

# **EABS: European Association for Brazing and Soldering**

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**EABS & Solvay Fluor GmbH announce the **ninth annual presentation** of their joint technical training seminar entitled:**

***The theory and practice of the flame- and furnace-brazing of aluminium***

***Dates:***

***1st & 2nd September 2009***

## **Purpose of the Seminar:**

This technical training seminar will be presented at the Offices and laboratories of Solvay Fluor GmbH, in Hannover, Germany. It will provide information concerning the manufacturing practices commonly used for brazing operations and, in particular, will address the **three** fundamental aspects of the industrial-scale brazing of aluminium. These are:

- **The flame brazing of aluminium.**
- **The Controlled Atmosphere Brazing (CAB) of aluminium heat exchangers with non-corrosive fluxes (NOCOLOK<sup>®</sup> Flux).**
- **The methodology of how to ensure that the brazing process selected is, indeed, the one that represents 'best practice'.**

## ***Who should attend this two-day event?***

- Technical staff who need to have a specific understanding of either one or both of the fine detail of the technology of the brazing of aluminium with flames, or the NOCOLOK<sup>®</sup> furnace brazing process.
- Design and production engineers who are fabricating, or who intend to fabricate, aluminium pipe-work assemblies and/or condensers and/or evaporators.
- Production Engineering Department Managers whose duties include day-to-day responsibility for the brazing of aluminium.

# Seminar Programme

## Day 1 - Tuesday 1<sup>st</sup> September 2009

### 1. Introduction to the Seminar

P.M.Roberts, EABS Chairman

### 2. Flame brazing aluminium

*Presented by: Philip Roberts – Delphi Brazing Consultants*

*Derek.Davies – Flame Application Services*

#### Session 1: Introduction to Brazing Technology

- What is brazing and what are its advantages?
- Where does brazing fit in joining technology?
- The six fundamental rules for successful brazing
- The methodology of Process Analysis

#### Session 2: Process Terminology

- Process definitions
- Wetting and flow
- Early brazing
- Metallurgical considerations

#### Session 3: Fuel gases and burners

- Heating things!
- Gases and gas mixtures
- Burner design and operating parameters

#### Session 4: Flame brazing aluminium

- Joint design
- Process criteria
- Metallurgical considerations
- Heat pattern development

#### Session 5: Automated flame-brazing

- Process criteria
- Machine types in common use
- Additional mechanisation devices

#### Session 6: Process analysis Case study; *practical demonstrations* of the flame-brazing of aluminium; and a final review of the day.

**Sessions 1 to 4** will be presented during the morning with **Sessions 5 & 6**, which will last for approximately 2¾ hours, being presented during the afternoon.

## Day 2 - Wednesday 2<sup>nd</sup> September 2009

### 3. The NOCOLOK<sup>®</sup> Flux Brazing Process

*Presented by: Dr. Hans Swidersky and Dr. Leszek Orman - Solvay Fluor GmbH*

#### 1. An introductory overview of the process.

- Fields of application
- Brazed products

## 2. Controlled atmosphere brazing (Process sequence)

- Factors for successful brazing
- Requirements for cleaning methods
- Guidelines for flux application
- Brazing flux characteristics and its role in the process
- The furnace brazing process and brazing reactions

## 3. Metallurgy and materials

- Aluminium alloys for CAB (non-corrosive flux) furnace brazing
- Filler materials and their form
- General metallurgical consideration
- Joint clearances/ product fit-up
- Filler metal management - potential erosion aspects (core alloy dissolution)

## 4. Troubleshooting problems encountered in the furnace brazing of aluminium

- Brazing failures and Parameter specifics
- Identification of Failure parameter
- Parameter adjustment and control
  - Temperature
  - Flux load and its uniformity of coating
  - Furnace atmosphere
  - Joint geometry
  - Filler metal availability
  - Cleanliness

### Scope:

- Technical presentation:  
approximately four hours (**morning session**)
- Tour of the Technical Centre and demonstration of furnace brazing:  
approximately two hours (**afternoon session**)

## 5. Further information:

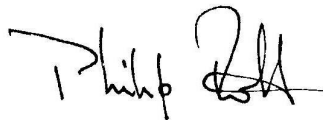
- The seminar will be presented in the English language
- Both EABS and Solvay Fluor GmbH have extensive written detailed notes on all of the subjects that will be covered during this two-day seminar. Solvay distribute their notes to delegates at the event and EABS gives a USB Memory Stick to each delegate that carries a full set of notes relating to the items presented by Mr Davies and Mr Roberts during the first day of the Seminar. The EABS technical notes are all provided as pdf documents, and when printed as hard copy cover about 110 sides of A4 paper and comprise about 52,000 words, together with pictures, (many in colour), together with Tables, and line diagrams.
- All delegates will be given a folder when they arrive at the lecture theatre. This will contain brief notes on each of the topics that will be covered by the presenters during each of the two days of the seminar.
- We will arrange hotel accommodation required by delegates to the seminar at the **Hotel am Stadtpark**. This hotel is about a seven-minute walk from the Solvay Office where the seminar is to be held. We have pre-reserved a sufficient number of rooms at the hotel, and delegates are asked to enter their booking requirements on the [Hotel Booking Form](#) attached to this note. **Delegates will be responsible for settling their own hotel bill on departure from the hotel.**
- It is **very important** that in cases where a Company needs to change their delegate that this fact is advised to [Annette.Daubner@solvay.com](mailto:Annette.Daubner@solvay.com) **before the 'new' delegate arrives at the Hotel Am Stadtpark**. This is because Solvay has to confirm to the hotel the name of each delegate when they make the room reservation for a specific delegate. Consequently, if another person arrives whom the Hotel is not expecting they have no option but to offer the 'unexpected' person a room that is

currently available. This means that the room that was **originally booked on behalf of a named delegate** remains unoccupied and, according to the Terms and Conditions of the Hotel, because it was Solvay Fluor GmbH who booked the room, the overnight charge for the empty room is billed to them! In such cases Solvay will pass this charge on to the Delegates Company. This is why it is so important to tell Mrs Daubner of any change of a delegate that is to be made as soon as it is known!

- The seminar will begin at **09:00 on Tuesday 1st September 2009**, and is expected to finish at about **16:45 on Wednesday 2<sup>nd</sup> September**.
- The cost of the seminar will be **€460, (or £400 for UK delegates), plus tax. (VAT/MWSt/etc)**. Delegates who are Personal Members of EABS, or who are employed by a company that is a **Corporate Member of the Association**, will receive a discount of 15% of the above fees.
- A buffet lunch will be provided during both days of the event, and all delegates are invited to attend the Informal Seminar Dinner as the guests of EABS and Solvay Fluor GmbH on the evening of **Tuesday 1st September**.
- Invoices for attendance at the Seminar will be sent by EABS directly to the delegate by e-mail and payment needs to be made **on or before Friday 28th August 2009**.
- Please note that the available places on all eight of the previous Seminars were booked very quickly. As a result, and since space is limited to 36 delegates, we would **strongly recommend** that to avoid disappointment you send your booking to us as soon as possible.

**Please note:** Early registration for the Seminar is particularly important for delegates who will require a Visa to enter the countries of the European Union. The issue of a Visa can take up to 12 weeks, and often requires the applicant to present a letter of invitation to the seminar, together with his application for a Visa, to the **German Embassy in his country of residence**. Delegates who require a formal letter of invitation should indicate this fact, **(on the Seminar Registration form, please)**, so that we can arrange for one to be sent to you.

We look forward to receiving your booking in the very near future.



Philip Roberts

**EABS Chairman**

**Attachment: Seminar- and hotel booking forms.**

# **EABS: European Association for Brazing and Soldering**

## **Seminar Booking Form**

Seminar: *The theory and practice of furnace- and flame-brazing aluminium'*

Dates: **1<sup>st</sup> & 2<sup>nd</sup> September 2009**

Venue Solvay Fluor GmbH  
Hans-Böckler Allee 20  
30173 Hanover  
Germany

E-mail: [annette.daubner@solvay.com](mailto:annette.daubner@solvay.com)

Please reserve.....place(s) on the above seminar, the delegate(s) will be:

<u>Title</u>	<u>Initials</u>	<u>Family name</u>
1.....		
2.....		
3.....		

Company:  
.....

Mailing Address:.....

Telephone ..... Telefax.....

e-mail.....

**Do any of the delegates mentioned above require a 'formal letter of invitation' to assist them with an application for a Visa to enter the European Union?**

Yes/No\*

\*Please delete **one** of these options

**N.B.** The Course will start at **09:00 on 1st September**, and finish at about **16:45 on the 2<sup>nd</sup> September**. If you wish to stay for an additional night in the **Hotel am Stadtpark**, and travel from Hannover on the **3rd September**, we can also arrange

for your stay at the hotel to include the night of **Wednesday 2nd September**. To avoid any accommodation problems we ask you to specify the **nights that you want to stay at the hotel**.

Consequently it is **very important** that you also complete the hotel booking form below!

### Hotel Reservations Required

Please reserve hotel accommodation at the **Hotel am Stadtpark, Clausewitzstrasse, Hannover**, as indicated below:

<u>Name of Delegate:</u>	<u>Nights for which a reservation should be made</u>		
<b>Example:</b>	<b>Monday 31st August</b>	<b>Tuesday 1st September</b>	<b>Wednesday 2nd September</b>
<b>John Smith</b>	Yes	Yes	No
1.....			
2.....			
3.....			
4.....			

**Hotel Telephone:** ++49 511 2805 555    **Hotel Telefax:** ++49 511 81 46 52

Please note that Delegates to the Seminar are responsible for settling their own hotel bill when they check out.

**As mentioned earlier, it is important** that the Hotel am Stadtpark are informed of all situations where they are expecting a named individual to check in but where another person arrives as a '**previously unannounced**' replacement! It is therefore **very important** to the smooth operation of the hotel reservations package that you tell [Annette.daubner@solvay.com](mailto:Annette.daubner@solvay.com) about **any changes that you or your company needs to make to your reservations**. In order to avoid any problems this needs to be done **by Friday 29<sup>th</sup> August 2008** at the latest. In situations where a delegate fails to arrive and claim his room on his expected day of arrival, Solvay Fluor GmbH will forward the invoice that they receive from the hotel to cover the room-cost for **one** night to the delegates company for payment.

Once you have completed **both** the Seminar Booking Form, **and** the request for hotel accommodation, please fax them direct to:

**The EABS Secretariat at :**

**++44 1260 27 67 29**

**Thank you - and we look forward to welcoming you to Hannover in September**

EABS Secretariat: January 2009  
EABS-Solvay Seminar 2009 - Booking details.