

CASTINGS

NEWS & VIEWS

March 2018

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South Island Branch Industry Tour

South Island Branch CTNZ industry tour –
Pyrotek & NZ Aluminium Smelter Invercargill



On the 28th of March a group of our members, 10 from Christchurch & 1 from Dunedin, were treated to the rare opportunity of a tour around the New Zealand Aluminium Smelter at Invercargill.

The event was hosted by Sean Rooney of Pyrotek, Invercargill who kindly chauffeured the mini bus throughout the day & showed us some of their manufacturing capabilities. At Pyrotek, delegates enjoyed running one of their insulating sleeve machines and were shown various other operations including; the heavy fabric & ceramic weave press cutter used in the manufacture of industrial

gloves & other items, manufacture of castable refractory launder/spout & alloying stirrer for the smelter & molten metal handling PPE manufacture. An interesting explanation of each of the areas was enhanced by the positive responses from their engaged, friendly staff, their input was much appreciated.



Approaching the smelter at Tiwai Point after a short drive impresses the vastness of the operation & the vision of the people involved in establishing such an ambitious venture. The tour started with a video presentation outlining some history, the processes & many facts & figures. Six hundred reduction cells process 3 tonnes of oxide to produce 1.5 tonnes of molten aluminium each per day which is formed into ingot, billet or rolling block.

Raw material is received as aluminium oxide which has already been reduced/extracted from the Bauxite state. Two kilometres of conveyor transports the AL₂O₃ particulate from ships in the deep water port along the promontory to the smelter storage buildings for subsequent transfer to the reduction cells. Oxide is fed into the top of the 600 reduction cells & reduced to aluminium with the use of heat & an electrical charge provided by carbon anodes & a cathode bottom. Collection vessels beneath contain 9

Tonnes of aluminium when full & 1.5 Tonnes is extracted once a day from each one by a suction tube & sealed vacuum ladle.

The molten primary aluminium is transferred to a casting area where alloying can be carried out & the aluminium formed into ingot, billet or rolling block.

An interesting aspect of the site is that more than a third of the area is dedicated to producing the carbon anodes for the plant, anodes are attached to carriers by the use of molten cast iron poured around the carrier & into the carbon anodes.

The tour of the site & facilities was conducted mainly by minibus with our tour guide giving us commentary & access to areas of interest. The day was rounded off with a short social function with snacks & refreshments provided by Pyrotek.

CTNZ Industry Champion Report

Following the resignation of Robin Stanley from our board nominations were sought from the membership.

The board is pleased to announce the appointment of Kurt Read, Pyrotek to the board. Kurt has a degree in Ceramic Engineering from the University of New South Wales. He has previously worked as a Technical Sales Engineer in refractories and Ceramics for CI Ceramics, Saint Gobain Industrial Ceramics and Phoenix Refractories in Australia. While with CI Ceramics Kurt brought to the Australian foundry market artificial sand called Cerabeads used for specialised sand casting applications.

I have recently received positive news that the business of A&G Price currently in liquidation has been bought. The company has been trading under the liquidation manager in a reduced scale to honour existing contracts and the business has been secured by the landlord.

For many years CTNZ has contracted HERA for accounting services and due to restructuring of their systems they have announced an increase in their fees. The

board has accepted the increase but will continue to look for a better deal as this increase will impact on the 2017/2018 budget.

Bill Lovell
Industry Champion

2018 Conference;

Our annual conference for 2018 is to be held from 10th to 12th August in Napier.



The venue is the iconic Art Deco Masonic Hotel in the centre of the art deco capital and as accommodation is in high demand all year round it would pay to reserve your accommodation early.



Details for accommodation as follows; The hotel is holding rooms for us for a limited time.

Superior single: \$159.00
Superior Queen: \$179.00
Superior King \$189.00

In order to receive your discount, use the booking code: 62695

The Masonic Hotel phone is 06 8358689 or email stay@masonic.co.nz

The hotel also owns the Expressotel which is a 7 minute walk from the Masonic Hotel, phone 06-835 3373 or email stay@expressotel.co.nz.

Queen, twin and park side studios \$139.00
Park side king \$159.00
(all prices include gst)

The banquet dinner on Saturday night will be held at Church Rd vineyards in the Tom McDonald Cellar



Keynote speaker, John Pearce received his B.Sc. and Ph.D. degrees from the University of Aston in Birmingham, England. Before retirement he was a Chartered Engineer and a Fellow of the Institute of Materials, Minerals and Mining. Whilst studying he gained industrial experience at International Nickel, Rubery Owen Group and British Leyland. After graduation he began his career as a research metallurgist at British Cast Iron Research Association before moving to education where for some 25 years he was a senior lecturer in Metallurgy & Materials at Sandwell College FHE.

After working as a metallurgical & quality consultant he moved to Thailand in 1996 to take up a position as a Senior Specialist at the National Metals and Materials Technology Centre, NSTDA in Bangkok. He retired from this post in 2014 and since then he has been a lecturer in the Faculty of Engineering at Panyapiwat Institute of Management, Bangkok.

He continues to be also a visiting lecturer and post-graduate mentor at a number of Thai universities and a consultant to the

metallurgical industry. He is the author/co-author of over 100 technical papers and his main research interests have centered on structure-property relationships in metal castings with particular attention to Alloy White Irons. He is also a referee for a number of technical journals.

Dr. Pearce is a Past-President of the Birmingham Metallurgical Association and in 1997 received the Voya Kondic Medal for services to education in the cast metals industry.

John has proposed the following topics;
Sat morning: "Metal Casting - A Challenge for Electron Microscopy"
Sat afternoon: "Alloy White Irons for Wear and Heat Resistance"
Sun morning: Control of Microstructure and Properties of Casting by Heat Treatment

Another overseas presenter (TBC) is Eric Buckley from the Australian Die Casting Association.

Eric has a degree in Industrial Chemistry and began his career in the laboratory of a non-ferrous metal producer. He has worked in several Die Casting companies in very senior roles, making zinc, aluminium and brass Die Castings by the high pressure, gravity and low pressure processes. Always active in education and technology with the Australian Die Casting Association, including seminars, technical presentations and conferences, he also has many years of experience marketing high technology Die Castings to Automotive companies around the globe.

Eric will talk on the following; **“Die Casting Quality Measurement, Monitoring and Training”**

The worldwide Die Casting industry is growing at about 4% every year and has done so for the past 20 years. However, the biggest gains are had by those companies that embrace new knowledge and technologies and integrate them into their factories. Some examples of who, and how this has been done to gain a share of the international market.

A new way to measure the quality of a cast part has been developed which establishes a quantifiable Quality Index Value. This enables the actual properties to be compared with the theoretical properties and is essential when making parts for critical applications. This Quality Index is applicable to all types of castings, not just pressure Die Castings. Hot Cup Die Casting, a totally new way of making aluminium pressure Die Cast parts which overcomes the shortfalls of the cold chamber process.

Advanced Shot Monitoring: This new system focusses on the 7 main elements of the Die Casting process: Cavity Filling, Solidification, Ejection, Die Temperature, Die Clamping, Vacuum and Plunger Movement. As well as the traditional sensors attached to the machine, this new system uses sensors in and on the dies to look inside and see what is really happening.

Online Training: Staff in Die Casting plants are rarely given sufficient training in Die Casting technology. Consequently, some plants make a lot of reject parts and have high production costs. When these companies try to introduce new technologies, it is often not successful due to the knowledge gap. Now there is a new, structured training program which teaches how to apply science and engineering to the Die Casting process in a commercial environment. These subjects can be accessed 24/7 from any location and are very low cost. Some companies are achieving startling results from participation in this training program.

We will have an interesting industry tour on Friday 10th afternoon and the partners will be catered for with a Saturday event.

Registration details and further details will be made available as they come to hand and will be on our website. Please contact Bill Lovell if you would like to make a presentation as I am still looking for speakers.

Employment - Job Vacancies

Recently I have received four employment application enquiries.

Martin Johansson: experienced in tool & patternmaking for castings, currently in Sweden. Email; info@bholmforvaltning.se
Vishal Bhatt: a metallurgy engineer who is in Auckland. Email; vishal0305@yahoo.com
Francisco Guerra: with a PhD in metallurgy and casting and currently studying in USA. Email; franciscovapeani@gmail.com
J Babu: experienced in foundry production, currently in India. Email;
If you are interested in these applicants and would like their CV please contact me.

Conferences and Events

The 22nd Global Foundry Sourcing Conference will be held in Shanghai on 26th April. 2018

Where: Shanghai

When: 26th April 2018

CTNZ Annual Conference

Where: Art Deco Masonic Hotel, Napier

When: 10th – 12th August 2018

AFI 54th Australian National Conference

When: 12 – 14 October, 2018.

Where: Sea World Resort, Gold Coast, Queensland.

Worksafe NZ Exposure Standards

WorkSafe New Zealand is consulting on proposed changes to Workplace Exposure Standards (WESs) and Biological Exposure Indices (BEIs) for the following substances:

- Flour dust
- Hydrogen sulphide
- Nitrogen dioxide
- Propylene oxide
- Styrene
- BEIs – Arsenic (elemental and soluble inorganic compounds); Benzene; Carbon disulphide; Carbon monoxide; Chromium VI (hexavalent chromium), water-soluble fume; Ethyl benzene; Fluorides; Mercury (elemental); 4,4-Methylene bis(2-chloroaniline) (also known as MOCA, MBOCA); 4-4-Methylene diphenyl diisocyanate (MDI); Methyl isobutyl ketone (MIBK); Pentachlorophenol (PCP); Phenol; Tetrahydrofuran (THF); Toluene diisocyanate-2,4- or 2,6- or mixture of isomers (TDI); Toluene; Trichloroethylene (TCE).

Reviews for each of these proposed WESs and BEIs have been carried out by WorkSafe. There are separate proposal documents for each of the

proposed WES and one proposal document that covers all of the proposed BEIs. The proposal documents and the Submission Document are located here:

[Proposed changes to Workplace Exposure Standards and Biological Exposure Indices](#)

To provide a submission please use (only use) the submission spreadsheet.

Please note within the next few weeks we will be consulting on a further group of WES

including: beryllium, cobalt, chromium (VI), manganese, nickel, perchloroethylene, Portland cement, synthetic mineral (vitreous) fibres, sulphuric acid, total welding fume.

WorkSafe encourages you to advise interested parties about this process, to help ensure that the consultation process is available to as many individuals and stakeholders as possible. We would encourage industry associations to share the information with their member organisations, and feedback is welcomed from individuals, businesses and industry associations.

The deadline for response is 15th June 2018.

Where to send your

response: exposurestandards@worksafe.govt.nz

. Subject line: Consultation on WES and BEIs

Official Information Act:

We are subject to the Official Information Act 1982, which means that your submission may be made available to those seeking information under that Act.

Board Members Email Contacts

Should you have any queries or require assistance, please feel free to contact a Board member.

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(Industry Champion/Secretary)

EMEX 2018

A reminder that coming up next month is the bi-annual EMEX show at the Auckland showgrounds from 1st to 3rd May. CTNZ has supported members exhibiting for the last 2 shows and has committed to a stand for the 2018 show. The deal is that CTNZ shares the stand with as many members' exhibits as possible and the cost will be shared equally. The 2014 show attracted several foundries who returned to exhibit in the 2016 show. Two companies have committed to exhibiting and ideally we would like to have another one so if you are interested in exhibiting please let me know as time is running out. Please contact Bill Lovell.