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# Datasheet for the decision of 16 November 2010

**Case Number:** T 1821/09 - 3.2.06

**Application Number:** 02779069.0

**Publication Number:** 1446261

**IPC:** B23K 35/02

**Language of the proceedings:** EN

**Title of invention:**
Product and method for low temperature fluxless brazing

**Applicant:**
Dana Canada Corporation

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 84, 123(2)

**Relevant legal provisions (EPC 1973):**
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**Keyword:**
"Claim 1 - scope of protection not supported by the description"
"Claim 1 - amendments - combination of features not originally disclosed"

**Decisions cited:**
-

**Catchword:**
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

**Case Number:** T 1821/09 - 3.2.06

# D E C I S I O N
**of the Technical Board of Appeal 3.2.06**
**of 16 November 2010**

**Appellant**: Dana Canada Corporation
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**Representative**: Sajda, Wolf E.
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**Decision under appeal:** **Decision of the Examining Division of the European Patent Office posted 31 March 2009 refusing European patent application No. 02779069.0 pursuant to Article 97(1) EPC.**

**Composition of the Board:**

**Chairman:** P. Alting van Geusau
**Members:** G. de Crignis
K. Garnett

## Summary of Facts and Submissions

I. By the decision posted on 31 March 2009 the examining division refused the European patent application No. 02 779 069.0 for lack of novelty and inventive step in view of

D1 WO-A-00/71784.

II. On 29 May 2009 the appellant (applicant) filed an appeal against this decision and simultaneously paid the appeal fee. A statement setting out the grounds of appeal was received at the European Patent Office on 7 August 2010 with amended claims in accordance with a main request and five auxiliary requests.

III. With letter of 4 June 2010, in a communication in the annex to the summons to oral proceedings, the Board indicated some clarity and support issues, questioned the disclosure of the subject-matter of the claim 1 of some of the auxiliary requests filed with the grounds of appeal and indicated that preliminarily it considered the opinion given in the appealed decision concerning the disclosure of D1 as convincing.

IV. Oral proceedings were held on 16 November 2010.

The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request, in the alternative on the basis of one of the auxiliary requests 1 to 5, all requests filed with letter of 14 October 2010.

V. Claim 1 of the main request has the following wording:

"A brazing product for low temperature, fluxless brazing, comprising:
a) a temperature modifier layer comprised of at least 50% of a metal selected from the group comprising zinc and copper; and
b) a braze promoting layer comprising one or more metals selected from the group comprising nickel and cobalt;
wherein during brazing, the temperature modifier layer and the braze-promoting layer form a filler metal having a liquidus temperature in the range from about 730 to 1130°F."

Claim 1 of auxiliary request 1 differs from claim 1 of the main request in that it additionally specifies that the temperature modifier layer has a thickness of 0.10 to 0.38 mm.

Claim 1 of auxiliary request 2 differs from claim 1 of the main request in that the liquidus temperature of the filler metal is limited to the range of between 750 and 1050°F.

Claim 1 of auxiliary request 3 differs from claim 1 of the main request in that the brazing product is specified as "consisting of" the layers (a) and (b).

Claim 1 of auxiliary request 4 differs from claim 1 of the auxiliary request 3 in that the liquidus temperature of the filler metal is limited to the range of between 750 and 1050°F.

Claim 1 of auxiliary request 5 differs from claim 1 of the auxiliary request 1 in that the temperature modifier layer is limited to "consisting of zinc; a zinc-aluminium alloy; or a zinc-aluminium-silicon alloy" and in that the braze promoting layer is limited to "consisting of nickel or a nickel-lead alloy".

VI. The arguments of the appellant may be summarised as follows:

The subject-matter claimed in claim 1 of the main request and of auxiliary requests 1 to 4 was supported by the description. Claim 1 as originally filed already included the reference to a temperature modifier layer comprised of at least 50% of a metal selected from the specific group. In the summary of the invention (paragraph [00021]) as well as in the detailed description of the preferred embodiments (paragraph [00031]) a corresponding disclosure was present. Furthermore, Table 1 demonstrated that any claimed amount of Zn, in particular in combinations with Al or Al/Si, was suitable for the temperature modifier layer.

The subject-matter of claim 1 of auxiliary requests 1 and 5 included the specification of a thickness range for the temperature modifier layer. Support for such amendment could be found in Table 2 of the originally filed description. Moreover, the examples 2, 3, 4, 6, 7, 10 and 20 provided a support for such an amendment and the requirements of Articles 84 and 123(2) EPC were met.

The subject-matter claimed in claim 1 of the various requests was clear. The skilled person would understand

that it was the filler material itself which had to have the claimed liquidus temperature. The bonding layer and the barrier coating were very thin and only had a negligible impact on the liquidus temperature of the filler metal. The skilled person would know how to adapt the brazing conditions and could apply the brazing product correctly. Hence, it was not necessary to specify further conditions of brazing.

## Reasons for the Decision

1. The appeal is admissible.

2. *Main Request / Auxiliary requests 1 to 4*

2.1 Support in the description (Article 84 EPC)

2.1.1 The subject-matter of claim 1 does not meet the requirements of Article 84 EPC because it is not sufficiently supported by the description of the originally filed patent application.

2.1.2 Claim 1 of the main request and of auxiliary requests 1 to 4 has been limited to a temperature modifier layer comprised of at least 50% of a metal selected from the group comprising zinc and copper.

2.1.3 Although claim 1 as originally filed refers to a temperature modifier layer comprised of at least 50 % of a metal selected from the group comprising zinc, aluminium and copper there is no embodiment disclosed in the application which would justify the selection of a range of "at least 50%" for any of these metals.

2.1.4 The requirement for the claims to be supported by the description is intended to ensure that the extent of protection as defined by the patent claims corresponds to the technical contribution of the disclosed subject-matter to the art. Therefore, the claims must reflect the actual contribution to the art in the claimed entire range. A purely formal support by the description, i.e. a verbatim repetition of the mention of a claimed feature cannot meet this requirement.

2.1.5 Although a purely formal support of the feature in question is present in paragraphs [00021] and [00031] of the description and in claim 1 as originally filed, such mere repetition does not give sufficient support to the claimed range. At least one embodiment (in exceptional cases) and usually more than one embodiment is necessary to show to the skilled person that the effects of the alleged invention are most probably achieved over the whole scope of the claim.

2.1.6 Considering that all the embodiments disclosed in the examples are based upon an amount of 90% or more of zinc and none of the example relates to a temperature modifier layer comprised of any amount of copper, there is, first, no basis whatsoever for a range of "at least 50%" and, second, in the absence of any embodiment in which the temperature modifier layer is made of copper, there is no basis for zinc being replaced by copper and the product claimed still meeting the specified liquidus temperature.

2.1.7 This objection under Article 84 as regards sufficient support of the claims applies to claim 1 of the main

request and for claim 1 of the auxiliary requests 1 to 4. Accordingly, none of these requests is allowable and a further discussion of clarity concerning the brazing conditions is not necessary.

2.1.8 The appellant's counterarguments in response to the above objections based on the data provided in Table 1 do not address the issue of support. Clearly the data shown in Table 1 concern melting temperatures which can be obtained generally for alloys of zinc with different amounts of either aluminium or aluminium and silicon or even combined with further minor elements like lead, tantalum or bismuth. Table 1 discloses that each of these alloys (containing between 28.5 and 100% Zn and up to 88% Al) already has a melting temperature within the range claimed for the filler metal during brazing. The Board does not see how such general information could provide a valid basis for the claimed product in which the temperature modifier layer has "at least 50% zinc", let alone "at least 50% copper". Moreover, the subject-matter of claim 1 does not refer to the melting temperature of the temperature modifier layer but to a liquidus temperature of a filler metal which is formed, during brazing, by the combination of a temperature modifier layer and a braze promoting layer comprising nickel and cobalt, the brazing method being undefined as regards the conditions (thickness of the respective layers, and brazing atmosphere) and the materials being brazed and their surface preparation.

3. *Auxiliary request 5*

3.1 Amendments

3.1.1 The amendments to claim 1 lead to subject-matter which is not disclosed in the application as filed, contrary to the requirement of Article 123(2) EPC. In particular the feature that the "temperature modifier layer having a thickness of 0.10 to 0.38 mm and consisting of zinc; a zinc-aluminium alloy; or a zinc-aluminium-silicon alloy" cannot be derived directly and unambiguously from the application as filed.

3.1.2 With respect to this issue, which was in essence raised in the Board's communication annexed to the summons to oral proceedings, the appellant argued that the upper and the lower limits of 0.38 and 0.10mm for the temperature modifier layer were not only disclosed in one example but throughout the experimental section of the application as originally filed.

3.1.3 However, the experimental section of the application is very specific:

(a) For a temperature modifier layer consisting of pure zinc, examples 2, 4, 6 and 7 relate to thicknesses of either 0.10mm, 0.12mm, 0.15mm or 0.38mm. The examples 2 and 4 concern brazing of aluminium type 3003, example 6 concerns brazing of aluminium alloys AA 2024, 3003, 5052 and 7075 and example 7 concerns brazing of aluminium type 6061 or 6262 to non-clad type aluminium type 3003. Hence, all these examples are very specific and do not concern brazing of any material but brazing of specific aluminium alloys.

(b) For a temperature modifier layer consisting of a zinc-aluminium alloy, Table 5 in Example 4 refers

to an alloy having a composition of 98% Zn and 2% Al, which alloy is applied in a thickness of 0.13mm for brazing of an aluminium type 3003 tube and plate. No further example concerning an alloy relating to any other zinc-aluminium alloy composition, thickness or brazing material is disclosed.

(c) For a temperature modifier layer consisting of a zinc-aluminium-silicon alloy, example 4, Tables 4 and 5 refer to an alloy having a composition of 98% Zn, 8.8% Al and 1.2% Si, which alloy is applied in a thickness of either 0.25, 0.36, 0.18 or 0.10mm and relates specifically to brazing of an aluminium type 3003 tube and plate. No other compositions of the alloy material are disclosed nor are there disclosed any other materials to be selected for brazing with such a brazing product.

3.1.4 Hence, no general teaching is disclosed for a brazing product comprising a temperature modifier layer having a specific thickness when consisting of either zinc, a zinc-aluminium alloy or a zinc-aluminium-silicon alloy which, during brazing, forms a filler metal having a liquidus temperature in the claimed range in combination with a braze-promoting layer consisting of either nickel or a nickel-lead alloy. Only for specific alloys are there disclosed specific thicknesses in combination with defined brazing conditions with regard to the material to be joined. The examples rather show specific thicknesses for specific uses and no basis is derivable from these examples as to the claimed range in relation to the modifier layer compositions.

3.1.5 Accordingly, the subject-matter is not disclosed in the claimed combination and the requirements of Article 123(2) EPC are not met and for these reasons, claim 1 is not allowable.

4. Consequently the subject-matter of the claim 1 of the main request and auxiliary requests 1 to 4 lacks support in the description (Article 84 EPC), and the subject-matter of claim 1 of auxiliary request 5 is not disclosed in such combination (Article 123(2) EPC). As no allowable request is on file, the appeal must be dismissed.

## Order

## For these reasons it is decided that:

The appeal is dismissed.

The Registrar The Chairman

M. Patin P. Alting van Geusau