Dr. JOHN ORMEROD
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SUMMARY

Dr. John Ormerod graduated from the University of Manchester, UK with a BSc, MSc and PhD in Metallurgy in 1975, 1976 and 1978 respectively. He has over twenty five years of research, product development, and manufacturing experience in the area of permanent magnets and magnetic materials. He has published and presented numerous papers in the field of magnetic materials. He has spent time in Europe working for Phillips and in the USA working for SPS Technologies (Arnold Engineering) in their magnetic materials businesses.
In 2002 John was named President of Res Manufacturing in Milwaukee, Wisconsin. Res is a manufacturer of stamped metal components, assemblies and value added services serving diversified industries. They are a major supplier of components and assemblies to Tesla Motors for their Model S and future Model X electric vehicle platforms.
He provided expert testimony on issues of invalidity during the recent rare earth magnet ITC investigation No. 337-TA-855 and is currently a technical consultant evaluating prior art for the Rare Earth Permanent Magnet Industry Alliance.
In 2015 John founded JOC LLC a consultancy specializing in the magnetics and metals-related industries.
He serves on the Advisory Board of Bunting Magnetics Company and is Senior Technology Advisor to Magnet Applications Inc. and Niron Magnetics.

EXPERIENCE

JOC LLC ***1/15 to present***
Loudon, TN

Principal and Owner

JOC LLC provides consultation services to the magnetics and metal-related industries. Areas of expertise include technology assessment, IP analysis and patent review, industry analysis, operations management, strategic planning, budgeting, new product planning, acquisition due diligence, and sales and marketing consultation.

Clients include the following; major magnet manufacturers, medical device R and D companies, motor manufacturers, tier 1 automotive suppliers and new magnetic material R and D businesses.

Res Manufacturing Company ***9/02 to 12/14***
Milwaukee, WI

Res Manufacturing is an innovative, privately held, ISO/TS 16949 certified manufacturer of stamped metal components, assemblies and value added services. The company was founded in 1907 and has a solid reputation in the markets it serves (automotive, clean-technology industries, agriculture, turf-care, commercial lighting, and commercial cookware).

In 2012, Res was the recipient of a Tesla Motors supplier award for total quality and time to market as well as a supplier of the year award from a tier one Honda supplier. Key core competencies include:

innovative equipment, tool and process design; medium to high volume progressive die stamping supported by welding, next level assembly, and a wide range of outside services.

President/COO

- **Grew revenue three fold over 10 years with improved margin and cash flow performance.**
- **Major supplier to Toyota, Honda and GM Tier 1's.**
- **Implemented market and diversification strategy.**
- **Increased value added content of products and services.**
- **Began company-wide implementation of Toyota Production System.**

The Arnold Engineering Company ***12/90 to 9/2002***
Marengo, IL

Arnold is the largest U.S. manufacturer of magnetic materials and components with revenues approximating $150 million. Headquartered in Marengo, IL., with plants located throughout the U.S., U.K. and China, it serves a wide customer base covering international markets for automotive, industrial, consumer, office automation, medical and appliances.

Vice President/General Manager, Technology and Bonded Magnets **3/97 to present**

- **P&L responsibility for multi-plant business unit (ISO/QS9000 facilities) with 2001 revenues exceeding $50 millions, operating in both engineered and commodity markets.**
- **Direct short and long range planning and development initiatives; identify strategic opportunities for expanding into new markets and development of new products.**
- **Key account management in automotive, industrial and consumer markets, both domestic and international.**
- **Implemented two major plant expansions with capital expenditures of $8 million during 1997.**
- **Responsible for corporate new product development, advanced magnetic materials commercialization and the Magnetics Technology Center. New products represented approximately 15% of total revenues in 2001.**
- **Member of team that established JV in PRC for sourcing, assembly and manufacturing.**
- **Member of several acquisition teams; relocated and consolidated $10 million acquisition (RJF) in 1997.**

Vice President/General Manager, Technology and Permanent Magnets **12/93 to 3/97**

- **P&L responsibility for multi-plant operations with revenues of $36 million in 1996.**
- **Achieved 45% sales and 429% profitability growth through new product introduction, improved customer service and manufacturing cost reduction.**
- **Member of Flexmag Industries due diligence team. Achieved first year (1996) financial objectives (profitability and R.O.E.C.) committed to the SPS Board of Directors.**
- **Member of RJF due diligence team (acquired March 1997).**
- **Member of Swift Levick (UK) due diligence team (acquired July 1996).**

Vice President, Technology and Quality Assurance **12/90 to 12/93**

- **Rebuilt Arnold Engineering's technical competence and product and process development activities.**
- **Increased quality awareness of organization and developed and implemented a Quality Index aimed at measuring continuous improvement.**

- Achieved significant improvements in scrap, customer returns and process capabilities through education and utilization of statistical techniques.
- Implemented Quality systems based on ISO 9000 standard.
- Member of 3M bonded magnet due diligence team. Responsible for the integration of the business into Arnold.
- Key contributor to several acquisition/joint venture evaluations.

Philips Electronics ***10/79 to 12/90***
U.K. and The Netherlands

General Manager, Rare Earth Magnets 1/89 to 12/90
Philips Components Ltd., Southport, U.K.

- Directed business planning, manufacturing, marketing and development of rare earth magnets globally.
- Achieved 40% sales growth through application and market development.
- Led ISO 9001 implementation team and achieved third party certification in 1989.
- Established World Class manufacturing facility.

Development Manager 1/85 to 1/89
Philips Components Ltd., Southport, U.K.

- Established NdFeB manufacturing operation with capital budget of $8 million.
- Responsible for all permanent magnet development.
- Member of Plant Management team

Program Manager 1/83 to 1/85
Philips N.V., Eindhoven, The Netherlands

- Developed process technology for production of 2:17 SmCo and NdFeB high-energy magnets.
- Responsible for technology transfer and commercialization.

Development Engineer 10/79 to 1/83
Philips Components Ltd., Southport, U.K.

- Established manufacturing operations for first generation of SmCo high-energy magnets.

The University of Manchester (U.K.) ***10/78 to 10/79***

- Research Fellow.

EDUCATION

- Ph.D. (Metallurgy) - The University of Manchester, U.K. 1978
- MSC (Metallurgy) - The University of Manchester, U.K. 1976
- BSC (Metallurgy) - The University of Manchester, U.K. 1975 (First Class Honors)

Published articles and presentations

1. Thermal diffusivity of cast irons
   J. Ormerod, R. Taylor, and R. Edwards,
   Metals Technology,1978, Volume 5, Issue 1, pp. 109-113

2. Processing and physical metallurgy of NdFeB and other R.E. magnets
   J.Ormerod,
   Nd-Fe permanent magnets: Their present and future applications
   Edited by Mitchell, I.V; 1985, pp. 69-92, Elsevier Science Pub. Co. Inc, New York, NY (USA)

3. The Physical Metallurgy and Processing of Sintered Rare-Earth Permanent Magnets
   J. Ormerod,
   Journal of Less-Common Metals 111, (1985), pp. 49-69

4. The production of a Nd-Fe-B permanent magnet by a hydrogen decrepitation/attritor milling route
   McGuiness PJ, Harris IR, Rozendaal E, Ormerod J, Ward, M.,
   Journal of Materials Science, 1986; 21(11):4107

5. The Hard Magnetic Properties of Sintered Nd-Fe-B Permanent Magnets
   R.Grossinger, R.Keenka, H.R.Kirchmayr, J.Ormerod, K.H.J. Buschow
   J. Less. Common Met. 118 (1986) 167

6. Permanent magnet materials
   Ormerod, J.
   Permanent Magnet Machines, IEE Colloquium on Publication Year: 1988 , Page(s): 1/1 - ¼

7. J. Ormerod
   The Journal of the Institute of Metals, 4, No.8 (1988) 478.

8. Vacuum sintering behaviour of NdFeB magnets
   McGuiness, P.J. Williams, A.J. ; Harris, I.R. ; Rozendaal, E. ; Ormerod, J.
   Magnetics Conference, 1989. Digests of INTERMAG '89., International 28-31 March 1989

9. A study of Nd-Fe-B magnets produced using a combination of hydrogen decrepitation and jet milling
   P.J. McGuinness, E.J. Devlin, I.R. Harris, E. Rozendaal, J. Ormerod
   Journal of Materials Science, 24 (1989), p. 2541

10. J. Ormerod, Metals and Materials, 4 (1989), 478-482

11. Powder metallurgy of rare earth permanent magnets,
J. Ormerod,
Powder Metallurgy, vol. 32, No. 4, pp. 244-249, 1989.

12. Permanent magnet materials
Ormerod, J.
New Permanent Magnet Materials and their Applications, IEE Colloquium on
Publication Year: 1989 , Page(s): 1/1 - 1/5

13. Water milling and gas passivation method for production of corrosion resistant Nd-Fe-B-N/C powder and magnets
Bogatin, Y.; Robinson, M.; Ormerod, J.
Journal of Applied Physics Volume: 70 , Issue: 10 Publication Year: 1991 , Page(s): 6594 – 6596

14. Improvements and Applications of Permanent Magnet Materials in Automotive Sensors
Ormerod, J., Taylor, R., and Roozee, J.
SAE Technical Paper 920171, 1992

15. Bonded permanent magnets: Current status and future opportunities (invited)
Ormerod, John ; Constantinides, Steve
Journal of Applied Physics Volume: 81 , Issue: 8 Publication Year: 1997 , Page(s): 4816 - 4820

16. Magnetization processes in hybrid magnets
Emura, M.; Neiva, A.C. ; Missell, F.P. ; Babcock, K.L. ; Ormerod, J. ; Constantinides, S.
Journal of Applied Physics Volume: 83, Issue: 11 Publication Year: 1998 , Page(s): 7127 - 7129

17. Bonded Magnets: A Major Force for the 21st Century
Ormerod, J.
Intertech Polymer Bonded Magnets 2000, March 27 - 29, 2000, Nashville, TN, USA

18. Reports of the Death of Bonded Ferrite have been Greatly Exaggerated
Ormerod, J., (May 2001), Gorham NdFeB Magnets and NdFeB Magnet Systems 2001 Conference in Atlanta

19. Chinese rare earth magnetics and the changing US legal landscape
Panel member, CWIEME Chicago, October 7, 2014

20. Bonded Magnets: Products, Processes and Markets by John Ormerod, Critical Materials Institute, Magnet Thrust Meeting, May 6, 2015 Brown University, Providence, RI.

21. Bonded Magnets: A versatile class of permanent magnets by John Ormerod. Magnetics Business and Technology Magazine, Summer 2015

22. Bonded Magnets: Materials and Process Update by John Ormerod, MCMA Technical Conference, November, 2015.

23. Binder Jetting: A Novel NdFeB Bonded Magnet Fabrication Process by John Ormerod et al., JOM April, 2016

24. Big Area Additive Manufacturing of High Performance Bonded NdFeB Magnets by John Ormerod et al, Nature's Scientific Reports, October 31, 2016.

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