

# Indian Institute of Welding, India ( IIW-India )

Incorporated on 22 April 1966 in Calcutta to promote and propagate the science, technology and engineering of welding in India. It has since spread its wings to cover the entire nation with thirteen branches all over the country. The Institute is a non profit organization registered under section 25 of Company Act 1956 and is also registered under section 12A of Income tax Act. 1961 as an Institute for charitable purpose .

The Indian Institute of Welding is proud to have established IIW-India Foundation to further it's theme, "WELDING FOR NATION BUILDING". The welding technology and its applications are changing swiftly and that's where IIW Foundation plays an important role in bridging the gap between the currently prevailing technology in India and one prevailing advanced countries. Ion to industry

The Foundation is an independent body as far as financial aspects are concerned. This is an inter-disciplinary body funded by industries, academicians and government agencies, which in the long run would benefit the industries. The Foundation facilitates research, training and education in welding and allied subjects. The Foundation provides scholarships to deserving students to enable them to present technical papers in international seminars/ conferences abroad every year. This helps in creating careers that can sustain and grow with the industry. The Foundation wishes to develop resources, facilities and infrastructure for the progress, usage and development of welding technology in India.

## The main objectives of IIW Foundation :

1. Assist human resources development in welding
2. Technology diffusion and the individual.
3. Foster R & D in welding
4. Promote health & safety in welding
5. To promote education, training & qualification in welding in line with international standards that would be globally recognized and accepted
6. Establish international standards of quality for the Indian fabrication industry

AWS LECTURE SERIES IX ORGANIZED

BY

**IIW-INDIA FOUNDATION**

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American Welding Society

# IIW India – AWS

Lecture Series IX



## WELDING OF NICKEL AND NICKEL ALLOYS

5<sup>th</sup> February to 15<sup>th</sup> February 2019 (in five cities)

&

Welding of Materials with Metal cored wires  
and Flux cored wires

**Mr. Brian Gaal**

Advisor AWS subcommittees on  
A5B , G2C,G2E and A5A groups

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**Mr. Brian Gaal**  
**Technical Director**  
**ARCOS Industries, LLC**

Brian Gaal was born in Ohio and raised near Columbus. He attained a bachelors in Welding Engineering from Ohio State University. He started his career with Electrode Engineering Inc. (EEI). While at EEI, he worked in as a formulator focusing on low alloy steel and nickel based SMAW electrodes. He was also took on special projects with other Euroweld partner companies such as: specialized turnkey welding systems, strip clad welding systems and fluxes, data acquisition systems and high deposition TIG overlays.

After working for Euroweld and EEI for over five years he moved on to Special Metals. While at Special Metals he completed his Master's degree in Welding Engineering at Ohio State University through their distance learning program. At Special Metals he became the Senior Welding Engineer. Not only was he formulating electro-slag, submerged arc fluxes, and SMAW electrodes, but also worked as a process engineer and obtained extensive Lean and Six Sigma training. In the summer of 2015 he left Special Metals and returned to Ohio to join Select Arc Inc. and Arcos Industries LLC. He worked as a formulator and product development engineer out of the Troy Ohio facility focusing on SMAW electrodes, submerged arc welding fluxes, nickel and stainless steel FCAW and GMAW-C (metal cored) wires. In April of 2018 he was transferred to Arcos and became the Technical Director. At that role not only did he continue to work on product development, but also over sees the Quality Assurance Department. He currently lives near Mount Carmel PA and focuses his full efforts on stainless steels and nickel based alloys for all arc welding applications.

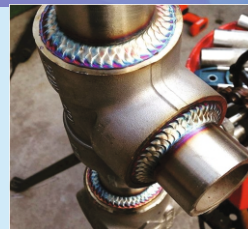
## Contents

### WELDING OF NICKEL & NICKEL ALLOYS

- 1) Advent and brief properties of Nickel, availability /source and applications.
- 2) Effect of Alloying elements
- 3) Various Alloys as defined by AWS
- 4) High temperature and corrosion properties of Nickel Alloys.
- 5) Nickel Alloys groups for different media in industry.
- 6) Development Tree of Nickel Alloys.
- 7) Welding characteristics of Nickel Alloys
- 8) Strip cladding of Nickel Alloys
- 9) Nickel Alloys for NACE applications
- 10) Effect of Fe content on corrosion
- 11) Health & Safety

### Welding of Tubular wires

Flux cored and metal cored wires are growing in popularity for many reasons. The largest is welder appeal and ease of use. From its use in field fabrication and erection to custom-made chemical compositions, there are many advantages to using a tubular wire. This lecture will cover how tubular wires are different from solid wires. The difference between and flux cored wires and a metal cored wires. What are the advantages and limitations of both flux cored and metals cored wires. The nuances of using tubular wires in the GMAW, FCAW, SAW and even GTAW process. It will discuss some of the most common industry applications and uses for tubular wires. Finally the lecture will close with some of the more unique and specialty applications were tubular wires have been used.



## The Lectures and Contact Persons

Sr. No.	Venue & Date	Co-ordinator
1	Vadodara Subha Elite 05-02-2019	Mr. Ashit Shah 9327270533 ashit.shah@weldflowengineers.com
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