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**Datasheet for the decision
of 11 November 2021**

Case Number: T 0711/17 - 3.2.01

Application Number: 05787631.0

Publication Number: 1803525

IPC: B23K31/02, B23K1/19

Language of the proceedings: EN

Title of invention:

Method of brazing of aluminum alloy material and method for producing an aluminum alloy heat exchanger

Patent Proprietor:

UACJ Corporation

Opponents:

MAHLE International GmbH
Solvay SA

Headword:

Relevant legal provisions:

EPC Art. 52(1), 54, 56, 83, 123(2), 113(1)
RPBA Art. 12(4)

Keyword:

Sufficiency of disclosure - undue burden (no)
Amendments - extension beyond the content of the application
as filed (no) - intermediate generalisation (no)
Novelty - (yes)
Inventive step - combination invention (yes)
Right to be heard - opportunity to comment (yes) - substantial
procedural violation (no)
Late-filed facts - request could have been filed in first
instance proceedings (yes)
Late-filed evidence - admitted (no) - evidence could have been
filed in first instance proceedings (yes)

Decisions cited:

T 0149/02, T 0330/16, T 0329/13, T 2242/19

Catchword:



Beschwerdekammern

Boards of Appeal

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Case Number: T 0711/17 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 11 November 2021

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Decision under appeal:

**Interlocutory decision of the Opposition
Division of the European Patent Office posted on
7 November 2016 concerning maintenance of the
European Patent No. 1803525 in amended form.**

Composition of the Board:

Chairman G. Pricolo
Members: V. Vinci
 S. Fernández de Córdoba

Summary of Facts and Submissions

- I. The appeals filed by the opponents 1 and 2 are directed against the interlocutory decision of the opposition division to maintain the European patent No. 1 803 525 in amended form.

In its decision the opposition division held that the ground for opposition under Article 100(a) in combination with Article 56 EPC prejudiced the maintenance of the patent as granted and decided to maintain the patent in amended form according to the auxiliary request 1. In particular, the opposition division found that the patent as amended according to the auxiliary request 1 met the requirements of Articles 83 and 123(2) EPC, and that the subject-matter of the sole independent claim 1 was novel and involved an inventive step in the meaning of Articles 52(1), 54 and 56 EPC in view, among others, of the following prior art:

D1-2: Claydon et al, D., *"Brazing Aluminum Automotive Heat Exchanger Assemblies Using a Non-Corrosive Flux Process"* SAE Technical Paper, No. 830021, 01.02.1983

D2-2: Safety Data Sheet NOCOLOK® Flux, 31.01.2002

D3-2: Mundt, R., *"Introduction to Brazing of Aluminium Alloys"* Talat Lecture, No.4601, 1994

D4-2: WO 98/45082 A

D7-2: US 4 781 320

D9-2: McCubbin, J.G., *"NOCOLOK® Flux Brazing of Aluminum"*, International Invitational Aluminum Brazing Seminar, 16 October 2002.

With the respective statements of the grounds of appeal the appellants (opponents 1 and 2) submitted following

additional evidence:

D23-1: JP H06-190590 A

D23-1': automatic English translation of D23-1

D24-1 : Data sheet for Aluminium Alloy 6951

D14-2 : Book *"Principles of Brazing"*, David M. Jacobson and Giles Humpston, ASM International, August 2005, p. 122-123

D15-2 : Book *"Brazing"*, second Edition, Mel M. Schwartz, ASM International, September 2003, p.273-275

D16-2 : Material Safety Data Sheet *"Nocolok® 100 Flux"*, ALCAN, April 1986

D17-2 : Book *"Industrial Brazing Practice"*, P. Roberts, 2013, p. 265-267

D18-2 : EP 0 552 567 B1

D19-2 : Scientific publication *"Optimisation of Nocolok(TM) Brazing Conditions for Higher Strength Brazing Sheet"*, Bolingbroke, R., Gray, A., and Lauzon, D., SAE Technical Paper 971861, 1997

D20-2 : ASM Specialty Handbook® *"Aluminum and Aluminum Alloys"*, Edited by J.R. Davis, Davis & Associates, ASM International, Article *"Brazing and Soldering"*, p. 420-423, 1993

D21-2 : Scientific publication *"International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys"*, in Registration Record Series, by The Aluminum Association, February 1997

D22-2 : EP 0 980 738 B1

II. Summons to oral proceedings were issued on 30 July 2020. With the communications under Article 15(1) RPBA dated 16 December 2019 and 13 May 2020, the Board informed the parties of its preliminary, non binding assessment of the appeals.

Oral Proceedings pursuant to Article 116 EPC were held before the Board on 11 November 2021 per videoconference.

The appellants (opponents 1 and 2) requested that the decision under appeal be set aside and that the European patent be revoked. During oral proceedings the appellant (opponent 2) filed an objection under Rule 106 EPC against the non-admittance of documents D14-2 to D22-2 into the appeal proceedings.

The respondent (patent proprietor) requested that the appeals be dismissed or, auxiliarily, that the patent be maintained on the basis of one of the auxiliary requests 1 to 3 filed with the reply to the statements of the grounds of appeal of the appellants.

III. Claim 1 of the patent as maintained by the opposition division reads follows:

"A method of brazing an aluminum alloy material, which is a Nocolok brazing method of the aluminum alloy material, wherein the aluminum alloy material is a brazing sheet comprising an aluminum alloy core material and an aluminum alloy filler material, and wherein the method satisfies the condition:

$$T_s \leq T_f \leq T_s + 15^\circ\text{C}$$

wherein T_f represents an incipient fluidization temperature of the filler material, and T_s represents an incipient fluidization temperature of flux, and wherein the aluminum alloy of the core material contains 0.05 mass% or more and 2 mass% or less of magnesium."

Reasons for the Decision

ARTICLE 83 EPC: Sufficiency of Disclosure

1. The patent as maintained meets the requirements of Article 83 EPC as assessed by the opposition division in the decision under appeal.

1.1 Both appellants contested the conclusion of the opposition division, and with the following arguments:

Definition/Measurement of T_s and T_f

1.2 The appellant (opponent 1) referred to the arguments submitted in writing and stressed that the patent does not provide either an unambiguous definition of the incipient fluidization temperatures T_s and T_f nor how these temperatures should be univocally determined, whereby the person skilled in the art would not be able to carry out the method of the contested patent without undue burden. The person skilled in the art or an observer would not be able to verify whether the method according to the contested patent is indeed carried out within the range defined in claim 1 for the incipient fluidization temperatures T_f and T_s . This would result in an unclear and ambiguous definition of the extension of the protection afforded by the claims at stake and thus also in a lack of legal certainty negatively affecting third parties. In response to the reasoning of the opposition division and to the arguments provided by the respondent, it was pointed out that the results which could be provided by at least 3 of the 4 measuring methods derivable from paragraph [0016] of the contested patent, in particular the direct measurement of the T_s and of the T_f by means of a presumably manually operated high temperature

microscope, would be inevitably affected by errors and vary according to the inherently subjective evaluation of the operator/observer carrying out the measurement and assessing the results manually. The same would apply, at least in the case of non-standard materials, to the determination of the solidus and liquidus temperatures which can be used, according to paragraph [0016], to indirectly determine the incipient fluidization temperatures. In other words, different operators measuring the incipient fluidization temperatures T_f and the T_s of the same combination of filler and flux materials according to the methods described in paragraph [0016] would inevitably report different results.

- 1.3 The appellant (opponent 2) essentially shared the arguments of the appellant (opponent 1) and further contested the assertion of opposition division according to which the solidus and liquidus temperatures, which according to paragraph [0016] of the contested patent could be used in order to indirectly determine the T_f and T_s , are very well known properties of the materials commonly used in brazing application available to the person skilled in the art without any burden. In this respect it was argued that the claimed method is not restricted to certain specific flux and filler materials and that the filler alloys and the fluxes used in several examples described in the contested patent are non-commercial or standardized products, and therefore their inherent physical properties, i.e. the solidus and liquidus temperatures, are unknown and need to be obtained by a measurement method which however is not specified in the contested patent. As the result would vary in dependence on the specific measurement method adopted, the determination of the solidus and liquidus

temperatures is not possible or at least not univocal.

1.4 Both appellants thus concluded that, due to the failure to define a method suitable for objectively and univocally directly or indirectly measuring the incipient fluidization temperatures T_f and T_s , the person skilled in the art would be confronted with an undue burden when trying to work the alleged invention in its full scope, whereby the contested patent does not meet the requirements of Article 83 EPC.

1.5 The arguments of the appellants in support of the alleged inability of the person skilled in the art to univocally determine the incipient fluidization temperatures T_f and T_s and thus to carry out the method according to the contested patent are non convincing for the following reasons:

The contested patent teaches in paragraph [0016] at least one way for indirectly determining the T_s and the T_f of the "NOCOLOK" flux and of the filler as a function of their respective solidus and the liquidus temperatures. The Board concurs with the opposition division and with the respondent that the solidus and liquidus temperatures of a certain material are well known physical properties available to any specialist working in the technical field of the science of materials for a large range of commonly used materials, including commonly used alloy fillers and "NOCOLOK" fluxes. Consequently, a method for directly measuring/determining the incipient fluidization temperatures T_f and T_s is in principle not compulsory required for carrying out the invention, because these temperatures T_f and T_s can be indirectly determined as function of the known solidus and liquidus temperatures as explained in paragraph [0016] of the contested patent,

lines 23-25. Even in the particular case envisaged by the appellant (opponent 2) that the solidus and liquidus temperatures would not be immediately available because the particular "NOCOLOK" flux and/or alloy filler used are non-standard materials, the Board is convinced by the argument of the respondent that the person skilled in the art would be able to determine these temperatures without undue burden by direct observation, i.e. by using conventional manual or semi-manual thermal analysis methods. The Board agrees with the objection of the appellants that the results thereby obtained might be somehow dependent on both the particular measuring method adopted and the individual appreciation skill of the observer or operator. However, as asserted by the respondent, this cannot lead to the conclusion that the method of the contested patent would not be sufficiently disclosed to an extent that it cannot be carried out by a person skilled in the art without undue burden, but rather to a clarity issue regarding the fact that the values of solidus and liquidus temperature measured by the operator (and thus of the incipient fluidization temperatures T_f and T_s derived therefrom) would be not univocal, but may slightly differ from each other depending on the method applied, the measurement conditions and/or the subjective appreciation of the particular observer. This also applies in particular and for the same reasons to the objection raised by the appellants in respect of the reliability of the disclosed direct measurement of the incipient fluidization temperatures T_f and T_s by means of high temperature microscopy. The Board is convinced that also in this case a person skilled in the art would be definitely able to determine workable values of the incipient fluidization temperatures T_f and T_s and to apply them when carrying out the method, and this notwithstanding the

possibility that these values might slightly vary depending on the individual appreciation skill of the operator/observer who carried out the measurement. This slight variation might again result in a clarity issue which however does not render the claimed method unworkable as alleged by the appellants.

- 1.6 The above conclusions analogously apply to the subject-matter of dependent claims 2 to 5 which were also objected under Article 83 EPC by the appellant (opponent 2) in view of the difficulties and inaccuracies allegedly affecting the measurement of the solidus and liquidus temperatures and of the incipient fluidization temperatures T_f and T_s eventually derived therefrom.

Definition of "Nocolok" flux

- 1.7 The appellant (opponent 2) further alleged that the term "*NOCOLOK brazing method*" used in claim 1 has no univocal meaning so that the person skilled in the art would not be able to carry out the invention without undue burden. At the oral proceedings the appellant (opponent 2) essentially referred in this respect to their written submissions and therefore the Board has no reason for deviating from the assessment of this issue provided with the preliminary written opinion which is hereby confirmed and is as follows:

The Board concurs with the opposition division and with the respondent that the contested patent provides the person skilled in the art with a precise indication of what is to be understood under "*NOCOLOK brazing method*", namely a method of brazing using a filler aluminium alloy and a so called "*NOCOLOK*" fluoride-based flux; see paragraph [0002] of the contested

patent or for example D1-2 and D4-2 submitted by the appellant (opponent 2) itself which define the essential characteristics of such a method. The arguments of the appellant (opponent 2) that paragraph [0002] which indisputably describes suitable filler alloys and flux compositions relates to the "BACKGROUND ART" and hence as such should not be taken into account, and that claim 1 does not contain any precise definition of "*NOCOLOK brazing method*" are void because, as correctly pointed out by the respondent, when assessing compliance with Article 83 EPC, all the information provided in the whole patent read in the light of the common general knowledge of the person skilled in the art at stake must be taken into account.

- 1.8 In the oral proceedings the appellant (opponent 2) presented further submissions in support of the allegation that the fact that the flux not being defined in claim 1 would result in a lack of disclosure under Article 83 EPC. The appellant (opponent 2) drew the Board's attention to an alleged contradiction between the teaching of the contested patent in paragraph [0024] in combination with the examples 15 and 16 in table 3 and the statement of the respondent in the reply to the grounds of opposition, page 8, lines 8-15, as well as to the information provided in documents D2-2 or D16-2 regarding the composition of known "*NOCOLOK*" fluxes and the melting range/melting points thereof. The admissibility of these new submissions at such a late state of the appeal proceedings, that the appellant (opponent 2) however considered to represent a mere deepening of the arguments already on file, was contested by the respondent under Article 13(2) RPBA in the version 2020.

1.9 Regardless of the question of the admissibility of these submissions which, among others, are also based on documents D16-2 filed for the first time with the statement of the grounds of appeal in a different substantial context, namely in support of objections under Articles 52(1), 54 and 56 EPC, the Board cannot see any relevance of these further submissions for the question of the compliance with Article 83 EPC. In fact, as pointed out by the respondent, the alleged contradiction eventually concerns the disputed interpretation of the terms "*liquidus temperature*" and "*solidus temperature*" used in the patent vs. the terms "*melting point/melting range*" used in D2-2 and D16-2 which would be eventually relevant in the context of the novelty and/or inventive step objections.

1.10 For the reasons above the decision of the opposition division that the patent as maintained meets the requirements of Article 83 EPC is hereby confirmed.

ARTICLE 123(2) EPC: Added subject-matter

2. The patent as maintained meets the requirements of Article 123(2) EPC as assessed by the opposition division.

2.1 The appellants contested the conclusion in the decision under appeal that the amendments in claim 1 of the patent as maintained are directly and unambiguously derivable from the application as originally filed.

2.2 During the oral proceedings the appellants referred to or repeated the arguments presented in the respective written submissions, and therefore the Board does not see any reason for deviating from the assessment of the compliance with Article 123(2) EPC provided in the

written preliminary opinion which is hereby confirmed and is as follows:

It is common ground that claim 1 is based on the combination of claims 1 and 2 as filed and further specifies that the aluminium alloy material is a *"brazing sheet comprising an aluminium alloy core material and an aluminium alloy filler"*. The appellants argued that the features above would result in an unallowable intermediate generalisation of the information disclosed in paragraphs [0002], [0026] to [0028] and [0030] of the application as originally filed cited as basis for the amendment by the opposition division, because these passages disclose particular fillers containing aluminium and specific *"NOCOLOK"* fluxes, whereby no unambiguous basis can be found in the original application for the omission of this information in claim 1. Furthermore, the appellant (opponent 2) pointed out that paragraph [0002] belongs to the section labelled *"Background Art"* and therefore the information contained therein cannot be considered to be part of the disclosure of the method according to the contested patent which is instead described in the following section labelled *"Disclosure of Invention"* and onwards.

2.3 These arguments are not convincing for the following reasons:

The Board concurs with the conclusions of the opposition division and with the respondent that the person skilled in the art would directly and unambiguously derive, for example from paragraphs [0002], [0026] to [0028] taken in combination with figure 1 of the originally filed application, that the aluminium alloy material in question is in fact a

"*brazing sheet comprising an aluminium alloy core material and an aluminium alloy filler*". In support of this, all the examples provided are consistent with such a composition of the brazing sheet underlying the brazing method of the contested patent. The view of the appellant (opponent 2) that the definition of the brazing sheet now given in claim 1 results in an unallowable intermediate generalisation of the preferred embodiments cannot be followed either. In this respect the Board is convinced by the argument of the respondent that the person skilled in the art would directly and unambiguously derive from the whole technical context of the patent that the only essential feature of the alloy material common to all the specific examples is the fact that this material is a brazing sheet comprising an aluminium alloy core material and an aluminium alloy filler, and that the further parameters associated to the examples, i.e. the content of Si of the filler, are clearly not essential and as such can be omitted in claim 1 without infringing Article 123(2) EPC. Furthermore, the view of the appellants that paragraph [0002] cannot be used as basis for the amendments in claim 1 because it would only relate to the "*Background Art*" rather than to the disclosure of the invention itself is not convincing either because, as correctly put forward by the opposition division and by the respondent, the person skilled in the art would directly and unambiguously recognize that the method according to the contested patent is a development of such a prior art's method whose essential features also apply to the invention.

- 2.4 Regarding the further argument of appellant (opponent 1) that the clarification added in the last 2 lines of claim 1 that specifies that it is the aluminium alloy core material the element containing magnesium, while

in claim 2 as filed reference was made only to a not further specified aluminium alloy material, would result either in the introduction of undisclosed information or again in an unallowable intermediate generalisation, cannot be followed. In fact, as convincingly explained by the respondent, a direct and unambiguous basis for this limitation can be found for example implicitly in paragraph [0005] and explicitly in paragraph [0024] of the originally filed application.

- 2.5 With the reply dated 11 October 2021 the appellant (opponent 2) further objected that the "*filler*" of claim 1 as filed is now specified in claim 1 as maintained, lines 4 and 5, as an "aluminium alloy filler", and that this additional information was not originally disclosed in combination with the features now presented in claim 1. Irrespectively of the admissibility issue affecting this new objection, it cannot be followed for the same reasons given under point 2.3 above.

ADMISSIBILITY OF THE EVIDENCE D14-2 to D22-2

3. The respondent contested the admissibility of the evidence D14-2 to D22-2 filed for the first time with the statement of the grounds of appeal of the appellant (opponent 2) with the argument that they could have been filed in the first instance proceedings. The appellant (opponent 2) replied that these new evidence and the submissions based thereon should be considered a justified reaction to the decision of the opposition division and should be admitted in view of their high relevance for the assessment of the requirements of Article 83 EPC (see D14-2 and D15-2) and of Articles

52(1), 54 and 56 EPC.

3.1 According to Article 12(4) RPBA in the version 2007, which as explained above still applies to the present appeal in view of the transitional provisions of Article 25(2) RPBA 2020, the Board has a discretion to hold inadmissible evidence which could have been presented in the first instance proceedings. In this respect the Board concurs with the observation of the respondent that the ground for opposition under Article 100(b) in combination with Article 83 EPC was under discussion since the begin of the opposition proceedings and that the decision under appeal merely confirmed the preliminary conclusions of the opposition division in this respect. Furthermore it was stressed that claim 1 as maintained corresponds to a combination of claims 1 and 2 as granted and was filed more than 1 year before the date of the opposition oral proceedings. In view of these procedural circumstances of the opposition proceedings the Board agrees with the respondent that these new submissions cannot be considered a commensurate and timely justified reaction to surprising developments in the first instance procedure because it is evident that the appellant (opponent 2) had enough time and opportunities to file the evidence D14-2 to D16-2 already at the first instance, i.e. at the latest during the opposition oral proceedings, if they wished to strengthen their position in respect of the issues under discussion. Regarding the allegation of the appellant (opponent 2) that the high relevance of documents D16-2 to D19-2 for the assessment of novelty and inventive step would justify their admittance in the proceedings, the Board reminds that, unlike opposition proceedings, the "*prima facie*" relevance is not the primary and decisive criterion to be applied in appeal proceedings when

deciding on the admittance of documents filed at the different stages of the appeal, and that admittance shall rather be decided in view of considerations compliant with the provisions of the RPBA, in the present case of Article 12(4) RPBA in the version 2007.

- 3.2 In view of the above the Board comes to the conclusion that the evidence D14-2 to D22-2 could and should have been filed at the first instance proceedings and therefore, in the exercise of the discretion conferred by Article 12(4) RPBA 2007, decides not to admit these evidence and the submissions based thereon into the appeal proceedings.

NOVELTY: ARTICLES (52) and 54 EPC

Admissibility of the objections of lack of novelty

4. Lack of novelty under Articles 52(1) and 54 EPC was raised by the appellant (opponent 2) only with the statement of the grounds of appeal. The Board concurs with the appellant (opponent 2) in that, although this issue was not discussed at the opposition oral proceedings in respect of the auxiliary request 1 (see point 55. of the decision), it had been raised and substantiated with the reply of opponent 2 to the preliminary opinion of the opposition division dated 30 August 2016 (see point 5. on page 6). The Board shares the interpretation of the appellant (opponent 2) that the wording of point 55. of the decision under appeal "*In view of the finding concerning the main request ...*" should be understood as meaning that the arguments submitted in support of the alleged lack of novelty - in view of the fact that the subject-matter of claim 1 of the main request had already been

considered novel by the opposition division - were not repeated for claim 1 of the auxiliary request 1, but nonetheless maintained. The objection of lack of novelty with respect to the subject-matter of claim 1 of the patent as maintained by the opposition division is thus part of the appeal proceedings and will be discussed.

- 4.1 The subject-matter of claim 1 of the patent as maintained by the opposition division is novel in the meaning of Articles 52(1) and 54 EPC.

Novelty in view of D1-2

- 4.2 The appellant (opponent 2) argued that document D1-2 discloses (see in particular page 1 and page 3, last paragraph labelled "Alloy") a method of brazing an aluminium alloy material which is a "NOCOLOK" brazing method, comprising an aluminium alloy core material containing up to 0.5 mass% of Mg, this content of Mg thus falling within the range defined in claim 1. In view of the explicit reference to the use of a "NOCOLOK" flux and of an AA4045 aluminium alloy filler, the person skilled in the art would read documents D1-2 in combination with D2-2 (data sheet of a "NOCOLOK" flux produced by the manufacturer Solvay) and D3-2 (non-patent literature providing on page 12 the liquidus and solidus temperatures of an AA4045 filler) as a single disclosure which deprives claim 1 of novelty. The appellant (opponent 2) put forward that the extremes of the "melting range 560°-577°" indicated on page 4 of the data sheet D2-2 would correspond to the solidus and liquidus temperatures of the "NOCOLOK" flux referred to in D1-2. This assertion is however contested by the respondent. Finally, the appellant (opponent 2) showed that a calculation of the incipient

fluidization temperatures T_s and T_f of the "NOCOLOK" flux and of the filler of D1-2 as a function of the respective solidus and liquidus temperatures derived from D2-2 and D3-2 carried out according to the method disclosed in paragraph [0016] of the contested patent would lead to values which satisfy the condition specified in claim 1. It was thus concluded that the information disclosed in D1-2, D2-2 and D3-2, read as a single piece of prior art, would destroy the novelty of the subject-matter of claim 1.

- 4.3 The reasoning and the conclusion of the appellant (opponent 02) are based, among others, on the assumption that the "NOCOLOK" flux mentioned in D1-2 is identical with the "NOCOLOK" flux described in D2-2. In the Board's view this assumption is not correct for the following reasons:

Even when taking for granted that the extremes of the melting range given on page 4 of D2-2 would correspond to the solidus and liquidus temperature of the "NOCOLOK" flux disclosed therein as asserted by the appellant (opponent 2) and contested by the respondent, the Board considers that it has not been unequivocally proved that the "NOCOLOK" flux described in the data sheet D2-2 is identical with the "NOCOLOK" flux used in the brazing method of document D1-2 and hence that it can be directly and unambiguously derived that the latter shows a melting range according to D2-2. In fact, as convincingly explained by the opposition division and pointed out by the respondent, D2-2 refers to a generic "NOCOLOK" flux of unspecified composition $K(x)Al(y)F(z)$ (see page 1), while D1-2 refers to a specific "NOCOLOK" flux containing an eutetic mixture of K_3AlF_6 , and $KAlF_4$ (see page 1). Furthermore, the Board agrees with the view of the opposition division

and the respondent that the alleged correspondence between the "NOCOLOK" flux of D1-2, dated 1983, and the one described in the data sheet D2-2 dated 2002 is rendered implausible in view of the very large interval between the publications of these two documents, whereby it can be assumed that the composition and thus the physical properties of the "NOCOLOK" flux of D1-2 are likely to have been modified over the years with respect to those of the NOCOLOK flux of D2-2. In view of the missing direct and unambiguous link between the "NOCOLOK" flux used in the brazing method of D1-2 and the "NOCOLOK" flux of the data sheet D2-2 these two documents cannot be read as single disclosure as pretended the appellant (opponent 2). It follows, that document D1-2, even if read by the person skilled in the art together with the disclosure of document D3-2, fails to directly and unambiguously disclose the condition for the incipient fluidization temperatures T_s and T_f specified in claim 1.

Further novelty attacks

- 4.4 The appellant (opponent 2) raised further novelty attacks in view of documents D4-2 and D7-2. However, the reasoning of the appellant (opponent 2) is based again on the uncorrect assumption (see point 4.3 above) that each one of these documents could be read together with D2-2 as single disclosure. Therefore, as correctly replied by respondent, the arguments of the appellant (opponent 2) are void for the same reasons provided in respect of the novelty attack based on D1-2.
- 4.5 The appellant (opponent 2) also presented several novelty attacks based on the assumption that the condition expressed in claim 1 for the incipient fluidization temperatures T_f and T_s is unclear to such

an extent that it cannot be used for further delimiting the subject-matter of claim 1 over the prior art. As concluded under points 1.1 to 1.6 above, the person skilled in the art would not face any kind of problems when determining the incipient fluidization temperatures T_f and T_s of the filler and the "NOCOLOK" flux by using one of the method disclosed in paragraph [0016] of the contested patent, and therefore there is no reason for disregarding the limitation imposed in the claim for these temperatures, and this irrespective of the possibility alleged by the appellants that by applying some of the method proposed in the patent the results of the determination might not be univocal. Therefore, these additional lines of arguments are void.

- 4.6 In conclusion, as the further lines of novelty attacks using documents D16-2 and D19-2 are disregarded under Article 12(4) RPBA 2007 (see point 3.2 above), the Board does not see any reason for deviating from the conclusion of the opposition division that the subject-matter of claim 1 is novel over the prior art in the meaning of Articles 52(1) and 54 EPC.

INVENTIVE STEP: ARTICLES 52(1) and 56 EPC

5. The subject-matter of claim 1 involves an inventive step in the meaning of Articles 52(1) and 56 EPC as stated in the contested decision.

- 5.1 The appellants contested this conclusion of the first instance and submitted the following lines of arguments:

D1-2 in view of common general knowledge or D23-1

5.2 It is common ground that D1-2 represents the closest prior art from which the subject-matter of claim 1 as maintained by the opposition division differs only in the restriction imposed on the incipient fluidization temperatures of the filler and flux T_f and T_s that:

$$T_s \leq T_f \leq T_s + 15^\circ\text{C}$$

As stressed by the appellants, this restriction was already present in claim 1 of the main request which was rejected by the opposition division for lack of inventive step.

5.3 The appellant (opponent 1) criticised the behaviour of the opposition division that on one side denied any inventive contribution of this one and only distinguishing feature with respect to D1-2 when assessing inventive step of the main request, while on the other side inexplicably decided that the subject-matter of claim 1 of the auxiliary request 1, which was amended by merely introducing the additional feature relating to the content of Mg in the aluminium alloy core material, involved an inventive step, and this notwithstanding the uncontested fact this additional feature was already known from D1-2 and hence, as such, could not provide any further limitation, and thus any further inventive contribution. The appellant (opponent 1) thus underlined the blatant contradiction resulting from the opposed conclusions reached by the opposition division in respect of the main request and auxiliary request which, as matter of fact, claim the same and only distinguishing feature with respect to D1-2.

5.4 In the substance, the appellants argued that the person skilled in art starting from D1-2 and aiming to provide an alternative to the brazing "NOCOLOK" method

disclosed therein, would be motivated in view of common general knowledge to select the filler alloy and the "NOCOLOK" flux in such a way to obtain an incipient fluidization temperature of the filler T_f slightly higher than the incipient fluidization temperature T_s of the "NOCOLOK" flux, as is generally known in state of the art and in particular from D23-1 or D3-2, D6-2, D8-2 and D9-2.

5.5 The appellant (opponent 1) drew the attention of the Board to document D23-1 (and of to its computer English translation D23'-1) and to the data sheet D24-1, filed with the statement of the grounds of appeal, whose admittance, which was contested by the respondent under Article 12(4) RPBA in the version 2007, is at discretion of the Board. The appellant (opponent 1) pointed out that D23'-1 discloses in paragraph [009] the solidus and liquidus temperatures of a $KAlF_4$ "NOCOLOK" flux and of a JSI4045 filler, the latter corresponding to the AA4045 filler suggested in D1-2, and that a calculation of the respective T_s and T_f as a function of the respective solidus and liquidus temperatures carried out according to the method proposed in paragraph [0016] of the contested patent would lead to values which satisfy the condition expressed in claim 1. The appellant (opponent 1) thus concluded that D1-2 in combination with the teaching of D23-1 would render obvious the subject-matter of claim 1 of the patent as maintained.

5.6 The appellant (opponent 2) endorsed the arguments provided by the appellant (opponent 1) and stressed that the technical problem addressed by the contested patent as amended - contrary to the view of the opposition division and of the respondent - is identical with the technical problem assessed when

discussing the main request and has nothing to do with the content of Mg of the core material now added in claim 1. This would follow from the undisputed fact that an aluminium alloy core material having a mass% of Mg falling within the range defined in claim 1 is already used in the "NOCOLOK" brazing method of D1-2. Furthermore, it was objected that the claimed technical effect is not achieved within the whole range covered by claim 1 as proved by the example "U" in table 4 of the contested patent. The appellant (opponent 2), similarly to the appellant (opponent 1), concluded that the person skilled in the art, starting from D1-2 and aiming to provide an alternative and improved brazing "NOCOLOK" method, would select the "NOCOLOK" flux and filler material in such a way to verify the claimed restriction on the incipient fluidization temperature T_f and T_s , thereby arriving only by using common general knowledge as documented for example by D3-2, D6-2, D8-2 and D9-2 and thus without any inventive step to the subject-matter of claim 1 of the patent as maintained.

- 5.7 The arguments of the appellants regarding the alleged lack of inventive step are not convincing for the following reasons:

The Board concurs with the view of the respondent and of the opposition division that the introduction in claim 1 of the additional information that the aluminium alloy of the core material contains Mg up to 2 mass% shifts the original technical problem addressed by the combination of features of claim 1 of the main request, i.e. to provide an alternative improved "NOCOLOK" brazing method, to the more specific technical problem underlying the patent as maintained according to the auxiliary request 1, i.e. to provide a

"NOCOLOK" brazing method which allows high quality brazing even in presence of a relatively high amount of Mg in the aluminum core alloy. The solution of this new technical problem clearly resides in the specific restriction assigned to the incipient fluidization temperatures of the filler and the flux that even in presence of a relatively high content content of Mg in the core, inhibits or at least limits the reaction between the Mg of the aluminum core alloy and the fluorine in the "NOCOLOK" flux which, as is well known, would be detrimental to the quality of the brazing. Contrary to the view of the appellants, the Board shares the view of the opposition division supported by the respondent in their reply that notwithstanding the fact the the core material used in the closest prior art brazing method of D1-2 contains Mg within the range defined in claim 1, the new technical problem addressed by the contested patent as maintained could not be derived from or associated to the combination of features of claim 1 of the main request, because, in absence of the explicit limitation that the core material contains Mg, no reaction of the core material with the fluoride of the "NOCOLOK" flux detrimental to the quality of the brazing could take place and be envisaged.

5.8 In view of the above and contrary to the view of the appellant (opponent 1) the Board does not consider surprising or contradictory that the opposition division reached different conclusions regarding the inventiveness of claim 1 of the main request and of the auxiliary request because the distinguishing feature has to be seen in the context of the whole set of other features, which context is different due to the added feature and thus leads to different formulations of the technical problem, and because a correct application of

the problem-solution approach for assessing inventive step in the presence of different technical problems may obviously lead to different conclusions, and this also when, as in the present case, there is only one and the same distinguishing feature under discussion.

5.9 Furthermore, the Board points out that the decision under appeal did not positively assess inventive step merely in view of the sole feature added to claim 1 as maintained relating to the amount of Mg in the core material which is already known from D1-2 as asserted by the appellant (opponent 1), but rather, as confirmed by the reasoning on page 16, 3rd full paragraph of the decision, in view of the finding that by selecting the NOCOLOK flux and the filler in such a way to fulfill the specific condition defined in claim 1 for the respective T_s and T_s , it is possible to minimize the undesirable reaction between the fluorine of the "NOCOLOK" flux and the Mg in the core material, thereby achieving good brazing results even when the aluminium alloy core material, as it is desirable in several applications, has a relatively high content of Mg.

5.10 The arguments provided by the appellants in the substance, regardless of the question of the admittance of documents D23-1 and D24 which is contested by the respondent, are non convincing for the following reasons:

It is not disputed that the restriction imposed on the incipient fluidization temperatures T_f and T_s in claim 1 may be verified by certain combinations of known fillers and NOCOLOK fluxes commonly used in the state of the art brazing methods. However, the Board shares the view of the opposition division and of the respondent that it has not been convincingly proved

that a person skilled in the art presented with the technical problem of "NOCOLOK" brazing an aluminium core sheet containing a certain amount of Mg would obviously recognize that an appropriate selection of filler and NOCOLOK flux characterized by respective incipient fluidization temperatures T_f and T_s in the range presented in claim 1 would be suitable for inhibiting the reaction of the fluoride of the NOCOLOK flux with the Mg of the core, thereby ensuring good brazing results even in presence of Mg in the core material. Regarding the sample "U" cited by the appellant (opponent 2) in support of their arguments, the wording of paragraph [0039] makes clear that it represents a *"Comparative example to the invention"* and not an example of the invention, whereby the argument of the appellant (opponent 2) is void.

5.11 In view of the above, the Board follows the view of the respondent that the reasoning of the appellants according to which starting from D1-2 it would be obvious to arrive to the subject-matter of claims 1 in view of common general knowledge documented by D3-2, D6-2, D8-2 or D9-2 or in view of document D23-1 is based on an incorrect definition of the technical problem to be solved and, in any case, on an ex-post facto analysis of the available state of the art with foreknowledge of the invention which is not suitable for correctly assessing inventive step.

5.12 Therefore, the Board does not see any reason for deviating from the assessment of the opposition division that the subject-matter of claim 1 as maintained involves an inventive step over the prior art in the meaning of Articles 52(1) and 56 EPC.

REFORMATIO IN PEIUS

6. The appellant (opponent 1) pointed out that the appeal was obviously directed, among others, to the decision of the opposition division that recognized an inventive step in the subject-matter of claim 1 of the auxiliary request 1. It was argued that this decision was apparently triggered by the introduction in claim 1 of the limitation regarding the content of Mg in the aluminium alloy core material. It was thus alleged that, shall now the Board maintain the view expressed in the preliminary opinion that it is the limitation imposed on the incipient fluidization temperatures rather than the presence of Mg in the aluminium alloy material of the core which indeed confers inventiveness to the subject-matter of claim 1 as maintained, the appellant, in view of the above mentioned contradictory conclusions of the opposition division in respect of the main request and of the auxiliary request 1, would be somehow deprived of any real possibility to submit convincing arguments demonstrating that the decision of the opposition division was incorrect. It was concluded that this situation would put the appellant (opponent 1) in a worse position compared with those of the opposition proceedings, thereby violating the established principle of prohibition of "*reformatio in peius*" which is applicable to the case of an inter-partes appeal lodged by the opponent only, i.e. as the present one.

6.1 The Board does not follow the arguments provided by appellant (opponent 1) for the following reasons:

According to established Case Law of the Boards of Appeal (see T149/02, cf. points 3.2 and 3.2.1), the

doctrine of the "*reformatio in peius*" cannot be construed to apply to each single point or issue decided or to the reasoning leading to the appealed decision, i.e. in the present case the reasoning which led to positively assess inventive step. Therefore, confirming the decision of the opposition division to maintain the patent in amended form would not put the appellant (opponent) in a worse position with respect to the outcome of the first instance proceedings but leave them in the same position because the patent has indeed been restricted and maintained in the same amended form.

Moreover, in view of the above reasoning in respect of inventive step, it also follows that the appellant (opponent 1) argument is flawed, as an inventive step was not recognized by the Opposition Division and is not recognized by the Board, merely on the basis of the limitation imposed on the incipient fluidization temperatures.

OBJECTION UNDER RULE 106 EPC

7. During the oral proceedings, the appellant (opponent 2) submitted in writing the following objection:

"Die Beschwerdeführerin sieht sich insoweit in ihrem Recht auf rechtliches Gehör verletzt, als dass es vollkommen überraschend kam, dass alle Dokumente D14-2 bis D22-2 nicht in das Verfahren eingeführt wurden bevor deren Relevanz im einzelnen diskutiert wurde. Weiterhin war dies um so überraschender als dass, das Dokument D16-2 bereits im Verlauf der Verhandlung diskutiert wurde. Weiterhin ist das Dokument D 19-2 ebenfalls prima facie hochrelevant. Alle Druckschriften wurden mit der Beschwerdebegründung eingereicht und die

Beschwerdeführerin hatte die legitime Erwartung, dass sie hierzu materiell rechtlich angehört würde."

Although the objection was made under the heading "*Rüge unter Art 112a 2*", the appellant made it clear during the oral proceedings that it intended to file an objection under Rule 106 EPC.

7.1 In substance, the appellant (opponent 2) submitted

(i) that the decision of the Board not to admit into the appeal proceedings the evidence D14-2 to D22-2 filed with the statement of grounds of appeal, before having given the appellant (opponent 2) the opportunity to discuss their prima facie relevance, was surprising and would amount to a violation of their right to be heard under Article 113(1) EPC; and

(ii) that this decision was even more surprising in view of the fact that document D16-2 had already been discussed during the oral proceedings.

As regards point (i):

As explained under point 3.1 above, Article 12(4) RPBA in the version 2007 confers the Board a discretion not to admit evidence which could have been already submitted at the first instance proceedings. The criterion of prima facie relevance is not a criterion explicitly referred to in Article 12(4) RPBA 2007. This is also in accordance with established case law (see e.g. T 330/16, point 1.5 of the reasons, or T 329/13, point 1 of the reasons, or T 2242/19, point 1.5 of the reasons), according to which when exercising the discretion under Article 12(4) RPBA 2007 the Board has to consider whether the procedural circumstances and

the development of the first instance proceedings would justify the submission of these evidence for the first time with the statement of the grounds of appeal. It is uncontested that the appellant (opponent 2) was given during the oral proceedings the opportunity to present their arguments regarding as to why in their view these evidence could not have been presented during the opposition proceedings. However the arguments presented by the appellant (opponent 2) were considered not convincing for the reasons given under point 3. to 3.2 of this decision.

7.2 As regards point (ii), the Board notes that it was the appellant themselves that referred to D16-2 in the context of sufficiency of disclosure for the first time during oral proceedings and that there was never a statement of the Board in the sense of admitting D16-2 at any time. Moreover, as explained above (see point 1.9), the reference to D16-2 was irrelevant for the Board's conclusion in respect of sufficiency of disclosure.

7.3 In view of the above, the appellant (opponent 2) could not be surprised by the fact that the documents D14-2 to D22-2 were not admitted into the appeal proceedings without discussing their prima-facie relevance. The appellant (opponent 2) was moreover given the opportunity to comment on the grounds on which the decision not to admit the evidence D14-2 to D22-2 into the appeal proceedings is based. Accordingly no violation of the right to be heard (Article 113(1) EPC) can be acknowledged and as a consequence the appellant's (opponent 2's) objection under Rule 106 EPC is to be dismissed.

Order

For these reasons it is decided that:

1. The appeals are dismissed.
2. The objection under Rule 106 EPC is dismissed.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated