Annual Report 2013

Representing the European PM Industry

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Introduction by the President

Dear Members, Dear PM Colleagues, Dear Partners,

While communicating on 2013 EPMA’s achievements, I am very pleased to see how much our Association has been dynamic and successful and how exciting are all the ongoing developments and projects for the near future. Let’s remember that EPMA is a nonprofit Association, serving the PM industry since 1989, with 3 key missions:

• Firstly, to promote PM technology with a special dedication in Europe.
• Secondly, to represent the European PM Industry, within Europe as well as internationally.
• Finally to develop the future of PM.

These have been, over the past 25 years, and remain the core missions of EPMA for EPMA’s staff, council board, but first of all, for all of you, members, customers and clients, who are involved and active, with a high degree of energy. At this point I must thank my predecessor Ingo Cremer for his efforts over the previous six years and his assistance in enabling a smooth transition into my new role.

Today, EPMA has more than 300 members from all over the supply chain: from industry, research, end-component designers and parts manufacturers, specific equipment manufacturers, powder manufacturers, raw material suppliers and of course academics.

End user participation is vital and this is probably one of the challenges for the years to come, in order to have their number increased.

The first focus of EPMA is metal powders, which can be generated either by water or gas atomization or chemical processes. From free powders we jump to PM-parts: research, design, manufacturing, with processes such as press and sinter, Hardmetals, Diamond Tools, MIM, HIP or Additive Manufacturing. Historically, press and sintering has been there from the very beginning, followed in the early years by Hardmetals. Today, developments cover HIP or metal injection moulding, or even additive manufacturing which is the most recent sector in EPMA, just founded in 2013.

We are moving indeed in a growing and developing industry, which fosters the activity of its sectoral groups, including of course all equipment and machinery manufacturers who design and construct specific equipment for all these technologies.

With regard to developing the future of PM, I would really like to share with you the reasons I believe the PM technologies shall expand in the future.

• The first reason is the freedom in designing, compared with the forging and machining processes. With PM, we can achieve today and especially for small parts, very complex shapes which would be very difficult to obtain, or even not accessible at all with classical forging and machine processing.
• The 2nd reason why PM should expand is the raw material savings: because by using the powder metallurgy techniques per se, intrinsically, you use more or less the exact quantity of metal powder required for the final part, with no leftover chips, scraps, and waste; thus leading to big savings in raw material.
• The 3rd driver is the lower cost of PM, because PM leads to less machining and less assembling along the production chain, with less energy consumption, and with shorter lead-times.

And finally, PM should also expand in the future because of the new material possibilities it offers: alloys that are impossible to cast or forge by conventional means like special alloys for the aerospace industry or functional materials.

To conclude, you need to remember that globally PM has a great development potential because it is fast-moving, lean, green, cost efficient, and innovative. Our 25th Anniversary celebration in 2014 will be the perfect occasion to have a look back on these 25 years, as well as work together on EPMA’s challenges for the future.

Yours faithfully

Philippe Gundermann
EPMA President
2013 was a year when we finally saw at least signs of recovery in the European economy and also an improvement in the PM markets although not in a uniform manner. From an EPMA point of view we had a satisfactory financial performance supported by a small rise in membership numbers and good performance from the congress and projects. We have also undergone a number of personnel changes with Frances Holland retiring after over 35 years of outstanding service and two new part time members of staff joining us. These are Karen Powell looking after membership/project administration and Tammy Harris who will be responsible for developing our website.

We continue to maintain our efforts in training and education activities that included the EPMA PM Summer Schools held at the University of Trento in Italy and the second sintering Short Course, which took place in Vienna. Thanks must also go to the excellent efforts of our lecturers and as a result both the events proved to be successful.

The Euro PM2013 Congress & Exhibition was held in Gothenburg and the attendance was our second highest ever for a EuroPM Event with over 800 attendees and a sold out exhibition area of over 80 booths. The event saw the introduction of our new Keynote Awards and the four selected authors received a prize and later had their papers published in the Powder Metallurgy journal. We would like to thank our Swedish members and the members of the Technical Programme Committee who provided much useful support.

The year also saw the launch of our latest sectoral group covering Additive Manufacturing and we already have seen a well-attended open meeting with over 60 participants and at least three new members. The success of our club projects continues with both the EHMG and EPHG groups undertaking work on industry specified short term research. As far as the EU supported projects are concerned in addition to the ongoing Dira-Green project we pleased to advise that we have now joined the EFFIPRO project as a dissemination and training partner. In terms of our European level activity we continue to use our contacts within Eurometaux and other EU institutions to provide support and information for members on REACH and other EU environmental legislation.

In 2014 we will again have a strong programme of training activity, a Hardmetals Short Course will be held in Vienna and the Summer School will take place in Kraków, Poland. We have nearly 50 attendees booked for the Short Course and anticipate at least 50 more at the Summer School. The Euro PM2014 Congress & Exhibition will take place in Salzburg with a full topic programme including three special interest seminars. This year a number of innovations will be included relating to online materials and proceedings. We will also be holding for the first time a Young Engineers Day for 32 undergraduate students.

Yours sincerely

Jonathan Wroe, Executive Director
The EPMA’s 24th General Assembly took place 2-3 May in Munich, Germany. Members of EPMA met together in Munich for their Annual Meeting. Executive Board and Council meetings were held on 2 May, followed by an Annual Dinner at Zum Franziskaner, where participants were able to relax and network while enjoying the Bavarian hospitality.

The EPMA General Assembly took place on the following day at the Eurostars Grand Central Hotel. Retiring EPMA President Mr Ingo Cremer welcomed members to the meeting and gave a review of the last 6 years of the EPMA during his presidency and highlighted some interesting figures in the Auto market, including some technology trends before discussing future production trends. Mr Cremer thanked everyone for attending and for all of the support he has received during his time as EPMA President.

Mr Jonathan Wroe, Executive Director of EPMA, then gave an update of EPMA’s activities over the past twelve months which focussed on research projects, the wide range of working group activities plus the success of the PM training courses and Euro PM2012 Congress. He reported that association membership numbers are holding steady and EPMA produced a positive financial result in 2012.

The new EPMA Council was introduced for the 2013-2016 period; due to no new nominations the council has remained the same with the exception of Ms Jody Turin from Bodycote joining the council to represent the Hot Isostatic Pressing sector.

Mr Philippe Gundermann from Aubert & Duval was elected as the new President of the EPMA, with Mr Peter Kjeldsteen from Sintex a/s becoming the new Treasurer.

Mr Ingo Cremer receiving gift from Dr Cesar Molins on behalf of the EPMA Council.

The event concluded with meetings of the European Structural Parts Group (ESPG).

AGM Meeting in progress.

Euro PM2014 Congress and Exhibition
21 - 24 September 2014
The Messezentrum Salzburg, Austria
Authority of the General Assembly

Under the Constitution, authority is vested in the General Assembly of members, which meets annually. The Council, directly or through its Executive Board, implements policies and decisions of the General Assembly and ensures effective operation between Assemblies.

Council

The EPMA Constitution requires the Council to be composed of a minimum of seven individuals with voting power and appointed by the General Assembly. In practice, the Council has always been larger than its permitted minimum. Initially, it consisted of twelve members. In line with increases in the range and number of members it has subsequently been increased to the present sixteen. Seats on Council are allocated according to the number of Full Members in each of the sectors making up the EPMA’s spectrum of interest; at the same time, consideration is given to ensuring an equitable geographical spread of Council members across Europe.

The 24th General Assembly elected a new Council and Executive Board for the period 2013-16. Currently these are.

Representing PM Parts Sector
Dr Rainer Link (GKN Sinter Metals, UK)
Mr Peter Kjeldsteen (Sintex A/S, Denmark)
Dr Michael Krehl (PMG, Germany)
Dr César Molins (AMES SA, Spain)
Dr Harald Neubert (Miba Sinter GmbH, Austria)

Representing Powder Sector
Mr Greg Lavallee (Rio Tinto, Germany)
Dr Pierre Blanchard (Erasteel, France)
Mr Per Engdahl (Höganäs AB, Sweden)
replaced Mr Ulf Engström in February 2014
Mr Jim Shaul (Hoeganaes Corporation, Germany) replaced Mr Shashi Shukla in October 2013

Representing Equipment Sector
Mr Ingo Cremer (Cremer Thermoprozessanlagen GmbH, Germany)
Mr Thomas Lambrecht (Dorst Technologies, Germany)

Representing Refractory and Hard Material Sectors
Dr Lorenz Sigl (Plansee SE, Austria)
Dr Henk van den Berg (Kennametal Shared Services GmbH, Germany)

Representing PM Semi Sector
Mr Philippe Gundermann (Aubert et Duval Holding, France)

Representing MIM Sector
Mr Martin Blömacher (BASF AG, Germany)
Dr Bruno Vicenzi (MIMitalia, Italy)

Representing Hot Isostatic Pressing Sector
Ms Jody Turin (Bodycote AB, Sweden)

Contact details for current Council Members can be found on the EPMA website

Executive Board (2013-2016)
Seven Council members have been elected to the EPMA Executive Board for the period.

President
Mr Philippe Gundermann

Vice Presidents
Mr Ingo Cremer
Dr Michael Krehl
Dr Harald Neubert
Mr Thomas Lambrecht
Dr César Molins

Treasurer
Mr Peter Kjeldsteen
Outlook for 2014

As the world manages to continue with an uneven and somewhat uncertain recovery from the crisis we see differing outcomes in the PM industry, depending to a large extent on geographic influences and end user markets. From the EPMA point of view, we have instigated some significant changes to the way we work and our support infrastructure and these will stand us in good stead in the years to come. The range of R&D projects that we continue to deliver is a real success story.

2014 will see the 25th Anniversary of the EPMA and we will mark this landmark with two events. The first, for members only, will be a special dinner and one day seminar on the “Development of the European PM industry” which will take place in London on 5/6th June. Invitations have been circulated and as places are limited please contact Kate Blackbourne, if you have not done so already. The second will be a Reception during the Euro PM2014 in Salzburg which will take place in the historic Bishops Palace and will be open to attendees of the event.

On that note the prospects for Euro PM2014 are positive with the exhibition space already 80% booked and a full topic programme of high quality oral and poster papers under preparation in the five themed areas for this year’s event. In addition to our recently revised range of activities the event will see this year the inclusion of electronic versions of the event proceedings within the conference registration fee. It will also see us trialling a ‘Young Engineers’ Day’ designed to introduce undergraduate students to the world of PM as a potential career opportunity.

More details will be available shortly via the new Euro PM2014 event website. We will be organising and assisting a range of other events including the PM Summer School, the Hardmetals Short Course and two HIP “end user” days. 2014 will be a busy year as we continue to revise and develop relevant services for members wherever we can.
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• Highlights of 2013
• EPMA Membership 2013
• EU: Influencing Regulations and Legislation

• Highlights of 2013
  • New Additive Manufacturing Group Launched
  • Sintering Short Course held in Vienna
  • Successful Euro PM2013 in Gothenburg

Once again EPMA’s unique role as a “cross material” industry orientated organisation is acknowledged by both members and outside agencies. The Secretariat continues to deliver a wide range of services as can be seen from this report. In addition to promotion and project management work, we are active in benchmarking, statistics collection, production of brochures and guides, plus support to our working and sectoral committees including the newly formed Additive Manufacturing Group.

A significant effort has been made in developing the underlying architecture and content of our IT systems to enable us to communicate more effectively with our members and the wider PM community. A new customer database has been installed and new systems for managing our congress abstracts and papers implemented. The latest stage in this major overhaul is the recent launch of a revised EPMA website which incorporates a number of advances that will give better and more flexible access for members and simplify the way visitors navigate the site.

A completely redesigned home page includes an interactive banner providing quick access to the Member Directory and features a Twitter feed showing the latest EPMA news and a showcase of new EPMA members. There is also now a link to the new EPMA YouTube archive with over 40 videos relating to our activities and PM products. Thanks to the hard work of the team it is envisaged the newly updated EPMA.com website will continue to be developed and expanded over the coming months.

• Membership

Overall membership remained stable at 306 with corporate members improving by four to 176 companies. The Membership totals by year are shown below. Corporate members are based in twenty-eight countries worldwide.

Membership Subscription Rates
It was agreed at the November 2013 Council meeting that 2014 membership rates should again be frozen at 2008 levels; therefore for 2014 the membership fees will remain unchanged for the sixth successive year reflecting the good financial position of the Association.

In addition it was agreed that in order to support micro and new start-up companies a third sub-category of full member would be created. Therefore, for 2014 full members would be divided into Large companies, that is those with PM related turnovers greater than €10million, SME companies with PM related turnovers between €3 and €10million and Micro/Start up companies with PM related turnovers less than €3million. Full details of the fees are available on the EPMA website.

![Graph of Total Membership Numbers and Income 2006-2013](image)

EPMA Membership 2013 by Category - total 306

- Full, 107
- Affiliate, 13
- Associate, 56
- Individual, 130
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• EU: Influencing Regulations and Legislation
• Sectoral Groups
• Working Groups

• EPMA Membership

New members in 2013
EPMA was pleased to welcome the following into membership during the year.

Full Members
Carbosint SpA
Dymet Alloys
Schneider Electric

Silicon Plastic srl
Silicon Plastic molding & components
System 3R International AB
System 3R

Associate Members
Arcast Inc
ATI Powder Metals
Huacheng Moulding (Changshu) Co. Ltd

Manufacturing Technology Centre (MTC)
Orton Ceramic Foundation
Orton

Individual Members
Bari, Klaudio, Dr
Bidulsky, Robert, Dr
Causton, Bob
Lengauer, Prof. Walter
Motmans, Filip Dr
Vleugels, Jozef
• **EU: Influencing Regulations and Legislation**

The EPMA has, through a process of ongoing lobbying and positive contributions to debate, been able to position itself to participate in and influence, the EU’s formulation of regulations and legislation.

**REACH and other EHS Legislation Activities**

In October 2013 the EPMA issued its 98th REACH News Flash. This regular email news flash informs over 320 interested EPMA member contacts about the latest developments of REACH and related legislation.

The EPMA continues to follow the EHS legislation, especially REACH and CLP, to assess their potential impact on the PM industry. In parallel, EPMA continues to follow the development of Exposure Scenarios, which establish the threshold levels of metals in our industry. Nickel thresholds for inhalation are especially followed by EPMA who are in close contact with the Nickel REACH Consortia. EPMA also works with and supports other metal institutes in their efforts to defend their sectors since the EPMA is a multi-metallic association. Thus, among others, the EPMA is following the Lead Specific Concentration Limits issue, which may have consequences on the PM industry and supports Eurometaux, who defend the metal industry in this special case.

• **Sectoral Groups**

**European Hard Materials Group (EHMG)**

Chairmen: Dr Leo Prakash (WTP Materials Engineering), Dr Steve Moseley (Hilti AG)

The EHMG activities of 2013 were mainly the organisation and coordination of the Club Projects, a General Open Meeting and a Special Interest Seminar on “Novel coating technologies for machining and wear applications” during the last Euro PM2013 and a WINTEREV Workshop in Barcelona, which attracted the record attendance of 42 participants.

In addition the EHMG also organized a special open meeting on 6 June 2013 with a networking dinner on the 5 June in Reutte during the PLANSEE SEMINAR 2013 with the kind support of CERATIZIT, which sponsored the event and PLANSEE.

The EHMG will also organize an intensive short course on Hardmetals in 2014 on the 10 - 11 April 2014 in Vienna together with the RET.

**European MIM Group (EuroMIM)**

Chairmen: Dr Frank Petzoldt (Fraunhofer IFAM), Dr Bruno Vicenzi (MIMitalia)

The EuroMIM group covers over 75 organisations from across Europe and from all parts of the MIM supply chain. The current co-chairmen are Bruno Vicenzi from MIMitalia and Frank Petzoldt from IFAM Bremen, supported by Marco Actis Grande and Keith Murray. Current activities can be divided into four parts:

**Promotion of European MIM**

An updated version of the “Introduction to MIM” Booklet was launched and circulated prior to the Euro PM2013. It includes new material as well as case studies developed as part of the “Spotlight on PM” promotion.

**Standards and Legislation**

EuroMIM was active with other groups to provide inputs the ISO TC119 subcommittee including the standard on MIM materials which was published during 2012.
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Technology and Quality Development
During the past seven years we have undertaken an annual benchmarking exercise for MIM parts makers across Europe. We also have introduced in the last three years a trends survey for the sector which adds a wider number of companies.

Roadmap
The EuroMIM meeting in Gothenburg attracted over 50 attendees and provided a first step in obtaining feedback and information for the new EPMA roadmap.

European Structural Parts Group (ESPG)
Chairmen: Mr Peter Kjeldsteen (Sintex), Dr Cesar Molins (AMES)
The ESPG held its second ESPG General and Parts Makers meetings during the Euro PM2013 after the first session in May. During the ESPG General meeting an interesting panel discussion was organized on the topic “Is there a way to optimize the R&D of Ferrous Structural PM in Europe?” with the kind participation of Paul Beiss, Volker Arnhold, Pierre Blanchard and Lars Nyborg. It seemed at this meeting that dedicated ESPG Meetings will be needed in the future in order to define clear targets for the FS PM industry and also because of the EPMA Roadmap update.

PMRADNET
This group comprises the 13 leading PM related Universities and research groups across Europe. Partners continue to work on a bilateral basis on student exchanges, joint projects and use of equipment. They also provide a number of the lecturers for the PM Summer Schools and the Sintering Short Course.

European PM HIP Group
Chairmen: Mrs Adeline Riou (Erasteel), Mr Anders Eklund (Avure)
The group now covers over 40 organisations from across the supply chain. Four sub groups cover; the promotion of PM HIP technology, conferences and seminars, R&D/benchmarking activity plus the development of international standards for the PM HIP sector. There have been regular conference calls plus a meeting in Gothenburg. A revised version of the “Introduction to HIP brochure” has been issued and work has started via a sub-committee on the development of first a national and then an international standard on the measurement of Argon in PM HIP components.

A new development has been the coordination of one day end user workshops working with local organisations and in 2013 a very successful event was held by SFM in Paris with over 80 attendees. Two events are planned for 2014 in Germany and the UK.

European Additive Manufacturing Group (EAMG)
Chairmen: Ralf Carlström (Höganäs) and Claus Aumund-Kopp (Fraunhofer IFAM)
Approved by the Council in May 2013, the new EAMG has started to build a programme and the following activities have been initiated:
• Press release in June 2013
• Online Survey of the EPMA members to check their expectations and their possible contributions. Replies of 22 participants were analysed.
• Release of a 4 page A5 Flyer on Additive Manufacturing at Euro PM2013
• A Special Interest Seminar during Euro PM2013 on the “State of the Art and Emerging Markets for Additive Manufacturing” co-chaired by Claus Aumund-Kopp and Ralf Carlström.
• External advertising to the PM and AM community: A first mailing list of ca. 100 persons has been drafted by the EPMA for this purpose.

The EAMG first open meeting also took place at Frankfurt Airport on the 29 January 2014 with the participation of 60 attendees from 58 organisations.
Highlights of 2013

EPMA Membership 2013

EU: Influencing Regulations and Legislation

Working Groups

Environmental Health and Quality (EHQ)

Benchmarking is a requirement under both ISO9000:2000 and ISO TC16949, and since 2001 EPMA has offered companies the chance to benchmark their operations externally. The procedure comprises 24 questions covering all the productivity benchmarks for the PM industry such as Delivery Achievement, Productivity, Energy usage, Overall Equipment Effectiveness, Wage, Absenteeism etc. The 2013 exercise saw a total of sixteen sites participating in the programme.

We also maintain the service advertising EPMA member quality accreditation on the EPMA website, which remains a popular area amongst the 120,000 visitors per year to the site. EPMA also provides, through the members’ area of the website, information on REACH (Documents to Download, Letters to suppliers, Letters to Customers, Workshop contents, useful links etc).

Research Education Training (RET)

Chairmen: Prof José Torralba (UC3M), Dr Pierre Blanchard (Erasteel Kloster AB)

Based on a RET initiative, the 25-26th March 2013 saw the second in what is planned will be a series of EPMA Short Courses. The RET will run, together with the EHMG, a third Short Course on “Hardmetals” in Vienna on 9 - 11 April 2014.

European PM Industry Roadmap - Update

The first European PM Industry Roadmap “Vision 2020: Future Developments for the European PM Industry” was published by EPMA in January 2004. This 16-page document addressed the main PM technologies used by the PM industry at that time, which turned out to be a very efficient promotion and lobbying tool for the PM community.

However, after almost ten years, the Roadmap naturally needed some updates to take into account the emergence of “new” technologies such as HIP and Additive Manufacturing and “new” concepts like nanomaterials, sustainability and energy efficiency. This is why the Council has given a mandate to the RET Working Group, co-chaired by Prof. José Torralba (UC3M) and Dr. Pierre Blanchard (Eramet-Erasteel), to coordinate an update of the Roadmap with the support of our Sectoral Groups.

Work started on this update during the middle of 2013 with a first draft document due to be produced by mid-2014 and a final version by the end of the year. Feedback has now been received from members of all the sectoral groups and is currently being consolidated.

EPMA Publications

EPMA online PM publications catalogue is one of, if not the most comprehensive listing of Powder Metallurgy and associated titles in Europe.

All publications featured are English language titles, with some titles exclusive to the EPMA.

www.epma.com/publications
• **PM Summer Schools**

Since it was agreed by the EPMA Council in 2009 that the EPMA would organise a Summer School, whose costs would be underwritten by the Association’s reserves, we have held successful events in Kosice, Madrid, Dresden and San Sebastian.

The very positive results from these events meant that we held a fifth event in 2013 at the University of Trento in Italy. We received 87 applications for the 52 places and, thanks to the input from our 25 guest lecturers and the support of Professors Alberto Molinari and José Torralba, the event was again a great success. Participants: 25 from industry, 21 from academia and 6 from research institutions, came from 13 countries throughout Europe. They had an opportunity to visit the University of Trento laboratories where they had some hands-on experience with: “Impact resistance of low alloyed PM steels”, “Microstructural analysis and microhardness” and “Hardenability and sinter hardenability by dilatometry”. Participants also visited two PM companies, Mimest, a typical MIM parts maker, and Eurocoating, a biomaterial company.

The Summer School Gala Dinner was held in the basement of the restaurant “Doc”, where the traditional Summer School Singing Contest rounded off a very enjoyable evening. Thanks to the on-going, high level of demand from members, academia and end users we are holding another Summer School this year. It will take place in Kraków, Poland, 16 - 20 June 2014, hosted by Professor Jan Kazior from the Cracow University of Technology and coordinated, as usual, by Professor José Torralba.
• **Sintering Short Course**

Following on from last year’s successful Short Course, the EPMA held a second Sintering Short Course in Vienna, 24 - 26 March, focusing on Advanced Processes and Materials. Sixty-one engineers and scientists from throughout Europe joined with sixteen speakers drawn from both industry and academia to examine the practical capabilities and applications of sintering technology as applied to the powder metallurgy process.

Lectures included: Sintering Atmospheres, High Temperature Sintering, Hot Isostatic Pressing, Spark Plasma Sintering, Modelling of Sintering and Sintering of PM High Speed Steels amongst others. Participants also had the opportunity to discuss and explore problems and case studies with the finest experts in the field.

![Lecture Hall](image1.jpg)

![Sintering Short Course, Vienna](image2.jpg)

**Thinking about using Powder Metallurgy?**

Then find out more with

**Design for PM**

An e-learning resource for designers and engineers

[www.designforpm.net](http://www.designforpm.net)
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- Education and Training Projects
- Publicly Supported Projects
- Research and Development Projects
- Member Funded Club Projects

**Research and Development Projects**

As far as research and development work is concerned, the projects can be divided in two. Firstly large scale, mainly publicly financed projects and then those projects where funding has been co-ordinated on a private basis by the Secretariat using members’ direct funding. This method has produced a number of smaller scale, but equally successful projects e.g. Ultrasonic Fatigue Testing of Hard Materials and Bioavailability. During the last four years some 9 projects valued at over €370,000 have been successfully completed some of them now entering a second or even third phase.

- **EPMA Projects**
  - Global Property PM Database
  - Club Projects
  - EU Projects
  - Roadmap

**Member Funded Club Projects**

**Global PM Property Database**

The online database GPMD was launched in 2004 as a joint project between the leading regional PM trade associations, the EPMA and its sister organisations in North America (MPIF) and Japan (JPMA). This year saw more ferrous data uploaded so the content has been increased to a total of nearly 4000 lines of high quality data covering both ferrous and non-ferrous PM materials as well as MIM. The number of registered users continues to grow steadily and has now exceeded 10,000.

A major step forward in expanding the reach of the GPMD has been the agreement originally signed in 2009 with Granta Design based in Cambridge, England a leading company in materials information technology. As a result the GPMD data is now available to a range of end users as part of an integrated and comprehensive materials information management system called GRANTA MI.

The need for members to be proactive in helping in providing information is essential for the growth and success of this long standing and valuable project. New data has been uploaded this year and a revised marketing strategy is being developed.

Website continues to attract new visitors
The EPMA continues to coordinate several Club Projects in order to improve the synergy of the PM community. All EPMA Club Projects are open to Corporate EPMA Members. All Projects and Project proposals are presented in detail on the EPMA web page: www.epma.com/projects

Below you will find a short update of four new and on-going club projects:

**Simulation of Fatigue Crack Growth in Hardmetal at a Mesoscopic Scale (Phase I and Phase II) Projects (in progress):**

After the successful completion of the first phase of the “SIMU-CRACK” project the EPMA has decided together with IWM Aachen and CIEFMA UPC Barcelona to launch a new project on this area called SIMU-CRACK Phase II. For this project the National Physic Laboratory NPL, London joined the contractors’ team. The consortium members agreed on the proposed plan and necessity to continue the project based on the interesting results obtained in Phase I. Thus the Phase II started in June 2013 with the support of the industrial partners.

**Ultrasonic Fatigue Testing of Hardmetals in the gigacycle regime Project Stage 2:**

The participants of the “UFTH 2” project met in Essen, Germany in June in a final meeting kindly hosted by Kennametal to recapitulate the progress of the project and agree on the next steps. The Consortium agreed on the principle of ultrasonic 3 points bending tests for further fatigue measurements and some further measurements with the existing samples. The corresponding “UFTH 2a” project has now been agreed by the consortium and should start around Q1 2014.

**Resistivity of Hardmetals (in progress):**

After the end of the Stiffness of Moduli project with NPL London another club project on Resistivity of Hardmetals was launched in partnership with NPL and CEIT San Sebastian. The project will measure electrical resistivity and thermal property data for a wide range of hardmetals between room temperature and 800 ºC. The project gathers 6 companies and the kick-off meeting took place in April at NPL.

**Toughness of PM HIP Steel stage 1A**

The project was completed on budget in June 2013 and comprised seven members of the PM HIP group with the work being contracted to IWM Aachen. It achieved its objectives which were to collect and determine data of toughness and fracture toughness for PM-HIP material and chemically identical, conventionally produced material.

A larger second stage proposal involving the generation of data relating to certain selected grades of material is currently at the contract level and should be launched in the second quarter of 2014.
EPMA is currently involved in two EU part funded projects.

1. **DIRA-GREEN**

Firstly DIRA-GREEN, where the EPMA is involved as a Dissemination Partner. This three year Project with a budget of €3m is due to complete in October 2014 and is coordinated by the EPMA Member R&D Centre ATEKNEA based in Budapest. The aim of the research is to develop a new inspection tool for the improved assessment of green parts, which will prove affordable for SMEs. The consortium consists of technical and end-user SMEs supported by associations both from the PM and the NDT sector while the development is carried out by research centres and a university. More information can be found at the project website www.diragreen.eu

2. **EFFIPRO**

The second project is EFFIPRO (Energy EFFIcient PROcess of Engineering Materials) which was launched in September 2013. This Project is also part funded by the European Commission in the 7th Framework Programme. The objectives of this three year Project are to develop a significantly shorter PM process using a new concept of hybrid electrical current assisted sintering and hard materials with improved properties, thus resulting in a more energy efficient and cost effective process. The developments of this Project will directly impact on the cutting tools industry as tools with enhanced properties and a longer lifetime will be obtained using a highly efficient process. Two types of parts will be machined, one for the aerospace sector and the other for the automotive sector.

For this Project, the EPMA has joined a Consortium of eight members including The University of Seville (USE), Fraunhofer IFAM, AMES Group (Aleaciones de Metales Sinterización), MIRTEC S.A., KYOCERA UNIMERCO, Airbus Group, EPMA and TECNALIA is the Project Leader. The EPMA’s main responsibility is for the dissemination and training activities and has already produced a publicity leaflet, banner, the first bi-annual newsletter and developed a project website (www.EFFIPRO.org).
• Euro PM2013 in Gothenburg

Gothenburg, the leading industrial centre of Sweden, hosted this year’s EuroPM Congress organised and sponsored by the EPMA which attracted delegates from more than 40 countries. The event which was the first EPMA congress held in Sweden since 1982 saw over 200 Oral and Poster presentations. Indeed with over 800 attendees it was the second largest EuroPM event we have held to date. The event also included a sell-out exhibition area with 85 stands covering companies from all parts of the PM supply chain.

The latest innovation for EuroPM conferences was the awarding of four special keynote paper awards to those papers selected as having the highest merit. The winners were Miss Helen Dugdale from Rolls Royce plc., Dipl. Engineer Markus Hadyn from Plansee SE, Dr. Iñigo Iturriza from CEIT and Mr. Per Lindskog, PM Consultant from Sweden. They each received an award and the papers have subsequently been published in the ‘Powder Metallurgy’ journal.

A full social programme included a city reception and several factory visits in addition to the traditional Congress Dinner.

Feedback from delegates has been positive with note being duly taken of any areas in need of improvement in terms of organisation and content. The EPMA extends its sincere thanks to the many people who worked on the organisation of Euro PM2013 in particular the congress co-chairmen Professor Lars Nyborg and Mr Ulf Engström.

We would also like to thank the Technical Programme Committee and delegates for their support, which is much appreciated. The three volumes of Congress Proceedings contain the text and key figures of the papers presented, both oral and poster, along with author details and references. Volumes can be purchased in CD ROM format or individually as hard copies. Details are available on the EPMA website in the Publications section.

Work is already underway for Euro PM2014 to be held in Salzburg, Austria from the 21 - 24 September 2014. To receive further information on this and other EPMA events please contact the EPMA Secretariat, or visit www.epma.com

• EPMA 2013 Distinguished Service Awards

During the Congress Plenary Session EPMA President Mr Philippe Gundermann presented the traditional EPMA Distinguished Service Awards to Dr Brian Roebuck of the NPL London, Professor José Torralba of University Carlos III Madrid and Dr John Dunkley of Atomising Systems, Sheffield in recognition to their services to the PM Industry over many years.
Annual Report 2013

- Euro PM2013
- Distinguished Service Awards
- Euro PM2013 in Pictures
- Other Activities in 2013

• Euro PM2013 in Pictures

![Winners of the EPMA Keynote Awards 2013](image1)

Winners of the EPMA Keynote Awards 2013

![EPMA Showcase](image2)

EPMA Showcase

![Philippe Gundermann and Mrs Annely Hulthén the Mayor of Gothenburg at the City Reception](image3)

Philippe Gundermann and Mrs Annely Hulthén the Mayor of Gothenburg at the City Reception

![Delegates Networking in the Exhibition Hall](image4)

Delegates Networking in the Exhibition Hall

![Delegates at the Welcome Reception](image5)

Delegates at the Welcome Reception

![Dr Henrik Karlsson (right) awarded Dr Dimitris Chasoglou (Swerea KIMAB) a Scholarship from the Swedish Steel Producers’ Association](image6)

Dr Henrik Karlsson (right) awarded Dr Dimitris Chasoglou (Swerea KIMAB) a Scholarship from the Swedish Steel Producers’ Association
• Other Activities in 2013

Aircraft Interiors Expo 2013, Hamburg, Germany

In April 2013 the EPMA exhibited at the Aircraft Interiors Expo, Hamburg, which played host to the world’s largest display of aircraft interiors products and services and attracted nearly 9,000 visitors to the 3-day event. The annual event recorded an increase of 12-percent of visitors to the show on the previous year and featured over 500 exhibiting companies from 26 countries, covering a record floor space on 18,000 sq m – the largest footprint to date. The Aircraft Interiors Expo was co-located with the World Travel Catering & On-board Services Expo.

Auto Aero Exhibition, Farnborough, UK

In February the EPMA exhibited for the first time at the Auto Aero Exhibition, also known as the Southern Manufacturing & Electronics Exhibition, Farnborough, UK. Southern Manufacturing & Electronics is one of the UK’s premier industrial business exhibitions, dedicated to showcasing a wide range of industrial and engineering innovations from Europe’s leading suppliers. The 2-day exhibition, which offered visitors a range of industrial seminars on highly topical subjects, made for an interesting mix of visitors to the event.

The event covered many industrial sectors, this made for an excellent opportunity to showcase the advantages of using the PM process and components produced, to a range of industrial applications and to open up discussions with potential new target markets.

The Auto Aero 2013 event attracted nearly 8000 visitors from across Europe and was up 10% on the previous year attendees making for one of the larger events at which the EPMA has exhibited at so far this year.

EPMA Launches New Website

After over 6-months of development work the EPMA has launched a new website. The new EPMA website went live on the 10th June. The newly designed website will be underpinned by a Joomla! system enabling the content and services to be added more freely than the previous version.

The new EPMA website has carried over a great deal of existing content from the previous version, making it one of the most comprehensive resources of Powder Metallurgy related information on the internet. A range of new services for Members and Non-Members is under development along with a rolling programme of updating the Powder Metallurgy Case Studies through the Spotlight in PM programme, to ensure the new site is current and relevant to end-users.
Financial Statements

EPMA is governed by Belgian Law of 25 October 1919, as amended by that of 6 December 1954. The Association, “un Association internationale poursuivant un but scientifique”, is therefore exempt from Belgian income tax. The Secretariat, situated in the UK, is registered for UK VAT. EPMA works to a calendar year. The Articles of Association require that members contribute towards the expenses of the EPMA through an annual subscription; the generation of funds from other sources and activities compatible with its objectives is permitted. Belgian law requires that the EPMA Council shall submit the accounts for the past year and the budget for the following year for the approval of the General Assembly. Set out below are the accounts for 2013, with those of 2012 for comparison.

ACKNOWLEDGEMENTS: Accounts prepared and audited by Turner Peachey Chartered Accountants, Shrewsbury, UK.

### Income

<table>
<thead>
<tr>
<th></th>
<th>2013 (€)</th>
<th>2012 (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership fees</td>
<td>381,646</td>
<td>387,093</td>
</tr>
<tr>
<td>Publications and promotions</td>
<td>5,592</td>
<td>2,500</td>
</tr>
<tr>
<td>Conferences, seminars and courses</td>
<td>711,501</td>
<td>528,552</td>
</tr>
<tr>
<td>EU and other projects</td>
<td>166,651</td>
<td>248,343</td>
</tr>
<tr>
<td>Summer School</td>
<td>29,900</td>
<td>25,550</td>
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<tr>
<td>Bank Interest Received (gross)</td>
<td>3,810</td>
<td>2,253</td>
</tr>
<tr>
<td></td>
<td>1,299,100</td>
<td>1,194,291</td>
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</table>

### Expenditure

<table>
<thead>
<tr>
<th></th>
<th>2013 (€)</th>
<th>2012 (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries social charges and pensions</td>
<td>349,871</td>
<td>398,840</td>
</tr>
<tr>
<td>Office overheads</td>
<td>57,896</td>
<td>54,645</td>
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<tr>
<td>Subsistence and travel</td>
<td>16,461</td>
<td>14,906</td>
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<tr>
<td>Publications</td>
<td>8,402</td>
<td>10,891</td>
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<tr>
<td>Conferences, seminars and courses</td>
<td>456,769</td>
<td>314,179</td>
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<tr>
<td>Professional and membership fees</td>
<td>32,928</td>
<td>26,030</td>
</tr>
<tr>
<td>Council and meetings expenses</td>
<td>15,903</td>
<td>5,761</td>
</tr>
<tr>
<td>Promotions</td>
<td>13,979</td>
<td>24,330</td>
</tr>
<tr>
<td>Bank and credit card charges</td>
<td>4,373</td>
<td>4,897</td>
</tr>
<tr>
<td>Taxation on interest received</td>
<td>491</td>
<td>372</td>
</tr>
<tr>
<td>Exchange rate differences (note 4)</td>
<td>29,201</td>
<td>-22,151</td>
</tr>
<tr>
<td>Printing, stationery, postage and sundries</td>
<td>6,133</td>
<td>6,665</td>
</tr>
<tr>
<td>EU and other projects</td>
<td>208,861</td>
<td>243,055</td>
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<tr>
<td>Summer School</td>
<td>41,696</td>
<td>28,604</td>
</tr>
<tr>
<td>Depreciation</td>
<td>6,998</td>
<td>6,371</td>
</tr>
<tr>
<td></td>
<td>1,249,962</td>
<td>1,117,395</td>
</tr>
</tbody>
</table>

**Surplus of income over expenditure**

|                      | 49,138   | 76,896   |

**Expenditure relating to 2014/2015/2016**

|                      | 50,288   |

**Expenses relating to 2013/2014/2016**

|                      | 71,443   |

**Net Surplus of income over expenditure**

|                      | (1,150)  | 5,453    |
### BALANCE SHEETS  AS AT 31 DECEMBER 2013

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>€</td>
<td>€</td>
</tr>
<tr>
<td><strong>NOTES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FIXED ASSETS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment</td>
<td>20,999</td>
<td>22,682</td>
</tr>
<tr>
<td><strong>CURRENT ASSETS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debtors</td>
<td>404,624</td>
<td>404,169</td>
</tr>
<tr>
<td>Bank accounts</td>
<td>1,116,711</td>
<td>1,097,412</td>
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<tr>
<td><strong>TOTAL CURRENT ASSETS</strong></td>
<td>1,521,335</td>
<td>1,501,581</td>
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<tr>
<td><strong>CURRENT LIABILITIES</strong></td>
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<tr>
<td>Creditors</td>
<td>610,512</td>
<td>610,498</td>
</tr>
<tr>
<td></td>
<td>910,823</td>
<td>891,083</td>
</tr>
<tr>
<td></td>
<td>931,822</td>
<td>913,765</td>
</tr>
<tr>
<td><strong>TOTAL CURRENT LIABILITIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>REPRESENTED BY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accumulated fund at 1st January</td>
<td>913,765</td>
<td>819,593</td>
</tr>
<tr>
<td>Adjustment for Swiss VAT</td>
<td>19,207</td>
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<tr>
<td>Adjustment re 2011 conferences</td>
<td>-</td>
<td>88,749</td>
</tr>
<tr>
<td>Less: Surplus of expenditure</td>
<td>1,150</td>
<td>-</td>
</tr>
<tr>
<td>Add: Surplus of income over expenditure</td>
<td>-</td>
<td>5,453</td>
</tr>
<tr>
<td></td>
<td>931,822</td>
<td>913,765</td>
</tr>
</tbody>
</table>
## NOTEP THE FINANCIAL STATEMENTS - YEAR ENDED 31 DECEMBER 2013

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. FIXED ASSETS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment brought forward</td>
<td>22,682</td>
<td>17,019</td>
</tr>
<tr>
<td>Additions during the year</td>
<td>5,315</td>
<td>12,034</td>
</tr>
<tr>
<td>Disposals during the year</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Less: depreciation @ 25%</td>
<td>6,998</td>
<td>6,371</td>
</tr>
<tr>
<td><strong>2. DEBTORS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sales ledger balances</td>
<td>404,624</td>
<td>404,169</td>
</tr>
<tr>
<td>Other debtors</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total Debtors</strong></td>
<td>404,624</td>
<td>404,169</td>
</tr>
<tr>
<td><strong>3. CREDITORS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PM conference amounts due</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Purchase ledger balances</td>
<td>5,476</td>
<td>4,235</td>
</tr>
<tr>
<td>Membership fees received in advance</td>
<td>389,959</td>
<td>383,883</td>
</tr>
<tr>
<td>PAYE owed to inland revenue</td>
<td>12,321</td>
<td>15,838</td>
</tr>
<tr>
<td>Taxation</td>
<td>4,014</td>
<td>3,996</td>
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<tr>
<td>Professional fees</td>
<td>5,685</td>
<td>5,827</td>
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<tr>
<td>Other sundry creditors</td>
<td>19,500</td>
<td>35,817</td>
</tr>
<tr>
<td>EU and other projects</td>
<td>169,478</td>
<td>156,812</td>
</tr>
<tr>
<td>VAT</td>
<td>4,079</td>
<td>4,090</td>
</tr>
<tr>
<td><strong>Total Creditors</strong></td>
<td>610,512</td>
<td>610,498</td>
</tr>
<tr>
<td><strong>4. EXCHANGE RATES</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The figures in the Income and Expenditure accounts have been converted at the actual rate of exchange for each month. The Balance Sheet figures have been converted at the closing rate of exchange as at 31st December 2013, which was £1 to €1.203104 (2012 £1 to €1.230172) and differences arising are shown in the Income and Expenditure account as ‘exchange rate differences’.
| **5. EXPENDITURE IN ADVANCE** |                |
Expenditure of €50,288 has been included in the accounts this year which relates to 2014/2015/2016. This has been shown as a separate item in the profit and loss account.