

**2<sup>nd</sup> International Conference, Zurich, 29 – 30 September, 1955**

2.01 The Importance of the Alloy in Precision Casting

*H J Meerkamp van Emden; NV Philips Gloeilampenfabrieken, Netherlands*

2.02 Investment Cast Turbo Rotors and Blades

*Dr Eiserman; Sulzer Bros. Switzerland*

2.03 Report of a Survey made by the American Investment Institute

*Mr Sulzer; Sulzer Bros., Switzerland*

2.04 US Investment Casting Industry; Its Growth, Problems and Future

*T Operhall, C W Schwartz*

2.05 Investment X Process

*Mr Turnball – presented by Sulzer Bros. Switzerland*

### **3<sup>rd</sup> International Conference, 7-8 May, Eindhoven, 1956**

- 3.01 A Review of the Properties of Stellite Alloys  
*M Riddihough; Deloro Stellite. UK*
- 3.02 Tentative and Finalised Specifications in the USA for Investment Castings  
*V Di Sambuy; Associazione Italiana di Metallurgia. Italy*
- 3.03 Could mistakes in the past in the Precision Foundry be avoided in the future?  
*B G Helders. N.V. Industrie, Netherlands*
- 3.04 The Philips X-Ray Intensifier  
*H J Meerkamp van Emden; NV Philips, Netherlands*
- 3.05 Defects in Precision Castings  
*A Bouman; Werkspoor N.V. & C Nieuwenhuis; NV Philips, Netherlands*
- 3.06 An Approach Towards the Classification of Casting Defects in Investment Castings  
*W H Sulzer; Sulzer Brothers, Switzerland*
- 3.07 Decarburization in Investment Castings and its Heat Treatment  
*N J Grant*
- 3.08 Price Estimation and Cost Calculation in Precision casting  
*F Polzgutter; Deutsche Edelstahlwerke AG Germany*
- 3.09 Some Applications of Mathematical Statistics in the Microcast Process  
*JJ Tiedema; Werkspoor N.V. Netherlands*

#### **4<sup>th</sup> International Conference, Stratford upon Avon, UK, 1957**

4.01 "Speaking of Investments"

*H J Meerkamp van Emden; NV Philips, Netherlands*

4.02 Tour of the P.I. Castings (Altringham) Ltd

*D Armitage, P.I. Castings Ltd, UK*

4.03 Investment Founders Discuss Specifications

*EICF Specification Sub Committee*

4.04 Application of Statistical Control in the Production of Precision Castings

*V di Sambuy; Associazione, Italiana di Metallurgia, Italy*

4.05 Wax Models for use in the Investment Casting Process

*E Sargent; Aster, Boisselier & Lawrence Ltd, UK*

4.06 Influence of Vacuum Melting on the Properties of Various Materials

*W Moore, A Kiesler, General Electric Research Laboratory, USA*

4.07 Refractories and Mould Materials for Vacuum Melting and Casting

*H O McIntire*

4.08 Investment Casting of Non Ferrous Metals

*E Weisner; Furstlich Hohenzollernsche Huttenverwaltung Laucherthal, Germany*

## **5<sup>th</sup> International Conference, Paris, 1958**

- 5.01 Quality Control of Melting Stock fro Investment Casting  
*L Taylor, GL Willan Ltd.UK*
- 5.02 Investment Casting in the US and UK: Part 1 – US Investment Casting Activities  
*H P Gray: Gray Syracuse Inc. USA*
- 5.03 Investment Casting in the US and UK:: Part 2 – Metal Specifications and Practices in the USA  
*R Waindle, WaiMet Alloy Co. USA*
- 5.04 Development of Corrosion Resisting Investment Casting with Higher Mechanical Properties and Good Weldability  
*R Taylor: Firth Vickers Stainless Steels Ltd, UK*
- 5.05 Die Leistung von gegosseeenen und warm verformten Werkzeugen aus Schnellarbeitssthl und ihre metallurgischen Grundlagen  
*K-A Krekeler, Behler & Co AG, Germany*
- 5.06 Oberflächenfehler bei Feinguss  
*E-G Nickel, VDG, Germany*

## **6<sup>th</sup> International Conference, 1-3 June, Essen, 1959**

- 6.01 Problems Poses Par L' Armurerie au Fondateur a Cire Perdue  
*P Mathy, Usines Gilson La Croyère, Belgium*
- 6.02 Das Batten-Cordonnier Ststem zur Klassifikation der Fachliteratur  
*S Jouwersma*
- 6.03 Bericht über die Arbeiten des Fachausschusses Feinguss innerhalb des Vereins  
Deutscher Giessereifachleute  
*Dr E G Nickel, Dr W Bochum, D.E.W. Bochum, Germany*
- 6.04 Estimation of the Temperature of the Melt  
*H J Meerkamp van Emden; NV Philips Gloeilampenfabrieken, Netherlands*
- 6.05 Some Investment Cast Alloys for High Temperature Service  
*D R Wood; Mond-Nickel, UK*
- 6.06 Technical Communication Between Investment Casting Manufacturers and their  
Customers  
*L R Schwedes; Lawrence Laboratories, USA*
- 6.07 The Investment Casting of Precious Metals  
*P E Gainsbury, Mond-Nickel, UK*
- 6.08 The American Investment Casting Industry in 1959  
*R J Waindle; WaiMet Alloy Company. USA*
- 6.09 Tolerances in Wax Moulding  
*G Nieuwenhuis; NV Philips Gloeilampenfabrieken, Netherlands*
- 6.10 Considérations sur Différents Arguments de Vente  
*M W Zwerner, Durox S.A. Switzerland*
- 6.11 Matrizenherstellung für Feinguss-Modelle  
*E Hengler; Carp und Hones, Germany*
- 6.12 Silica Binders for Investment Casting  
*J I Evans; Monsanto, UK*
- 6.13 Eisenkunstguss um 1800  
*Dr S Theissen-Trier, Germany*

## **7<sup>th</sup> International Conference, Liège, 4-6 July, 1960.**

- 7.01 Specifications for the Investment Casting Industry in the UK  
*L S Taylor & A G Mason; A.C.T. (Birm). UK*
- 7.02 Tätigkeit Der Deutschen Feingiessergruppe Auf Dem Gebete Der Werkstoff Untersuchungen.  
*Dr Ing K A Krekeler; Gebr. Böhler & Co A.G., Germany*
- 7.03 Introduction to the American Film on Shells for Investment Casting ( K W Thompson)  
*H J Meerkamp van Emden; NV Philips Gloeilampenfabrieken, Netherlands*
- 7.04 Some Activities of the British Investment Casters' Technical Association  
*J Bolton, BICTA, UK*
- 7.05 Le Pyrometre a Immersion aux Points Multiles avec Enregistreur de Temperatures  
*M F Faus; Maquinas de Coser, Spain*
- 7.06 Einfluss der Giessbedingungen auf Eigenschaften Hochwaemfester Legierungen  
*W Tolfaute & U Gravenhorst; Freid, Krupp Widia-Fabrik, Germany*
- 7.07 Investment Casting in Vacuum: Some Experiences  
*L S Taylor; A.C.T. (Birm). UK*
- 7.08 The Investment Casting Industry, US, 1960  
*R F Waindle, Michigan, USA*
- 7.09 The Influence of Test Bar Design on the Mechanical Properties of Two Cast High Temperature Alloys  
*R M Cook, P J Penrice; Mond Nickel Company, UK*
- 7.10 Report on the Impact Value of Castings – Survey by EICF member Companies  
*P Mathy; S.A. Ursines Gibson, Belgium*  
*A Bouman; Werkspoor, Netherlands*

## **8<sup>th</sup> International Conference, Florence, 11-13 September, 1961**

- 8.01 The Vacuum Techniques Applied to Investment Casting  
*A Dunlop; Jessop-Saville Ltd, UK*
- 8.02 The US Market for Investment Castings and Casting Reliability  
*R Waindle, Michigan, USA*
- 8.03 Rundentkohlung Bei Präzisionsguss  
*K Keiper; Gebr. Pfafdf. Nahmaschinenfabrik*
- 8.04 Equipment for Carbon Restoration in Precision Castings  
*S Grunde Ohlin, B Behle; AB Kanthal, Sweden*
- 8.05 Randsenkung Ein Beispiel Aus Der Praxis  
*S Pellier; Deutsche Spinnereimaschinenbau, Germany*
- 8.06 Une Fonderie a Modele Perdue Grand Serie  
*M Marinier; Regie Nationale des Usines Renault, France*
- 8.07 Technical Reports and US Patents on Investment Precision Castings  
*R Tindula: US Department of Commerce, USA*
- 8.08 Investigation on Impact Properties  
*A Bouman; Werkspoor, Netherlands*
- 8.09 The Misrun Problem in Investment Castings  
*H Rosenthal; Frankford Arsenal, USA*
- 8.10 Vacuum Cast Rotors in "Nimocast 713V" Alloy  
*R Cook; Mond Nickel Co. UK*
- 8.11 The Drying of the Dip Coat  
*B Buysman et al: NV Philips, Netherlands*
- 8.12 Semi Continuous Vacuum Melting and Casting of Investment Moulds  
*L Taylor; GL Willan Ltd, UK*
- 8.13 Bewertungsmethoden Für Feinguss  
*J Sprung; Bohler & Co AG, Germany*
- 8.14 Contribution à l'étude des Caractéristiques Mécaniques d'acier et d'alliages moulés à la Cire Perdue  
*M Roques, M Cameo; Microfusion, France*
- 8.15 Ausführungen über ein neues, Billigeres Verfahren Formsand mit Kolloid der Kieseleure zu Binden  
*W Kring; Dynamit Nobel AG, Germany*
- 8.16 The Minicast Process for Commercial and Industrial Investment Castings  
*J Cadieux; Casting Engineers Inc, USA*
- 8.17 A Casting Problem in NonFerrous  
*K Thompson; K Thompson Tool Co.Inc. USA*

**8<sup>th</sup> International Conference, Florence, 11-13 September, 1961 - continued**

8.18 Investment castings in Spring Steel

*J Gwynn; PI Castings Ltd, UK*

8.19 Commentaire du Film "Le Procédé Shaw"

*H Marshall; Nicholas Hezmark, France*

## **9<sup>th</sup> International Conference, Stockholm, 27-29 May, 1963**

- 9.01 Recent Developments in Investment Cast Nickel Base High Temperature Alloys  
*D R Wood; Mond Nickel Inc. UK*
- 9.02 Anschnitt Und Abguss Eines Hochbeanspruchten Fligzeugteiles Nach Dem Feinguss-Verfahren  
*H Ballewski; Zentroguss Hizenhaim, Germany*
- 9.03 Case Study of an Investment Casting, Gas Burner Nozzles  
*N Mason; Firth Vickers Stainless Steels Ltd, UK*
- 9.04 Solidification of Investment Castings  
*H Rosenthal; Frankford Arsenal, USA*
- 9.05 British Investment Casting Specifications  
*L S Taylor; BICTA Metallurgical Committee*
- 9.06 Une Etude Comparative des Possibilities Economeques Contemporaine d'une Fonderie a la Cire Perdue  
*C A Nieuwenhuis; 'Cirex' Philips Netherlands*
- 9.07 The formation of Blisters in the Dip-Coat of Investment Moulds  
*P J Buysman; NV Philips, Gloeilampenfabrieken, Netherlands*
- 9.08 Quantum Planning  
*K Hemmes 'Cirex' Philips, Netherlands*
- 9.09 Hat Der Feinguss Eine Zukunft  
*H Moeschlin; Precisions-Produkte AB, Sweden*
- 9.10 Ceramic Cores  
*B Behle, AB Kanthal, Sweden.*
- 9.11 Specifications in the USA 1963  
*R E Waindle; Techno-Metallurgical Co. USA*
- 9.12 Cast v Forged Turbine Blades for Aircraft Gas Turbines  
*W H Sharp; Connecticut Metallurgical Corp. USA*
- 9.13 Ethyl Silicate  
*G Fredenmark; AB Nyäs-Petroleum, Sweden*
- 9.14 Adaption of the Ceramic Shell Mould to Meet Mass Production Requirements  
*E J Shepherd; Monsanto Chemicals Ltd. UK*
- 9.15 Le Procédé Ceramcast  
*H J Marshall; N Hezmark, France*

## **10<sup>th</sup> International Conference, 4-7 October, Madrid, 1964**

- 10.01 Losung Einer Massproblems  
*W Wiedenhoff; Fürstlich Hohenzollernsche Hüttenverwaltung, Germany*
- 10.02 Pressure Casting in Investment Moulds  
*S Lipson, F Ripkin, Frankford Arsenal, USA*
- 10.03 Silica-Aluminiumester, ein Neuer Binder Für Präzisionsgussformen  
*W Dittricht, Dynamit Nobel AG, Germany*
- 10.04 Dewaxing Autoclaves  
*M Pickard; Leeds and Bradford Boiler Company, UK*
- 10.05 Superalloys for Investment Precision Casting  
*A Dunlop; Jessop-Saville Co. UK*
- 10.06 An Investigation of Catastrophic Oxidation of Castings Produces from N-155 Alloy  
*W M Mathes, N Davidson, B Heyer; Arwood Corp. USA*
- 10.07 Pre-formed Cores, their use, Manufacture and Benefits  
*E M Briscoe; Doulton Industrial Porcelains, UK*
- 10.08 The Future Development of the Lost Wax Casting Process  
*P A Crooke; Rolls-Royce Ltd. UK*
- 10.09 An Automatic Bottom Pouring Method for Invested Moulds, Eliminating the Melting Furnace  
*J B Ingall; AEI Birlec, UK*
- 10.10 Eigenschaften und Verhalten von Wachsen bei der Herstellung von Waschmodellen für den Metallpräzisionsguss  
*E Frink. Germany*
- 10.11 The Relative Merits of Medium and High Vacuum Casting with some notes on a recent development in Vacuum Refractories  
*L S Taylor; G L Willan Ltd. UK*
- 10.12 Casting Copper Parts  
*J Valenta; Cercast, Canada*
- 10.13 Untersuchungen an einem Warmfesten Chromstahl mit Co-Zusatz and Hochwarmfesten Co-Legierungen  
*K A Krekler, H R Kautz, H Gerlach; Gebr Bohler, Germany*
- 10.14 The Application of the Ceramic Shell Process to the Production of Investment Castings  
*D E Hope; Monsanto Chemicals UK*
- 10.15 How to Keep Tolerances in Wax Models  
*C E Nieuwenhuis; Cirex, Netherlands*
- 10.16 Investment Casting has a future  
*J Aherne Heron; Trucast, UK*
- 10.17 Hat der Feinguss eine Vergangenheit  
*H Moeschlin; Precisions Produkter A.B. Sweden*

## **12<sup>th</sup> International Conference, 11-13 September, Eindhoven, 1967**

- 12.01 Soluble Cores Based on Calcium Phosphates for use with certain Non Ferrous Alloys  
*K Rose; Doulton Industrial Porcelains Ltd. UK*
- 12.02 Serienfertigung von Feingussteilen  
*H Staehl; Gebr. Sulzer, Switzerland*
- 12.03 Feingusswerkzeuge aus dem Schnelldrehstahl mit Hoher Schlagtorsionszähigkeit  
*O Kastanek; Techn Hochschule, CSSR*
- 12.04 Influence of Casting Conditions on the Grain Size and Tensile and Stress Rupture Properties of Cast Nickel Base Alloy MC 102  
*P J Penrice, E G Richards, International Nickel Ltd. UK*
- 12.05 Precision Castings in Titanium and Titanium Alloys  
*A Dunlop; Dunlop Metallurgical Services Ltd, UK*
- 12.06 History and Future of Gas Turbine Alloys  
*R H Tielemann; Martin Marietta Corp. USA*
- 12.07 Development of the Extended Launder Process for High Quality Melting Stock and Lost Wax Castings.  
*L S Taylor; GL Willan Ltd, UK*
- 12.08 Applications du Moulagede Précision a des Fabrications d'Outillages  
*J Blanchard; Ac Legénsil at Blanchard, France*  
*R G Greenwood; Unicast Development Corp. USA*
- 12.09 Meeting the Social Obligations of the Investment Casting Industry  
*A Saunders; A Saunders & Co. USA*
- 12.10 The Development of a non Shrinking Wax "Nosink", Machinery for its use and the result: High Precision Casting.  
*H Moeschlin; Precisions Produkter A B Sweden*
- 12.11 The Relationship Between the Structure and the Strength of Ceramic Shell Moulds and Permeability of Ceramic Shell Moulds  
*P J Buysman, W Luiten, Philips Research Laboratories, Netherlands*
- 12.12 Dipcoat Nucleation  
*R C Feagin; Howmet Corp. USA*
- 12.13 Ventilation and Protection against Radiant Heat in Hot Factories  
*H Bordes Philips Gloeilampenfabrieken, Netherlands*
- 12.14 Feingussteile aus Martensi Aushartbarem Nickel-Cobalt-Molydänstahl  
*E G Nickel; Deutsche Edelstahlwerke, Germany*
- 12.15 The Influence of Mechanisation on the cost of Investment casting  
*G M Tofield, E J Shepherd; Monsanto Chemicals. UK*

## **14<sup>th</sup> International Conference, Zurich, 5-7 October, 1970**

- 14.01 The Economic production of Investment Cast Valves in Austenitic Steel 18/8  
*O Kastenek; CSSR*
- 14.02 Experiences in Setting-up Mechanised Shell Mould Production in a Typical Jobbing Investment Foundry  
*D Hope; Monsanto Chemicals, UK*
- 14.03 Investment Casting Supports Development in the Non-polluting Sterling Engine  
*G TM Neelen; NV Philips, Netherlands*
- 14.04 Isostatically Presssed Products in the Investment Casting Industry  
*W B Harris; Refractory Mouldings, UK*
- 14.05 Design features of an Automatic Production Investment Casting Machine  
*W Hart; Elliott Mechanical Automation Ltd, UK*
- 14.06 The Features and Development of Wax Injection Machines  
*A Muesfeldt; H Maihak AG, Germany*
- 14.07 A Film on Investment Casting made at CIREX with the Collaboration of the Delft Technical University  
*B Helders; Cirex BV, Netherlands*
- 14.08 Speeding up Quotations by Positioning the Relevant Price factors in a Nonagram  
*H Moeschlin; Precision-Produkte AB, Sweden*
- 14.09 The INCAMET Rapid Shell System of Investment Casting  
*A Dunlop; UK*
- 14.10 Effect of Mould Materials on Micro Cracks in Ceramic Shell Moulds during Flash Dewaxing  
*T Nishigori, Ishikawajima-Harima, Heavy Industries Co, Ltd, Japan*
- 14.11 Some Factors influencing the Dewaxing of Ceramic Shell Moulds  
*G Halsey, UK*
- 14.12 Precision Investment Casting of Aluminium Alloys  
*W O Beer; Canadian Marconi Company, Canada*
- 14.12 The Economies of Sand or Shot Blasting in Investment Casting  
*H Schulze; Scheinmann & Vogel, Germany*
- 14.14 Cost reduction in the Investment Foundry  
*J Broughton; Singer Manufacturing, UK*
- 14.15 Materials used for Lost Wax Models  
*D Muller; Honsel Werke, Germany*
- 14.16 Quality of Wax Patterns as a Function of Wax Preparation and Injection  
*V Stanciu; Tempcraft Tool & Mold Co. USA*

## **16<sup>th</sup> International Conference, London, 1974**

- 16.01 Ductile Iron Castings at Two Tons per Day  
*G D Chandley; Hitchiner Manufacturing, USA*
- 16.02 Factors Influencing the Properties of Cast High Strength Nickel Base alloys  
*J Hockin; Hockin Associates, Canada*
- 16.03 The Development and Application of the Lost Wax technique in Dentistry  
*J N Kidd; University of Leeds, UK*
- 16.04 The Value of Ceramic Feeders in Investment Casting  
*M Leadbetter; Nalfloc Ltd, UK*
- 16.05 Recent Developments in Autoclave Dewaxing  
*M Pickard; Leeds & Bradford Boiler Co. Ltd. UK*
- 16.06 Analytical Spectrometric Inspection in the Investment Foundry  
*G Rotamartir; Microfusione, Italy*
- 16.07 Developments in the Transition from Solid Moulds to Shell Moulds for the Production of Non Ferrous investment Castings  
*F Valenta; Cercast Canada*
- 16.08 Ceramic Cores Materials and Manufacture  
*C E Webb; Doulton Industrial Products Ltd, UK*
- 16.09 Manufacture of Large Ceramic Cores by Injection Moulding  
*S Uram; Certech, USA*
- 16.10 Managing the Energy Crisis: Some Implications for an Effective International Energy Project  
*M K Badawy; Cleveland State University, USA*
- 16.11 Unidirectional Solidification of Nickel Base Alloys  
*E Grundy; International Nickel Ltd. UK*
- 16.12 Ceramic Moulds with a Sprayed Internal Layer  
*W Dittrich, Dynamit Nobel A.G. Germany*
- 16.13 The Identification, Segregation and Preparation of Nickel and Cobalt Base Alloy Scrap for Air and Vacuum Induction Melt Applications  
*G A Sked; Ireland Alloys Ltd, UK*
- 16.14 The Unimate Industrial Robot and Investment Casting  
*W G Lamb; Unimation Inc, UK*

## **18<sup>th</sup> International Conference, Stockholm, 18-21 June, 1978**

- 18.01 Investment Cast Cutting and Forming Tools  
*R McCallum: National Engineering Laboratory*
- 18.02 Use of an Industrial Microwave Furnace for Dewaxing  
*J Hichon: Fonderie de Laval, France*
- 18.03 Computer Aided Determination of Technological Time of Solidification of Wax Patterns  
*K Rushin Technical University of Czechoslovakia*
- 18.04 Trace Elements in Investment Castings  
*R Hambleton, Howmet Alloys International, UK*
- 18.05 Flexible Automation of Shell Mould Production  
*S Soini Oy Rosenlew, Finland*
- 18.06 Estimating the Wax Temperature Range for Mould Injection  
*G Szende, t Kovacs: Institut fur Technologie des Maschinenbaue, Hungary*
- 18.07 The Univocal Appreciation of Casting Ultimate Strength  
*S Balicki et al: Politechika, Czeestochowska, Poland*
- 18.08 Thermographic Investigation of Ceramic Mould Forming Processes in Investment Casting  
*Chr Iv Ivanov: deL'Institut Superieur, Bulgaria*  
*M Schklennik: deL'Institut dses Aciers et Alliages, URSS*
- 18.09 Quality of Slurry Materials for Ceramic Shell Moulding  
*P Taylor, Monsanto, Belgium*
- 18.10 Some Mathematical Models of Changes Involving Mechanical Properties in Connection with Structural Stability  
*V Bina, J Hakl, National Institute for Materials, Czechoslovakia*
- 18.11 Unusual Additions and their Influence on Steel Crystallisation  
*O Kastanek: Technical Hochschule, Czechoslovakia*
- 18.12 A Few Considerations on Investment Casting of Textile Machine Parts  
*A Fulop et al: Research and Engineering Centre for Machines and Equipment for Light Industry, Romania.*
- 18.13 Production Experience with Boron Modified Nickel Base High Temperature Alloys  
*C Hammersley: Sorcery Metals Ltd, UK*
- 18.14 The Influence of Nitrogen and Oxygen on the Castability of IN100  
*K Harris, r Schwer, Cannon-Muskegon, USA*  
*G Brown, D Valentine, AiResearch Casting Company, USA*
- 18.15 High Speed Motion Picture Analysis of the Wax Injection Process  
*T Piwonka; TRW Inc. USA*
- 18.16 Demonstration of Mechanisation Concepts for the Investment Casting Process  
*T Piwonka; TRW Inc. USA*
- 18.17 Removing Ceramic Cores and Coating using High Pressure Water  
*R Fisher: Dare Hydrophone Ltd, UK*

## **18<sup>th</sup> International Conference, Stockholm, 18-21 June, 1978 - continued**

- 18.18 Technical Aspects on the use of Ceramic Cores fro Investment Casting  
*J Doskar et al, Technical University of Brno Czechoslovakia*
- 18.19 Dendrite Arm Spacing in the Cast Microstructure of Alloy A 356  
*P Wilson: Arwood Corp, USA*
- 18.20 Preformed Cores: Some Case Histories and Recent Developments  
*K Rose, J Poulter, C Webb: Doulton Industrial Preoducts UK*
- 18.21 Electrohydraulic Blasting of Investment Castings  
*J Valenta: Vestshell Inc, Canada*
- 18.22 Characteristics of some AluminoSilicate – Colloidal Shell Systems  
*R Feagin: Remet Corp USA*
- 18.23 The Influence of Different Test Bar Dimensions on the Mechanical Properties of Investment Cast Steels  
*E Hauschild, F Klein: Schubert & Salzer, Germany*
- 18.24 On Cost Reduction and Process Improvement by the use of In House Wax Reclamation.  
*K Wiese: Unimation Inc, USA*
- 18.25 A Survey of the Physiological Conditions Relevant to Work in an Investment Foundry  
*F Alacevich, Pacchetti; Microfusione, Italy*
- 18.26 Promising Development of Investment Casting in the USSR  
*L Koslov: Moscow Steel Institute, USSR*

**19<sup>th</sup> International Conference, Palma de Mallorca ,10-14 October, 1982**

- 19.01 Use of Foamed Ceramic Nodules to Increase Shell Permeability  
*G Chandley; Hitchener Mtg. Co. Inc., D Rostoker; Norton Co. USA*
- 19.02 Actions Taken to Improve the Working Conditions in the Wax Assembly Department at Microfusione Italiana (MFI)  
*F Alacevich & L Pozzoli; Microfusione Italiana, Italy*
- 19.03 The Scope for Using Silica Binder Gel testing Time  
*P R Taylor; Monsanto European Technical Centre, Belgium*
- 19.04 Time Dependant Change in Precision Investment Casting Slurries on a Silica Sol Basis and Possibilities for their Control  
*H Friedrich; Schubert 7 Salzer AG, Germany, P Schober; Bayer AG, Germany*
- 19.05 New Waxes for Investment Casting  
*A Saunders; Saunders Foundry Supply Inc, USA*
- 19.06 Single Crystal Alloys for Gas Turbine Blades  
*J Northwood, M Winstone, J Greenbank; NGTE, UK*
- 19.07 Computer Gesteuertes Mechanisches Abtrennen von Feinguss  
*W S Blazek, T Piwonka; TRW, USA*
- 19.08 Development of the CM Series of Single Crystal Alloys for Advanced Technology Turbine Components  
*K Harris, G Erickson, R Schwer; Cannon Muskegon Corp, USA*
- 19.09 Segmented Mould Processing of Castings Having Circular Symmetry  
*W Blazek, T Piwonka; TRW, USA*
- 19.10 Metallurgical Advantages of Induction Melted/AOD Refined Master Alloy  
*J Snowden, R Quigg, R Schwer, Cannon Muskegon Corp. USA*

## **20<sup>th</sup> International Conference, 4-7 June, Brussels, 1986**

- 20.01 Improved Ceramic Mould Technology and Process Automation  
*W Weinacht; Feingusswerk, Lobenstein, German Democratic Republic*
- 20.02 A New Approach to the Assessment of Hot Deformation of Ceramic Shell Moulds  
*R McCallum, W Lang; Nationals Engineering Laboratory, UK*
- 20.03 Alumina Ceramic Shell Moulds for Directional Solidification of Nickel Base Superalloys  
*J Cihlar, K Rusin; High Technical University, Brno, Czechoslovakia*
- 20.04 Improvement of Mechanical Properties on a Ni Based Superalloy by the reduction of Microporosity Levels through Mould Design  
*R Lowe, J McGobbon et al; National Institute for Materials Research, South Africa*
- 20.05 Further Development Work on High Strength High Integrity Investment Castings  
*R McCallum, W Lang, R Loy; Nationals Engineering Laboratory, UK*
- 20.06 Defining the Material Properties in Conventional Precision Casting by means of Process Parameters involving Melt and Temperature Progression  
*K Bydlowski, H Friedrich; Johannes Croning GmbH, Germany*
- 20.07 Directional Solidification and Single Crystal technology in the Investment Casting Process  
*F Feikus, F Hediger, Giessereie Institut RWTH, Germany*
- 20.08 Application of Polish experiments and Materials in Casting the Endoprosthese of the HIP Joint  
*L Lusniak-Lech, J Stachanczyk, Foundry Research Institute, Poland*
- 20.09 Remelting Practice for the Precision Caster  
*T Klomp, J P Kiety; Cannon Muskegon, USA*
- 20.10 The Benefits of Double Refined Remelt Barstock to the General Cleanliness of Investment Castings  
*W Molloy, J Dykes, T Dalton; Glossop Superalloys Ltd, UK*
- 20.11 Ceramic Foams for Metal Filtration  
*C Richmond, W Steen, Morgan Refractories Ltd, UK*
- 20.12 The Use of Supervac Melting and Advanced Casting Technology in the Production of High Integrity Large castings  
*P E Wauby R&C Ltd, G H George, Deritend Vacuum Castings Ltd, UK*
- 20.13 New Developments in the Manufacture of Aluminium Investment Castings  
*D Lorch; Fürstlich Hohenzollernschen Huttenverwaltung Laucherthal, Germany*
- 20.14 Titanium Investment Casting – A Review of Technology  
*R Feagin; Remet Corporation, USA*
- 20.15 Titanium Investment Castings: Properties and Applications  
*Ch Liesner, H P Nicolai, Titan-Aluminium Feinguss GmbH, Germany*
- 20.16 From Micro to Mega HIP  
*D J Roberts HIP Ltd, UK*
- 20.17 Upgrade and Repair of Aerospace Castings by GTA Welding Process  
*W H Simon; US Welding Corporation, USA*

**21<sup>st</sup> International Conference, Lugano, Switzerland, 27-30 June 1990**

- 21.02 The role of analysis in the development of new casting wax materials  
*A. Barker, Burmah Speciality Chemicals; P Solomon, Yates Manufacturing Co.*
- 21.04 An analysis of the changes in properties of a copolymer silicate binder during the process of its aging  
*A Karwinsky, L Lusnjak : Lech, Academy of mining and metallurgy, Poland*
- 21.05 The production of water base shells in one day  
*R Challinor, E Williams: Drytech Processing Ltd  
W Lang, R McCallum: Nationa Engineering Laboratory*
- 21.07 Improved casting characteristics by optimised shell schedules  
*S Plibury, I Metcalf: Vickers Precision Components UK  
W Lang, R McCallum: Nationa Engineering Laboratory*
- 21.08 An analysis of ceramic shell materials  
*M Hendricks: Ransom & Randolph USA*
- 21.09 A comparison of investment casting shell making practice  
*J Regrych: Minco Inc, USA*
- 21.10 New trends and developments in vacuum precision casting equipment with special consideration for cold crucible melting.  
*F Hugo, Leybold AG, Germany*
- 21.11 Observations of the atmosphere in a vacuum casting furnace  
*J M Gibbon, S Yates: CSIR, South Africa*
- 21.12 An alternative single crystal casting process  
*F Bernasconi, Precicast, Switzerland,  
B Walser, J Wortmann, Sulzer-MTU Casting Technology, Switzerland*
- 21.13 Present and future trends in DS/SC Technology  
*G Higginbotham, Rolls Royce plc*
- 21.14 Investment Casting of Aluminium-Lithium Alloys  
*C Bolfarini, P Sahm, W Axmann: Aachen Foundry Institute*
- 21.15 A comparison of the lost pattern casting process  
*T Piwonka, University of Alabama, USA*
- 21.16 Simulation of the solidification process in an integral rotor and comparison of results with casting practice.  
*H Bowles, P Carter, P Kotscky, J McGibbon: CSIR South Africa*
- 21.17 BICTA Research and Development  
*R Smart, BICTA*
- 21.18 Development of a versatile shell system  
*J-C Carlier, Fonderie Formetal, Sa, Belgium*
- 21.19 "Inductive Cold Wall Metallurgy" A new approach to the manufacture of highly stressed investment castings for high technology applications.  
*S Baliktay, E-G Nickel, Vacuacast Feinguss GmbH, Germany*

## **22<sup>nd</sup> International Conference, 22-25 April, Paris, 1992**

- 22.01 Update on Market Trends in the Investment Casting Industry  
*R Williams; Blayson Olefines Ltd. UK*
- 22.02 Development of European Standards for Aluminium Castings  
*D B Critchley; BICTA. UK*
- 22.03 Factors Affecting the Precision of Investment Casting  
*J Dudley, G Bennett; Sandwell College of Technology*
- 22.04 A Review of Investment Casting applications and Process Problem Areas  
*J Shearer; TPC Components. Sweden*
- 22.06 Rapid Grinding  
*G Bell; AW Bell Pty. Australia*
- 22.07 New Approach to the Determination of the Dropping Points and Softening Points of the Pattern Waxes used for Investment Casting  
*P Bouvet; CTIF. France*
- 22.08 Innovative Pattern Waxes to Satisfy Modern Casting Needs  
*J Argueso; M Argueso & Co, G Schiefelbein; Remet, C Kovach; Signcast. USA*
- 22.09 Advances in Reclamation and Reconstitution of Filled Wax  
*D J Morson, R B Williams; Blayson Olefines Ltd. UK*
- 22.10 Continuous Wax Cooling at the Wax Injector for Higher Productivity  
*B S Phipps; Mueller Phipps International Inc. USA*
- 22.11 Le Place de la Fonderie a Modele Perdu Français  
*J-G Deponge; SGFF. France*
- 22.12 The Effect of Impurities upon the Thermal Reponse of Several Proprietary Casting Binders  
*S Jones, P Marquis; Uni. of Birmingham, B Page; Deritend Precision Castings. UK*
- 22.13 Development of Meaningful techniques for Testing Investment Casting Shell Mould  
*R McCallum; NEL. UK*
- 22.14 Plaster Investments for the Block Mould Process  
*P Magnier; UCPI. France*
- 22.15 Factors Affecting Shell Strength and the Effect of Dry Time on Shell Strength  
*M Guerra, W Roberts; Remet Corporation. USA*
- 22.16 On Line Monitoring of Shell Drying Cycles  
*J MacGibbon, et al; CSIR. South Africa*
- 22.17 Environmental Conditions and Shell Materials Impact on Shell Integrity  
*M Hendricks, D Hsu; Ransom & Randolph. USA*
- 22.18 Evaluation of Silica Sols as Ceramic Shell Binders at high Temperatures.  
*M Persson; EKA Nobel, A Törnecrona; Chalmers Uni, S Karlsson; Ceramic Inst. Sweden*

**22<sup>nd</sup> International Conference, 22-25 April, Paris, 1992 - continued**

22.19 Comparison of Fused Alumina Shell System using Rapid Dry and Standard Binders for DS/SX Components

*S Barnett; Incast Consultancy Ltd. UK, D Pocci; CSM. Italy*

22.20 Fused Silica ASA High Temperature Material

*J Snow; Minco. USA, R Frost; Colorado School of Mines, D Sturgis; PCC. USA*

22.21 Environmental Protection – Problems and Possible Solutions

*D Duffy; Wex Chemicals. UK. D Yarwood; Akzo; France*

22.22 Measurement of Emissions During Shell Manufacture

*S Yates, J MacGibbon; CSIR, South Africa*

## **23<sup>rd</sup> International Conference, Prague, 1994**

- 23.01 Feingiessen in der Tschechischen Republik  
*M Pavelka; SPL Czech Republic*
- 23.02 The World Investment Casting Market  
*R B Williams; Blayson Olefines Ltd. UK*
- 23.03 New Developments in Rapid Dry Water Based Shell Systems  
*M J Hendricks et al; Ransom & Randolph. USA*
- 23.04 Remasol Adbond BV: A Practical Update  
*J R Pyne; Remet Corporation. USA*
- 23.05 Influence of Backing Materials on the Thermal Profiles of Investment Casting Moulds  
*P Withey, S Jones, P Marguis; University of Birmingham. UK*
- 23.06 Reactions at the Mould/Metal Interface in Investment Castings  
*T S Piwonka; University of Alabama. USA*
- 23.07 CAEF Its Objectives and Activities for the Foundry Industry  
*H Chapotot; CAEF. France*
- 23.08 Developments in Aerofoil Ceramic Core Measurement Techniques  
*K Howells, J Pearson; Certech International UK, J C Doriath; SNECMA, France.*
- 23.09 Analysis of the Nature and Extent of the Interaction Between Ceramic Foam Filters and High Chrome Steel.  
*N Immam, P Marguis, S Jones; University of Birmingham. UK*
- 23.10 Replicast Lost Foam or Lost Cause  
*M C Ashton, Casting Technology International. UK*
- 23.11 Walter Deritend a.s – A Joint Venture in the Czech Republic  
*J D Sharp; Triplex Lloyd. UK*
- 23.12 Moulding Processes – A Personal Assessment  
*J Lawrenson; FMJ International Publications Ltd. UK*
- 23.13 The effect of Fracture Toughness Degradation on Life Time Estimation using the Critical Defect Criterion  
*V Bina, J Hakl; SVUM, Czech Republic*
- 23.14 Rapid Prototyping: Part of a Computer Integrated Approach to Investment Casting  
*D I Wimpenny; University of Warwick. UK*
- 23.15 Environmental Protection: Legislation and Practice.  
*R F Smart; EICF. UK*

## **24<sup>th</sup> International Conference, 10-12 May, Rome, 1998**

- 24.01 Revolution in Pattern Wax  
*J P Argueso, P Solomon; M Argueso & Co, Inc. USA*
- 24.02 Ceramic filters for Abatement of Smoke from Mould Burnout Furnaces  
*D Morson; Blaysons.UK, C Withers; Caldo Environmental Engineering UK*
- 24.03 Shell Drying – Water Base  
*J D Snow, D H Scott; Minco, Inc. USA*
- 24.04 Unexpected Binder Particle Size Effects in “Ludox SK” Slurries  
*W O Roberts; Dupont USA*
- 24.05 Comparison of the Properties of Zircon/Alumino-Silicate Shells with water based and Ethyl Silicate based Slurries  
*M Guerra; Remet Corporation. USA*
- 24.06 An Improved Investment Casting Procedure Exploiting Water Based Silica Binders  
*Z Adamczyk; Institute. of Surface Chemistry, A. Karwinski; Foundry Institute, Poland*
- 24.07 Revitalisation of Expertise in Foundries using Information Technology  
*C N Bancroft; University of Coventry, UK*
- 24.10 Investment Casting of Low Density Turbine Wheels from Nickel Aluminide  
*I Chequer et al; University of Birmingham, D Henley R&C, S Leyland; Trucast.UK*
- 24.11 Mathematical Modelling of Casting Process: Analysis of a Production Case and Rapid Prototyping Case  
*A Carosi et al; CSM,Italy, D Taccardo; Microcast, France, G Mondadori; Promau, Italy*
- 24.12 Mould Non Fill and its Relationship to Mould Wettability and Surface Finish in Walled Castings  
*S Connolly et al Birmingham University, D A Ford; Rolls-Royce plc. UK*
- 24.13 The Investment Casting Industry: Its Structure and Markets  
*N A J Swanson; Ransom & Randolph, Dentsply Ltd., UK*
- 21.14 Prerequisites for the use of Investment Casting to Manufacture Components Currently Produced by other Technologies  
*M Horaček; Technical University of Brno, J Cileček; Fimes Foundry, Czech Republic*
- 21.15 The Market for Investment Casting in Poland  
*Z Pączek et al; Foundry Research Institute. Poland*
- 21.16 Investment Cast Parts via SLS and Selective Laser Sintering Process  
*S van de Crommert; DTM Corporation. USA*
- 21.17 The Drying of Water Base Shell Moulds  
*P A Withey; Rolls-Royce plc. UK*

## **25<sup>th</sup> International Conference, 16-19 June, Berlin, 2002**

- 25.01 A Review of Investment Casting Market Trend Data  
*R F Smart; EICF, UK*
- 25.02 Current Market Trends – Europe  
*J-G Déponge; Lajoinie-Fonderie, France*
- 25.03 Market Overview – North America  
*M Perry; Investment Casting Institute, USA*
- 25.04 Current Trends of Investment Casting Industry in Far East  
*K Ishikawa; Japanese Association of Casting Technology, Japan*
- 25.05 Prerequisites for Increased Application of Investment Castings – an Aeronautical View  
*W Entelman & H Frommeyer; Airbus Deutschland GmbH, Germany*
- 25.06 The Future use of the Investment Casting Process in the Manufacture of Components for Small to Medium Civil Aero Engines.  
*S Lee, J Geitner; Rolls-Royce Deutschland, Germany*
- 25.07 Investment Casting for High Volume Automotive Production – a Technology with a future.  
*M Held; AUDI AG, Germany*
- 25.09 Building, Maintaining and Securing your Data Assets  
*R Marengo; Axr8.com, Ltd, UK*
- 25.10 Simulation of Die Filling for the Wax Injection Process  
*J-C Gebelin, M R Jolly; University of Birmingham, UK*
- 25.11 Health and Safety Aspects of Investment Casting Waxes  
*H Fielder, Remet Ltd. UK*
- 25.12 Advances in Polymer Enhanced Water Based Primary Binders and Slurries  
*M J Hendricks et al; Ransom & Randolph, USA*
- 25.13 Precision Casting of Gas Turbine Components  
*U Betz, M Mede; ALD Vacuum Technologies, Germany*
- 25.15 Casting Improvements for the Automotive Industry  
*D W Hofmann, Deloro Stellite GmbH, Germany.*
- 25.16 R&D for the Investment Casting Industry  
*D A Ford; DAF-Associates, UK*
- 25.17 The Influence of Processing Parameters and Mould Design on the Quality of Wax Patterns  
*A Huber et al; Battenfeld Injection Moulding Technology, Austria*
- 25.18 Thermophysical Property Data for Investment Casting – What do you need and where do you get it?  
*R Brooks et al; National Physical Laboratory, UK*
- 25.19 Investigation of Wax Expansion using the new Blayson Test Method  
*D Bond, K Nishikawa; Blayson Olefines Ltd. UK*
- 25.20 Improving the Reliability of Aluminium alloy Investment Castings  
*R A Harding, M Cox; University of Birmingham, UK*

# **EICF 50 Year Anniversary Conference Papers. Bilbao 2006**

## **Markets and Business Opportunities**

1. State of the Industry – Key Note Speech

*P Withey – Chairman of Cast Metals Federation*

World Market Review

2. Europe and USA

*R Hirst – Blayson Olefines,*

3. Chinese Markets

*Zhigang Lu – Chinese Foundry Association*

4. Japanese Markets

*J Take-Uchi Japanese Foundry Society*

5. Indian Markets

*ModTech Machines*

6. Challenges from Aeroengine Manufacturers on Investment Casting Suppliers

*O Caballero - ITP*

7. Market Opportunities in the Power Generation Sector

*D Allen - Alstom*

8. *EICF – The First 50 Years*

*R Smart*

## **Management and Process Control**

9. Successful Turbocharger Wheel Manufacture

*S Leyland – Honeywell Turbo Technologies*

10. Concurrent Engineering to Develop a Manufacturing Process for Turbine Rear Frame Components

*C Duquenne – SNECMA*

11. Advantage of Statistical Tools Application in the Foundry: a way to Optimise Productivity and Reduce Costs

*A Mourier - UCPI*

12. 6 Sigma in Investment Casting. A scientific method for improvement

*C Olabe - PCB*

13. Simulation assisted optimisation of shell design for investment casting

*C Veringmeier – Eurocast bv*

14. Self Learning Diagnostic System for Scrap Reduction

*R Ransing – University of Wales Swansea*

15. How to Become a First Class Investment Casting Foundry: A cost efficient approach to process improvement based on numerical data

*J Bedialauneta - PCB*

## **EICF 50 Year Anniversary Conference Papers. Bilbao 2006 – cont.**

### **Pattern and Shell Technology**

16. Understanding how Wax Properties can Affect Foundry Performance  
*P Hancock – Blayson Olefines*

17. Profit Begins in the Wax Room  
*B Phipps – MPI*

18. Dimensional Stability of Commercial Shell Systems  
*P Qusted – NPL, S Jones – Birmingham University IRC*

19. A Shell for All Seasons  
*J Snow – Minco*

20. A New Philosophy for Shell Drying  
*W Weihnacht – Wex*

21. Rapid Shell Build: Returning to Basics in an Art Foundry  
*M Thomas – Birmingham University IRC*

22. Alumina and Silico – Aluminate refractories and their role in ceramic mould properties.  
*D Frulli – Imerys Molochite*

### **Casting and Finishing**

23. Investment Casting - Quantum Leap  
*S Byrne - VA Technology*

24. Practical Aspects in Using Simulation for Equiaxed Process, Concerning the use of Insulation and Alloy Composition.  
*A Carosi*

25. Equipment for Large DS and Single Crystal Casting  
*U Betz – ALD*

26. Developments in Superalloy Castability and New Applications for Advanced Superalloys  
*K Harris – Cannon Muskegon*

27. Some Recent Developments in the Melting and Casting of Titanium Alloys  
*R Harding – Birmingham University – IRC*

28. State of the Art Technology in Robotised Grinding Systems.  
*J Byrne – VA Technology*

29. Determination of the factors controlling crystallography non-conformance in single crystal turbine blade production on an industrial scale  
*J Cameron – Firth Rixson Superalloys*

30. Gating System Optimisation. A Design for 6 sigma approach  
*I Menoyo - PCB*