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Datasheet for the decision of 3 March 2025

Case Number: T 1373/23 - 3.3.05

Application Number: 16740893.9

Publication Number: 3247814

IPC: C22C21/08, C22F1/05

Language of the proceedings: EN

Title of invention:
ALUMINUM ALLOY PRODUCTS

Applicant:
Arconic Technologies LLC

Headword:
ALUMINUM ALLOY PRODUCTS/Arconic

Relevant legal provisions:
EPC Art. 123(2), 84, 54, 56
RPBA 2020 Art. 13(2)

Keyword:

Amendments - allowable (yes)
Claims - clarity (yes)
Novelty - (yes)
Inventive step - (yes)
Amendment after summons - exceptional circumstances (yes) - exercise of discretion - taken into account (yes)

Decisions cited:

T 1800/21, T 0499/02

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 1373/23 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 3 March 2025

Appellant: (Applicant)	Arconic Technologies LLC 201 Isabella Street Pittsburgh, PA 15212 (US)
Representative:	Forresters IP LLP Skygarden Erika-Mann-Straße 11 80636 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 2 February 2023 refusing European patent application No. 16740893.9 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	E. Bendl
Members:	J. Roider
	S. Fernández de Córdoba

Summary of Facts and Submissions

I. The appeal lies from the decision of the examining division to refuse European patent application No. 16740893.9.

II. The following documents, which were already cited in the opposition proceedings, are relevant here.

D1 US 2014/0366998 A1

D2 J. R. Davies, (Editor): "ALUMINUM AND ALUMINUM ALLOYS, ASM SPECIALTY HANDBOOK", 1993, ASM INTERNATIONAL, OHIO, XP002784921, ISBN: 978-0-87170-496-2, pages 523-531

D11 Murtha, S. J. et al: "Anisotropy Effects in the Forming of Aluminum Sheet", SAE Special Publications, SAE Inc., 1995, pages 103-111, ISSN: 0099-5908, XP008005835

III. Claim 1 of the main request reads as follows.

"An aluminum alloy product comprising:
a pair of outer regions and
an inner region positioned between the outer regions;
wherein a first concentration of eutectic forming alloying elements in the inner region is less than a second concentration of eutectic forming alloying elements in each of the outer regions;
wherein the aluminum alloy product comprises an aluminum alloy selected from the group consisting of 2xxx, 6xxx, and 7xxx series alloys
wherein the aluminum alloy product has a delta r value of 0 to 0.10;

wherein the delta r value is calculated as follows:

*Absolute Value [(r_L + r_LT -2*r_45)/2]*
wherein r_L is an r value in a longitudinal direction of the aluminum alloy product;
wherein r_LT is an r value in a transverse direction of the aluminum alloy product; and
wherein r_ 45 is an r value in a 45 degree direction of the aluminum alloy product."

Dependent claims 2 to 7 relate to particular embodiments of the invention.

IV. The appellant considers the main request admissible and allowable.

V. Substantive requests

The appellant requested that the decision under appeal be set aside and that a patent be granted based on the main request (filed as auxiliary request 11 during oral proceedings before the board), or in the alternative based on the (former) main request filed on 14 June 2022, or in the alternative based on auxiliary request 1 filed on 14 June 2022, or in the alternative based on one of auxiliary requests 2 to 9 filed on 13 July 2022, or in the alternative based on auxiliary request 10, which was filed with the statement of grounds of appeal.

Reasons for the Decision

Main request

1. Amendments

The main request corresponds to the former main request filed in the course of the examination procedure, now auxiliary request 1, except that claims 8 to 14 have been deleted.

2. Admission, Article 13(2) in connection with Article 13(1) RPBA

The new request overcomes the objections raised in relation to the former main request and does not give rise to new objections, as apparent from the assessment below. According to recent case law, this may constitute an exceptional circumstance allowing for a positive discretionary decision (T 1800/21, Catchword and Reasons 3.4.6 and 3.4.7).

In the present case, the cited documents and the considerations under Article 56 EPC remain the same. The factual and legal framework does not therefore change. Moreover, the change does not impair procedural efficiency.

Therefore the board admits the main request.

3. Article 123(2) EPC

The subject-matter of claim 1 originates from claims 1 and 5 as originally filed.

The requirements of Article 123(2) EPC are met.

4. Article 84 EPC

Achievement of the delta r value depends on the Mg content, as apparent from the assessment below, which is a technical requirement and not a commercial one. It is therefore clear to the skilled person that the reference to the groups 2xxx, 6xxx, and 7xxx of the *"International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys"* (hereafter referred to as "IAD") of the Aluminum Association limits the type of alloys to the composition according to the "Recommendation" section of the IAD, which defines the technical criteria for the assignment of a registered international designation, and not only to alloys which are in active commercial use and have a registered international designation.

The requirements of Article 84 EPC are therefore met.

5. Novelty, Article 54(1) and (2) EPC

D1
D1 does not disclose the delta r value.

Paragraph [0082] of the application as originally filed discloses that a high Mg content increases the delta r value. This is consistent with the examples in the patent application, which generally show an Mg content well below 1%. Therefore, the inclusion of the delta r value in the subject-matter of claim 1 is a limiting feature that is not necessarily met for all 2xxx, 6xxx, and 7xxx series alloys according to claim 1, in particular for 1.4% Mg, as disclosed for alloy 6-3 in

paragraph [0041] of D1.

Therefore, the subject-matter of claim 1 is novel over D1.

D11

D11 discloses a standard 6009-T4 aluminium sheet which has a delta r value of 0.03 (Table II). A standard aluminium sheet is made from an ingot by direct chill ingot casting.

According to D2, ingots of a 2124 alloy show a macrosegregation in which copper, an eutectic alloying element, is depleted in the centre of the ingot (D2: Fig. 21 and associated description on page 527, middle column).

However, a 2124 alloy has a much higher concentration of Cu than a 6009 alloy (3.8-4.9% rather than 0.15-0.6%) and significantly different contents of Si and Mg. It is also known that alloying elements can interact to influence their behaviour during solidification.

With the much lower Cu concentration of the 6009 alloy and the significantly different concentration of other alloys, it is not apparent that the same macrosegregation of a 2124 alloy will be observed in the chill-cast ingot of a 6009 alloy, let alone that it can persist throughout the course of processing into a T4 tempered sheet.

Therefore, the subject-matter of claim 1 is novel over D11.

6. Inventive step, Article 56 EPC

The patent application is directed to an aluminium alloy product (paragraph [0002], claim 1).

Both D1 and D11 are directed to an aluminium alloy product. They differ from claim 1 of the patent application in different aspects, and will therefore be assessed separately.

D1

The patent application does not explicitly state a problem to be solved by claim 1. However, on comparing claim 1 with D1 it is immediately apparent that claim 1 aims at providing an isotropic material.

It is proposed to solve this technical problem by the features of claim 1, which differ from D1, alloy 6-3 (D1: paragraph [0041]) in the claimed range for the parameter delta r, which is equivalent to a high isotropy.

The objective of obtaining a low delta r value is a definition in terms of a result to be achieved. However, according to paragraph [00082] of the application as originally filed, a high Mg content results in high delta r values. Therefore the skilled person is given clear instructions on how to achieve that desired value without undue burden.

Nor can the subject-matter be defined more precisely without restricting the scope of the invention. Alloying elements may interact to mutually influence their behaviour. Specifying a particular Mg content would not necessarily ensure that the delta r value would be achieved, nor would it necessarily ensure that

all the claimed delta r values resulting from adjustment of the Mg value would be covered by such a claim (T 499/02, point 3.1).

D1 is directed to post-solutionising cold work for improving strength, toughness, corrosion resistance or fatigue crack growth resistance (paragraphs [0003] and [0004]). Isotropy does not play a role in D1.

Even if the skilled person were to attempt to provide an isotropic material, they would receive no guidance from D1 or any of the other cited documents as to what measure to apply to the alloy 6-3 (D1: paragraph [0047]) in order to arrive at the claimed delta r value with any prospect of success.

D11

The patent application does not state a problem to be solved by claim 1. D11 already deals with the technical problem of reducing anisotropy, i.e. it has a goal similar to the application at issue.

Therefore the technical problem is the provision of an alternative aluminium alloy product.

As discussed above in relation to novelty, it is not apparent that a macrosegregation of Cu necessarily exists in a 6009 alloy ingot, let alone in a 6009-T4 aluminium sheet.

D2, page 527, middle column suggests that macrosegregation is undesirable. Even if macrosegregation of Cu did exist to some extent, the skilled person would seek to eliminate it in accordance with the teaching of D2.

Thus, even if one were to provide an alternative aluminium alloy sheet starting from D11, the skilled person would not arrive at the claimed subject-matter.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent on the basis of claims 1 to 7 of the main request (filed as auxiliary request 11 during oral proceedings before the board), and a description to be adapted.

The Registrar: The Chairman:

C. Vodz E. Bendl

Decision electronically authenticated