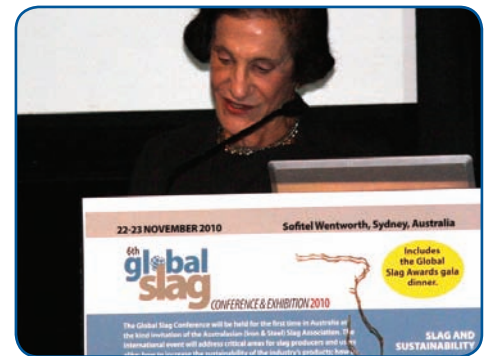


Editorial - Governor Opens Successful 6th Global Slag Conference and Exhibition - Sydney

It was a great privilege to have Her Excellency, Professor Marie Bashir AC CVO Governor of New South Wales open the 6th Global Slag Conference and Exhibition at the Sheraton Wentworth Sydney in November of last year. Her Excellency congratulated the Global Slag organisers Pro Publications International Ltd for attracting more than 120 delegates to the conference, half of who were attending from overseas. She also paid tribute to the part played by the Australasian (iron & steel) Slag Association for its part in securing the conference for NSW and for its ongoing efforts in supporting the 20 years young, iron & steel slag products industry.

As part of her visit, the Governor inspected the exhibition and was present for Michael Hitchens' (1) key note paper: Australia's climate change policy response in the context of the Copenhagen Accord, Cancun and beyond. (2) This paper challenged some of the domestic and international perceptions around Australia's performance in response to the calls for emissions reductions. He stated "Australia's unilateral commitment to reduce emissions to -5% of 2000 emission by 2020 is far more aggressive than the EU commitment of -20% of 1990 emission by 2020 and the USA's -17% of 2005 emission by 2020." Australia is on the way target to meet 8% reduction exceeding the Kyoto target by more than 50 million tones.



Her Excellency Professor Marie Bashir AC CVO Governor of New South Wales opening the conference

There is a need to break the developed / developing world paradigm Mr Hitchens said. In the final analysis, USA and China are key to making great inroads on global emissions. In the future, there is likely to be a global patchwork of pledges and actions; rather than binding agreements.

1. Michael Hitchens is Chief Executive Officer, Australian Industry Greenhouse Network
2. Hitchens, M: - Australian Greenhouse Network - Australia's climate change policy response in the context of the Copenhagen Accord, Cancun and beyond - 6th Global Slag Conference and Exhibition Sydney Australia 2010.

6th Global Slag Conference a great success

After several years of negotiation between the ASA and Global Slag Conference and Exhibition organizers, Pro Publications International, the Conference came to Sydney in November 2010. With a full line up of high quality speakers, this 6th Global Slag Conference and Exhibition provided great international technical exchange as well as the opportunity to look at new products and establish new contacts. In addition to the two full days of presentations and the Conference Dinner at the Opera House forecourt, many delegates chose to take the optional site tour to BlueScope Steels and Australian Steel Mill Services respective operations in Port Kembla 80km south of the Sydney conference venue.

Based on the survey response of delegates at the end of the conference - the event yielded very positive feedback. In summary, Dr Robert McCafrey from the conference organizers Pro Publications International reported: "We were delighted with the response to the conference and after analysing the conference feedback, the event actually scored top marks in a number of categories compared to our previous Global Slag Conferences, including in pre-conference administration, conference literature, the balance of papers, the quality of the conference hotel, the usefulness of the conference for technical information and also the usefulness of the event for making contacts. In short it was rated by delegates as the 'best ever Global Slag Conference and Exhibition thus far.'"

A selection of delegate responses includes the following: 'The conference was very well-run, and kept strictly to time.' '...very helpful conference and I would like to participate again. A big thank you for the warm welcome and to the warm-hearted help of the conference staff.' "It was an outstanding Gala Dinner with superb entertainment." 'Keep up the good work.' 'There was a good mix of presentations: Job well done!' 'A thoroughly enjoyable and rewarding experience, increasing my knowledge of slag materials.' 'It was a good opportunity for networking in the industry group.' 'Job well done! The session chair's excelled at their jobs, and brought an element of humour into the mix.'

"The next Global Slag Conference will take place in Helsinki, Finland, on 17-18 November 2011. All details for Helsinki and reports on the Sydney conference can be viewed at www.propubs.com/gsc

1. **Editorial** - Governor Opens Successful 6th Global Slag Conference and Exhibition - Sydney
1. 6th Global Slag Conference a great success
2. First international meeting of Slag Associations
2. New case study on Low carbon products opportunities in the EAFS supply chain
3. **Insider** - Fire Resistance of Slag Blended Cements
4. **Insider** - A New Integrated Dry Slag Granulation (DSG) and Heat Recovery Process
5. What's in a name? - Beyond slag!
5. New reference data sheet on aggregates and cementitious products
6. News Briefs - Australasian & International

First international meeting of Slag Associations

With so many overseas delegates present, the opportunity was taken to open more formal dialogue between the international slag associations - National Slag Association (USA), Nippon Slag Association (Japan), Euroslag (EU), Brazilian Slag Association and Australasian (iron & steel) Slag Association. Other countries such as Korea, India and China, not having formal networks, were invited to join the meeting and share their respective views. The Australasian (iron & steel) Slag Association facilitated and hosted the meeting. The discussions and proposals focused on sharing of; international production and utilisation data, government legislation, regulation and technical rule changes, environment, chemistry, testing requirements and research activities. The aims for the meeting were simple - firstly to reconnect and strengthen global and mutual interest in 'all things' iron and steel slag, to agree on ways to share global experiences, determine common ground where and how we can share these experiences, good or bad, learn from each other's positive and negative outcomes and lastly to globally coordinate better opportunities to further strengthen our mutual interest.

Those present were keen on strengthening the informal network and exploring ways of building further international cooperation. Whilst the decisions at this meeting are not formally binding a number of aspirational goals were established. Those present undertook to explore the development of an international survey tool and common base for the collation of international statistics. Each Association has working groups that cover technical and educational objectives; the group will explore how appropriate information can be shared across the network.

The optimal use of slag products is underpinned by substantial research work. An aim is to prepare a summary of worldwide research current and proposed. It is also proposed to form an 'in kind' secretariat to support the network with Australasian (iron & steel) Slag Association offering to take up this responsibility for 2011 and 2012. There are many conferences each year directly and indirectly on iron & steel slag products. To this end the aim is to prepare an International Conference Calendar providing a rolling 2-year notice of upcoming events. Given global ascent to these goals, the informal network will become a reality, further underpinning the global slag products industry.



(L - R): Karen Kiggins – Executive Director National Slag Association (USA), Nick Jones (UK), Andrew Hayes & Dan Cartwright (AUS) at the 6th Global Slag Conference and Exhibition – Sydney November 2010

New case study on Low carbon products opportunities in the EAFS supply chain

Several new low-carbon product opportunities have been identified during an 18 month exploration of ways to utilise iron and steel slag (ISS) in particular Electric Arc Furnace Slag (EAFS). The Australasian (iron and steel) Slag Associations (ASA) 'Sustainable Capacity Building Program' contributes towards the ASA's broad aims of increasing the effective utilisation of EAFS currently co-produced in Victorian steel mills.

The program, supported by Sustainability Victoria's Business Partnerships program and delivered in association with Link Strategy, has conducted a series of supply chain workshops with industry stakeholders to raise awareness of the beneficial uses of ISS and encourage an increase in the utilisation of the material.

Participating companies, including producers, processors and value adders of the material recognised that real benefits would only accrue from the program if they tackled the complexity of the supply chain and challenged old assumptions and practices about the utilisation of EAFS.

To benchmark the current knowledge of EAFS as held by the participating companies, an industry efficiency benchmarking report was developed. The report analyses the ISS supply chain from three perspectives: energy use; products; and participant attitudes to issues that impact on effective utilisation of the material in Victoria.

Participants assessed new low-carbon product options, and their application. Their resulting discussions have led to the development of a case study that focuses on the potential uses of EAFS in road construction application. This case study focuses on the environmental benefits arising from the effective recovery and use of EAFS, which would otherwise most likely go to landfill.

Case study can be downloaded from <http://www.asa-inc.org.au/Doc/ASA-Low-carbo-product-opportunities-Single.pdf>

Fire Resistance of Slag Blended Cements

Alessandra Mendes reported to the Technical Committee of Australasian (iron and steel) Slag Association on the early stages of her research into the Fire Resistance of Concretes made with slag-blended cements in 2008. At the 6th Global Slag Conference and Exhibition in Sydney, Alessandra presented her conclusions on this research to a highly appreciative international audience.

Concrete is one of the most used construction materials in the world. When concrete is subjected to a fire, deterioration of its mechanical properties occurs, leading to reduction of the safety of the structure. Consequently, the fire resistance of concrete has been the focus of many researches since 1920.

A common methodology to investigate the physical and chemical transformations experienced by concrete when exposed to heating is to divide the study into two stages: i. the study of the cement paste and ii. the study of the concrete as a whole, in which the paste, the aggregates and the interface between those are analysed. (1) This paper reported on investigations into the physical and chemical transformation that take place in pastes subject to exposure to high temperatures. It compares pastes made with Ordinary Portland Cement (OPC) and pastes made with 35, 50 and 65% replacement of OPC with Ground Granulated Blast furnace Slag (GGBFS).

Both short- and long-term behaviour (up to 1 year) of pastes after an initial exposure to high temperatures were investigated. After exposure to temperatures up to 800°C the specimens were subject to compressive strength testing. The physical and chemical transformations of the binders of the concrete were analysed by thermogravimetric analysis (TGA), silicon and aluminium nuclear magnetic resonance (^{29}Si NMR and ^{27}Al NMR), x-ray diffraction (XRD), infrared spectroscopy (IR) and Synchrotron Si K near edge x-ray absorption fine structure (NEXAFS) spectroscopy.(1)

This work concluded that partial replacement of OPC with GGBFS in concrete pastes subject to high temperature results in

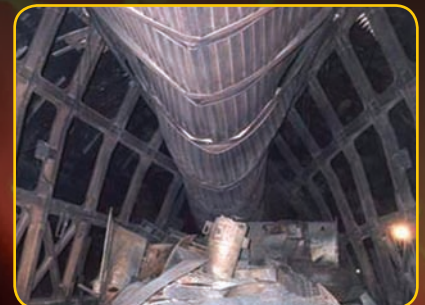
- Beneficial consumption of Ca(OH)_2
- More polymerized silicate phase after 800°C
- Aluminate phase less susceptible to rehydration and
- Improvement in the mechanical properties following exposure to temperatures beyond 400°C.

Editors Note: Based on feedback from conference delegates, Alessandra Mendes' presentation was judged to be the best presentation of the conference. This is a great tribute given the high standard of papers presented to the conference.

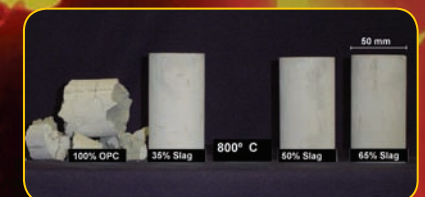
1. Mendes A - Monash University - Fire resistance of blended cements - 6th Global Slag Conference and Exhibition Sydney Australia 2010. - e-mail: alessandra.mendes@eng.monash.edu.au



Alessandra Mendes



Specimens immediately after 800°C showing the effects of dehydration of Ca(OH)_2



After 1 Year OPC Paste and 50% Slag

Company Members

A primary role of our Association is to bring together Slag Producers, Processors, Customers & Suppliers to the Slag Industry. Our activities cover technical developments, plant operations and processes, education and promotion. If you would like more information on the Association and how you can become involved, simply complete the information section at the end of this newsletter. Current membership is as listed below.

Australian Steel Mill Services Pty
BIS Industrial Logistics
Boral Cement Ltd
Bluescope Steel Ltd (Port Kembla)
Cement Australia
Concrete Pty Ltd
HiSmelt Ltd
Holcim Pty Ltd
Holcim NZ Ltd

Harsco Metal Holdings Pty Ltd
OneSteel Limited
Roads & Traffic Authority of NSW
SCE (Steelstone)
Steel Cement Ltd
SteelServ Ltd (NZ)
Swinburne University of Technology
University of Newcastle
University of Wollongong

Personal Members

Anderson, L
Gregory, G
Hanley, P (Hon.)
Heaton, B (Hon.)
Hinczak, Dr, I (Hon.)
James, W (Hon.)
Jones, D E (Hon.)
Prosser, S D (Hon.)
Venour, M (Hon.)

Related Associations - Canadian Slag Association | National Slag Association (US) | Nippon Slag Association (Japan) | European Slag Association (EU)

A New Integrated Dry Slag Granulation (DSG) and Heat Recovery Process

The common approach to granulation of molten iron blast furnace slag is to use high volume high-pressure water sprays to rapidly quench and solidify the material into sand like granules containing high glass contents. Once dried granulated blast furnace slag (GBFS) can ground finely to produce a cement replacement product. Given the rapid cooling required, the water to slag ratio is up to 10:1 and although generally recirculated there is a significant quantity of makeup water (up to 10%) required. To minimize fugitive sulphur emissions (H₂S) cold-water granulation systems are generally employed around the world. The paper asserts, whilst successful in producing quality GBFS, water granulation has the detriments of significant water consumption and has no scope for heat recovery (1.8GJ/t slag) in current installations. To address these shortcomings, a new integrated dry slag granulation (DSG) process has been developed at Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO).^(2.) In this process, the molten slag is atomized using a spinning disc to produce slag droplets, which are then quenched by air and solidified to produce glassy slag suitable for cement manufacture. The new process could also recover high grade heat. Apart from saving water, the new method also eliminates fugitive sulphur emissions.



Semi-industrial Scale Plant (2009/10)

The concept of the integrated DSG process has been proved through a prototype pilot plant capable of processing molten slag at up to 10 kg/min. The process has been scaled up and a semi-industrial scale DSG plant with a capacity of 100 kg/min slag has been recently built and commissioned at CSIRO. Tests are being carried out using this plant to provide information to validate a Computational Fluid Dynamic model of the process. This model will be used to design a full size industrial DSG plant (treating 1-2 t/min), which will be used in trials in the near future.

Several technical challenges associated with operating a compact granulator have been successfully resolved. The new process can dry granulate molten blast furnace slags at 1400-1500C and discharge solid granules at 50-100 C, while simultaneously recovering heat from the slag using air. The dry granulated slags were found to have high glass content and good cementitious properties suitable for cement manufacture. A preliminary techno-economic evaluation indicated that the new process might also deliver considerable savings in capital and operating cost. The new process is now being scaled up to a semi-industrial DSG plant for further demonstration in preparation for further scale up to a full size industrial DSG plant for plant trials at one of Australian blast furnaces in 2-3 years.

2. Dongsheng Xie, Terry Norgate, Sharif Jahanshahi - A new integrated dry slag granulation and heat recovery process - CSIRO Minerals Down Under National Research Flagship, Australia. 6th Global Slag Conference and Exhibition Sydney Australia 2010

What's in a name? - Beyond slag!

Slag – This is the first thing that confronts any new person entering the world of iron and steel slag products. Usually what follows is a strong suggestion that we change the name given its perceived lack of marketability and in some cultures its negative connotations. With some 120 delegates from around the world present, Conference Convener Dr Robert McCaffrey engaged the conference in discussion. How is slag perceived around the world, is the name a problem and what alternate suggestions do the delegates have. A lively discussion ensued. Consensus seemed initially to build around the word slag connoting images of waste, dirty and industrial, and in some cultures having sexual or undesirable connotations. Since it floats on the metal during the refinement process, in some countries it is likened to cream and as such highly valued. Other comments included “anything is better than slag”, “we don’t get credit for optimizing slag” and “with a new name we could promote it – change the name, change your brain”. In preparation for the session, delegates were asked to submit their suggestions for a new name.

Clearly delegates enjoyed the session and from it came some areas of consensus and some suggested new names. There was agreement that producers and marketers generally produced products with names that were more closely aligned to the end purpose. Slag more closely refers to the molten material that is then transformed by processes of cooling and subsequent processes such as crushing and screening or grinding to suit market applications. The raw materials of iron and steel molten slag is not sold directly to the construction market, the focus more correctly belongs to the proprietary products of manufacture rather than the raw material.

A definition for the ‘new slag’ might be: A technologically advanced engineered and specified product that uses molten slag as the raw material. In these terms, the materials we work with and promote are products – not waste. Given this, perhaps the Global Slag Conference and indeed other similar forum should refer to the products and their technological research, development and application rather than the raw material.



Dr Robert McCaffrey (Global Slag Conference organisation)
with Mr Robert Newman (Australasian iron & steel Slag Association)

New reference data sheet on aggregates and cementitious products

It is a core part of the Australasian (iron & steel) Slag Associations charter to develop and maintain technical publications to support the use of iron & steel slag products. Initially this involved the production of booklets the first of which at the beginning of the 1990’s was A Guide to the Use of Slag in Roads, developed in partnership with the NSW Roads and Traffic Authority. This underwent several revisions along with changes in road making design and the increased technical and performance data available. Following the ‘roads’ guide, an allied publication; A Guide to the Use of Slag in Asphalt and Bituminous Surfaces and A Guide to the Use of Slag in Cement and Concrete have been published amongst others.

The technical underpinnings of these documents remain sound. However, they have been in circulation for a number of years and there is additional technical information available making updating appropriate. Changes in the way we use and store documents have occurred over the past 2 decades. Consistent with this, the Association has decided to move to downloadable data sheets rather than printed publications in book form.

A Guide to the Use of Slag in Cement and Concrete is the first ‘guide’ to be updated and produced as a series of Reference Data Sheets. Released during December, the Association’s first Reference Data Sheet, on Aggregate and Cementitious Products, is now complete and ready for download from the ASA’s website at the following link: <http://www.asa-inc.org.au/techguides.shtml>

Thanks for a Great 2010 & Wishes for an even greater 2011

Thank you for your support of the Association during 2010.
Our particular thanks to all who attended and supported the 6th Global Slag

AUSTRALASIAN



Mona Forghani leaves HBM Group

“Mona having been with us for 2 1/2 years and having recently completed her studies in Communications and Marketing announced she has accepted a position in Israel with

the Bahai Cultural Centre. Whilst it is sad to see her leave, our best wishes go with her on the next stage in her personal journey”. Alison Fitzgerald joined HBM Group in December, taking up Mona’s responsibilities for the ASA.

Conference CMIC 2010

The Association participated in the successful CMIC conference in October this year. Great encouragement was taken from the success of the conference and responses to the Association’s participation from the some 330 delegates. Significant interest was attracted to the ASA new booth design and USB “technical compendium” give aways. ASA has committed to participating in the 2012 conference as one of its strategic activities for that year.



Highly successful 6th Global Slag Conference – Sydney 2010 reviewed

Participants at the conference strongly praised the slick organisation of the conference, which was greatly enhanced by the cooperation and efforts of the Australasian (Iron and Steel) Slag Association. The technical content and networking opportunities at the conference were also very highly rated. Many international delegates were impressed with the spectacular city of Sydney and with the friendliness and openness of the Australians they met at the conference and field trip

For conference review go to <http://www.propubs.com/gsc/>

BlueScope Steel Port Kembla restructure

Changes within the operations centres of the steelworks have resulted in a change in the reporting responsibility for the alliances in the recycling business. Accordingly, the Energy Services manager Chris Page will become the new BlueScope Steel nominee for the Executive Committee in early 2011. Association Chairman Jim Graham will retire at the Association’s AGM as a result of this change.

The Concrete Institute of Australia

has launched a call for abstracts of papers for the 25th Biennial Conference from 12 - 14 October 2011, Burswood Convention Centre, Perth. The broad theme of the conference is concrete – building a sustainable future. Details of the conference and conditions for submission of abstracts are available at www.concrete2011.com.au.

INTERNATIONAL

Karren Kiggins visit – President of the National Slag Association – USA was a delegate and speaker at the 6th Global Slag Conference in Sydney 2010.

Harsco Appointments

Worldwide industrial services and engineered products company Harsco Corporation (NYSE:HSC) announced today two key appointments in its global Harsco Metals and Harsco Minerals business groups, with Daniel S. McAtee joining Harsco Minerals as President and Gene A. Iannazzo being named Chief Commercial Officer for Harsco Metals and Harsco Minerals. Both positions will report to Executive Vice President and Group CEO Galdino Claro.

Mr. Iannazzo joined Harsco’s senior management team

In 2001 and brings to his new responsibilities over 30 years of global experience in the metals and minerals industries. He serves on

the Board of Directors of the American Iron and Steel Institute and the Board of Trustees of the Association for Iron & Steel Technology, and is a current Director and Past Chairman of the National Slag Association.

Source: HARRISBURG, Pa., Oct. 25, 2010 (GLOBE NEWSWIRE)

VCNA PRAIRIE JOINS LEVY BEHIND SUPERIOR MATERIALS

Oct 5, 2010 2:08 PM

Sources: Edw. C. Levy Co., Dearborn, Mich.; VCNA Prairie Inc., Chicago; CP staff

By Don Marsh

Levy Co. and VCNA Prairie have entered a 50/50 joint venture to own and manage Superior Material Holdings, LLC in Detroit. The move coincides with U.S. Concrete’s exit from a partnership with Levy backing the entity since 2007, when the business spanned 28 ready mixed plants and a fleet of nearly 300 mixers—assets since scaled back with the Michigan economy’s sharp decline. “This transaction will consolidate Prairie’s and Levy’s presence and create a stronger company for all stakeholders, leveraging the vast experience of its employees, [and] solidify Superior’s position in Michigan as a leading provider of ready mix concrete,” the new partners noted in a joint statement.

7th Global Slag Conference – in Scandinavia 2011

In 2011, the 7th Global Slag Conference will return to Europe, but will take place in Scandinavia for the first time. Given the concentration of high-quality research into slag behaviour and the long history of the use of slag-derived products in Scandinavia, the 7th Global Slag Conference, in November 2011 in Helsinki is a must. For conference details go to <http://www.propubs.com/gsc/>



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