

Register by June 26 and save!

Register and receive over \$400 worth of publications including *Powder Metallurgy & Particulate Materials Processing, Fundamentals of Powder Metallurgy, Hot Consolidation of Powders & Particles, MPIF Standard 35*, and other literature

YOU DO NOT NEED TO HAVE A TECHNICAL BACKGROUND TO BENEFIT FROM ATTENDING THE BASIC POWDER METALLURGY SHORT COURSE.

THIS COURSE IS DESIGNED FOR:

*Engineers
Tool designers
Product designers
Metallurgists
Supervisors
Purchasing agents
Technicians
Managers
Hands-on workers
Administrators
QC personnel
Office personnel*

CO-CHAIRMEN:

Myron I. Jaffe
Consultant

Harb S. Nayar
President
TAT Technologies, Inc.



**July 27–29, 2009
Penn Stater
Conference Center
Hotel
State College,
Pennsylvania**

THIS INTENSIVE 3-DAY COURSE IS DESIGNED ESPECIALLY FOR YOU, IF YOU ARE:

- *Starting* out in the field and looking for an introduction to PM
- *Updating* your knowledge of recent developments in PM
- *Seeking* to expand your current knowledge of the PM industry in order to enhance your advancement opportunities
- *Specialized* in one area of PM and looking to broaden your background in the field
- *A user of* PM parts or wish to be one

WHEN YOU ATTEND THIS COURSE YOU WILL LEARN:

- The history of PM, PM today, and PM tomorrow
- Why it is a viable method of producing metal parts
- Why so many industries use PM parts
- The fine points in designing for PM
- How metal powders are produced
- About the different designs used in compacting tools
- How sintering develops the functional properties
- What injection molding of metal powder is all about
- About the various secondary operations used with PM parts
- What MPIF standards are all about
- Special tests for powders
- About the latest high-tech PM technologies

...and receive over \$400 in books/standards

SPONSORED BY THE



PROGRAM

MONDAY, JULY 27

Opening Remarks
Myron I. Jaffe
Consultant

Movie:
Powder Metallurgy

Overview of PM
Randall M. German, FAPMI
Associate Dean of Engineering
San Diego State University
College of Engineering

History of PM... The basic process...
Raw materials... Engineering principles...
General applications

Metal Powder Production
Candido Ruas, Manager, Cust. Tech. Service
QMP

General process principles... Carbonyl,
reduction of oxides, granulation, high-pressure
water atomization, binder treatment

Testing, Characterization and
Mixing of Metal Powders
David Milligan, Director, Quality, Env., & Safety
North American Höganäs, Inc.

Chemistry, powder morphology... Particle size
and distribution... Engineering characteristics...
Mixing and blending... MPIF/ASTM/ISO
standards

Metal Powder Injection Molding
Randall M. German, FAPMI
Associate Dean of Engineering
San Diego State University
College of Engineering

Applications... Properties... Comparison and
contrast with traditional PM

Basic Principles of Compacting
Tom Pontzer, Senior Sales Engineer
Gasbarre Products, Inc.

Behavior of powder under pressure... Uniaxial
vs. isostatic principles... Density distribution in
two-step parts... Density distribution in long
parts... Ejection force and effects... Explanation
of HIP, CIP, forging, rolling, etc.

Tooling for PM
Robert T. Beimel, President/General Manager
JIT Tool & Die, Inc.

Tooling materials—traditional and modern...
Design to our advantage... Tooling engineering,
manufacturing... Tool utilization and quality

Reception
Featuring a demonstration of the famous
"Popcorn Press"

TUESDAY, JULY 28

Design of PM Parts
Myron I. Jaffe, Consultant

Getting the most from the MPIF "Design
Solutions" booklet... Theory of proper design...
Uniqueness of PM... Economics examples

Lubricants in Ferrous Powder Metallurgy
W. Brian James, FAPMI, Mgr., International
Technical Service
Hoeganaes Corporation

Apparent density... Flow... Compressibility...
Ejection characteristics... Green strength...
Removal during sintering... Dimensional
change

Sintering Principles
Harb Nayar, President
TAT Technologies, Inc.

Theory of sintering... Walk through a sintering
cycle in practice... Dimensional control...
Effects of sintering on properties... Various
sintering atmospheres... Sintering systems in
the industry... Monitor and control option review

Spark Plasma Sintering (SPS) and Vacuum
Sintering
Donald F. Heaney, CISP Director
The Pennsylvania State University

SPS fundamentals... Equipment
configurations... Benefits and concerns
associated with vacuum sintering... partial
pressure sintering in various atmospheres

Conventional Sintering Furnaces and
Practices
Raymond Serafini, PMT, Major Customer
Executive - Automotive
Linde Inc.

Types of furnaces... Conveyors... Burn-
off/delube... Sintering zones... Slow cool...
Cooling... Instrumentation... Trends

PM Material Standards
W. Brian James, FAPMI, Mgr., International
Technical Service
Hoeganaes Corporation

Why material standards... Review of MPIF
Standard 35... Structural parts, bearings, MIM,
powder forged... MPIF material code
designations... Guaranteed minimum values...
Proof testing... Material properties... Process
design considerations

CISP Tour
Center for Innovative Sintered Products
The Pennsylvania State University

WEDNESDAY, JULY 29

Fully Dense PM Products—High-Alloy Tool
Steels, Superalloys, and Corrosion-
Resistant Near-Net Shapes
Edward J. Tarney, Chief Product Metallurgist
Crucible Specialty Metals

Manufacturing process of prealloyed powder to
achieve 100% density... High-alloy tool
steels... Nickel-base superalloys... Corrosion
resistant near-net-shape alloys... Composite
bars

PM Testing and Characterization
Donald F. Heaney, CISP Director
The Pennsylvania State University

Literature and resource summary... Highlight
PM-specific testing—mechanical, metallurgical,
functional, physical... Common PM
misconceptions

Secondary Operations on PM Parts
John Engquist, New Business Applications
Manager, PM Products
Burgess-Norton Mfg. Co.

Machining, heat treating, grinding... Steam
treating, resin/oil impregnation... Tumbling,
welding/joining, plating... Sizing/coining, hot
forging

Closing Remarks and Wrap-Up Discussion
Harb Nayar, President
TAT Technologies, Inc.

COURSE SCHEDULE

MONDAY, JULY 27

7:15–8:15 a.m.: Registration & Continental Breakfast
8:15 a.m.–12:15 p.m.: Morning Session
12:15–1:15 p.m.: Lunch
1:15–5:00 p.m.: Afternoon Session
5:00–6:00 p.m.: Reception with "Popcorn Press" Demo

TUESDAY, JULY 28

7:30–8:00 a.m.: Continental Breakfast
8:00 a.m.–noon: Morning Session
Noon–1:00 p.m.: Lunch
1:00–4:00 p.m.: Afternoon Session
4:30–6:00 p.m.: CISP Tour

WEDNESDAY, JULY 29

7:45–8:15 a.m.: Continental Breakfast
8:15 a.m.–noon: Morning Session & Wrap-up
Discussion
Noon: Lunch & Hotel Departures



Attendance at this course can be used for
professional credits toward PMT Level I
certification and PMT Level II recertification.

COURSE ORGANIZED IN COOPERATION WITH APMI



APMI International, headquartered in Princeton,
New Jersey, is a worldwide technical society for
individuals working in, or interested in
developments related to, PM technology.
Members of APMI are eligible for discounted
registration rates as shown on the registration
form. Membership includes the *International
Journal of Powder Metallurgy* and the annual
Who's Who in PM membership directory.

GENERAL INFORMATION

FEES

A complete schedule of fees is listed on the registration form. All fees include:

- Course registration, speaker handouts, binder, and portfolio bag
- *Fundamentals of Powder Metallurgy, Powder Metallurgy & Particulate Materials Processing and Hot Consolidation of Powders & Particulates* textbooks, *Standard 35*, and other literature
- Tour—Center for Innovative Sintered Products
- 3 breakfasts, 3 lunches, and breaks
- Certificate of course completion

Registration fees are based on your MPIF/APMI membership status. Employees of MPIF member companies who are not APMI members may join APMI with registration by selecting MPIF member joining APMI registration fees. Individuals who are not MPIF or APMI members may join APMI with registration and take advantage of lower Non-member joining APMI registration fees. Membership in either of these organizations is not required for course participation.

CANCELLATIONS

Registration fees will be refunded in full if a written request is received no later than June 26, 2009. Thereafter, written requests received up to July 17, 2009, will be subject to a \$325 cancellation fee. Registrants who fail to attend, and have not cancelled as noted above, are liable for the entire registration fee.

ACCOMMODATIONS

All course sessions will take place at the Penn State Conference Center Hotel, 215 Innovation Boulevard, State College, PA 16803, telephone: 814-863-5000. MPIF has reserved a block of rooms at the special rate of \$109 single/\$119 double; this rate is guaranteed for attendees registering during the advance registration period, no later than June 26, 2009. After that date, room reservations will be accepted on a space-available basis. Reservations at the Penn State Conference Center must be made through MPIF. Complete the hotel reservation information on the registration form below. Credit card number must accompany reservation to guarantee accommodation. Changes or cancellations must be made through MPIF until July 17. Thereafter contact the hotel directly. Hotel cancellation policy is by 6 p.m. day of arrival. After that you will be charged room and applicable taxes for one (1) night.

COURSE SPONSOR

MPIF is a federation of independent trade associations representing companies engaged in the application of powder metallurgy, including manufacturers of PM parts, metal powders, and PM processing equipment.

DISCOUNT CAR RENTAL

Hertz is the official car rental company for the course. Special discounted rates with unlimited mileage have been negotiated and are available from the week prior to through the week after the course. Advance reservations are recommended. To make a reservation, call 1-800-654-2240 and identify yourself with the course name and meeting CV#01CB0019.

AIRPORT TRANSPORTATION

US Airways Express, Northwest Airlines, and United Airlines have 20 commuter flights a day from several international airports to the State College Airport in State College, which is 5 miles from the Penn State Conference Center Hotel. Hotel shuttle service from and to the airport is provided free of charge. Hotel courtesy phone is available at the airport.

ADVANCE REGISTRATION

Take advantage of special pre-registration discounts by registering in advance. You may register by fax, online (using a credit card), or by mail. Registration and payment must be received no later than June 26, 2009, to qualify for the reduced rates. If you do not receive an acknowledgement by e-mail within 10 business days, please contact MPIF's registration department.

TO REGISTER:

You may either register online (using a credit card), or fill out the registration form and mail or fax it with full payment (payable to MPIF) to:



Metal Powder Industries Federation
105 College Road East
Princeton, NJ 08540-6692
FAX: 609-987-8523

Fax and mail registrations will be accepted until July 24. Late registrants should call MPIF at 609-452-7700.

Programming subject to change.

REGISTRATION FORM

You may either register online (using a credit card by visiting our Web site www.mpiif.org) or fill in the information below and fax or mail the form to MPIF.

Please register me for the **Basic Powder Metallurgy Short Course**

Full Name _____
 First Name for Badge _____
 Job Title _____
 Company _____
 Address _____
 City _____
 State/Province _____ Zip _____ Country _____
 Telephone _____ Ext. _____
 FAX _____
 E-mail _____

METHOD OF PAYMENT

- Check made payable to MPIF is enclosed.
 Payment to follow by mail.
 Please charge my course registration fee to:
 AMEX VISA MasterCard
 *Card Number _____
 Security Code _____ Expiration (Month/Year) _____
 (AMEX 4 digits on front, VISA/MasterCard 3 digits on back)
 Signature _____
 * Name on credit card and/or full billing address if different from info at left

COURSE REGISTRATION FEES (in U.S. Dollars)

Fee includes course registration, breakfasts, lunches, and breaks

	Advance by June 26	After June 26	Enter Amount
___ MPIF member	\$1,375	\$1,505	\$ _____
___ MPIF member joining APMI	\$1,480	\$1,610	\$ _____
___ APMI member	\$1,490	\$1,620	\$ _____
___ Non-member joining APMI	\$1,595	\$1,725	\$ _____
___ Non-member	\$1,695	\$1,825	\$ _____
Total Fees Enclosed			\$ _____

HOTEL RESERVATIONS

- I will not require a hotel reservation.
 Please reserve a room in my name at the Penn State Conference Center Hotel at the special rate of \$109 single/\$119 double. (Please circle one)
 Arrival Date _____ Departure Date _____
 Special instructions for hotel _____

Note: Credit card number must accompany reservation to guarantee accommodation. Hotel cancellation policy is by 6:00 p.m. day of arrival

RETURN TO:

Metal Powder Industries Federation
 APMI International
 105 College Road East
 Princeton, NJ 08540-6692
 Or FAX your registration to: 609-987-8523

MAKE COPIES OF FORM FOR MULTIPLE REGISTRATIONS