

# WAX MATTERS

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## 13<sup>th</sup> World Investment Casting Conference Kyoto

The 13<sup>th</sup> World Investment Casting Conference with the theme of "Innovation from Asia" took place in Kyoto Japan from the 15<sup>th</sup> - 18<sup>th</sup> April 2012.



Organised by the Japan Foundry Society and supported by the China Foundry Association, EICF and ICI. This is the first time this important industry event has taken place in Asia. With beautiful weather and the cherry trees in full blossom the conference was a major success. Over 1,200 visitors from 24 countries attended the conference, exhibition and factory tours in Japan and China.



Giuseppe Facchini EICF President presents a statue to Kanetake Nakatani Japan Foundry Society Chairman

There was a general consensus amongst attendees that the Japan Foundry Society had organised an excellent event.

## World Investment Casting Market Overview

The conference opened with Ron Williams, Managing Director of The Blayson Group presenting the overview of the World investment casting market.

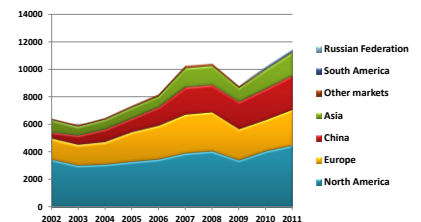


At the last World Conference in Dallas in 2008 concern was rightly expressed about the probability of a major global recession, so it was very reassuring to learn that the investment casting industry has recovered and is well placed for further growth.

Ron Williams was pleased to report that the forecast total for World investment casting sales for 2011 is US\$11.4B. This is an increase of 13% on 2010. Whilst some of the increase can be attributed to exchange rates, some to the continued high cost of metals, the biggest factor is growth of the investment casting industry itself. With GDP growth of many countries at very low levels this is a remarkable result and the industry should be congratulated.

Some significant trends are noticeable in particular the continued strong growth of production in China and Asia.

World Sales by Region 2002 – 2011  
US\$M



## Market Sectors

### Aerospace

Sales performance is extremely strong with full order books for the next 8 years.

Fuel efficient planes and engines are the major driver of sales and airlines around the World are looking to renew their fleets to take advantage of the significant fuel cost savings.

As a result in 2011 Boeing delivered 477 aircraft and took 805 new orders whilst Airbus delivered 534 aircraft and took 1419 new orders.

Production levels for aerospace castings in the West continue to improve but it seems that a percentage of the new extra work is being cast in China/Asia. To confirm this Dr Lu of the China Foundry Association reported that the annual growth for aerospace in China is now approaching 20%. Importantly both China and India are insistent that much more manufacturing of the airplanes destined for their countries airlines is carried out there.

### Industrial Gas Turbines

IGT is the low spot for investment casting as this sector has not yet recovered from effects of the 2008 economic problems. Many planned power generation plants cancelled or remain on hold. However we are now beginning to see a slow improvement that is expected to continue through 2012.

### Automotive

Sales of investment castings continue to grow in this increasingly important sector with Europe and Asia in particular benefitting. The range of parts cast is increasing whilst turbocharger wheels are increasingly used in the fuel efficient engines that are driving automotive sales and growth.

### Medical

With a growing and ageing World population more prostheses are required with an ensuing higher demand for surgical instruments and diagnostic equipment.

However it appears that much of the increased production is being cast in

developing regions whilst traditional Western producers' sales remain steady.

### Commercial

North American and European production is increasing steadily with import/export ratios apparently now fairly stable.

Investment in new capacity is being made in Asia, particularly in India. Interestingly improving the quality of castings is high on Asian producer's agendas.

### Summary

The individual market papers presented demonstrated a clear consensus on performance and growth levels and supported the view that there is a continuing drift of extra new castings orders being placed in the fast growing industries in China and the other Asian countries.

Aerospace will set the trend with another strong performance based on full order books, whilst industrial gas turbines will show a slow improvement.

The use of castings in the growing automotive sector will continue to increase.

The steady improvement in commercial casting sales is expected to continue.

Many regions predict sales growth of around 7% in casting sales in 2012. This compares to the IMF/World bank prediction of 3.3% growth in the global economy in 2012 and on this basis represents a very creditable position for the World investment casting industry.

## Advanced Testing, Wax Developments

Dave Bond introduced the audience to the latest work at the Blayson Technical Centre on advanced wax testing and the subsequent development of innovative wax materials designed to deliver real process benefits to foundries.

The presentation centred on wax properties, factors that influence wax pattern shape and process related testing.



Many factors affect the net shape of a wax pattern - die temperature, wax temperature, injection time, pressure and the solidification rate of the wax. One other significant factor affecting the final shape of the pattern is wax thermal hysteresis, often called wax memory. Whilst the effect of wax thermal hysteresis is well known it is not fully understood.

Overcoming this phenomenon is critical to the production of net shape patterns. Various techniques have been adopted by foundries to try and control this behaviour including the use of setters (formers), thermal treatment, or modifications to the die. However the main problem is that the movement is not consistent.

Extensive research to understand and control wax thermal hysteresis has in turn led to a development programme for advanced wax materials.

The work carried out has confirmed that wax injection process conditions play a major part and these together with the use of advanced wax pattern materials can lead to a major improvement in the final dimensional capability of patterns. Accordingly major process benefits can result from the adoption of an advanced wax formulation with a significantly reduced wax memory.

## Full Transcripts of Conference Market Papers Available

Transcripts of all the full individual market presentations made at the World Conference and Dave Bond's technical paper are available as pdf downloads from the 'Library' page of [www.investmentcastingwax.com](http://www.investmentcastingwax.com)