

# The Role of Niobium in Advanced Ferritic Stainless Steels – Building a Sustainable Future

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The Royal Society of Chemistry  
15th July 2015



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CHARLES HATCHETT SEMINAR 2015

# WELCOME AND INTRODUCTION

Dr Naila Croft

International Coordinator of the Charles Hatchett Award

Today's Programme:

- A seminar recognising the Role of Niobium in Advanced Ferritic Stainless Steels and their importance for Building a Sustainable Future

INCLUDING

- Presentation of the 2015 Charles Hatchett Award winning paper

# A FEW WORDS OF HOUSEKEEPING.....

- Safety - Fire Alarm
- Guest packs / Agenda for the day
- Coffee / Lunch Breaks
- Questions or comments on the presentations
- Mobile phones OFF, please!

# Companhia Brasileira de Metalurgia e Mineração

**CBMM:** World leader in niobium technology



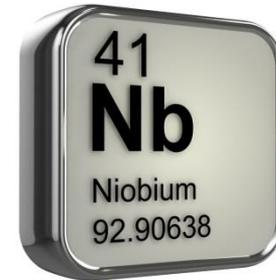
Sponsors of the Charles Hatchett Award since 1979

**Niobium:** Solutions for a sustainable future



# CHARLES HATCHETT AWARD

Niobium - 1801



IOM3 Award



Awarded annually to the best publication on the science and technology of niobium

[www.charles-hatchett.com](http://www.charles-hatchett.com)

CHARLES HATCHETT SEMINAR

2015

# PROCESS OVERVIEW FOR CHARLES HATCHETT 2015



CHARLES HATCHETT SEMINAR 2015

# 2015 AWARD WINNING AUTHORS

B. Kuhn, M. Talik, J. Zurek, H. Hattendorf, P.J. Ennis,  
W.J. Quaddackers, T. Beck, L. Singheiser

Development of high chromium ferritic steels strengthened by  
intermetallic phases



# CURRENT INTERNATIONAL PANEL

- Dr Dong Woo Suh, Pohang University of Science and Technology, South Korea
- Dr Ronaldo Barbosa, ABM, Brazil
- Prof Chengjia Shang, University of Science & Technology Beijing, China
- Dr Volker Flaxa, Salzgitter Mannesmann Forschung GmbH, Germany
- Dr Murali Manohar, ArcelorMittal Global, USA
- Mr Alan Denney, AKD Materials Consulting Ltd, UK

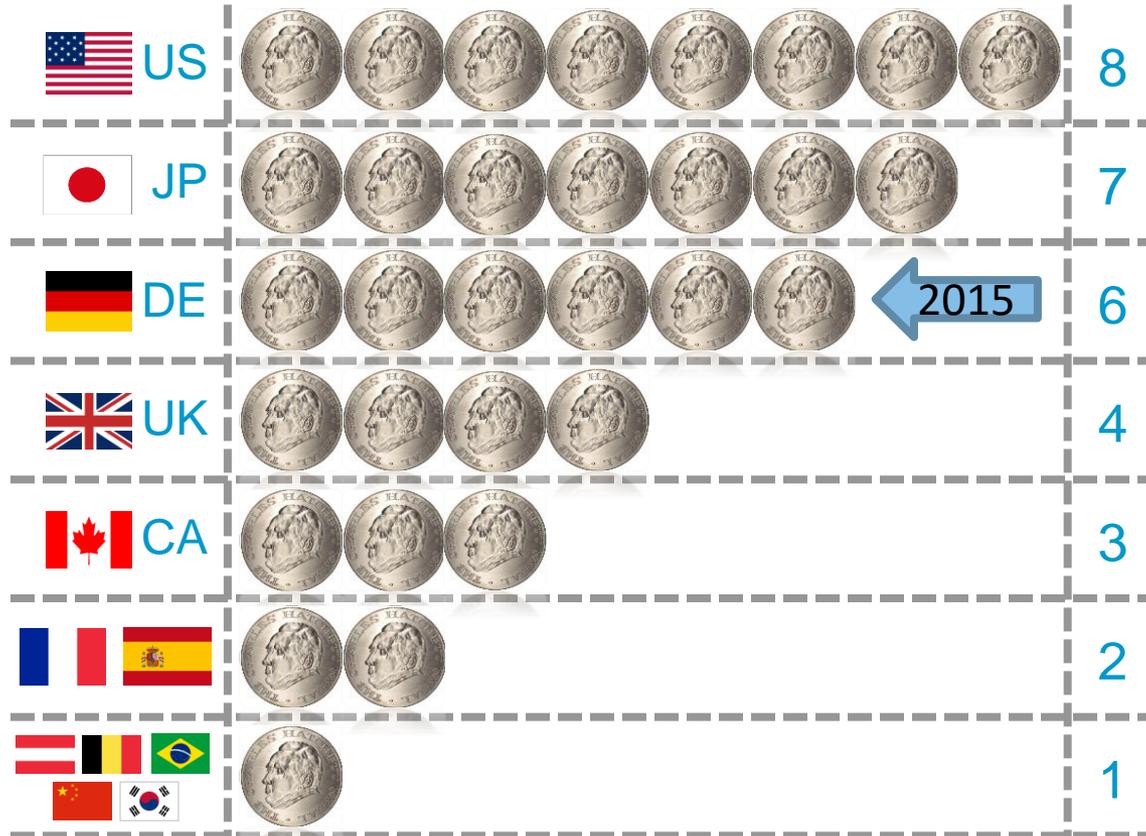


# INTERNATIONAL PANEL (2016)

- Dr. Kiso Kim, POSCO Technical Research Laboratories, **South Korea**
- Prof. Oscar Balancin, Universidade Federal de São Carlos, **Brazil**
- Dr. Hani Henein, University of Alberta, **Canada**
- Dr. Isabel Gutierrez, CEIT - Materials Department, **Spain**
- Prof. Indradev Samajdar, Indian Institute of Technology Bombay, **India**
- Mr Alan Denney, AKD Materials Consulting Ltd, **UK**



# MEDAL TABLE – 2015 AWARD



# What is Sustainable Development?

World Commission on Environment and Development:  
1987 Brundtland Report - “Our Common Future”

“Meeting the needs of the present without compromising the ability of future generations to meet their own needs”

“Sustainability is not a choice; it is a necessity. We did not inherit the earth – we are borrowing it from our great-grandchildren” (King Willem-Alexander, of the Netherlands)

# Sustainable Development – The “Triple bottom line”



# The role of Nb-containing ferritic stainless steels

Contribute to all 3 domains of Sustainable development:

## Economically attractive

- Small additions of Nb may produce increased strength or increase efficiency at high temperatures or to a **substitution of an austenitic steel by a ferritic one**
- Weight savings, a shorter operation lead time or a reduction of alloying elements would lead to reduced costs

## Environmentally friendly

Reduce,  
reuse,  
recycle

- Excellent life cycle considerations
- **Ferritic stainless steels are easily recyclable**
- Environmentally-conscious producer (CBMM – ISO 14001 certified since 1997)
- **Long-term availability of Nb**

## Socially conscious

- CBMM's active participation in **urbanization, cultural, educational, and health initiatives** in Araxa, Brazil is well-known

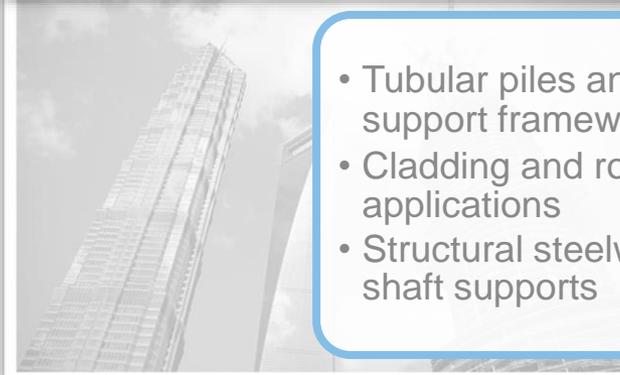
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## Everyday Applications



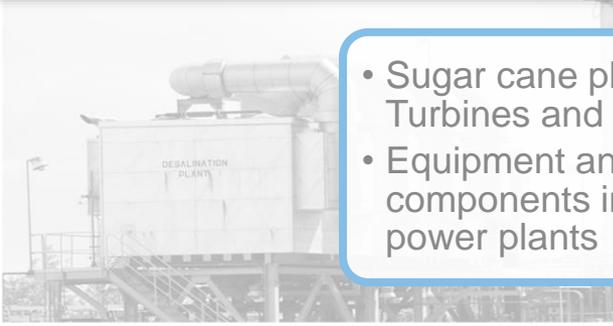
- White goods, e.g. Kitchen cookers and fridges
- Cutlery
- Elevators

## Structural Applications



- Tubular piles and support framework
- Cladding and roofing applications
- Structural steelwork for shaft supports

## Industry Applications



- Sugar cane plants, e.g. Turbines and distillery
- Equipment and/or components in steam power plants

## Transport Applications



- Car exhaust systems
- Load-bearing members
- Railway electrification masts

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# Ferritic Stainless Steels