



NOCOLOK® News #2-2021

November, 2021

New Member of the NOCOLOK® Team – Jose Garcia

We are pleased to announce that as of July 12th, Jose Garcia joined the Fluorine Business Line as Business Development Manager for NOCOLOK® in North America. After a handover phase he will take over the role as the successor to Daniel Lauzon.

Jose brings his extensive experience in heat-exchanger manufacturing, problem solving and process improvement which will help Solvay unlock its full potential. Jose will assume responsibilities of technical expert supporting our customers of the NAM market in order to increase our cooperation. He will be based in Ciudad Juárez, México.

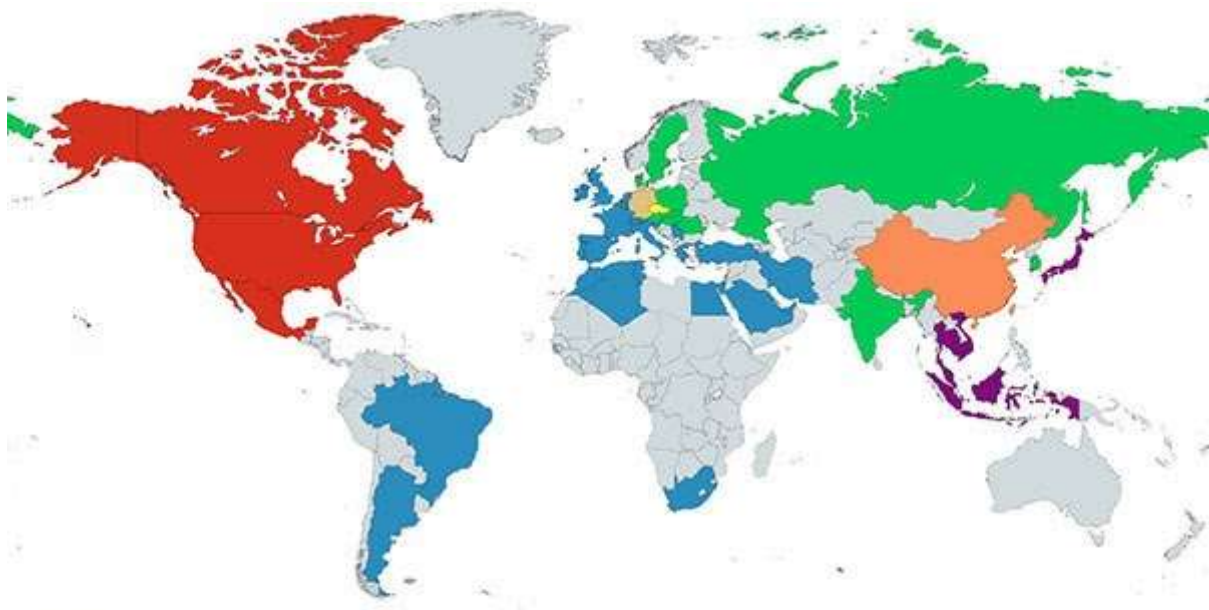
Jose holds a Bachelor's degree in Manufacturing Engineering from University Autónoma de Ciudad Juarez (UACJ) where he brings 13 years of experience in the automotive manufacturing industry (Delphi, Mahle, Nexteer, Eaton) specialized in structural problem solving and scrap reduction methodologies using design of experiments.

At the end of the year, Daniel Lauzon will end his professional career of 25 years in Solvay, and will retire. On behalf of the NOCOLOK® BU and the NAM organisation, we also want to express our deep appreciation to Daniel for his rich career in the group and contribution in implementing the NOCOLOK® portfolio worldwide.





NOCOLOK® Business Development Manager – Who takes care where?



- Roman Barta
- Daniel Lauzon and Jose Garcia, till 31.12.2021 - Jose Garcia, from 01.01.2022
- Hynek Pawera
- Toby Ding
- Yuta Kobayashi
- Hans Swidersky, Hynek Pawera, Sebastian Gutmann
- Roman Barta (West) and Hynek Pawera (East)



11th Gränges Technology Seminar China 2021

The aluminium sheet and tube producer Gränges China invites for a presence Seminar again. It will take place in Shanghai in November 2021. Like in previous Solvay and some other companies support the event with presentation and contact booths.

We are Bonded Together, Clients You can Count on Us!

Dear Customers, the time remains challenging for all of us. In our last issue we highlighted the forecast accuracy and communication between us but we all recognized over the months how volatile the situation remains in the meantime.

Semiconductor chip shortages, the missing of other raw materials in plastic production or other components and the delivery delays or logistic breaks stress a lot.

Hereby we commit as much as possible to adapt your requests in our reliable service showing unmatched flexibility, uncompromising quality, loyalty and transparency.

Such characteristic of partnership shall continue and must get proven daily from both sides. You already recognized the driving higher costs for your own productions and Solvay sees the same in various types like freight rates, raw materials and energy. We are connected in one chain and Solvay intends to keep the performance level as usual in a good partnership.



Analysis of Brazing Imperfections by Metallographic Investigation / Optical Microscopy – Part 2

In everyday practice we can encounter problems connected with brazing imperfections - often manifested as leaking. In order to identify the failure root causes, usually a detailed examination needs to be performed. Optical metallography is one of the most important tools for such an analysis.

The purpose of this article is to present the basic principles for performing analysis of brazing joints, and to show what information can be obtained from the investigation.

We continue with part 2. If you missed part 1 here is the [link to the NOCOLOK® News #1-2021](#).

The major fault in any brazed joint is porosity - or using other words: presence of voids. Their sizes can vary substantially from very small ones to much bigger ones. The fact is that for the CAB process there is no numerical criterion for determining the level of acceptable porosity. Case by case criteria are used for accepting the quality of joints, though the obvious standard is the so called leak test - to check if the part is tight.

When porosity is too large it can develop into a leak. Thus, identification of its origin is of great importance. As a first step it must be identified if the free surface of the porosity was wetted by the filler alloy. That can be determined by presence or absence of residual filler alloy clad layer on the joint surface. It is manifested by the presence of a white ribbon at the surface of porosity (see fig. 5).

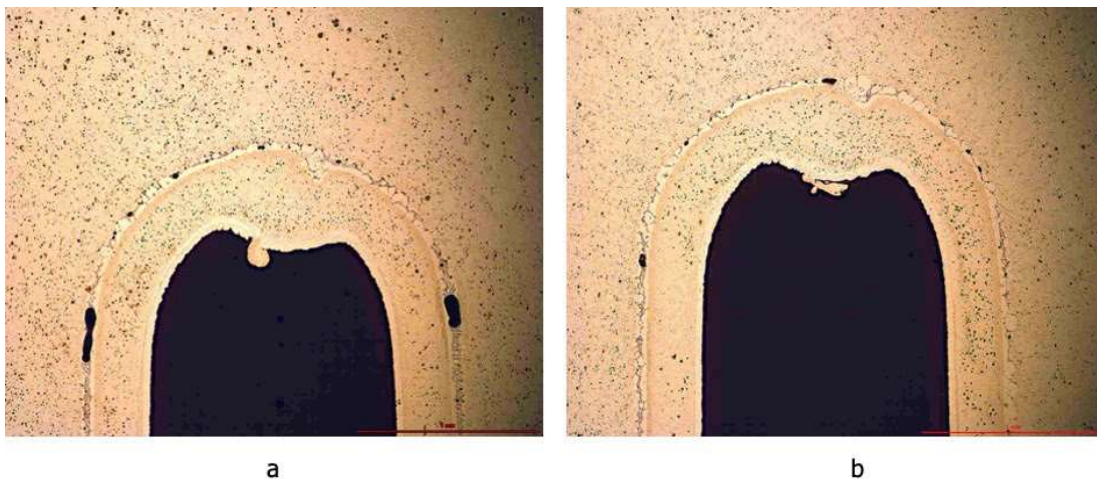


Fig. 4: Examples of brazed joints with porosity
a) Poor quality joint
b) Good joint quality, with only tiny porosity

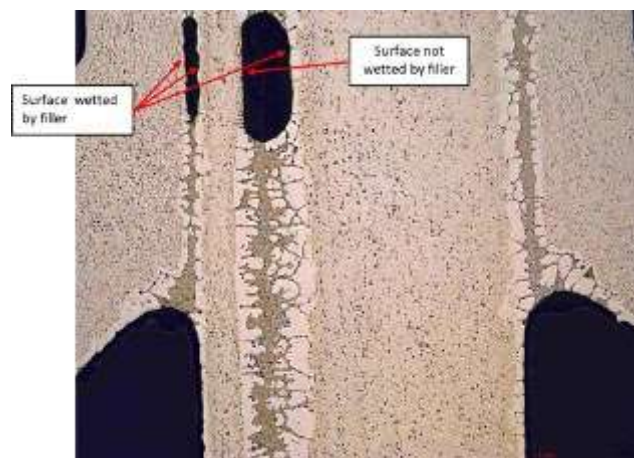
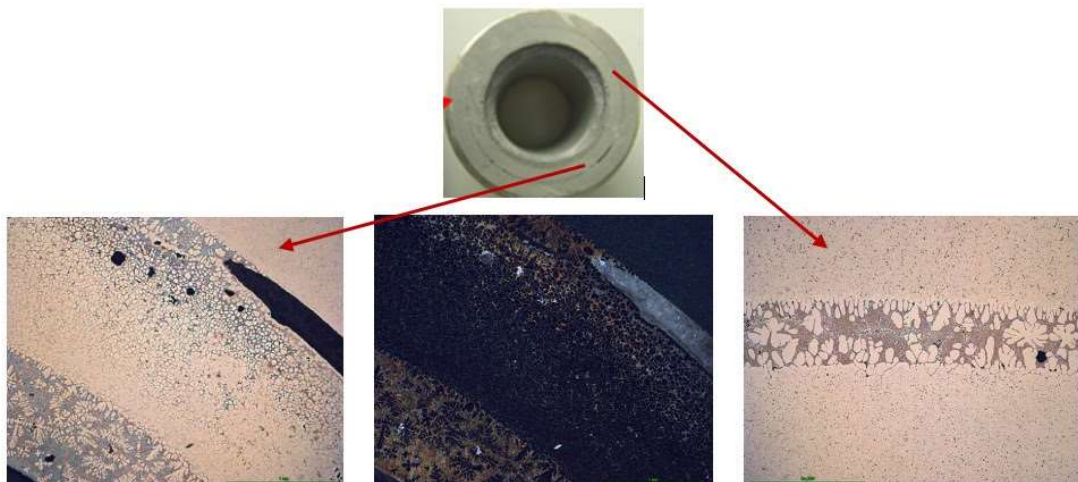
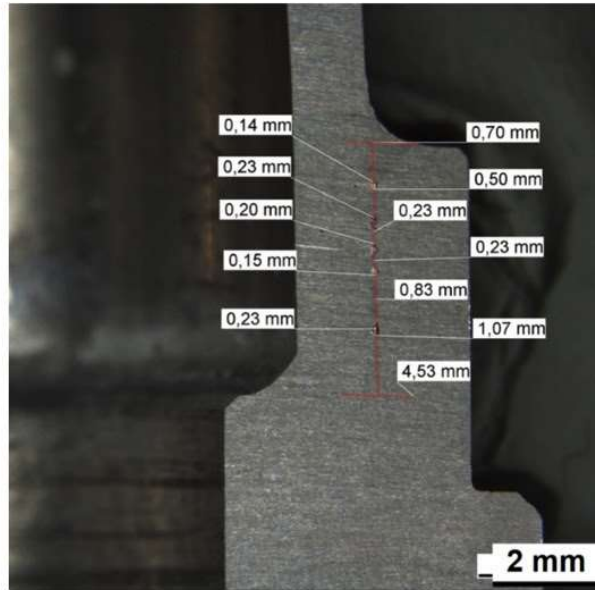


Fig. 5: Large porosities showing evidence of filler alloy wetting and lack of wetting

The joint surface might be not wetted by filler - because of: contamination, too large gap, insufficient volume of the liquid. Only after determining the cause of porosity we can undertake proper counter measures going in a right direction.

Approaches to porosity problems will be different when looking at flame brazing - dealing with a single or just few connections. Most of the OEM's specify the percentage of maximum porosity volume and its maximum size; for example: the brazing depth must be larger than 5mm with 2.5mm length of the joint pore free and 60% of the total length free of voids. In such a case accurate measurements of the joint porosity must be performed. This it is a destructive method, assuming that the porosity in other parts is at a similar level.



Partial melting of the base alloy

Dark field image

Good quality joint

Fig. 6: Example of brazing with area of overheated joint

Metallography of the joint can also provide information about the brazing temperature. In this example (fig. 6), a case of flame brazing of a small connector to a tube is shown. The structure of the joint from one side is entirely different then the structure from the other side. In the defect joint we see evidence of partial base metal melting and as evident in the dark field image, we can tell that the porosity is filled with flux. Thus, both the heating method and fluxing should be verified.



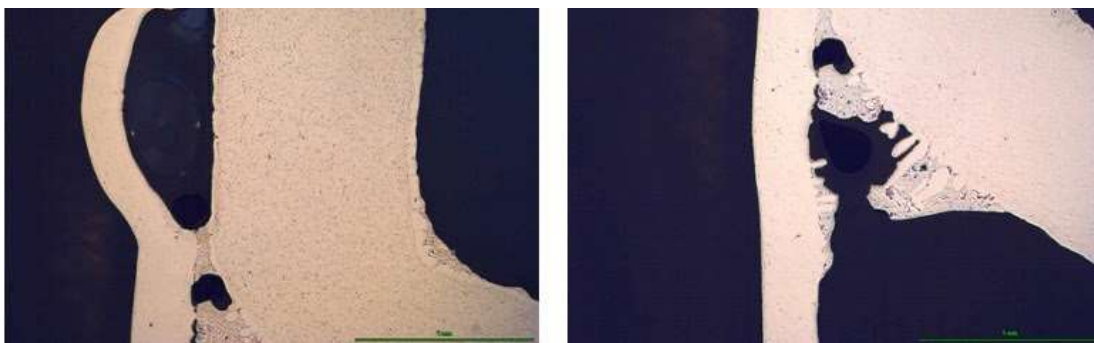
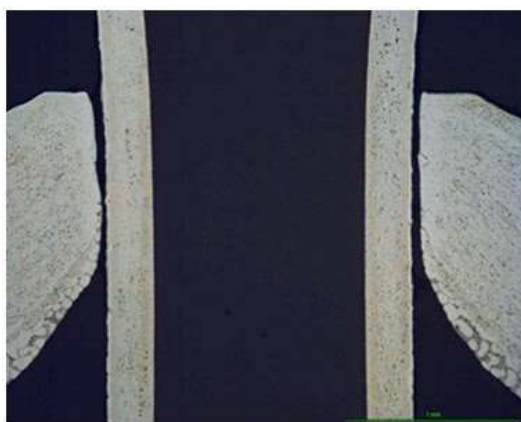


Fig. 7: Field return leak due to a bulge in the joint

In another case a field return leaking radiator is presented. A bulge was observed that broke open next to the tube to header joint. It was assumed that during service moisture got into originally closed voids and then the water going through a cycle of freezing caused the voids to bulge up - leading eventually to a leak. However, there was a question why there were discontinuities in the originally isolated joint. Optical metallography revealed evidence of corrosion, which enabled moisture to penetrate into the prior isolated void.



Header material:

3005 (0.45% of Mg) with intermediate clad layer from 3003 to prevent diffusion of Mg.

Tube material:

modified 3005 with Mg content 0.24%

Fig. 8: Joint defect due to the presence of magnesium in the base alloy

In the above case (fig. 8), an intermediate clad layer made of 3003 alloy was supposed to stop diffusion of Mg to the surface of the header (multi-clad layer brazing sheet) - thus eliminating the negative influence of Mg on flux action. But inside the header opening - simply due to the cutting of the material - this protection was removed, and Mg could diffuse into the joint - causing flux poisoning, which resulted in lack of joint. Such situation can be considered as a design mistake. It can be fixed only by changing the material of the header.

To summarize the above:

- Optical metallography is a powerful tool for investigating imperfections in brazing.
- Sample preparation - i.e. proper choice of observation plane and perfect polishing - is a prerequisite for a thorough analysis of the brazing failures.
- Optical metallography allows for determination of the braze quality by assessing voids and other brazing faults.
- It also allows to identify the root causes of the examined faults, thus enabling introduction of proper corrective actions.

Update – New Competence Center in Germany

As reported in our last issue the Tech-Service, research and development departments (with our pilot line) will be transferred to the new Competence Center based in our Bad Wimpfen site. We are in line with all schedules. The pilot line is already under re-assembling as shown in the photo. The research part should be ready within this year. The Tech-Center will be installed within 2022 depending on the construction progress of the new buildings.





[The NOCOLOK® website gives access to all information](#)

[Exchange your experiences about aluminium brazing in the Brazing Blog](#)

[All videos about aluminium brazing on YouTube](#)

[Contact us](#)

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Solvay Fluor GmbH
Department SFLU-RBUSI
E-Mail: hans.swidersky@solway.com

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AhlersHeinel GmbH, Hannover
www.ahlersheinel.de
nocolok@ahlersheinel.de

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Schmitt, Werner <werner.schmitt@solway.com>

11. November 2021 um 11:17

An: Jeanette Stellbrink <jeanette.stellbrink@solway.com>, Claire SEGUIN <claire.seguin@solway.com>

Hallo ihr beiden. Ich hoffe es geht gut. Unten zur Info habe den neuen Newsletter fertig nach Verbesserung meines Chefs. Jetzt geht es ans Verschicken und da muesst ihr mir nochmals helfen. Das ging doch auch über das CRM System irgendwie mit den upgedatenen Adressen aus dem Webinar oder so?

Mit freundlichen Grüßen/Kind Regards



Progress beyond

Werner Schmitt

Global Key Account Manager
Commercial Management NOCOLOK(R)
GBU Technology Solutions
T +49 (0) 511 857 - 0 M +49 172 708 7548
Solvay Fluor GmbH
Hans-Böckler-Allee 20, 30173 Hannover, Germany



| www.solway.com

Sitz der Gesellschaft/Place: Hannover - Registergericht/Register: Hannover HRB 58647 Geschäftsführer/Managing Directors: Christoph Meurer, Uwe Männel

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