

World Investment Casting Market Review

Ronald Williams
The Blayson Group Ltd

JFS ISIC Tokyo
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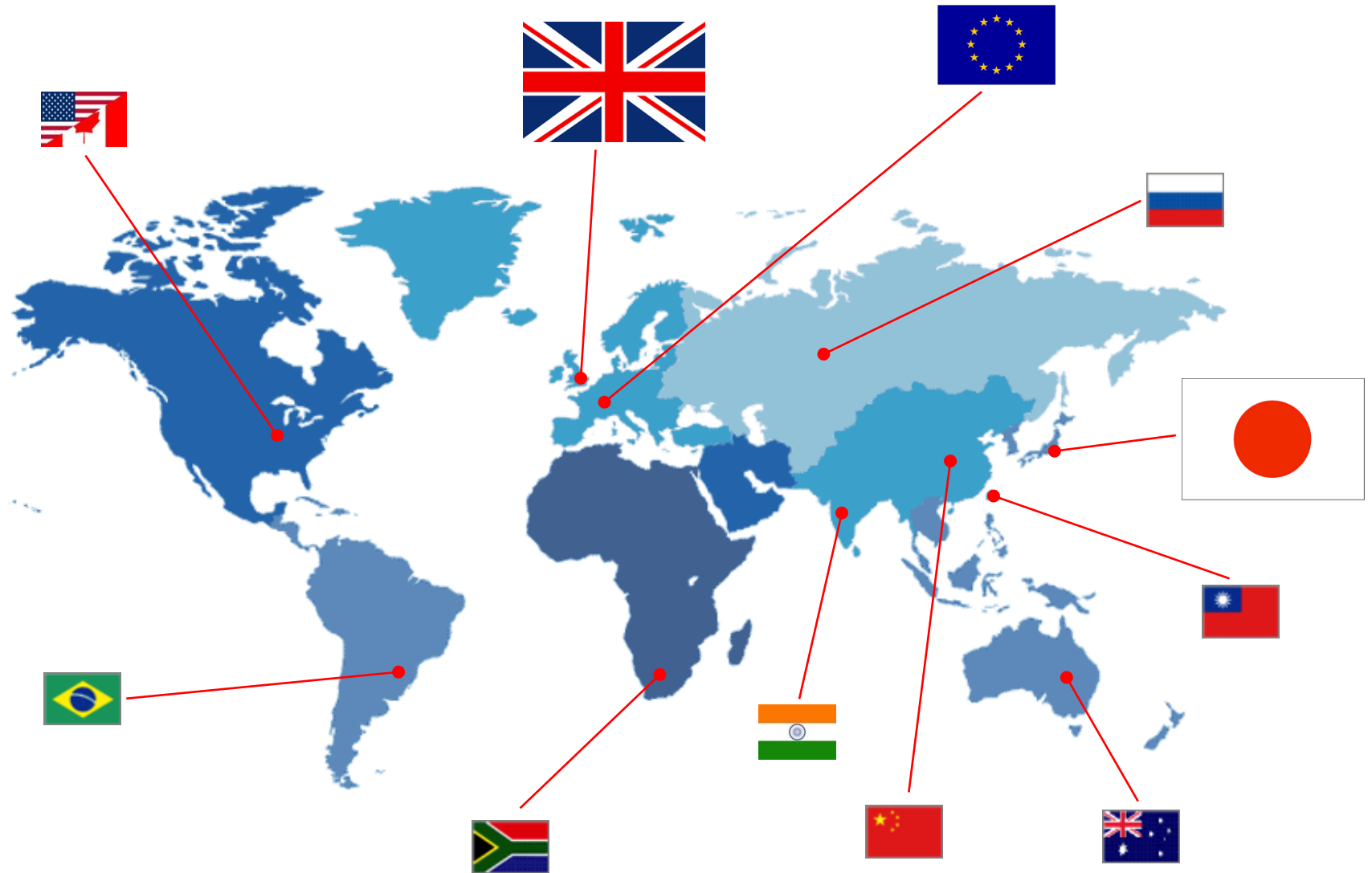
Agenda

- Blayson Introduction
- World Investment Casting Sales 2016
- Sales by Region
- Market Sector Analysis
- Market Sector Review
- 2016 Summary
- 2017 Prospects

Blayson Introduction

- Blayson was established in 1961
- Supplying a full range of wax materials worldwide through a global network of partners and distributors
- Serving aerospace, medical, industrial gas turbine, automotive and commercial markets
- Also a full range of products and services with the objective to support the foundry and improve wax control
- Research and development and wax control is of key importance and part of the Blayson ethos
- Technical Centres in Cambridge UK and Chiba Japan

Manufacturing Sites and Global Partners



Acknowledgements

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ICI - Investment Casting Institute, United States

EICF - European Investment Casters' Federation

CMF - Cast Metals Federation, UK

JFS - Japan Foundry Society

CFA - China Foundry Association

Other - Individual contributors

The information given is based on official figures together with best estimates where statistics are not available. No legal responsibility is accepted for information, advice given or opinions expressed

World Investment Casting Sales 2016

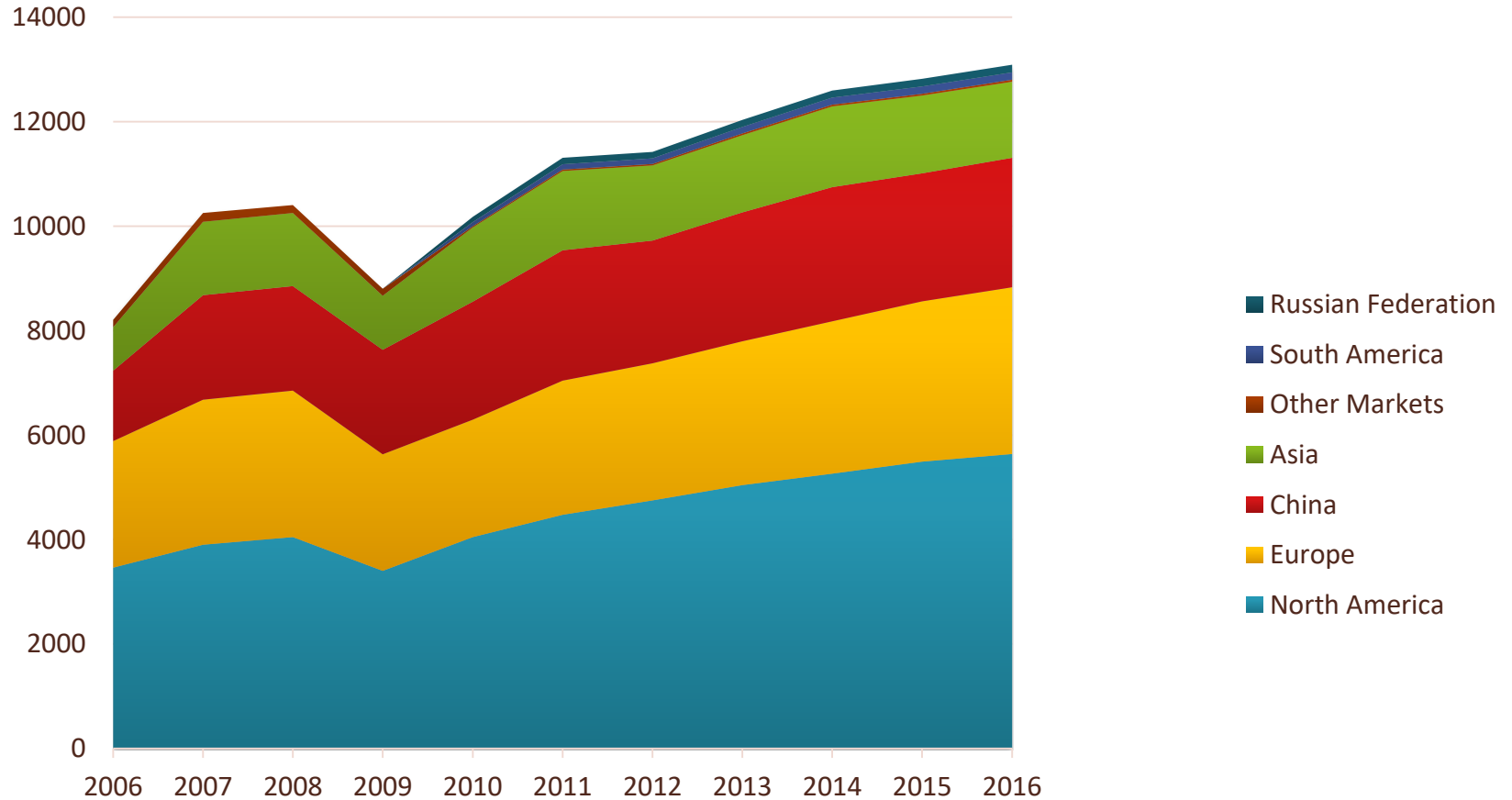
- Global investment casting achieved sales of almost US\$13.1 Billion in 2016
- Representing an increase of 2% over 2015
- Continuing upward trend of overall sales value since 2009
- The demand for castings for commercial aircraft eased slightly in 2016 but remains at a high level
- The industrial gas turbine market improved during the year

World Investment Casting Sales 2016

- The automotive industry performed well with improved casting sales across the regions
- Regional market shares moved slightly as a result of the strong High Added Value sales and weaker Other Markets performance
- As a result the market share of North America has increased to 43%, Europe to 24%
- China is now at 19% compensating for a slight fall giving a total regional market share of 30% for Asia

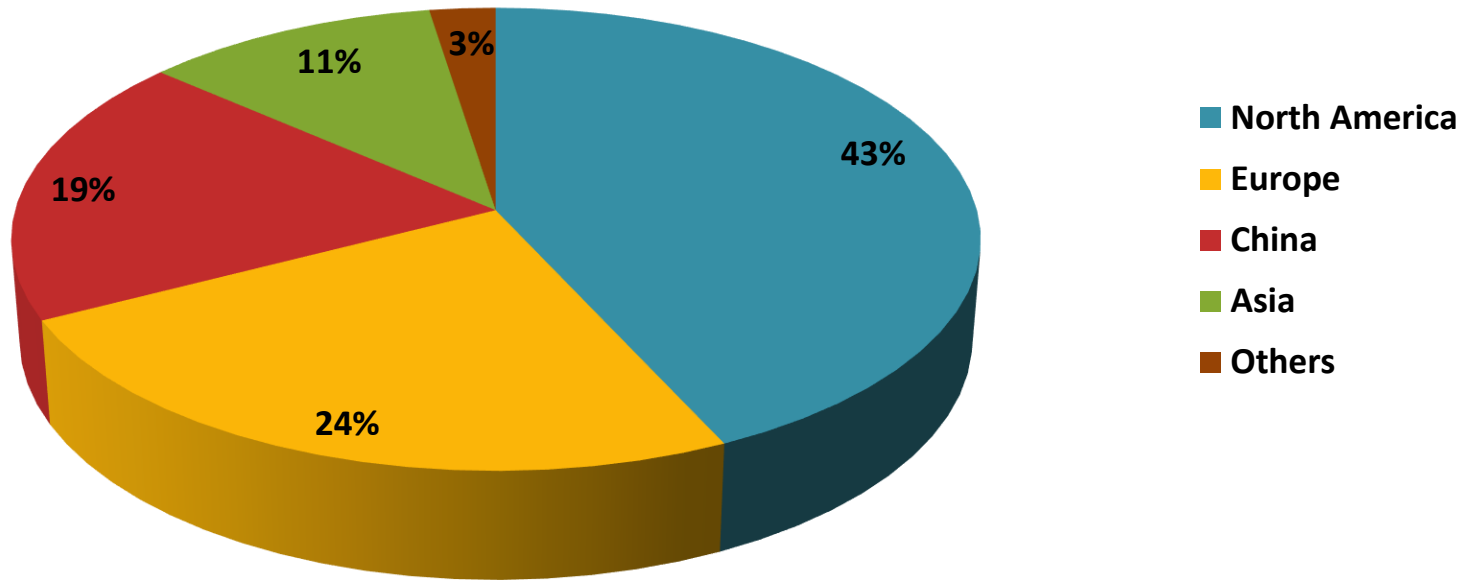
Sales by Region 2016

World Investment Casting Sales US\$M



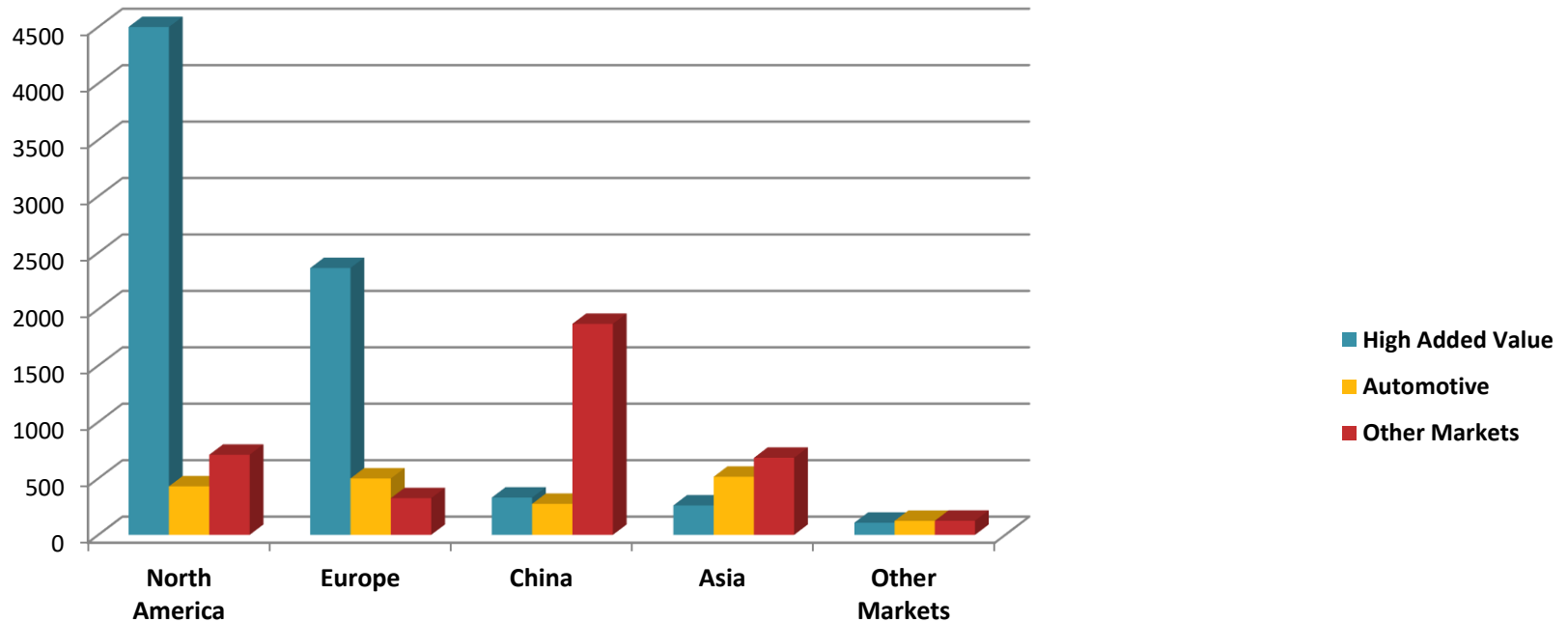
2016 Sales by Region

Sales by Region 2016



2016 Region Sales by Sector

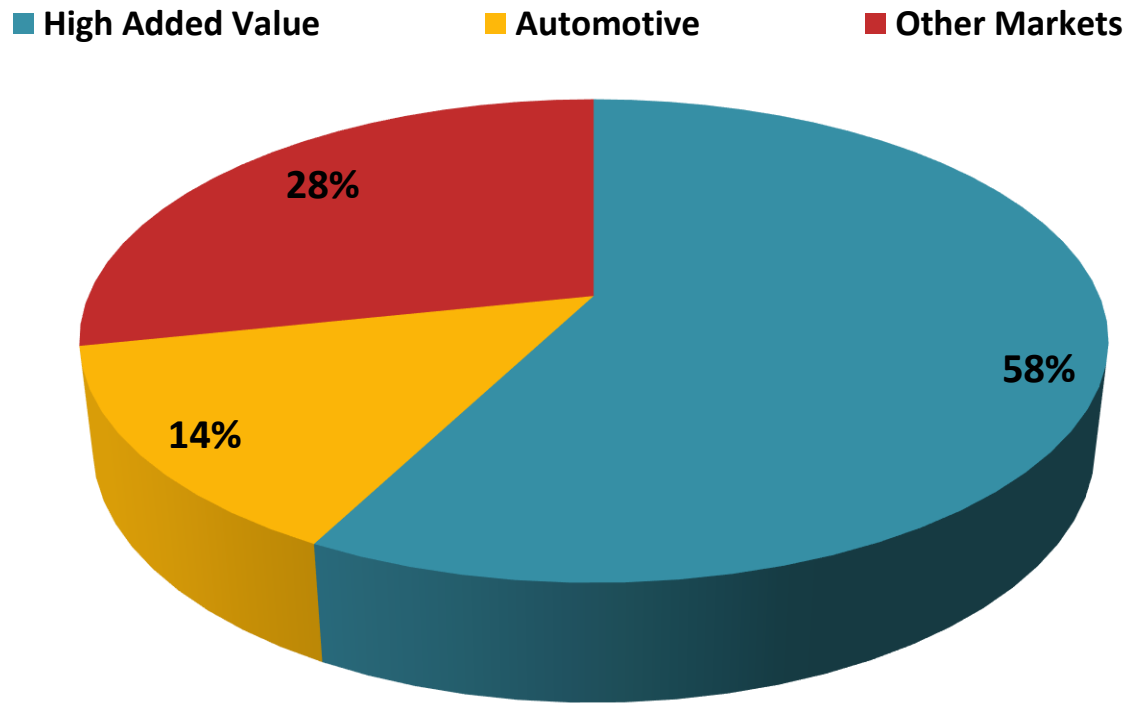
2016 Investment Casting Sales by Sector
US\$M



High Added Value casting production leads in North America and Europe in contrast to the other regions

Investment Casting Sector Sales 2016

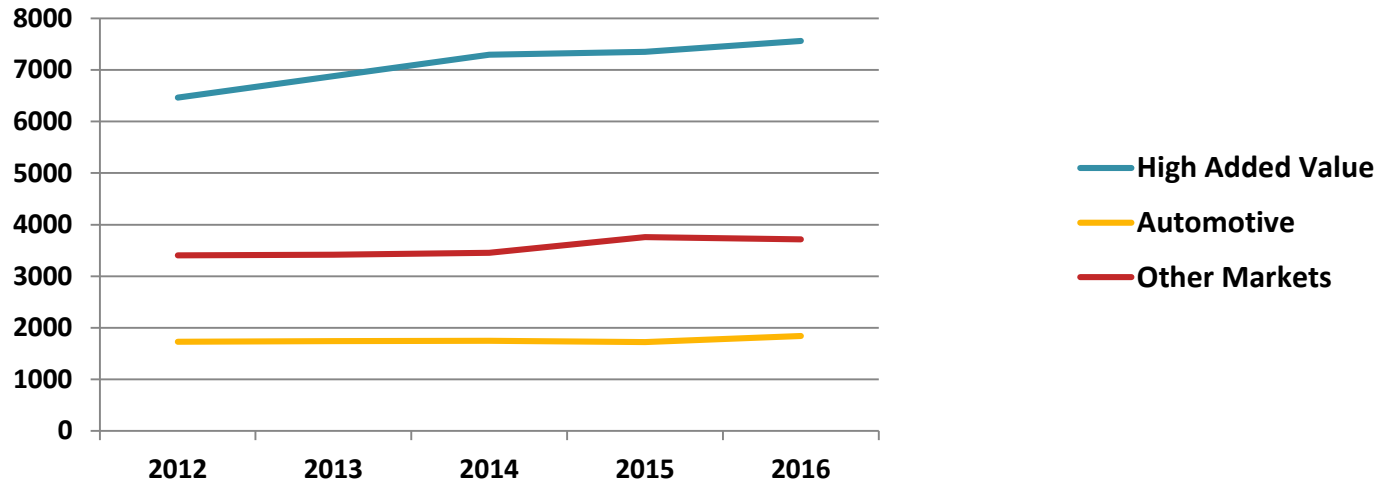
Investment Casting Sectors 2016



High Added Value castings account for 58% of total sales

Investment Casting Sector Trends

Investment Casting Sector Trends US\$M



- Improvements in the IGT market combined with continued strong sales to aerospace increased High Added Value sector
- Sales of commercial castings decreased slightly
- Automotive casting sales improved in most major markets

Aerospace Review

- New commercial aircraft sales orders lower than previous year
- Low oil prices prompt some carriers to fly older planes longer rather than upgrading to new fuel efficient models
- The order backlog is undiminished and remains equivalent to around 9 years production
- China, backed by government initiatives, continues to develop its first home grown regional jet

Industrial Gas Turbine Review

- Consolidation of turbine manufacturing has taken place
- Increased demand has been a pleasing feature of 2016 after the prolonged slower period since 2009
- As with aerospace the Chinese government is actively supporting its development

Automotive Review

- 2016 shows a casting sales increase of 2.5 to 3% across all major markets
- US markets having reached record sales levels it is felt demand is likely to be relatively flat in the next two years
- In Europe the business market performed extremely well with buying decisions increasingly based on quality, value for money and safety
- Benefiting UK and German manufacturers
- In terms of manufacturing, increasing efficiency pressures and globalisation continue to impact on the type of parts, costs and location of production

Other Sectors Review

Medical

- The medical castings sector is benefiting from an ageing population with a more active lifestyle driving implant sales
- In many markets the sector is very competitive as more foundries enter this sector

Commercial

- General commercial castings finished 2016 slightly below the level of 2015
- Whilst many markets are reporting similar sales levels China is indicating a further fall in the production of commercial castings

Industry Prospects

Aerospace

- Whilst commercial aircraft sales orders have slowed in 2016 the backlog of orders for the aircraft industry and engine manufacturers remains high
- As a result the expectation of Airbus and Boeing is that high production levels should be maintained for the foreseeable future
- Airbus predicts that in 10 years China will become the largest aviation market. The response of the Chinese government is to actively develop domestic production capacity to take advantage of this situation

Industrial Gas Turbines

- The long awaited improvement in the market is expected to be maintained in 2017
- Again the IGT market in China is seen as being of major importance by the Chinese government with a resulting strategic focus on domestic production

Industry Prospects

Automotive

- Market activity is at a high level with record numbers of new vehicles sold in 2016 and looks set to continue
- Sales are tending to focus on quality, value for money and safety
- There is also an identified need for companies to adapt to a much faster pace of change than in the past
- Continuing investment and innovation by the foundry industry will be essential for investment casting to maintain its strong supply position

Industry Prospects

Medical

- The sector is expected to maintain a low growth trend with the benefit of a growing and ageing population

Commercial

- Will remain very competitive, low growth levels are likely

Summary

- The industry has continued to develop in 2016
- Business conditions remain difficult to predict
- Increasingly stringent demands present an ongoing challenge to foundries and suppliers
- Market conditions appear less variable than in the recent past with improvements seen in the aerospace, IGT and automotive sectors
- Opportunities for growth within the investment casting industry remain positive

This paper is available from
www.investmentcastingwax.com

Thank You

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