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Datasheet for the decision of 5 March 2026

Case Number: T 1410/24 - 3.3.05

Application Number: 18716840.6

Publication Number: 3601626

IPC: C22B21/00, C22C21/06, C22C1/02

Language of the proceedings: EN

Title of invention:
CASTING RECYCLED ALUMINUM SCRAP

Patent Proprietor:
Novelis, Inc.

Opponent:
Arconic Corporation

Headword:
Casting Recycled Aluminium/Novelis

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no)

Decisions cited:
T 1518/20

Catchword:

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Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0

Case Number: T 1410/24 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 5 March 2026

Appellant: (Opponent)	Arconic Corporation 201 Isabella Street Pittsburgh, PA 15212-5858 (US)
Representative:	Forresters IP LLP Skygarden Erika-Mann-Straße 11 80636 München (DE)
Respondent: (Patent Proprietor)	Novelis, Inc. 3560 Lenox Road, Suite 2000 Atlanta, GA 30326 (US)
Representative:	Weickmann & Weickmann PartmbB Postfach 860 820 81635 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 7 October 2024 concerning maintenance of the European Patent No. 3601626 in amended form.**

Composition of the Board:

Chair	R. Winkelhofer
Members:	G. Glod
	T. Burkhardt

Summary of Facts and Submissions

I. The opponent's (appellant's) appeal concerns the opposition division's decision finding that European patent No. 3 601 626 B1 in amended form based on the then auxiliary request 2 meets the requirements of the EPC.

II. The following documents used in the impugned decision are relevant.

D1: US 4 282 044 A
D2: ASM Handbook, Volume 4, Heat Treating, 1991, pp. 841-879
D12: Rolling Aluminium: from the Mine through the Mill, The Aluminum Association, 2008

III. Broken down into features, claim 1 of auxiliary request 2 (now the main request) underlying the impugned decision is as follows:

A) A metal casting method comprising:
B) melting recycled aluminum into liquid metal;
C) adding an alloying element to the liquid metal to form a modified liquid metal, the alloying element comprising magnesium, silicon, or copper;
C1) degassing the modified liquid metal;
D) continuously casting the modified liquid metal into a metal product, wherein the modified liquid metal includes at least 50% recycled aluminum; and
E) rolling the metal product, wherein the rolling comprises hot rolling and cold rolling the hot rolled metal product from an intermediate gauge to a final gauge,
F) wherein the method further comprises reheating the

cold-rolled metal product to an annealing temperature at or above 350°C for 1 hour after the cold rolling; and

F1) coiling the metal product for delivery;

G) wherein the metal product comprises an aluminum alloy comprising 0.1 to 0.9 wt.% Cu, 0.25 to 0.7 wt.% Fe, 1.0 to 5.0 wt.% Mg, 0.1 to 0.9 wt.% Mn, 0.01 to 1.0 wt.% Si, 0.01 to 0.15 wt.% Ti, 0.01 to 5.0 wt.% Zn, 0.01 to 0.25 wt.% Cr, 0.01 to 0.1 wt.% Zr, up to 0.15 wt.% impurities, and Al.

Auxiliary request 3 includes the underlined amendment at the end of claim 1.

[...] up to 0.05 wt.% impurities each and 0.15 wt.% impurities total, and Al.

In claim 1 of auxiliary request 4, feature G) has been amended as follows:

[...] wherein the metal product comprises an aluminum alloy comprising 0.2 to 0.8 wt.% Cu, 0.3 wt.% to 0.6 wt.% Fe, 1.4 wt.% to 3.0 wt.% Mg, 0.2 wt.% to 0.7 wt.% Mn, 0.2 wt.% to 0.5 wt.% Si, 0.02 wt.% to 0.1 wt.% Ti, 0.02 wt.% to 3.0 wt.% Zn, 0.02 wt.% to 0.1 wt.% Cr, 0.02 wt.% to 0.05 wt.% Zr, up to 0.15 wt.% impurities, and Al.

Compared with claim 1 of auxiliary request 4, claim 1 of auxiliary request 5 includes the underlined amendment at the end.

[...] up to 0.05 wt.% impurities each and 0.15 wt.% impurities total, and Al.

IV. The appellant argued that the requirements of Article 56 EPC were not met for any of the requests.

The respondent (patent proprietor) refuted this position, in particular by arguing that feature F) and the presence of Zr were not rendered obvious by the prior art.

V. The appellant requests that the decision under appeal be set aside and amended such that the patent be revoked.

The respondent requests that the appeal be dismissed (main request), or alternatively that the patent be maintained in amended form on the basis of one of auxiliary requests 3 to 5 submitted before the opposition division.

Reasons for the Decision

Main request (auxiliary request 2 underlying the impugned decision)

1. Article 56 EPC

1.1 The invention concerns a metal casting method comprising recycled aluminium.

1.2 It is not disputed that D1 is an appropriate starting point for the discussion of inventive step. As indicated in the impugned decision (point II.4.3.2; see page 13, bottom of the page), D1 does not disclose steps F), F1) and the amounts of Zn, Cr and Zr in step G) in combination with the other components of the composition in claim 1.

1.3 The problem to be solved over D1 can be considered that of providing an alternative method providing the desired temper.

For the reasons why the more ambitious formulation of the problems to be solved put forward by the respondent cannot be retained, see points 1.5.1 and 1.6 below.

1.4 It is proposed that the problem be solved by a method according to claim 1, characterised in that it comprises reheating the cold-rolled metal product to an annealing temperature at or above 350°C for 1 hour after the cold rolling, coiling the metal product for delivery, and wherein the aluminium alloy comprises 0.01 to 5.0 wt.% Zn, 0.01 to 0.25 wt.% Cr and 0.01 to 0.1 wt.% Zr.

1.5 The solution is obvious for the following reasons:

1.5.1 D1 discloses that it is within the scope of the invention of D1 to adapt the fabrication steps to produce the desired tempers, including fully annealed (O-temper; see column 11, lines 54 to 59). It is evident that, when starting from D1, D2 teaches that full annealing can be obtained by soaking for at least 1 hour at 415 to 440°C (page 869, middle column and right-hand column), as correctly pointed out in the impugned decision (point II.4.3.6).

The respondent, though, was of the view that the O-temper in D1 was not disclosed in combination with continuous casting. Even if the skilled person consulted D2, there was no pointer in D2 to choose a temperature in the claimed range in combination with the duration of 1 hour.

The respondent's view that the combination of continuous strip casting with a specific temper was not disclosed cannot be followed.

D1 has a specific chapter dedicated to continuous strip casting (column 12) and discloses explicitly that such a process can replace a conventional casting process (column 12, lines 8 to 11). It is not apparent why this disclosure would not be compatible with the fabrication of a fully annealed product mentioned just a couple of lines earlier (column 11, line 57). In addition, column 11, line 55 refers to the "present invention", meaning that the skilled person understands that the production of the desired temper applies to both a conventional casting process and to the continuous casting process.

D2 relates to full annealing and would be considered by the skilled person seeking to produce a fully annealed aluminium alloy. It discloses (page 869, right-hand column) that for both heat-treatable and non-heat-treatable aluminium alloys, reduction or elimination of the strengthening effects of cold working is accomplished by heating at a temperature from 260°C to 440°C. It is also indicated that the time required to soften a given material by a given amount can vary from hours at low temperatures to seconds at high temperatures. Furthermore, 345°C is stated to suffice if the purpose of annealing is merely to remove the effects of strain hardening, while soaking at 415°C to 440°C is required if it is necessary to remove the hardening effects of a heat treatment or of cooling from hot-working temperatures. It is further mentioned that it is common to specify a soaking period of at least 1 hour.

The skilled person understands from this disclosure that, depending on the material and the desired result, the temperature and time need to be adapted. There are multiple options for obtaining the desired result by combining temperature and time. The fact that, for the process listed in Table 11 of D2, a specific temperature of 345°C was chosen for AA 5xxx alloys does not mean that this temperature is the only acceptable one. The combination of temperature (≥ 350°C) and time (1 hour) present in claim 1 of this request is one of the conditions falling within the multiple options. A merely arbitrary choice from a host of possible solutions cannot be considered inventive (Case Law of the Boards of Appeal of the EPO, 11th edition, 2025, I.D.9.21.9 a)). In addition, if the problem to be solved is that of providing an alternative, the presence of an incentive towards the solution is not needed (Case Law of the Boards of Appeal of the EPO, 11th edition, 2025, I.D.4.5 referring to T 1518/20, point 1.5.4 of the Reasons).

D1 discloses an intermediate annealing process, which is different from the annealing disclosed in D2; however, if the skilled person is trying to find an alternative process, they will not limit themselves to the process disclosed in D1, but will consider all the processes that lead to the desired O-temper. Therefore, D2 will be taken into consideration. In any case, claim 1 does not exclude the presence of intermediate steps.

D12 (paragraph bridging pages 3-3 and 3-4) discloses that continuously cast alloys *may* have different capabilities than their direct chill (DC) counterparts, but D1 itself does not consider there to be any inconvenience in choosing either process. The

differences which possibly occur in the microstructure are apparently not relevant in D1. In any event, claim 1 does not include any specific properties, which would be at risk when changing the process.

1.5.2 D1 also foresees the presence of Cr up to 0.1%, Zn up to 0.25%, and others up to 0.05% each, and up to 0.2% total (column 6, lines 10 to 12). Cr and Zn are explicitly disclosed and their ranges overlap with the ranges given in claim 1 of the current main request. It is evident that one solution among many others to the posed problem (alternative) is to choose Cr and Zn such that they are within said overlap.

Zr is not explicitly mentioned in D1, but is evidently covered by the impurities (others up to 0.05% each). Again, this range overlaps with the range present in claim 1 of the present request. It is acknowledged that many elements are possible, but Zr is one of them. There is no evidence that the addition of Zr at such low levels in the specified composition has a specific effect. Paragraph [0165] referred to by the respondent does not mention Zr in that respect. This means that in cases in which Zr is not present in the recycled aluminium, or is present below the required 0.01 wt.% (see, for example, Table 4 of the patent), it would have to be added on purpose. As no effect is established, this is clearly disadvantageous and cannot serve as a basis for an inventive step. Adding a substance without purpose to a composition is not necessary and might only have cost implications and complicate the process.

Even if it were accepted that Zr in the claimed range had an effect on grain refinement, this would have been

known to the skilled person, as admitted by the respondent when arguing in favour of such an effect.

1.5.3 It is generally known to the skilled person that the metal product can be coiled prior to delivery.

1.6 The respondent's arguments (in particular, pages 8 and 11 of the reply to the appeal) concerning a more ambitious problem related to the tolerance for larger quantities of Zr, and the specific use and the grain size are not convincing. Claim 1 does not relate to a specific use, but very generally to a casting method. It does not define any properties of the obtained product, such as grain size, and does not specify the composition of the recycled aluminium. Therefore, the respondent cannot rely on features which are not present in the claim.

The examples of the patent cannot prove an effect either, as none of the examples falls under the ambit of claim 1 (Zr concentration that is too low).

1.7 Consequently, the subject-matter of claim 1 of the main request does not involve an inventive step, and this request must fail.

Auxiliary requests 3 to 5

2. Article 56 EPC

Regarding these auxiliary requests, following the communication pursuant to Article 15(1) RPBA, the respondent has only referred to their written submissions made earlier in the appeal proceedings. Consequently, there is no reason to deviate from the

opinion given in said communication, which is repeated below.

The respondent very generally refers to the arguments provided for the main request (point IV on page 11 of the reply to the appeal). Notwithstanding the question of whether such a reference is sufficient for meeting the requirements of substantiation set out in Article 12(3) RPBA, it can only lead to the conclusion that the same arguments as those presented for the current main request also apply to auxiliary requests 3 to 5. The reference to the main request does not give any answer to the question of why the skilled person would not work within the overlap of the ranges given in D1 and those present in claim 1 when, as in the case in hand, the problem to be solved is only that of providing an alternative.

Therefore, the auxiliary requests fail as well.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chair:

C. Vodz R. Winkelhofer

Decision electronically authenticated