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Datasheet for the decision of 14 May 2025

Case Number: T 0787/23 - 3.3.03

Application Number: 17815645.1

Publication Number: 3342794

IPC: C08G63/18, C08G63/181, C08G63/199, C08K5/00, C08K5/103, C08K5/12

Language of the proceedings: EN

Title of invention:
PLASTICIZER COMPOSITION, RESIN COMPOSITION, AND PREPARATION METHOD FOR BOTH COMPOSITIONS

Patent Proprietor:
LG Chem, Ltd.

Opponent:
Evonik Operations GmbH

Relevant legal provisions:
EPC Art. 56, 123(2)
RPBA 2020 Art. 12(6)

Keyword:
Amendments - allowable (yes)
Inventive step - (yes)
Late-filed objections - admitted (no)

Decisions cited:
G 0003/89, G 0011/91, G 0002/10, T 0035/85, T 0197/86, T 1137/21

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Case Number: T 0787/23 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 14 May 2025

Appellant: (Opponent)	Evonik Operations GmbH Rellinghauserstrasse 1-11 45128 Essen (DE)
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Respondent: (Patent Proprietor)	LG Chem, Ltd. 128 Yeoui-daero Yeongdeungpo-gu Seoul 07336 (KR)
Representative:	Goddar, Heinz J. Boehmert & Boehmert Anwaltspartnerschaft mbB Pettenkoferstrasse 22 80336 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 3 March 2023 concerning maintenance of the European Patent No. 3342794 in amended form.**

Composition of the Board:

Chairman	D. Semino
Members:	O. Dury
	L. Basterreix

Summary of Facts and Submissions

I. The appeal of the opponent lies from the interlocutory decision of the opposition division regarding maintenance of European Patent No. 3 342 794 in amended form on the basis of the claims of the main request filed with letter of 28 January 2022 and an adapted description.

II. Claims 1 to 6 of the application as filed read as follows:

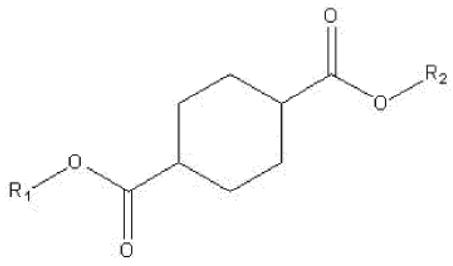
"1. A plasticizer composition comprising:

a cyclohexane 1,4-diester-based material represented by the following Chemical Formula 1; and

a dibenzoate-based material including one or more compounds represented by the following Chemical Formula 2,

wherein the cyclohexane 1,4-diester-based material is included at greater than 30 wt% and equal to or less than 99 wt% and the dibenzoate-based material is included at equal to or higher than 1 wt% and less than 70 wt%:

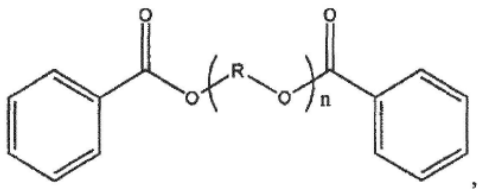
[Chemical Formula 1]



,

wherein R_1 and R_2 each independently are the same or different from each other and are alkyl groups having 1 to 12 carbon atoms.

[Chemical Formula 2]



,

wherein R is an alkylene group having 2 to 4 carbon atoms and n is an integer ranging from 1 to 3."

"2. The plasticizer composition according to claim 1, wherein a weight ratio of the cyclohexane 1,4-diester-based material to the dibenzoate-based material is 95:5 to 40:60."

"3. The plasticizer composition according to claim 1, wherein R_1 and R_2 in Chemical Formula 1 each independently are alkyl groups having 4 to 10 carbon atoms."

"4. The plasticizer composition according to claim 1, wherein R_1 and R_2 in Chemical Formula 1 each independently are selected from the group consisting of a butyl group, an isobutyl group, an amyl group, a hexyl group, a heptyl group, an isoheptyl group, a 2-ethylhexyl group, an octyl group, an isononyl group, a nonyl group, a 2-propylheptyl group, an isodecyl group and a decyl group."

"5. The plasticizer composition according to claim 1, wherein the cyclohexane 1,4-diester-based material is a single compound or a mixture of two or more selected

from the group consisting of butyl(2-ethylhexyl) cyclohexane-1,4-diester (1,4-BEHCH), (2-ethylhexyl) isononyl cyclohexane-1,4-diester (1,4-EHINCH), butyl isononyl cyclohexane-1,4-diester (1,4-BINCH), dibutyl cyclohexane-1,4-diester (1,4-DBCH), diisononyl cyclohexane-1,4-diester (1,4-DINCH) and di(2-ethylhexyl) cyclohexane-1,4-diester (1,4-DEHCH)."

"6. The plasticizer composition according to claim 1, wherein the compound represented by Chemical Formula 2 is one or more selected from the group consisting of diethylene glycol dibenzoate (DEGDB), dipropylene glycol dibenzoate (DPGDB) and triethylene glycol dibenzoate (TEGDB)."

III. The following documents, among others, were cited in the decision under appeal:

D3: US 2005/0020718 A1
D4: Applied Plastics Engineering Handbook - Processing and Materials, M. Kutz Editor, William Andrew / Elsevier, 2011, A. D. Godwin, Chapter 28 "Plasticizers"
D5: US Defensive Publication T864003
D7: EP 2 810 982 A1
D8: WO 00/78704 A1

IV. The decision under appeal was based on the sole main request filed with letter of 28 January 2022. In so far as relevant to the present case, the following conclusions were reached in the decision in regard of this request:

- The requirements of Article 123(2) EPC were met.

- The subject-matter of independent claim 1 involved an inventive step when either document D3 or document D7 was taken as the closest prior art.

On that basis, the patent amended on the basis of the main request was held to meet the requirements of the EPC.

V. The opponent (appellant) lodged an appeal against that decision.

VI. With the rejoinder to the statement of grounds of appeal, the patent proprietor (respondent) requested the dismissal of the appeal as main request and filed various sets of claims as 1st to 11th auxiliary requests.

VII. The parties were summoned to oral proceedings and a communication pursuant to Article 15(1) RPBA indicating specific issues to be discussed at the oral proceedings was then sent to the parties.

VIII. During the oral proceedings held on 14 May 2025 in the presence of both parties, the appellant stated that, taking into account the Board's considerations set out in the communication, they no longer had any objections regarding the identity of the respondent's representative for the present case and that the following objections were not maintained:

- The objection that additional comparative examples 1 to 3 that were referred to in the respondent's rejoinder (table 1 on pages 14-15) be not admitted into the proceedings.

- The objection concerning the uncertainty regarding which version of claim 1 of the main request was effectively dealt with in the decision under appeal (see minutes of the oral proceedings: page 2, first full paragraph), i.e. the appellant agreed that the main request dealt with in the decision under appeal was the clean version filed with letter of 28 January 2022 (whose claim 1 did not contain chemical formula 2).

IX. **The final requests of the parties were as follows:**

(a) The appellant requested that the decision of the opposition division be set aside and the patent be revoked.

(b) The respondent requested that the appeal be dismissed (main request) or, in the alternative, that the case be remitted to the opposition division for further prosecution on the basis of any of the 1st to 11th auxiliary requests filed with the rejoinder to the statement of grounds of appeal.

X. Claim 1 of the **main request**, which is the only claim of this request that is relevant to the present decision, read as follows (additions as compared to claim 1 as originally filed in **bold**, deletions in ~~strikethrough~~, respectively):

"1. A plasticizer composition comprising:

a cyclohexane 1,4-diester-based material ~~represented by the following Chemical Formula 1~~; and

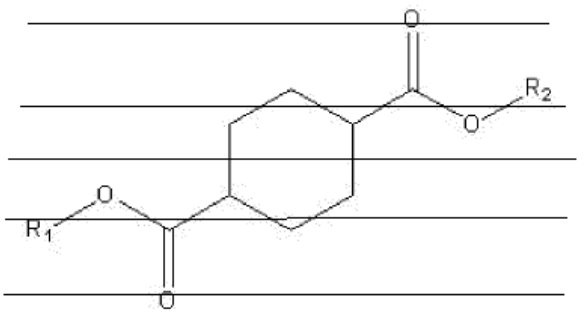
a dibenzoate-based material ~~including one or more compounds represented by the following Chemical Formula 2~~,

wherein the cyclohexane 1,4-diester-based material is a single compound or a mixture of two or more selected from the group consisting of butyl(2-ethylhexyl) cyclohexane-1,4-diester (1,4-BEHCH), (2-ethylhexyl) isononyl cyclohexane-1,4-diester (1,4-EHINCH), butyl isononyl cyclohexane-1,4-diester (1,4-BINCH), dibutyl cyclohexane-1,4-diester (1,4-DBCH), diisononyl cyclohexane-1,4-diester (1,4-DINCH) and di(2-ethylhexyl) cyclohexane-1,4-diester (1,4-DEHCH), and

wherein the dibenzoate-based material is one or more selected from the group consisting of diethylene glycol dibenzoate (DEGDB), dipropylene glycol dibenzoate (DPGDB) and triethylene glycol dibenzoate (TEGDB)

wherein the cyclohexane 1,4-diester-based material is included at greater than 30 wt% and equal to or less than 99 wt% and the dibenzoate-based material is included at equal to or higher than 1 wt% and less than 70 wt%~~.~~;

~~[Chemical Formula 1]~~

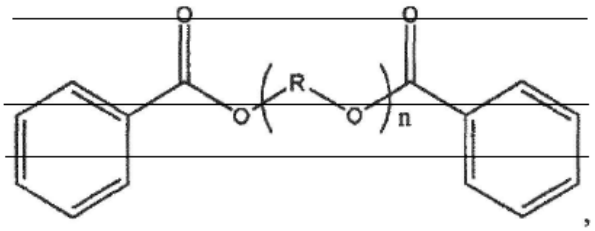


,

~~wherein R_1 and R_2 each independently are the same or~~

~~different from each other and are alkyl groups having 1 to 12 carbon atoms~~

~~[Chemical Formula 2]~~



,

~~wherein R is an alkylene group having 2 to 4 carbon atoms and n is an integer ranging from 1 to 3~~

wherein a weight ratio of the cyclohexane 1,4-diester-based material to the dibenzoate-based material is 90:10 to 50:50."

XI. The parties' submissions, in so far as they are pertinent, may be derived from the reasons for the decision below. The disputed points concerned:

- Whether or not claim 1 of the main request infringed the requirements of Article 123(2) EPC.

- The question of inventive step of the subject-matter of claim 1 of the main request when either document D3 or document D7 was taken as the closest prior art.

- The admittance into the proceedings of the objections pursuant to Article 123(3) EPC and Article 84 EPC that were put forward in the statement of grounds of appeal.

Reasons for the Decision

1. Subject-matter of the operative main request

1.1 Considering that the respondent's main request was that the appeal be dismissed, the operative main request is the one that was allowed by the opposition division in the decision under appeal, i.e. the main request that was filed with letter of 28 January 2022.

1.2 In the statement of grounds of appeal, the appellant put forward that whereas claim 1 of the clean version of the main request that had been filed with letter of 28 January 2022 did not contain chemical formula 2 according to claim 1 as originally filed, claim 1 of the marked-up version of the main request that had been filed with letter of 28 January 2022 did. Therefore, according to the appellant, it was unclear whether or not claim 1 of the main request dealt with in the decision under appeal contained said chemical formula 2 (statement of grounds of appeal: section 2).

1.3 However, the appellant eventually agreed with the respondent's view (rejoinder, section II) that the main request dealt with in the decision under appeal was the one provided as an annex to the decision, i.e. the clean version of the main request filed with letter of 28 January 2022 (i.e. the version of claim 1 that does not contain any reference to chemical formula 2; see point VIII above). For the reasons indicated in section 6 of the communication pursuant to Article 15(1) RPBA (section 6), the Board sees no reason to be of a different opinion.

Main request (clean version filed with letter of 28 January 2022 and allowed by the opposition division)

2. Article 123(2) EPC

2.1 The appellant disagreed with the conclusion reached by the opposition division that claim 1 of the main request met the requirements of Article 123(2) EPC (section 3.1 of the reasons).

2.2 In order to assess if the requirements of Article 123(2) EPC are met, the question to be answered is whether or not the subject-matter of an amended claim, here claim 1 of the main request, extends beyond the content of the application as filed, i.e. whether after the amendments made the skilled person is presented with new technical information (see G 2/10, point 4.5.1 of the reasons and Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, II.E.1.1). To be allowable the amendments can only be made within the limits of what a skilled person would derive directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing, from the whole of the documents as filed (G 3/89; G 11/91).

2.3 Claim 1 of the operative main request differs from claim 1 of the application as filed in the following amendments:

(a) The definition of the cyclohexane 1,4-diester-based material was limited;

(b) The definition of the dibenzoate-based material was limited;

(c) A range defining the weight ratio of the cyclohexane 1,4-diester-based material to the dibenzoate based material was added.

2.4 Regarding amendment (a), it remained undisputed that a literal basis for the list of compounds inserted in claim 1 of the main request is either claim 5 or the passage on page 8, line 1-6 of the application as filed, whereby all the compounds disclosed individually in these passages of the application as filed were taken up, i.e. no selection/choice within the list of suitable components originally disclosed was made.

2.4.1 The appellant put forward that the list of cyclohexane 1,4-diester-based materials according to claim 5 as originally filed could only be arrived at after performing a series of three selections within the application as filed: from the original set of claims, one had first to select a compound according to original claim 3 (the subject-matter of which is more limited than the one of original claim 1 but more general than the one of original claim 5), then according to original claim 4 (the subject-matter of which is more limited than the one of original claims 1 or 3 but more general than the one of original claim 5), and then according to original claim 5 (letter of 11 April 2025: page 2). According to the appellant, the same series of selections would have to be made in the passage of the description on page 7, line 15 to page 8, line 6 of the application as filed (which reflects the content of original claims 1 and 3 to 5), whereby it should further be taken into account that additional preferred embodiments of said cyclohexane 1,4-diester-based materials were disclosed on page 8 of the application as filed (page 8,

line 7ff).

2.4.2 In that regard, the Board does not agree that the introduction of the list of cyclohexane 1,4-diester-based materials according to original claim 5 in claim 1 of the main request amounts to a series of selections within the ambit of the application as filed. Rather, the Board considers that, in order to arrive at the definition of the cyclohexane 1,4-diester-based material according to claim 1 of the main request, the generic definition of the cyclohexane 1,4-diester-based material specified in original claim 1 was merely limited to the (whole) list of individual components that were originally disclosed as embodiments of said chemical formula 1, namely the list according to original claim 5. Such an amendment does not amount to making a series of selections within a list of several alternatives but merely amounts to a (single) limitation of the original generic definition of the cyclohexane 1,4-diester-based material present in claim 1 of the application as filed to the complete list of individual embodiments disclosed in the application as filed therefor.

2.4.3 The same conclusion is valid if the passage on page 7, line 15 to page 8, line 6 of the application as filed is considered instead of original claim 5. In that regard, the preferred embodiment mentioned on page 8, lines 7-9 of the application as filed is directed to a special case in which a single compound is used as a cyclohexane 1,4-diester-based material. The other embodiment specified on page 8, lines 10-18 is directed to specific mixtures of three cyclohexane 1,4-diester components. Therefore, these passages on page 8 of the application as filed are each directed to specific situations that were also contemplated as preferred

embodiments in the application as filed. However, these passages provide no cause to deviate from the conclusion that a direct and unambiguous basis for the list of cyclohexane 1,4-diester-based materials that was inserted into claim 1 of the application as filed is given in claim 5 or in the passage on page 8, lines 1-6 of the application as filed.

2.5 Regarding amendment (b), it also remained undisputed that a literal basis for the list of compounds inserted in claim 1 of the main request is based on the disclosure of the dibenzoate-based material of chemical formula 2 provided in either claim 6 or in the passage on page 4, lines 8-10 of the application as filed, whereby all the compounds disclosed individually in these passages were taken up, i.e. no selection/choice within the list of suitable components originally disclosed was made. Therefore, for the same reason as indicated above, the Board considers that amendment (b) constitutes a mere limitation of the generic definition of the dibenzoate-based material specified in claim 1 of the application as filed, whereby pointers to this amendment are provided in the application as filed.

2.5.1 On several occasions the appellant proposed to read claim 1 of the main request in such a manner that the dibenzoate-based material mentioned therein was not limited to one or more of the three specific components indicated therein (DEGDB, DPGDB and TEGDB) but encompassed compositions in which the dibenzoate-based material would bear substituents on the benzene ring (statement of grounds of appeal: paragraph bridging pages 3 and 4; page 5, last full paragraph; page 7, section 4, second paragraph; appellant's letter of 22 November 2023: page 4, third to sixth paragraphs; page 6, last paragraph; page 7, section 5, first

paragraph; page 8, second full paragraph). On this basis, the appellant considered that the definition of the dibenzoate-based material according to claim 1 of the main request extended beyond the scope of the application as filed, in particular claim 1 thereof, in which the dibenzoate-based material was defined to be according to chemical formula 2, i.e. it was limited to compounds having no substituents on the benzene ring.

2.5.2 In that regard, the Board does not share the view of the appellant and rather agrees with the respondent that the three chemical names indicated in claim 1 of the main request for the dibenzoate-based material specifically limit said material to one or more of the three chemical components specified therein, i.e. to compounds having no substituents on the benzene ring (rejoinder: section III.2). From the wording of claim 1 *per se*, there is no reason to read these chemical names as being related to a group or family of components, in particular not the group of components in which substituents are present on the benzene ring mentioned by the appellant. In addition, also the patent specification was not shown to disclose any other chemical components than the three ones specified in claim 1 of the main request, whose benzene ring is not substituted. Under these circumstances, the appellant's argument is rejected.

2.5.3 In view of the above considerations, there is no need for the Board to address the issue of the admittance of the appellant's objection/argument, which was disputed by the respondent (rejoinder: page 6, last paragraph).

2.6 Regarding amendment (c), the appellant put forward that, contrary to the opposition division's finding (decision: page 4, first paragraph), the range of

weight ratio of the cyclohexane 1,4-diester-based material to the dibenzoate based material ("90:10 to 50:50") was not derivable from the various ranges disclosed on page 11, lines 3-4 of the application as filed (statement of grounds of appeal: page 3, last full paragraph).

2.6.1 However, the Board shares the view of the opposition division and of the respondent (rejoinder: section III.1) that the range "90:10 to 50:50" amounts to the mere combination of one of the preferred upper limit and one of the preferred lower limit disclosed on page 11, lines 3-4 of the application as filed. Although it is correct that the range specified in claim 1 of the main request is not disclosed *per se* as a more preferred range on page 11, line 5 of the application as filed, the range of "90:10 to 50:50" is in the Board's view nevertheless directly and unambiguously derivable from the former indicated upper and lower limits.

2.6.2 The appellant considered that the disclosure on page 11, lines 3-4 of the application as filed did not amount to the disclosure of a range (appellant's letter of 22 November 2023: page 3, second and third full paragraphs). However, the Board is satisfied that the disclosure of an upper limit of 99:1 and a lower limit of 40:60 amounts to the disclosure of a broader range of weight ratio of e.g. 99:1 to 0.66:1. The range of "90:10 to 50:50" according to claim 1 of the main request then constitutes a mere limitation of that broader range (99:1 to 0.66:1) to a narrower range (9:1 to 1:1), based on one of the contemplated higher and lower limits originally disclosed. Therefore, the appellant's argument is not persuasive.

2.7 The appellant argued that the combination of amendments (a) and (b) led to added-matter (letter of 11 April 2025: section between pages 3 and 4).

In that respect, the Board is of a different opinion and rather shares the view of the respondent and of the opposition division that each of amendments (a) and (b) (as compared to e.g. claim 1 of the application as filed) is a mere limitation of the cyclohexane 1,4-diester-based material and of the dibenzoate-based material already mentioned in claim 1 of the application as filed according to the broadest disclosure for these individual components provided by the application as filed (see application as filed: claims 5 and 6; page 4, lines 8-10; page 8, lines 1-6 and page 10, lines 13-21). Therefore, the Board is satisfied that original claims 5 and 6, although they were only dependent on original claim 1 and not dependent on each other, constituted pointers to the combination of these two lists. Further considering that these specific components are according to formula 1 or formula 2 of claim 1 of the application as filed, the fact that these formulae are not present in claim 1 of the main request any more does not lead to added-matter since the indication of these formulae would have been superfluous. For this reason, the appellant's argument is rejected.

2.8 The appellant further argued that the combination of amendments (a), (b) and (c) also led to added-matter (statement of grounds of appeal: page 4, second to fourth full paragraphs).

2.8.1 However, starting from claim 1 of the application as filed, said combination of features may be arrived at by limiting the definition of the cyclohexane 1,4-

diester-based material and of the dibenzoate-based material according to the broadest disclosure for these individual materials in the application as filed (as explained in sections 2.4, 2.5 and 2.7 above) and limiting the weight ratio thereof on the basis of a specific range of weight ratio that is derivable from the application as filed (as outlined in section 2.6 above). In this respect, the Board sees no reason to consider that the ranges of weight ratios derivable from the passage at page 11, lines 3-4 of the application as filed would not be valid for an embodiment according to claim 1 of the application as filed, when read in combination with the most general disclosure for the two groups of individual components on page 8, lines 1-6 (corresponding to original claim 5) and page 4, lines 8-10 of the application as filed (corresponding to original claim 6). Therefore, the appellant's argument is not convincing.

2.8.2 The appellant further argued that the combination of amendments made amounted to a non allowable multiple combination of various passages taken from the description, which was not allowable by analogy with the findings of decision T 1137/21 (appellant's letter of 11 April 2025: bottom of page 1).

However, in T 1137/21 (see in particular point 1.4 of the reasons), the Board arrived at the conclusion that the subject-matter being claimed could only be arrived at by making multiple selections among a high number of possibilities and different degrees of preference disclosed in the application as filed, whereby several other options had not been taken up. This, in the Board's view, distinguishes the case of T 1137/21 from the present one, in which at least claim 2 of the application as filed provides a basis, albeit at a

higher level of generality, for the specific combination of the four features defining the plasticizer composition according to claim 1 of the main request, namely the cyclohexane 1,4-diester-based material, the dibenzoate-based material, the specific (absolute) amounts of these materials and their specific weight ratio. Therefore, amendments (a) to (c) made in claim 1 of the application as filed are not arrived at considering the description as a reservoir from which features pertaining to separate embodiments were combined in order to artificially create a certain embodiment, contrary to the appellant's view. As an aside, it is noted that in point 1.3 of the reasons of T 1137/21, it is expressly pointed out that the assessment of Article 123(2) EPC in cases of multiple amendments has to be decided on a case-by-case basis. Therefore, it cannot be held that the conclusion reached in this decision is generally applicable. For these reasons, the appellant's arguments related to the findings of T 1137/21 are rejected.

2.9 The appellant put forward that the combination of the range of weight ratio according to above amendment (c) with the (absolute) amounts by weight of the cyclohexane 1,4-diester-based material and the dibenzoate-based material constituted further added-matter (statement of grounds of appeal: paragraph bridging pages 4 and 5; letter of 22 November 2023: section 3.3).

2.9.1 However, the specific ranges of the absolute amount by weight of each of the two materials specified in claim 1 of the application as filed are already contained in said claim 1. Therefore, the combination of features objected here by the appellant can be arrived at after combining original claim 1 with a

specific weight ratio that is derivable from a single passage of the application as filed, namely the one on page 11, lines 4-5. In addition, considering that claim 2 of the application as filed discloses a combination of these two features (albeit with a broader range of weight ratio), it makes no doubt that the combination of these features was contemplated in the application as filed. Also, this shows that the combination of features here at stake can also be arrived by merely limiting the range of weight ratio of said original claim 2.

2.9.2 The Board also does not share the appellant's view that these features (amounts by weight and weight ratio of both materials) would not be read in combination because they were contradictory (statement of grounds of appeal: page 5, first full paragraph). Rather, in the Board's view, these features would be read as distinct and cumulative features defining some limitations regarding on one hand the absolute amounts and on the other hand the relative weight ratio of the two materials. Although it is correct that parts of the ranges of absolute amounts cannot be achieved over the whole range of weight ratio specified in claim 1, it remains that many combinations of these features are possible and make sense, as put forward by the respondent (rejoinder: section III.4). Therefore, the appellant's argument is not convincing.

2.10 In view of the above, the Board is satisfied that the combination of amendments (a) to (c) indicated in point 2.3 above is directly and unambiguously derivable from the application as filed, as it may be arrived at by limiting, in claim 1 of the application as filed, the definition of each of the cyclohexane 1,4-diester-based material and the dibenzoate-based material on the

basis of e.g. claims 5 and 6 of the application as filed, while additionally defining the weight ratio of these materials in the light of original claim 2 together with the passage on page 11, lines 4-5 of the application as filed.

2.11 For these reasons, the appellant's arguments do not justify that the Board overturns the opposition division's conclusion that claim 1 of the main request meets the requirements of Article 123(2) EPC.

3. Article 56 EPC

The appellant contested in appeal the conclusions reached by the opposition division according to which claim 1 of the main request involved an inventive step taking either D3 or D7 as the closest prior art. In that regard, it was not disputed by the respondent that each of these documents was a suitable starting point. The Board has no reason to be of a different opinion, in particular for the reasons already considered by the opposition division (points 3.2.1 to 3.2.5 of the reasons). Therefore, both objections are dealt with separately hereinafter.

4. D3 as the closest prior art

4.1 Starting point and distinguishing feature(s)

4.1.1 The appellant considered the disclosure of the formulation according to the table of paragraph 59 of D3 as particularly relevant and started the assessment of inventive step therefrom (statement of grounds of appeal: page 10, section 5.3). This table discloses formulations for extrusions defined as follows (in parts per hundred):

PVC	100
fast fusing plasticizer	5-15
DINCH	10-30
Filler	0-25

whereby it is indicated in the introductory paragraph 52, first sentence, of D3 that DINCH is the diester of diisononyl cyclohexanoic acid.

According to the appellant, the combination of DINCH and fast fusing plasticizer according to the table of paragraph 59 of D3 constituted a plasticizer composition of two materials very similar, if not identical, to the ones of claim 1 of the main request: while DINCH was a cyclohexane diester based, it was disclosed in paragraph 62 of D3 that the fast fusing plasticizer could be a dibenzoate-based material as defined in claim 1 of the main request. On this basis, the appellant considered that the subject-matter of the latter differed from the formulations of the table of paragraph 59 of D3 only in the fact that the DINCH component was not specifically disclosed to be a "1,4" diester (statement of grounds of appeal: page 11, second paragraph).

4.1.2 In this regard, the Board considers - in accordance with the appellant's submissions - that claim 1 of the main request differs from the formulations according to the table of paragraph 59 of D3 at least in the fact that the DINCH component is not specifically disclosed to be a "1,4" diester. Indeed, the component DINCH mentioned in the table of paragraph 59 of D3 is only disclosed to be the ester of "diisononyl cyclohexanoic acid" without indicating if it is the 1,2, 1,3 or 1,4

isomer, which are all within the ambit of D3 (see e.g. paragraph 71 thereof). To the contrary, although D3 makes some generic references to esters of cyclohexane 1,4-dicarboxylic acids (see e.g. paragraphs 71 and 144 or claims 35, 41, 46 and 51), the disclosures of paragraphs 72, 96 and 97 of D3 rather appear to show that the component DINCH according to D3 is the ester of the 1,2 isomer of DINCH (not the 1,4 isomer as specified in claim 1 of the main request as 1,4-DINCH). Therefore, the compositions defined in the table of paragraph 59 of D3 do not directly and unambiguously comprise a cyclohexane 1,4-diester-based material, let alone a component according to any of the six specific components specified in claim 1 of the main request.

4.1.3 However, the Board considers that the subject-matter of claim 1 of the main request further differs from the disclosure of the table of paragraph 59 of D3 in that it must contain a dibenzoate-based material as defined therein. Although it is correct that it is disclosed in paragraph 62 of D3 that the fast fusing plasticizer indicated in the table of paragraph 59 of D3 can be a dibenzoate-based material as defined in claim 1 of the main request (DEGDB and DPGDB are specifically disclosed), these are not the sole possibilities disclosed in this paragraph of D3. Therefore, it cannot be concluded that the fast fusing plasticizer according to the table of paragraph 59 of D3 is directly and unambiguously a dibenzoate-based material as defined in claim 1 of the main request.

4.1.4 During the appeal proceedings, the question arose if the subject-matter of claim 1 of the main request further differed from the disclosure of the table of paragraph 59 of D3 in respect of the absolute amounts and/or of the weight ratio of the two groups of

plasticizers defined therein (the cyclohexane 1,4-diester-based material and the dibenzoate-based material).

a) In that regard, the Board agrees with the opposition division (point 3.2.6.1 of the reasons) that, assuming that the plasticizer composition can be regarded as being constituted of the fast fusing plasticizer and DINCH, the plasticizer compositions defined in the table of paragraph 59 of D3 may comprise DINCH in an amount between 40 and 86 wt.% and a fast fusing plasticizer between 14 and 60 wt.%, whereby the ratio of DINCH to fast fusing plasticizer is between 86:14 and 40:60 (i.e. 6:1 to 0.66 to 1).

b) On this basis, for all the plasticizer compositions defined in the table of paragraph 59 of D3, the amounts of DINCH and fast fusing plasticizers meet the requirements of claim 1 of the main request regarding the absolute amounts of cyclohexane 1,4-diester-based material ("greater than 30 wt% and equal to or less than 99 wt%") and dibenzoate-based material ("equal to or higher than 1 wt% and less than 70 wt%"), respectively.

c) Regarding the weight ratio of plasticizers defined in claim 1 of the main request, the appellant contested the finding of the opposition division according to which for the compositions according to the table of paragraph 59 of D3, the range of weight ratio of the DINCH to fast fusing plasticizer was not completely included but only overlapped with the one of claim 1 (see point 3.2.6.3 of the reasons: operative claim 1: 90:10 to 50:50, i.e. 9:1 to 1:1; table 59 of D3: 86:14 to 40:60, i.e. 6:1 to 0.66:1). In particular, the appellant put forward that it was derivable from the

disclosure of D3 as a whole that the DINCH plasticizer disclosed in the table of paragraph 59 would be understood by the skilled person to be used as primary plasticizer, i.e. it would be used in a higher amount than the fast fusing plasticizer. This was in particular in accordance with the disclosure of D4 regarding fast fusing plasticizers (page 492: left hand side column, third full paragraph), so the appellant. On this basis, according to the appellant, the weight ratio DINCH:fast fusing plasticizer of any composition according to paragraph 59 of D3 was within the range of weight ratio cyclohexane 1,4-diester-based material:dibenzoate-based material defined in claim 1 of the main request (letter of 11 April 2025: bottom of page 5 to middle of page 6; oral proceedings before the Board).

In that respect, the Board notes that, as discussed with the parties at the oral proceedings, the paragraph introducing the table of paragraph 59 of D3 contains the following sentence (sentence bridging pages 5 and 6): "Adding a little fast fusing plasticiser to the plasticiser blend can correct this problem. Examples of suitable formulations for extrusions in parts per hundred are (table of paragraph 59) together with pigments, lubricants, stabilizers, other additives, as needed". On this basis, the Board considers that the table of paragraph 59 has to be read together with the limitation that, in these formulations, "a little" fast fusing plasticizer is added to the plasticizer blend, which can only mean that DINCH is used in majority as compared to the fast fusing plasticizer. This means that, in the Board's view, the absolute amounts of DINCH and fast fusing plasticizer disclosed in the table of paragraph 59 of D3 have to be read with the additional limitation that DINCH is present in a higher

amount than the fast fusing plasticizer, i.e. the weight ratio DINCH:fast fusing plasticizer has to be higher than 1:1. In these circumstances, the Board agrees with the appellant that it is derivable from paragraph 59 of D3 as a whole that, in the compositions according to the table of paragraph 59, DINCH and the fast fusing plasticizer are used as primary and secondary plasticizers, respectively, according to the general definition given for these terms in D4 (page 489, right hand side column, first full paragraph). Therefore, the Board is satisfied that the weight ratio DINCH:fast fusing plasticizer of any composition according to the table of paragraph 59 of D3 is higher than 1:1 (DINCH is the primary plasticizer) and at most 6:1 (considering the highest amount of DINCH and the lowest amount of fast fusing plasticizer disclosed in the table of paragraph 59 of D3), i.e this ratio is within the range of 90:10 to 50:50 (9:1 to 1:1) defined in claim 1 of the main request for the weight ratio cyclohexane 1,4-diester-based material:dibenzoate-based material.

4.1.5 In view of the above, the subject-matter of claim 1 of the main request differs from the disclosure of the formulation according to paragraph 59 of D3 in the following features:

- The DINCH cyclohexane diester is not explicitly disclosed as being the 1,4-DINCH isomer;

- There is no simultaneous disclosure in D3 of a cyclohexane 1,4-diester-based material and a dibenzoate-based material as defined in claim 1 of the main request.

4.2 Problem effectively solved over the closest prior art

4.2.1 The parties disagreed how the problem effectively solved was to be formulated.

The respondent put forward that this problem resided in the provision of a plasticizer composition having improved physical properties in regard to tensile strength, migration loss, volatile loss and absorption rate (rejoinder: page 16, section VI.2.3). The respondent further considered that the examples of the patent in suit together with the ones of table 1 on pages 14-15 of the rejoinder rendered credible that the specific combinations of cyclohexane 1,4-diester-based materials and dibenzoate-based materials according to claim 1 of the main request led to said improvements as compared to similar compositions comprising the 1,2 or 1,3 cyclohexane diester isomers (rejoinder: page 16, section VI.2.2).

To the contrary, the appellant argued that the comparison relied upon by the respondent (and the opposition division) was not illustrative of the disclosure of the closest prior art (statement of grounds of appeal: paragraph bridging pages 11 and 12). In addition, said comparison was related to a single cyclohexane 1,4-diester-based materials according to claim 1 of the main request (namely 1,4-DINCH) but there was no evidence on file that the same effects were also achieved for the other cyclohexane 1,4-diester-based material defined in said claim 1 (appellant's letter of 22 November 2023: page 11, second full paragraph). Therefore, according to the appellant, no improvement over the closest prior art had been shown and the problem solved over D3 only resided in the provision of further plasticizer

compositions, in alternative to the ones of D3 (statement of grounds of appeal: page 11, last sentence; appellant's letter of 22 November 2023: page 11, first full paragraph).

4.2.2 In this respect, example 1 of the patent in suit is directed to a plasticizer composition comprising 1,4-DEHCH (i.e. one of the six cyclohexane 1,4-diester-based material defined in claim 1 of the main request) and DEGDB (i.e. one of the three dibenzoate-based material defined in claim 1 of the main request) in a weight ratio of 7:3. The compositions of comparative examples 6 and 7 of the patent in suit only differ from the one according to example 1 in that 1,2-DEHCH or 1,3-DEHCH (i.e. other isomers of DEHCH) were used. Therefore, the comparison of these examples illustrates the effects of one of the distinguishing features identified in point 4.1.5 above.

In addition, it was not contested that additional comparative examples 1 to 3 only differ from example 1 of the patent in suit in that a fast fusing plasticizer according to paragraph 62 of D3 but that was not a dibenzoate-based material was used (pages 15 and 16 of the rejoinder: two paragraphs following table 1). Therefore, the comparison of these examples illustrates the effects of the other distinguishing feature identified in point 4.1.5 above.

Also, it is derivable from table 2 of the patent in suit that the plasticizer composition according to example 1 leads to improved tensile strength, improved migration loss, improved volatile loss and improved absorption rate. In addition, the Board considers that the comparison of example 1 of the patent in suit with the additional comparative examples 1 to 3 (end of the

table on pages 14-15 of the rejoinder and two paragraphs directly below this table) also show that all the fast fusing plasticizers disclosed in paragraph 62 of D3 are not equivalent, whereby DEGDB (as used in example 1 and which is one of the three dibenzoate-based materials specified in claim 1 of the main request) led - as compared to other plasticizers according to paragraph 62 of D3 - to improved performances, in particular regarding the combination of properties relied upon by the respondent (tensile strength, plasticising properties, migration loss, volatile loss and absorption rate).

In these circumstances, the Board is satisfied that the comparison of example 1 of the patent in suit with either comparative examples 6 and 7 of the patent in suit or additional comparative examples 1 to 3 demonstrates that the improvements in terms of tensile strength, migration loss, volatile loss and absorption rate together with good plasticising properties relied upon by the respondent were indeed shown to be causally related to the distinguishing features indicated in section 4.1.5 above.

4.2.3 The appellant put forward that the examples of the patent in suit and the ones in table 1 on page 15 of the rejoinder relied upon by the respondent (namely example 1 and comparative examples 6-7 of the patent in suit as well as the additional comparative examples 1-3 of table 1 on page 15 of the rejoinder) were not illustrative of the teaching of D3, in particular paragraph 59 thereof, because the cyclohexane 1,4-diester used therein was not an ester of diisononyl cyclohexanoic acid according to paragraphs 59 and 52 of D3 (i.e. DINCH) but di(2-ethylhexyl) cyclohexane 1,4-diester (1,4-DEHCH

according to claim 1 of the main request). Therefore, according to the appellant, the comparison relied upon by the respondent was not made with respect to the closest prior art and was, for that reason, not suitable to demonstrate any improvement over this closest prior art.

a) In this regard, the Board took into account that the disclosure of the formulation in paragraph 59 of D3 is rather generic since it allows many variations regarding the nature of the fast fusing plasticizer and the DINCH. In addition, this disclosure is at least ambiguous regarding the nature of the DINCH isomer. Also, it was not shown that D3 provided any specific guidance regarding the specific combination of materials to be used to prepare this formulation. Under these circumstances, it would not be possible to reproduce exactly the formulation according to paragraph 59 of D3.

b) In addition, it is established case law (Case Law, *supra*, I.D.4.3.2; see in particular T 35/85: section 4 of the reasons, and T 197/86: section 6.1.3 of the reasons) that the patent proprietor (here, the respondent) may discharge his onus of proof by voluntarily submitting comparative tests with newly prepared variants of the closest state of the art identifying the features common with the invention, in order to have a variant lying closer to the invention so that the advantageous effect attributable to the distinguishing feature is thereby more clearly demonstrated. In that respect, if comparative tests are chosen to demonstrate an inventive step on the basis of an improved effect over a claimed area, care should nevertheless be taken that the nature of the comparison with the closest state of the art is such that the

alleged advantage or effect is convincingly shown to have its origin in the distinguishing feature of the invention compared with the closest state of the art.

In the Board's view, these requirements are met by the comparisons made by the respondent indicated in point 4.2.2 above, since it was not contested by the appellant that the comparative examples relied upon by the respondent were according to the general teaching of D3 and that they differed from example 1 of the patent in suit illustrating the subject-matter being claimed in the above indicated distinguishing features. In particular, although it is correct that paragraph 59 of D3 is related to DINCH as the primary plasticizer, the general disclosure of D3 is more generally directed to esters of cyclohexane polycarboxylic acids (D3: claims 30, 35, 37, 40, 41, 43, 45, 46, 48; paragraphs 61, 71), which encompass diethylhexyl cyclohexane-1,4-diester (1,4-DEHCH) as used in the examples relied upon by the respondent.

c) Moreover, it is agreed with the opposition division that the cyclohexane 1,4-diester used by the respondent (1,4-DEHCH) is very similar from a structural point of view to DINCH, in particular the 1,4 isomer thereof, namely 1,4-DINCH (point 3.2.6.6 of the reasons).

In this respect, the appellant disagreed with this view considering that whereas the cyclohexane 1,4-diester used by the respondent (1,4-DEHCH) was a single, well defined component, DINCH according to the disclosure of the table of paragraph 59 of D3 was a mixture of isomers (letter of 11 April 2025: bottom of page 7 to middle of page 8).

However, the appellant's argument is not supported by

any evidence or convincing arguments that could justify to consider that it is not credible that the effects demonstrated in the examples of the patent in suit and in table 1 on pages 14-15 of the rejoinder would also be achieved when using 1,4-DINCH instead of 1,4-DEHCH. In these circumstances, the appellant's argument amounts to a mere allegation, which is not sufficient for the Board to overturn the conclusion reached by the opposition division.

d) The Board further took into account that the appellant has provided no counter-evidence in appeal to refute the finding of the opposition division that the evidence on file rendered credible that improvements were effectively achieved by the particular combinations of cyclohexane 1,4-diester-based material and dibenzoate-based material defined in claim 1 of the main request. Therefore, the Board is satisfied that the examples relied upon by the respondent render credible that the effects they claimed to be achieved would also be obtained in the context of the disclosure of D3, in particular paragraph 59 thereof.

e) For these reasons, the appellant's objection did not convince.

4.2.4 During the oral proceedings before the Board, the appellant argued that even if it were to be considered that example 1 showed improvements over comparative examples 6 and 7 of the patent in suit in terms of tensile strength, migration loss, volatile loss and absorption rate, it led to the deterioration of other properties such as hardness and elongation rate (see e.g. table 2 of the patent in suit). Therefore, it could not be held that the plasticizer compositions being claimed were improved as compared to the ones of

the closest prior art.

However, the respondent's line of argument was only based on an improvement in terms of tensile strength, migration loss, volatile loss and absorption rate. In this respect, it was not contested that the data of table 2 of the patent in suit showed that the plasticizer composition according to example 1 was superior to the one of comparative examples 6 and 7 as far as these properties are concerned. In these circumstances, the Board is satisfied that the improvements relied upon by the respondent are effectively demonstrated by the data of table 2. Therefore, the appellant's argument is rejected.

4.2.5 Regarding the appellant's objection that the effects claimed by the respondent were only shown in relation to a single cyclohexane 1,4-diester (letter of 22 November 2023: page 11, second full paragraph), it is noted that no evidence were provided by the appellant in support of their argument that said effects would not be achieved for any of the other embodiments encompassed by claim 1 of the main request. In this regard, the Board considers that it would have been the duty of the appellant to provide such evidence in order to refute the presumption created by the examples of the patent in suit and by the ones of table 1 on page 15 of the rejoinder, e.g. by showing that said improvements were not achieved over the whole scope of claim 1 of the main request. In the absence of such evidence, the appellant's argument cannot succeed.

a) During the oral proceedings before the Board, the appellant disagreed with that view and argued that, in the present case, there was no reason to reverse the burden of proof.

b) In that respect, it is established case law that in (appeal) opposition proceedings each party bears the burden of proof for the facts it alleges (Case Law, *supra*, III.G.5.1.1), whereby the probative value of each item of evidence/argument relied upon by the parties has to be established on the basis of the general principle of free evaluation of evidence (Case Law, *supra*, III.G.1, III.G.4.1, III.G.4.2).

c) In the present case, the Board considers that, for the reasons outlined above, the evidence provided by the respondent (experimental data compiled in table 1 on pages 14-15 of the rejoinder) are suitable to demonstrate the improvements claimed by the respondent to be achieved over the closest prior art.

d) In addition, as argued by the respondent during the oral proceedings, the plasticizer compositions according to claim 1 of the main request are defined in that they comprise a rather limited number of individual cyclohexane 1,4-diester-based materials (see the six components mentioned therein) and individual dibenzoate-based materials (see the three components mentioned therein), whereby the individual components of each category of plasticizer have similar chemical structure (according to either chemical formula 1 of original claim 1, whereby R_1 and R_2 are each alkyl groups with either 4, 8 or 9 carbon atoms or according to chemical formula 2 of original claim 1 whereby n = 2 and R is an alkylene group with 2 or 3 carbon atoms or n = 3 and R is an alkylene group with 2 carbon atoms). Therefore, not only is the scope of claim 1 of the main request rather narrow/small but there is also a high degree of similarity in terms of chemical structure among the individual components specified for both

groups of plasticizers. In these circumstances, the Board is satisfied that the respondent has rendered credible that the effects shown in the patent in suit for a single, specific combination of a cyclohexane 1,4-diester-based material and a dibenzoate-based material can be extrapolated to the other combinations of materials being claimed.

e) To the contrary, the appellant has neither provided any counter-evidence, nor convincing arguments to show that the effects relied upon by the respondent were not achieved/credible for at least part of the compositions being claimed.

f) In these circumstances, the appellant's arguments are not suitable to put in doubt the conclusion drawn by the Board from the evidence and arguments relied upon by the respondent. Therefore, the appellant's objection is rejected.

4.2.6 In view of the above, it is agreed with the respondent that the problem effectively solved over the relevant disclosure of D3 resides in the provision of a composition having good plasticising property and improved physical properties in regard to tensile strength, migration loss, volatile loss and absorption rate.

4.3 Obviousness

4.3.1 The question remains to be answered if the skilled person, desiring to solve the problem(s) identified as indicated above, would, in view of the closest prior art, possibly in combination with other prior art documents or with common general knowledge, have modified the disclosure of the closest prior art in

such a way as to arrive at the claimed subject matter.

4.3.2 In that respect, it was not shown that D3 contained any hint to use a cyclohexane 1,4-diester-based material together with a dibenzoate-based material as defined in claim 1 of the main request in order to solve the problem indicated in section 4.2.6 above. In particular, D3 was not shown to contain any motivation to combine specifically a cyclohexane 1,4-diester-based material with a dibenzoate-based material according to said claim 1 with the aim to achieve any effect(s), let alone the ones that were taken into account in the formulation of the problem effectively solved. Therefore, for that reason alone, the skilled person would have found no motivation in D3 to provide a composition having good plasticising property and improved physical properties in regard to tensile strength, migration loss, volatile loss and absorption rate by combining a cyclohexane 1,4-diester-based material together with a dibenzoate-based material as defined in claim 1 of the main request. In these circumstances, the subject-matter of claim 1 of the main request amounts to a purposive selection within the ambit of D3 which leads to the demonstrated improved technical effects.

4.3.3 This conclusion is further confirmed by comparative examples 6 and 7 of the patent in suit and additional comparative examples 1-3 of table 1 on page 15 of the rejoinder, which show that the objective technical problem indicated in above point 4.2.6 is not solved by all the formulations according to the table of paragraph 59 in combination with paragraph 62, in particular for all the combinations of DINCH and fast fusing materials taught therein.

4.3.4 The appellant put forward that it would have been obvious to obtain the improvements claimed to be achieved by the respondent in view of the combination of paragraph 59 of D3 with the teaching of either D5 or D7 in relation to cyclohexane 1-4-diesters (statement of grounds of appeal: page 13, first and second full paragraphs). In that respect, the appellant further argued that some of the cyclohexane 1,4-diester-based material as defined in claim 1 of the main request were also known from D8, page 7, lines 1 and 14-15 (statement of grounds of appeal: page 12, third full paragraph; page 16, seventh paragraph; appellant's letter of 22 November 2023: page 16, sixth paragraph).

However, neither D5, nor D7, nor D8 was shown to provide any information regarding the use of any dibenzoate-based material in combination with cyclohexane 1,4-diester-based materials and/or the improvements in terms of tensile strength, migration loss, volatile loss and absorption rate in relation to the use of the 1,4 isomer of DINCH as compared to the 1,2 and 1,3 isomers (see rejoinder: sections VI.2.4.2; see also points 3.2.6.7 and 3.2.6.9 of the reasons of the decision under appeal). Therefore, these prior art documents cannot render obvious the specific combination of plasticizers defined in claim 1 of the main request, in particular not in order to solve the technical problem posed.

4.3.5 The appellant further pointed out that the advantages of benzoate esters were disclosed in section 28.10 of D4 (letter of 11 April 2025: page 7, first paragraph). However, these advantages are not related to the effects/properties that are relevant in the formulation of the problem to be solved indicated in section 4.2.6 above. Therefore, the appellant's argument is not

convincing.

4.3.6 During the oral proceedings before the Board, the appellant pointed out that there were only three alternative isomers of DINCH disclosed in D3 and that the number of alternative fast fusing plasticizers disclosed in paragraph 62 of D3 was rather small. In addition, as was shown from the textbook D4 (which represented the common general knowledge in the present technical field), the skilled person in the present technical field already had a good knowledge and understanding of how different classes of plasticizers worked and could be combined in order to obtained beneficial effects. In these circumstances, the appellant considered that it would have been obvious for the skilled person to try each possible combination of DINCH and fast fusing plasticizer according to the teaching of D3 (table 59 in combination with paragraph 62) and check which beneficial properties were achieved.

a) In this regard, even if it were to be agreed that D4 disclosed various classes of plasticizers known in the art (see title of sections 28.3 to 28.13, which encompass at least some of the fast fusing plasticizers disclosed in paragraph 62 of D3) and taught that, for each class of plasticizers, it was also known which properties could be obtained and/or manipulated (D4: the advantages of each class of plasticizers are mentioned in sections 28.3 to 28.13; see also tables 28.1 and 28.3), the appellant has not shown that it was known in the art how the specific improvements relied upon by the respondent and that were considered to formulate the problem effectively solved over the closest prior art could be achieved. In particular, the appellant's arguments do not show that it would have

been obvious, in view of the teaching of the available prior art, to achieve the effects aimed at by combining a cyclohexane 1,4-diester-based material together with a dibenzoate-based material as defined in claim 1 of the main request.

b) Regarding the disclosure of paragraph 62 of D3, the Board further at least does not agree with the appellant's view that the number of alternative fast fusing plasticizers is so small as held by the appellant. For instance, it is noted that several groups of plasticizers are disclosed therein in generic terms, whereby only some specific components are indicated as examples (see use of the terms "Examples of .. plasticizers which can be used include", "such as"). In this regard, the Board cannot recognise that the two dibenzoate plasticizers disclosed in paragraph 62 of D3 and that fall under the definition of the dibenzoate-based material according to claim 1 of the main request are for any reason preferred/ prominent within the list of alternatives according to paragraph 62 of D3, in particular in order to solve the problems posed. For this reason alone, the appellant's argument that the combination of 1,4-DINCH and either diethylene glycol dibenzoate or dipropylene glycol dibenzoate was obvious is held by the Board to be based on hindsight, which is not allowable.

c) For these reasons, the appellant's argument did not succeed.

4.3.7 In view of the above, the subject-matter of claim 1 of the main request involves an inventive step in view of the relevant disclosure of D3 as the closest prior art.

5. D7 as the closest prior art

5.1 Starting point and distinguishing feature(s)

5.1.1 The appellant considered the disclosure of the formulation according to paragraph 46 of D7 as particularly relevant and started the assessment of inventive step therefrom (statement of grounds of appeal: page 15, second full paragraph). In addition, the appellant was of the opinion that the subject-matter of claim 1 of the main request differed from this disclosure only in the fact that it was not disclosed in said paragraph 46 that the cyclohexane-1,4 dicarboxylic acid ester mentioned therein corresponded to any of the components specified in claim 1 of the main request as the cyclohexane-1,4-diester-based material (statement of grounds of appeal: page 15, last paragraph).

5.1.2 In that regard, paragraph 46 of D7 reads as follows:

"[0046] As a further embodiment formulations for the production of calendered floor tiles could be in parts by weight PVC copolymer 100 or PVC 100 or combinations of the two.

Plasticiser fast fusing	10-30
Cyclohexane-1,4-dicarboxylic acid ester of this invention	20-30
Epoxidized soybean oil	0-6
Filler (calcium carbonate)	500-800
pigments, stabilizers, other additives	0-10 or as needed".

a) In this respect, D7 as a whole is directed to the use as plasticizers of di-esters of cyclohexane-1,4-

dicarboxylic acid wherein the alkyl groups in the ester are of carbon number 5 to 13 (see e.g. claims 1-5 of D7). This means that the group of diesters taught in D7 encompasses but is not limited to the six components specified as cyclohexane 1,4-diester-based material in claim 1 of the main request. On this basis, it cannot be concluded that the formulations disclosed in paragraph 46 of D7 directly and unambiguously comprise a cyclohexane 1,4-diester-based material according to any of the six specific components specified in claim 1 of the main request. Therefore, the Board agrees with the appellant in that claim 1 of the main request differs from the disclosure of paragraph 46 of D7 at least in the fact that the cyclohexane-1,4-dicarboxylic acid ester mentioned therein is not one of the six components mentioned in said claim 1 as cyclohexane 1,4-diester-based material.

b) However, the Board considers that the subject-matter of claim 1 of the main request further differs from the disclosure of paragraph 46 of D7 also in that it must contain a dibenzoate-based material as defined therein. Indeed, although it is disclosed in paragraph 47 of D7 that the fast fusing plasticizer indicated in paragraph 46 can be a dibenzoate-based material as defined in claim 1 of the main request (DEGDB and DPGDB are specifically disclosed), these are not the sole possibilities disclosed in this paragraph of D7. Therefore, it cannot be concluded that the fast fusing plasticizer according to paragraph 46 of D7 is directly and unambiguously a dibenzoate-based material as defined in claim 1 of the main request.

c) Regarding the amounts and weight ratio of the plasticizers, the Board agrees with the opposition division (point 3.2.7.1 of the reasons) that, assuming

that the plasticizer composition can be regarded as being constituted of the fast fusing plasticizer and cyclohexane-1,4-dicarboxylic acid ester, the plasticizer compositions defined in paragraph 46 of D7 may comprise the cyclohexane-1,4-dicarboxylic acid ester in an amount between 40 and 75 wt.% and a fast fusing plasticizer between 25 and 60 wt.%, whereby the ratio of cyclohexane-1,4-dicarboxylic acid ester:fast fusing plasticizer is 75:25 to 40:60 (i.e. 3:1 to 0.66:1).

d) On this basis, for all the plasticizer compositions defined in paragraph 46 of D7, the amounts of cyclohexane-1,4-dicarboxylic acid ester and fast fusing plasticizers meet the requirements of claim 1 of the main request regarding the absolute amounts of cyclohexane 1,4-diester-based material ("greater than 30 wt% and equal to or less than 99 wt%") and dibenzoate-based material ("equal to or higher than 1 wt% and less than 70 wt%"), respectively.

e) Regarding the weight ratio of plasticizers, the range disclosed in paragraph 46 of D7 allows for less cyclohexane-1,4-dicarboxylic acid ester than fast fusing plasticizer, i.e. the weight ratio cyclohexane-1,4-dicarboxylic acid ester:fast fusing plasticizer can be smaller than 1:1, i.e. outside the range of weight ratio defined in claim 1 of the main request.

The appellant argued that, similarly to the line of argument put forward in respect of D3, the skilled person would understand that the cyclohexane 1,4-dicarboxylic acid ester according to paragraph 46 of D7 was disclosed as a primary plasticizer (letter of 11 April 2025: page 10 to top of page 11).

However, contrary to the situation of D3, neither paragraph 46, nor any other passage of D7 was shown to support such a reading of paragraph 46 of D7. To the contrary, as discussed with the parties during the oral proceedings before the Board, paragraph 20 of D7 expressly discloses that the cyclohexane 1,4-dicarboxylic acid ester may be present as a minor component of a mixture of plasticizers. Although it is derivable from said paragraph 20 that higher amounts of cyclohexane-1,4-dicarboxylic acid ester, in particular amounts such that it is used as the main plasticizer, are preferred, the Board sees no reason to read paragraph 46 of D7 in such a limited manner.

In view of the above, the Board agrees with the opposition division and the respondent (rejoinder: page 21, first full paragraph) that the weight ratio of "cyclohexane-1,4 dicarboxylic acid ester of this invention" to fast fusing plasticizer derivable from the disclosure of paragraph 46 of D7 (only) overlaps with the range of "90:10 to 50:50" specified in claim 1 of the main request for the weight ratio of cyclohexane 1,4-diester-based material to the dibenzoate-based material.

f) In view of the above, the subject-matter of claim 1 of the main request differs from the disclosure of the formulation according to paragraph 46 of D7 in the following features:

- the cyclohexane 1,4-diester is not explicitly disclosed as being one of the six components indicated in claim 1 as the cyclohexane-1,4 diester-based material;

- there is no simultaneous disclosure of a cyclohexane 1,4-diester-based material and a dibenzoate-based material as defined in claim 1 of the main request and in the weight ratio indicated therein.

5.2 Problem effectively solved over the closest prior art

5.2.1 The parties disagreed how the problem effectively solved was to be formulated, whereby both parties followed a line of reasoning that was very similar to the one put forward when starting from D3 as the closest prior art (respondent: the examples on file rendered credible that the same improvements over D7 were achieved as the ones considered for D3; appellant: no improvement was held to be shown since no fair comparison with the closest prior art had been made).

5.2.2 In that respect, the Board considers that the examples of the patent in suit and the ones in table 1 on pages 14-15 of the rejoinder relied upon by the respondent (namely example 1 and comparative examples 6-7 of the patent in suit as well as the additional comparative examples 1-3 of table 1 on page 15 of the rejoinder) are illustrative of the general teaching of D7 (claim 1; paragraphs 14-16), as pointed out by the respondent (rejoinder: page 21, last paragraph). Also, similarly to D3, the disclosure of the formulation in paragraph 46 of D7 is rather generic since it allows many variations regarding the nature of the fast fusing plasticizer, the 1,4 diester and the respective amounts of these two components and D7 was not shown to provide any specific guidance regarding the specific combination of materials to be used to prepare this formulation. Under these circumstances, it would not be possible to reproduce exactly the

formulation according to paragraph 46 of D7. Therefore, following the same line of reasoning as the one indicated above in respect of D3, it is agreed with the respondent that the problem effectively solved over the closest prior art resides in the provision of a composition having good plasticising property and improved physical properties in regard to tensile strength, migration loss, volatile loss and absorption rate (rejoinder: section VI.3.3).

5.2.3 During the oral proceedings before the Board, the appellant argued that comparative examples 4 and 5 of the patent in suit showed that the weight ratio of cyclohexane-1,4-dicarboxylic acid ester:dibenzoate-based material had an impact on the properties of the plasticizer combination. Therefore, these comparative examples showed that it was not credible that the effects relied upon by the respondent were achieved on the whole scope of the claims.

a) In this regard, comparative examples 4 and 5 are directed to plasticizer compositions that only differ from the one according to example 1 of the patent in suit in that a ratio of 1,4-DEHCH:DEGDB of 1:9 and 3:7, respectively (i.e. outside the range specified in claim 1 of the main request) was used.

b) In addition, it is derivable from table 2 of the patent in suit that, as put forward by the appellant, the tensile strength, migration loss, volatile loss and absorption rate properties are worse than the ones of example 1 of the patent in suit (which is according to claim 1 of the main request).

c) However, contrary to the appellant's view, the Board considers that what these comparative examples show, is

that the distinguishing feature "weight ratio cyclohexane-1,4-dicarboxylic acid ester:dibenzoate" also has a causal effect on the achievement of the beneficial effects claimed to be achieved by the respondent. In other words, comparative examples 4 and 5 confirm the conclusion reached in point 5.2.2 above.

5.2.4 In view of the above, the problem effectively solved over the relevant disclosure of D7 is the same as the one indicated above in respect of D3, namely it resides in the provision of a composition having good plasticising property and improved physical properties in regard to tensile strength, migration loss, volatile loss and absorption rate.

5.3 Obviousness

5.3.1 Regarding the obviousness of the solution, the Board considers that independently of whether or not D7 discloses any of the six components according to the cyclohexane 1,4-diester-based material specified in claim 1 of the main request (which was in dispute between the parties in view of the disclosure of compound (4) of table 4 of D7), it is at least implicitly derivable from paragraphs 14-17 and from the diester (4) according to table 4 of D7 that the skilled person would understand that 1,4-DINCH is within the ambit of D7 (even the respondent seems to acknowledge this on page 24, second full paragraph of the rejoinder). However, for similar reasons as the ones indicated above in respect of D3 as the closest prior art, it has to be concluded that D7, either alone or in combination with either D5, D6 or D8 does not provide any hint to solve the problem posed by using a combination of a cyclohexane 1,4-diester-based material and a dibenzoate-based material as defined in claim 1

of the main request. In particular, it was not shown that the skilled person would have had any motivation to combine two plasticizers as defined in claim 1 of the main request with the aim to achieve the improvements specified in the formulation of the problem solved according to point 5.2.4 above.

5.3.2 For these reasons, the subject-matter of claim 1 of the main request involves an inventive step in view of the relevant disclosure of D7 as the closest prior art.

6. Objections pursuant to Article 123(3) EPC and Article 84 EPC put forward for the first time in appeal - (Non)admittance

6.1 The respondent requested that the objections pursuant to Article 123(3) EPC that were raised against the operative main request for the first time in the statement of grounds of appeal be not admitted into the proceedings (rejoinder: bottom of page 6; top of page 10).

6.2 In that respect, it is derivable from the file history that the sole occasion on which Article 123(3) EPC was addressed during the opposition proceedings was the preliminary opinion of the opposition division (point 2.1.1.5), whereby the requirements of Article 123(3) EPC were considered to be met. That view was not questioned by the opponent any further. In particular, the Board found no trace in the file that any objection pursuant to Article 123(3) EPC was discussed at the oral proceedings before the opposition division or addressed in the decision under appeal. Under these circumstances, the Board shares the respondent's view that the objection pursuant to Article 123(3) EPC put forward by the appellant in the

statement of grounds of appeal appeal was filed for the first time at the outset of the appeal proceedings. This view, which was indicated in the Board's communication (section 7), was not contested by the appellant, in particular at the oral proceedings before the Board.

6.3 The Board further notes that the same conclusion is valid for the objections pursuant to Article 84 EPC that were raised against the main request in the statement of grounds of appeal.

6.4 Therefore, the admittance of these objections pursuant to Article 123(3) EPC and Article 84 EPC is subject to the Board's discretion pursuant to Article 12(4) to 12(6) RPBA.

6.5 In this respect, considering that the main request was filed at the outset of the opposition proceedings (with the rejoinder to the notice of opposition), the Board cannot recognise any reason justifying the filing of these new objections for the first time with the statement of grounds of appeal.

6.6 Contrary to the appellant's view, the Board is of the opinion that the alleged difference between the clean and marked-up versions of the main request filed during the opposition proceedings regarding the presence or not of the chemical formula 2 in claim 1 of the operative main request cannot justify the filing of these new objections only in appeal (since there was, in the Board's view, no ambiguity regarding the text to be considered as the valid main request, which was eventually agreed upon by the appellant: see section 1 above).

6.7 Under these circumstances, there are no compelling reasons justifying the submission of the objections pursuant to Article 84 EPC and Article 123(3) EPC against the claims of the main request dealt with in the decision under appeal for the first time with the statement of grounds of appeal. Therefore, the Board made use of its discretion by not admitting into the proceedings these new objections (Article 12(6), second sentence RPBA).

7. In view of the above, the appellant's objections raised against the main request either did not succeed or were not admitted into the proceedings. Therefore, the appeal is to be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

D. Hampe D. Semino

Decision electronically authenticated