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**Datasheet for the decision
of 12 June 2026**

Case Number: T 0693/24 - 3.3.03

Application Number: 16746428.8

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Title of invention:
FLAME-RETARDANT POLYOLEFIN RESIN COMPOSITION

Patent Proprietor:
Adeka Corporation

Opponent:
Borealis GmbH

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - effect not achievable across the whole scope
of claim - obvious alternative



Beschwerdekammern

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 0693/24 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 12 June 2026

Appellant:
(Patent Proprietor) Adeka Corporation
2-35, Higashiogu 7-chome
Arakawa-ku
Tokyo 116-8554 (JP)

Representative:
Forstmeyer, Dietmar
Boeters & Lieck
Oberanger 32
80331 München (DE)

Respondent:
(Opponent) Borealis GmbH
Trabrennstrasse 6-8
1020 Vienna (AT)

Representative:
Maiwald GmbH
Elisenhof
Elisenstraße 3
80335 München (DE)

Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted/electronically
transmitted on 19 March 2024 revoking European
patent No. 3255095 pursuant to Article 101(3) (b)
EPC.**

Composition of the Board:

Chairman D. Semino
Members: M. Barrère
A. Bacchin

Summary of Facts and Submissions

I. The appeal of the patent proprietor lies against the decision of the opposition division revoking European patent No. 3 255 095. This decision was based on two amended sets of claims filed as main request and auxiliary request 1 with letter dated 30 November 2023.

II. Claim 1 of the main request read as follows:

"1. A flame-retardant polyolefin resin composition comprising 100 parts by mass of a polyolefin resin, 30 to 60 parts by mass of component (A), 15 to 90 parts by mass of component (B), 10 to 140 parts by mass of component (C), and 1.0 to 7.5 parts by mass of component (D) per 100 parts by mass of the sum of components (A) and (B):

component (A): at least one melamine salt selected from the group consisting of melamine orthophosphate, melamine pyrophosphate, and melamine polyphosphate;

component (B): at least one piperazine salt selected from the group consisting of piperazine orthophosphate, piperazine pyrophosphate, and piperazine polyphosphate;

component (C): glass fiber, wherein the glass fiber is in the form of chopped strands having a length of 1.0 to 5.0 mm; and

component (D): zinc oxide."

Claim 1 of auxiliary request 1 differed from claim 1 of the main request in that the amount of component (A) was 30 to **40** parts by mass (instead of 30 to **60** parts by mass).

III. The following documents were *inter alia* cited in the decision of the opposition division:

D3: JP 2011-88970

D3a: English translation of D3

D4: EP 2 789 653 A1

D5: Kandola, B.K. and Toqueer-Ul-Haq, R., "*The effect of fibre content on the thermal and fire performance of polypropylene-glass composites*", Fire Mater., 2012, 36, pages 603 to 613, <https://doi.org/10.1002/fam.1120>

IV. The contested decision, as far as it is relevant to the present appeal, can be summarised as follows:

- Starting from D4, the subject-matter of claim 1 of the main request involved an inventive step, but lacked one over D3/D3a. The same negative conclusion applied to claim 1 of auxiliary request 1.

V. An appeal was filed by the patent proprietor (appellant). With its statement of grounds of appeal, the appellant submitted an amended set of claims as auxiliary request 2.

VI. The opponent (respondent) filed a rejoinder to the statement of grounds of appeal.

VII. Further written submissions and additional documents were filed by the parties during the appeal

proceedings. As these documents were not relevant to the present decision, they are not addressed in the reasons below.

- VIII. In preparation for the oral proceedings, a communication pursuant to Article 15(1) RPBA containing the Board's provisional opinion was issued.
- IX. Oral proceedings before the Board were held on 12 June 2026 with the participation of both parties.
- X. The final requests of the parties were as follows:

The appellant requested that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the main request or auxiliary requests 1 or 2 whereby

- the main request and auxiliary request 1 were filed with letter dated 30 November 2023 and
- auxiliary request 2 was filed with the statement of grounds of appeal.

The respondent requested that the appeal be dismissed.

- XI. The main request and auxiliary request 1 correspond to the requests dealt with in the decision under appeal (reference is made to point II. for the wording of claim 1).

Claim 1 of auxiliary request 2 differs from claim 1 of auxiliary request 1 in that the following feature has been added at the end of the claim:

"which polyolefin resin composition meets the UL94 5VA standard".

- XII. The parties' submissions, in so far as they are relevant, can be derived from the reasons for the decision set out below. They essentially concerned inventive step of claim 1 of the main request starting from document D4 as the closest prior art.

Reasons for the Decision

Main request (as filed with letter dated 30 November 2023)

1. Inventive step

In the decision under appeal, the opposition division concluded that claim 1 of the main request involved an inventive step starting from document D4 as the closest prior art (contested decision, point 7.3.3 on pages 12 to 14). This finding is contested by the respondent in appeal (see rejoinder to the statement of grounds of appeal, page 29, paragraph 144 to page 32, paragraph 165; letter dated 24 April 2025, page 12, paragraph 57 to page 13, paragraph 62).

1.1 Closest prior art and distinguishing features

The parties concurred with the opposition division that:

D4 could be selected as starting point for assessing inventive step and

the subject-matter of claim 1 differed from the composition of example 15 (see table 2 of D4) in that the composition comprised

- (i) 30 to 60 parts by mass of component (A) per 100 parts by mass (pbm) of the polyolefin resin (instead of 28 pbm), and
- (ii) 10 to 140 pbm of glass fibres, wherein the glass fibre was in the form of chopped strands having a length of 1.0 to 5.0 mm (while no glass fibre was present in the composition of example 15 of D4).

The Board has no reason to deviate from that view.

1.2 Objective problem to be solved

- 1.2.1 The first point of disagreement between the parties concerned the question whether a technical effect could be acknowledged in view of distinguishing features (i) and (ii).
- 1.2.2 In the contested decision (see bottom of page 12), the opposition division held that a technical effect of the distinguishing features had not been shown. Therefore the problem to be solved was considered to be the provision of an alternative flame retardant polyolefin resin composition.
- 1.2.3 The appellant argued that, contrary to the opposition division's view, a technical effect of the distinguishing features had been demonstrated, namely the avoidance of fluorine-containing anti-drip agents, which were known to impair resin properties and raised ecological and biological concerns. It was submitted

that the invention aimed to provide a halogen-free flame-retardant composition meeting the UL94 5VA flame retardancy standard, which was achieved by replacing the anti-drip agent polytetrafluoroethylene (PTFE) with the glass fibres defined in claim 1 (letter dated 10 March 2025, page 18 and letter dated 15 September 2025, page 11, last paragraph to page 12, second full paragraph).

- 1.2.4 In that regard, the Board concurs with the respondent that operative claim 1 is not limited to halogen-free compositions (letter dated 24 April 2025, page 12, paragraph 58). In fact, paragraph [0084] of the opposed patent explicitly discloses that an anti-drip agent such as PTFE may be present, albeit as a non-preferred embodiment. Consequently, claim 1 encompasses compositions containing halogen-based compounds.

The alleged technical effect relied upon by the appellant, namely the provision of halogen-free compositions through the replacement of PTFE by glass fibres, cannot therefore be acknowledged over the entire scope of the claim. In particular, this effect is not achieved by embodiments falling within claim 1 that still contain PTFE or another halogen-containing compound.

Moreover, contrary to the appellant's argument, arriving at the subject-matter of claim 1 starting from example 15 of D4 does not require the removal of PTFE or any other halogen-containing component. Rather, it is sufficient to modify the composition by incorporating the claimed amount of glass fibres and increasing the amount of component (A), i.e. by implementing distinguishing features (i) and (ii). The alleged replacement of PTFE is therefore neither

required by the claim nor reflected in the distinguishing features over D4.

1.2.5 Consequently, in the absence of any other technical effect with respect to the composition of example 15 of D4, the objective problem to be solved is formulated as the provision of an alternative flame-retardant composition.

1.2.6 However, the parties agreed that the common objective of both D4 and the opposed patent was to provide flame-retardant compositions that met the UL94 5VA standard (see D4, paragraph [0001] and opposed patent, paragraph [0001]). This was achieved by the compositions of example 15 of D4 and examples 1 to 5 of the patent (see D4, table 2 and opposed patent, table 1). Accordingly, the Board concurs with the parties that the alternative flame retardant composition should also fulfil this requirement. In other words, the skilled person would only consider modifications of the compositions of D4 that are not expected to compromise their ability to meet the UL94 5VA standard.

1.3 Obviousness

1.3.1 In the decision under appeal (page 13, first paragraph), the opposition division concluded that it was obvious, in view of the teaching of D4, to increase the amount of component (A) in order to obtain an alternative flame-retardant composition. The obviousness of distinguishing feature (i) was not contested in appeal so that the Board has no reason to arrive at a different conclusion.

1.3.2 The main point of dispute concerned the obviousness of distinguishing feature (ii), i.e. whether it was

obvious for a skilled person wishing to provide an alternative flame-retardant composition meeting the UL94 5VA standard, to include in the compositions of D4 10 to 140 pbm of glass fibres, wherein the glass fibre is in the form of chopped strands having a length of 1.0 to 5.0 mm.

- 1.3.3 In agreement with the opposition division, the appellant argued that the cited prior art documents did not suggest to use glass fibres as anti-drip agent. Hence, there was no incentive to replace PTFE (as used in example 15 of D4) by glass fibres. Even if the claimed invention were regarded merely as an alternative to the compositions of D4, the skilled person would have had no motivation to consult other prior-art documents. Since example 15 of D4 already achieved the object of meeting the UL94 5VA standard, the skilled person would have remained within the teaching of D4 rather than turning to D3/D3a, which did not address UL94 at all, or to D5, which explicitly disclosed samples failing the UL94 test and relied on different flame retardants (letter dated 10 March 2025, page 19; letter dated 15 September 2025, page 12, second to fourth full paragraph).

During the oral proceedings before the Board, the appellant additionally contended that, according to paragraph [0047] of D4, the amount of anti-drip agent should remain between 0.01 and 5 % by mass otherwise the properties of the resin composition could be deteriorated. However, D5 taught that 10% by mass of glass fibres as anti-drip agent would be insufficient to meet the UL94 5VA standard (see D5, conclusion). Therefore, in the light of D4, the skilled person would refrain from using more than 5% by mass of glass fibres with the consequence that the skilled person would not

obtain a composition according to operative claim 1. Furthermore, the appellant argued that if the skilled person were to additionally consider D3/D3a despite the absence of any indication regarding the flame retardancy of the compositions, particularly with regard to the UL94 5VA standard, this document would not recommend the use of short glass fibres as defined in operative claim 1.

- 1.3.4 The respondent argued that, once the objective technical problem was formulated as the provision of an alternative flame-retardant composition, no particular motivation or pointer was required to modify the composition of example 15 of D4. It was sufficient that the modification remained within the teaching of the prior art (letter dated 24 April 2025, page 13, paragraph 61).

D4 already suggested the addition of glass fibres as reinforcing agents (paragraph [0062]). This teaching was consistent with the opposed patent, which likewise envisaged compositions containing both reinforcing fibres and PTFE. Therefore the skilled person would not be deterred from adding glass fibres to the composition of example 15 of D4.

The respondent further relied on D3/D3a as evidence that short glass fibres having the claimed length (about 3 mm) and used in the claimed amounts were already known in flame-retardant polyolefin compositions.

Finally, the respondent cited D5 as evidence that the addition of glass fibres as defined in claim 1 did not impair flame retardancy and could even improve it. In particular, D5 taught that glass fibres reduced the

overall flammability of polypropylene composites, slowed down thermal decomposition and significantly reduced melt dripping, which the appellant itself considered important for compliance with the UL94 5VA standard. Since example 15 of D4 already satisfied the UL94 5VA requirement, the skilled person merely had to be confident that the addition of glass fibres would not adversely affect flame retardancy, which D5 demonstrated.

On that basis, the respondent concluded that the addition to the composition of example 15 of D4 of glass fibres having the required length and in the required amount constituted an obvious modification and that the subject-matter of claim 1 lacked an inventive step (see rejoinder, page 30, paragraph 150 to page 32, paragraph 165).

During the oral proceeding before the Board, the respondent further contended that the amount of anti-drip agent in paragraph [0047] of D4 pertained only to the fluorine containing compounds disclosed in paragraph [0046] of that document. By contrast, according to paragraph [0062] of D4, the amount of glass fibres as reinforcing agent was not limited as long as the properties of the composition were not impaired. Accordingly, nothing in D4 would teach away from using glass fibres in the required amount.

- 1.3.5 With regard to the obviousness of feature (ii), the Board concurs with the respondent's line of argument for the following reasons:
- 1.3.6 The first point of disagreement between the parties concerned the question whether D3/D3a suggested to use glass fibres as defined in claim 1 in the compositions

of D4. In that context, the parties put forward different interpretation of the scope of claim 1 of the main request. While the appellant held that the length of the glass fibre was that of the fibres before processing the composition, the respondent argued that it was the length of the fibres in the composition (i.e. after processing). In the present decision, the Board did not rely on document D3/D3a for the assessment of inventive step, but rather on a combination of documents D4 and D5 (see points 1.3.7 to 1.4 below). Therefore the issue of the interpretation of the scope of claim 1 with regard to the fibre length can be left unanswered.

- 1.3.7 The second point of a disagreement concerned the question whether the skilled person wishing to provide an alternative flame-retardant composition meeting the UL94 5VA standard would have found in D5 a teaching to use glass fibres as defined in claim 1.
- 1.3.8 As a preliminary remark, the parties did not contest that D5 disclosed chopped glass fibres having a length of 4.5 mm, which corresponded to glass fibres as defined in claim 1 (see D5, page 604, point 2.1, glass fibre a)). In particular, as far as D5 was concerned, it was not disputed that the addition of a sufficient amount of this glass fibre type would correspond to distinguishing feature (ii).
- 1.3.9 The decisive question is therefore whether a skilled person seeking to provide an alternative flame-retardant composition meeting the UL94 5VA standard would have considered using such glass fibres in the composition of example 15 of D4.

- 1.3.10 In this respect, D4 itself already discloses that the compositions of the invention may additionally contain reinforcing agents, including glass fibres, provided that the effects of the invention are not impaired (paragraph [0062]). The Board therefore agrees with the respondent that the skilled person would, in principle, consider adding glass fibres to the composition of example 15 of D4, which already satisfies the UL94 5VA standard, in order to obtain an alternative composition.
- 1.3.11 Furthermore, D5 is an academic study concerning the effect of glass fibres on the thermal and fire performance of polypropylene based compositions (see D5, title). This document teaches that the addition of short glass fibres does not impair flame retardancy but may even improve it, in particular by significantly reducing melt dripping (see D5, page 604, paragraph 2.1 and page 612, conclusion). Consequently, D5 reinforces the expectation that the addition of glass fibres to the composition of D4 (such as the chopped glass fibres having a length of 4.5 mm disclosed in paragraph 2.1 of D5) would not compromise its flame-retardant properties.
- 1.3.12 In this regard, the Board is not persuaded by the appellant's arguments that D5 uses different flame retardants nor that the teaching of D5 is not relevant as the compositions of D5 do not themselves pass the UL94 test. The positive effect of glass fibres on flame retardancy or melt dripping, as described in D5, is not presented as depending on the particular flame retardant employed (see D5, page 612, conclusion). Moreover, the objective of providing a composition meeting the UL94 5VA standard is already achieved by the composition of example 15 of D4. As noted

previously (see point 1.2.6), the skilled person merely seeks an alternative composition and would therefore consider modifications that are not expected to adversely affect flame retardancy. Accordingly, even if the positive effect of glass fibres disclosed in D5 were disregarded, the skilled person would still have no reason to expect that their addition would impair the flame retardancy of the composition of D4.

- 1.3.13 The Board is likewise not convinced by the appellant's argument that the skilled person would have no incentive to replace the fluorine-containing anti-drip agent PTFE used in example 15 of D4 by glass fibres. As explained previously (see point 1.2.4), operative claim 1 does not require the removal or replacement of PTFE. The skilled person may therefore arrive at the claimed subject-matter simply by adding the required amount of glass fibres while retaining PTFE.
- 1.3.14 The Board can also not accept the appellant's submission that D4 teaches away from using more than 5 % by mass of glass fibres. The limitation mentioned in paragraph [0047] of D4 concerns the anti-drip agents disclosed in paragraphs [0044] to [0046], in particular fluorine-containing compounds, and does not apply to glass fibres. By contrast, paragraph [0062] of D4 expressly discloses glass fibres as reinforcing agents and imposes no quantitative restriction other than requiring that the effects of the invention should not be impaired. Hence, D4 does not discourage the skilled person from employing glass fibres in the amounts required by operative claim 1.
- 1.3.15 Furthermore, no technical effect has been shown to be associated with the specific range of 10 to 140 pbm of glass fibres. Consequently, once the skilled person has

decided to add glass fibres (such as those disclosed in D5) to the composition of D4, the selection of an amount falling within the claimed range merely constitutes an arbitrary choice without inventive character.

- 1.3.16 Last but not least, the Board also cannot follow the appellant's contention that the skilled person would have had no motivation to modify the composition of example 15 of D4 since this composition already met the UL94 5VA standard. The motivation stems first and foremost from the wish to solve a problem (in the present case to provide an alternative flame retardant composition) which implies that the skilled person would consider any known modification of said composition (albeit without impairing the flame retardancy).

- 1.4 In view of the foregoing considerations, the Board concludes that distinguishing features (i) and (ii) are obvious in the light of D4 and D5. Consequently, the subject-matter of claim 1 of the main request does not involve an inventive step starting from D4 as the closest prior art in combination with D5.

Auxiliary requests 1 and 2

2. The appellant did not submit any additional arguments concerning inventive step of claim 1 of auxiliary requests 1 and 2 over D4 and acknowledged that, if the Board were to decide that claim 1 of the main request lacked an inventive step starting from D4, the same conclusion would apply to the auxiliary requests (see minutes of the oral proceedings before the Board, page 3, second full paragraph). Accordingly, for the same reasons as set out above with respect to the main

request (see point 1.), the Board concludes that the subject-matter of claim 1 of auxiliary requests 1 and 2 likewise does not involve an inventive step starting from D4 as the closest prior art.

3. As none of the appellant's requests is allowable due to lack of inventive step, there is no need to deal with any other issue and the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



N. Schneider

D. Semino

Decision electronically authenticated