 years, Pometon has been the industry standard for innovation, quality and customer service for both ferrous and non-ferrous metallic powders and stainless steel grits. Pometon melts, atomises and blends metallic alloys to develop unique bespoke powders. Each powder is a specific technical solution with specialised characteristics depending on the application. Pometon’s powders are utilised in many applications: sintered mechanical parts, self-lubrication bearings, diamond tools, welding consumables and brake pads, expanding in the aerospace and biomedical applications.

ROH TINTO METAL POWDERS (QMP)
www.qmp-powders.com
Rio Tinto Metal Powders (QMP) provides a full product line of iron and steel powders in the Americas, Europe, and Asia. ATOMET™ standard grades and prealloys, binder-treated FLOMET™ Mixes, diffusion-bonded ATOMET™ DB powders, machinable (sulfur-free) grades, sinter-hardening grades, and soft magnetic composite materials are available to customers worldwide. Rio Tinto Metal Powders (QMP) is registered to ISO 9001, ISO 14001, and IATF 16949.

ROYAL METAL POWDERS, INC.
www.royalmetalpowders.com
Royal Metal Powders Inc. located in Maryville, Tennessee, is a U.S. manufacturer of high-quality metal powders. Royal offers a wide variety of air and water-atomized copper-based powders including: copper, brass, bronze, bronze premix, infiltrating, and copper/nickel products. In addition to our main copper products we offer, tin powders, copper/tin powders, tin/tungsten blends, and lead powders. Applications include: powder metallurgy, MIM, additive manufacturing, friction, ammunition, filters, brazing, and numerous chemical/industrial applications.

U.S. METAL POWDERS, INC.
www.usmetalpowders.com
As North America’s largest producer of aluminum powder, U.S. Metal Powders, Inc. (USMP) produces spherical and nodular aluminum powder in a full range of particle sizes. USMP operates manufacturing facilities in Pennsylvania (Ampal, Inc.) and France (Poudres Hermillon SARL) and is a global leader in advanced engineered aluminum grades for powder metallurgy (PM), additive manufacturing (AM) and metal injection molding (MIM). In addition to aluminum powder, USMP sells aluminum flakes and pastes, carbonyl iron powder and stainless steel powder.

MIM/PIM
3DEO, INC.
www.3DEO.co
3DEO has developed patented production metal 3D printing technology. We sell small, complex parts—NOT printers—in volumes that are highly complementary to the MIM industry. 3DEO’s technology dramatically reduces final part cost while achieving exceptional properties such tolerances of +/- 0.004 in/in, sintered density of 99.5%, and the surface finish of ~100 Ra microinch. Reimagine Manufacturing with 3DEO and the unlimited potential of 3D printing—change your designs at any time, order parts on demand with no minimum order quantities or setup costs, eliminate molds and tooling, and get production parts in days, not months.

ADVANCED METALWORKING PRACTICES, LLC
www.ampmim.com
Advanced Metalworking Practices’ wax/polymer Advacam® feedstock, has been a recognized building block of the MIM Industry for 30 years. In 2015, AMP introduced catalytic feedstock with the Advacat® product line. AMP works with its customers to find the best powder and binder configurations to meet demanding application requirements. Custom alloys and metal scale factors are available. Advacam® and Advacat® are the advantage to help your MIM operation succeed.

ADVANCED POWDER PRODUCTS, INC.
www.advancedpowderproducts.com
For almost two decades, APP has been a metal injection molding provider for the industrial, sporting goods, medical and defense industries. Powered by innovation, we develop, engineer and produce precision metal components that are designed for manufacturing, for industries that demand a part within days or weeks, we have a technical solution to meet your needs and improve your time to market, freeing you up to continue to revolutionize your industry.

AMETEK SPECIALTY METAL PRODUCTS | EIGHTY FOUR
www.powderclad.com
AMETEK Specialty Metal Products (SMP) at Eighty Four is a long established leader in the design, development and manufacture of atomized metal stainless steel and high-alloy powders as well as roll-bonded clad metal products. AMETEK SMP is certified to ISO 9001 in accordance with strict quality standards and recognized as premier source of metal powders for applications where ultimate quality is critical and solutions for corrosion, wear and abrasion, magnetic properties, permeability or high temperatures are required. Structural stainless steel powders are typically used in press and sintering applications (PM). Specialty powders are for a variety of markets and applications including thermal spray/surface coatings as well as plastic compounding, metal injection molding (MIM), polymer spinning and sintered filters.

AMETEK SMP uses roll bonding technology to metallurgically bond dissimilar metals to make clad plate. Typical applications include plates for commercial cooktops and grills, and pressure vessel plate used in chemical processing and heavy industry applications. Standard clad materials include stainless steels, inconel, nickel, aluminum, and titanium.

ARBURG GmbH + Co KG
www.arburg.com
ARBURG is one of the leading global manufacturers of plastic processing machines. The portfolio encompasses ALLROUNDER injection moulding machines with clamping forces from 125 to 6,500 kN, the freecoupling for industrial additive manufacturing, robotic systems, specific turnkey solutions and further peripheral equipment. ARBURG holds a leading position in the PIM sector for decades. The PIM range includes especially equipped ALLROUNDER injection molding machines, comprehensive customer support and training courses.

CARPENTER TECHNOLOGY CORPORATION
www.carpenterpowder.com
Carpenter Technology Corporation is a recognized leader in high-performance specialty alloy-based materials and process solutions for critical applications in the aerospace, defense, transportation, energy, medical, industrial, and consumer electronics markets. Founded in 1889, Carpenter has evolved to become a pioneer in premium specialty alloys, including titanium, nickel, and cobalt, as well as alloys specifically engineered for additive manufacturing (AM) processes and soft magnetic applications. Carpenter has expanded its AM capabilities to provide a complete “end-to-end” solution to accelerate materials innovation and streamline parts production.
and aluminum powder metallurgy and true cations. MPP has operations in North America and techniques, used in numerous industries and applications. MPP specializes in various industries including ferrous and nonferrous, and provides materials such as stainless steel and filters. Press tonnage from 2 to 825 tons

Other Products/Services: In-line delube and debind ovens with air, inert and/or reducing atmospheres. Debind ovens for BASF binder system. Furnaces for AM applications. Tolland firing and process development.

PHILIPS MEDISIZE www.philipsmedisize.com

PM PRODUCTS OR PARTS PRODUCERS

PMPP is a manufacturer ofcustom high-temperature vacuum and controlled-atmosphere heat-treat and sintering furnaces for the metals and ceramics industries. Applications include heat treating, brazing, sintering, hot pressing, diffusion bonding, 3D/additive manufacturing, and metal injection molding furnaces. Systems are available with either refractory metal or graphite hot zones in sizes from 1 cu. cm. to several cubic meters, from 1,000 °C to 3,500 °C.

CM FURNACES, INC. www.cm furnaces.com

Furnaces & Equipment: Furnaces operating at temperatures from 1,200 °F to 4,000 °F (650–2,200 °C). Batch and continuous pusher furnaces from lab scale to fully automated production units. All electric with high-efficiency insulation packages.

Atmospheres: Furnaces available to operate in hydrogen, nitrogen, inert or air atmospheres. Continuous dew point and oxygen level monitoring and control are offered.

Other Products/Services: In-line delube and debind ovens with air, inert and/or reducing atmospheres. Debind ovens for BASF binder system. Furnaces for AM applications. Tolland firing and process development.

DSH TECHNOLOGIES, LLC www.dshtech.com

DSH provides real-world solutions to meet all your MIM/AM needs. DSH provides debinding, sintering, heat treatment, R&D and Contract services, as well as, facility optimization and production flow improvements. DSH utilizes full size production Debind and Sinter Equipment manufactured by Elnik Systems.

Partnering with DSH Technologies helps you avoid countless pitfalls in MIM/AM parts production. We are in this Together. Innovation...Quality...Experience...Excellence.

ELNIK SYSTEMS LLC www.elnik.com

ELNIK SYSTEMS supplies expertise in Debind and Sinter processing technology. A manufacturer of solvent/catalytic debinding and ONE-step debind and sinter equipment for metal injection molded and metal AM parts, with integrated shelving systems for reduced handling/staging time. Elnik’s commitment towards innovation is driven through its sister company DSH Technologies, LLC, (Your Partner in MIM/AM). As an in house customer of Elnik, the relationship allows for real time trial of innovations and upgrades before they hit the market to ensure functionality. We are in this Together. Innovation...Quality...Experience...Excellence.

KYMERA INTERNATIONAL kymeriinternational.com

Kymera International is the leading manufacturer of high-quality gas-atomized, spherical powders for metal injection molding, additive manufacturing, and other markets. The company offers a comprehensive range of alloys including stainless steels (17-4PH, 304L/316L, 420, 440C, HK30), low-alloy steels (4140, 4340, 4605), cobalt alloys (CoCrMo & steellites), nickel alloys (Inconels, Nimonic, hastelloys, etc.), and copper alloys. Master alloys are also a specialty (17-4PH, 316L, 420, 4140 and others).

SANDVIK OSPREY LTD www.materials.sandvik/osprey

Sandvik Osprey is a leading manufacturer of high-quality gas-atomized, spherical powders for metal injection molding, additive manufacturing, and other markets. The company offers a comprehensive range of alloys including stainless steels (17-4PH, 304L/316L, 420, 440C, HK30), low-alloy steels (4140, 4340, 4605), cobalt alloys (CoCrMo & steellites), nickel alloys (Inconels, Nimonic, hastelloys, etc.), and copper alloys. Master alloys are also a specialty (17-4PH, 316L, 420, 4140 and others). Sandvik Osprey has a strong track record of successful developments with customers from pilot plant to bulk production. As part of the global Sandvik AB corporation we can give effective technical support for customers' projects. The company is continually expanding its capacity to satisfy market needs.

SELEE CORPORATION www.selee.com

SELEE Corporation, a member of the Porvair Group, manufactures high-temperature, low-mass kiln furni-
America, and Europe.

...market, nowadays Metalpó is one of the leading companies in the most diverse industrial segments. Besides Brá-

sors, bearings, gears for washing machine transmis-

tions, and appliance applications, such as hermetic compres-

sors, magnetic and magnetic composite; experts in sin-

tering; conventional; and high-temperature vacuum

sintering up to 1,315 °C; in-house tooling design

...growth. Combustol & Metalpó Group in Brazil, dedicated to innovating PM solutions, now serves an ever-expanding

...market, Metalpó is proud to offer a value metal technology

...solution. We use the latest design software and FMEA analy-

sis to achieve a cost-effective and reliable manufacturing

solution. We use AutoCAD and Solidworks to develop the best part. Similarly, they always take the time to understand the requirements of each project.

The staff at Webster-Hoff will listen to the customer's needs and analyze the application in order to help create the best part. Similarly, they always take the time to understand the requirements of each project.

WEBSITE-HOFF CORPORATION

...located in Glendale Heights, Illinois, is an experienced manufacturer of powder metal parts. Founded in 1971, we are dedicated to providing high-quality products every time. We can handle low, medium, and high-volume orders with precise repeatability. We have won numerous Design Excellence Awards, which testifies to our innovativeness and skill. Moreover, the customer's choice to work with us year after year shows that we are reliable and trust-

worth.

...will listen to the customer's needs and analyze the application in order to help create the best part. Similarly, they always take the time to understand the requirements of each project.

We use the latest design software and FMEA analyses to achieve a cost-effective and reliable manufacturing solution. We use AutoCAD and Solidworks to develop all of our new tooling. Our quality control is unparalleled and all parts that leave our facility meet the highest standards our customers expect. Additionally, we are ISO 9001:2008 certified.

Our 27,000 square feet of operational space contains all the equipment necessary for PM production and tooling. Webster-Hoff can produce complex, multi-level parts using a wide range of materials such as iron, steel, stainless steel, copper, aluminum, titanium, brass, and bronze. Tight tolerance gears and related parts are a specialty, but we can manufacture any shape. Furthermore, we can provide secondary machining on products if requested. Our machines include hydraulic & mechanical presses, furnaces, lathes, grinders, and much more. Get in contact with Webster-Hoff today!
**DESKTOP METAL**
www.desktopmetal.com

Desktop Metal is accelerating the transformation of manufacturing with its portfolio of end-to-end 3D printing solutions. The new Shop System enables shop owners to leverage affordable, high-quality binder jetting technology to print end-use metal parts with unparalleled speed, print quality, and productivity. The Studio System offers users office-friendly 3D printed prototyping and low volume serial production, while Production System provides true high-volume manufacturing capability.

**ROYAL METAL POWDERS, INC.**
www.royalmetalpowders.com

Royal Metal Powders Inc. located in Maryville, Tennessee, is a U.S. manufacturer of high-quality metal powders. Royal offers a wide variety of air and water-atomized copper-based powders including: copper, brass, bronze, bronze premix, infiltrating, and copper/nickel products. In addition to main copper products we offer, tin powders, copper/tin powders, tin/tungsten blends, and lead powders. Applications include: powder metallurgy, MIM, additive manufacturing, friction, ammunition, filters, brazing, and numerous chemical/industrial applications.

**KITYHAWK PRODUCTS**
www.kittyhawkinc.com

Kittyhawk Products - Qualified experts in the field of hot isostatic pressing. HIP is a densification process that provides a unique benefit in solving complex design problems while increasing the strength of properties. Kittyhawk is the world leader in providing HIP service to PM, MIM, and AM companies.

**KYMERA INTERNATIONAL**
kymeriainternational.com

Kymera International is the global leader in copper and aluminum powder metallurgy and true “Pioneers in Material Science™”. We provide our customers with a wide array of material options including aluminum/aluminum alloys copper/copper alloys, copper oxide, electrolytic copper, lead, magnesium, plain bearing alloys, tin, silver coated, zinc, specialty alloys, and ultrafine powders. Our operations in seven countries can manufacture products in powders, pastes, flakes, preforms, and granules.

**NORTH AMERICAN HÕGANÁS, CO.**
www.hoganas.com

North American Höganas, Co., a subsidiary of Höganas AB, is a supplier of iron-based metal powders and stainless steel powders designed for a broad spectrum of applications, including components, friction, welding, brazing, thermal coating, soft magnetic composites, electro photographic and numerous chem/met applications. Production takes place in four strategic locations: Stony Creek Plant, located in Holliscope, PA, is the world’s most integrat ed production resource for atomized iron and steel powders. St. Marys Plant, located in St. Marys, PA, is a mixing facility which is capable of producing small to truckload-size custom mixes. Niagara Falls Plant, located in Niagara Falls, NY, produces a comprehensive range of products ranging from friction materials, powder metallurgy and soft magnetics, to food additives and general chemical use. Johnstown Plant, located in Johnstown, PA, produces a broad range of products including stainless steel powders, iron-alloy powders, nickel-alloy powders, electrolytic iron powders and chips, manganese and silicon powders, and GLIDCOP® dispersion-strengthened copper products.

**ROYAL METAL POWDERS, INC.**
www.royalmetalpowders.com

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**SANDVIK OSPREY LTD**
www.materials.sandvik/osprey

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**U.S. METAL POWDERS, INC.**
www.usmetalpowders.com

As North America’s largest producer of aluminum powder, U.S. Metal Powders, Inc. (USMP) produces spherical and nodular aluminum powder in a full range of particle sizes. USMP operates manufacturing facilities in Pennsylvania (Ampal, Inc.) and France (Poudres Hermillon SARL) and is a global leader in advanced engineered aluminum grades for powder metallurgy (PM), additive manufacturing (AM) and metal injection molding (MIM). In addition to aluminum powder, USMP sells aluminum flakes and pastes, carbonyl iron powder and stainless steel powder.

**HIP/CIP**

**KITYHAWK PRODUCTS**
www.kittyhawkinc.com

Kittyhawk Products—Qualified experts in the field of hot isostatic pressing. HIP is a densification process that provides a unique benefit in solving complex design problems while increasing the strength of properties. Kittyhawk is the world leader in providing HIP service to PM, MIM, and AM companies.

**THE P/M EXPERIENCE INC.**

The P/M Experience Inc. provides consulting assistance in the manufacturing of PM parts. We specialize in tooling, compaction and sizing, as well as training in all aspects of efficient manufacturing. Let our experience working with Powder Metal components since 1976 help you make better parts.

*“Helping to Make Better Powder Metal Parts”*

**TRIBOTECC GmbH**
www.tribotec.at

Metal Sulfides, especially synthetics, such as tungsten or Tin Sulfides as well as multiphase Sulfides in various particle-size distributions improve the machinability and tribological properties of sintered parts. They are mainly used in high-performance applications where resistance to wear with high loads and temperatures is demanded such as valve seats and guides, gears, piston rings, etc.

**ULTRA INFILTRANT**
www.ultra-infiltrant.com

The patented Ultra Infiltrant Copper Infiltration Technology System exceeds MPIF Standard 35 in metallurgical and mechanical response. Ultra Infiltrant eliminates all the non-value-added process, cost and waste associated with pressing powder copper infiltrants. Ultra Infiltrant leaves no residue or erosion and is available in multiple wire diameters and cross sections to accommodate virtually any preform geometry. Ultra Infiltrant is the world leader in copper infiltration technology... A Solid Line of Thinking.
PM CONSULTANTS

DSH Technologies, LLC
107 Commerce Road
Cedar Grove, NJ 07009
Tel: 973-239-7729
Fax: 973-239-3272
E-mail: bsherman@dshtech.com
Consultant: Bryan C. Sherman

MIM/AM Process Educators: In-house capabilities of debinding and sintering in production-scale equipment. Metallography testing both in-house and with lab partners.

Education/Partnering: DSH Technologies can assist with all aspects of MIM/AM part processing. From R&D and prototype development, to the set-up of turnkey production operations and facilities. We want to help you become successful at processing metal parts!

Toll Debinding & Sintering: From small experimentation to full size production loads, DSH can work with you to process all your Metal parts and material.

We are in this together.

HJE Company, Inc.
820 Quaker Rd.
Queensbury, NY 12804
Tel: (518) 792-8733 Fax: (518) 792-8735
Email: info@hjeco.com
Consultant: Joseph Tunick Strauss, Ph.D.

Specializing in: Atomization technologies, metal injection molding, cold isostatic compaction, hot pressing, die compaction, sintering, powder optimization for Additive Manufacturing. World leader in the development of P/M technologies for precious metals including Additive Manufacturing.

Services offered: Atomization trouble shooting and optimization. Contract R&D and pilot scale operations for proof-of-concept P/M part fabrication for conventional and non-traditional materials. Powder production of small batch runs using gas, water, and oil atomization. Laboratory and pilot scale metal injection molding, cold isostatic compaction, induction hot pressing, die compaction, controlled atmosphere sintering, dilatometry, powder size analysis, powder classification.

Testing facilities: Versatile and integrated 15,000 sf facility includes in-house gas, water, and oil atomization systems; powder classification including sonic, ultrasonic, and conventional sieving; particle size analysis equipment (Microtrac, sieve, FSS); MIM equipment for mixing, molding, debinding, and sintering; die, isostatic, and hot pressing; dilatometry, metallographic equipment, optical microscope, macro and micro hardness testing, torque rheometer, macro-TGA, high energy milling, and machine shop.

JENS Solutions LLC
E-Mail: jrengquist@gmail.com
Consultant: John Engquist

Consulting for manufacturing with emphasis in the PM industry. Specializing in the use of critical thinking processes combined with simple statistical tools to uncover hidden quality and productivity improvement opportunities (supporting Lean Mfg. principles through the elimination of waste). Working with customers to create value by eliminating losses due to quality or process related engineering problems.

Koehler Associates, LLC
17 Burchfield Ave, Cranford, NJ 07016
Tel: 908-477-9542
E-mail: loukoehler1@yahoo.com
Consulting Team: Mike Cox, Dr. Victor Ettel, Lou Koehler, Donna McGlynn, Dr. Les Renny, Malcolm Rosenow

Koehler Associates, LLC, provides management, marketing, product development and technical assistance to the powder metals and related industries. The Team consists of six former Vale Inco employees with a cumulative experience of over 150 years in the metals industry. The Team members collectively have a unique blend of experience in marketing, operations, research, and development over a very large range of product application areas.

Team areas of expertise include:
• Production and Marketing of specialty nickel particulate products including powders, oxides, salts, flakes and coated particles (e.g. nickel coated graphite);
• Production and Marketing of nickel foams and nickel coated carbon fibers
• Rechargeable batteries; Nickel Metal Hydride, Nickel Cadmium, and Lithium Ion
• Fuel cells; Solid Oxide, Molten Carbonate
• Powder Metallurgy; Sintered steels, Diamond tools, and Metal Injection Molding
• Nickel carbonyl production technology
• Composites
• Market research
• Quality Management; ISO, Six Sigma
• Stage Gate new product development
• Raw material sourcing
• Export market development particularly in the Far East and Europe
Mason Global Materials
E-Mail: rmason@masonglobalmanagementllc.com
Consultant: Richard Mason

Sales and marketing: Gas atomized additive manufactured powders and parts, wide variety of gas atomized thermal spray powders, tungsten carbide powders, high purity chrome in powder, flake, and briquette, specialty cobalt melt ingots, vibratory screening systems, pretension screens to customer specifications, proprietary process to cost effectively recycle used screens, precision wire processing equipment and cut-to-length services for strip, wire and fine tubing. 99.98% pure nickel shapes for sputtering targets, gaskets, and high end semiconductor and battery applications. Recycle cobalt, nickel alloys and tungsten carbide materials.

Additional services include: raw material sourcing, market research, new product launch.

Powder-Tech Associates Inc.
31 Flagship Drive, North Andover, MA 01845
TEL: (978) 685-6027 • FAX: (978) 683-5733
E-mail: ptech@shore.net • Web site: http://www.powder-tech.com
Consultant: Leander F. Pease, III, Sc.D., FAPMI, PMTII, FASTM

Specializing in: Failure analysis, troubleshooting P/M manufacturing processes.

Services offered: Failure and referee analysis; troubleshooting of molding, sintering, heat treating and machining processes; quality control analysis including powder inspection, parts metallography; measurement of mechanical properties; selection of PM materials; provision of prototype materials.

Testing facilities: Complete metallographic and photographic labs automated including image analysis; pilot plant for blending, pressing, atmosphere, sintering and forging development; presses to 1000 ton; microhardness, apparent and superficial hardness testers; equipment to measure tensile strength, density, sieve analysis, tap density, green strength, and compressibility. Complete P/M test bar tools. Easy access to SEM, impact testing, production sinter and heat treating facilities and vacuum sintering.

TAT Technologies, LLC
106 Enterprise Street
St. Marys, PA 15857
Consultant: Harb Nayar, PhD, FAPMI, FASM
E-Mail: harb.nayar@tat-tech.com
Website: www.tat-tech.com
Tel: 814-834-1166 - Cell: 908-391-9478

Specializing in:
• FASTER Debinding process and furnace for green parts molded by AM and MIM
• LEAN Sintering - Significantly improving sintering in PM by increasing production rates up to 60% and decreasing energy consumption by 30%.
• Custom design and manufacture of LBT units for faster and cleaner delubing/debinding in existing and new furnaces.

Services Offered:
• Hands-on training courses for better debinding, delubing and sintering in AM, PM and MIM.
• Furnace analysis and engineering studies of existing sintering plants with a focus on increased production rates, energy reduction and development of better operating practices.
• Troubleshooting of sintering, delubing, Cu infiltration or sintering-brazing problems.
• Increasing belt and muffle life through the elimination of soot-related maintenance issues.
• VOC/lubricant emission reduction and equipment to meet EPA and OSHA requirements.
• Atmosphere selection, zoning, monitoring and controlling for sintering & brazing furnaces.
• Furnace Diagnostic Services for health checks of existing furnaces.

Facilities:
The TAT Technology Development & Training Center located in St. Marys, PA includes a 6-inch belt furnace, a 4-inch pusher furnace using N2-H2-Oxident atmospheres and a broad range of physical, dimensional, hardness, tensile strength, TRS, metallography, atmosphere analysis, emission monitoring, energy consumption measurement and temperature profiling capabilities. The Center enjoys a large local network for compaction, sample analysis, fabrication, machining, coating, heat treating, steam treating and special analysis etc.

The Center can be used for:
1. Hands-on training for employees in the AM, PM and MIM industry.
2. PM/MIM/AM Products & Process Technology Developments for 3rd party.
4. Third party demonstration and verification of powder, product, process and equipment.
Kymera INTERNATIONAL
Pioneers in Material Science™

Global leaders in Aluminum, Copper and Titanium for Additive Manufacturing and Powder Metallurgy

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INNOBRAZE GmbH für Löt- und Verschleißtechnik
Eckagranules Metal-Powder-Technologies
ReadingAlloys advanced engineered materials®

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Inspire industry
to make more with less

A big transformation is going on in the automotive industry. Through our relentless strive for ground-breaking innovations and new business opportunities, we offer smart solutions that will take the powder metallurgy community into the era of electrification and hybridization.

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