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Datasheet for the decision of 27 March 2024

Case Number: T 1766/21 - 3.3.03

Application Number: 14859994.7

Publication Number: 3070125

IPC: C08L69/00, C08K5/42, C08K5/55, C08L71/02

Language of the proceedings: EN

Title of invention:
POLYCARBONATE RESIN MOLDING MATERIAL

Patent Proprietor:
Idemitsu Kosan Co., Ltd.

Opponent:
SABIC Global Technologies B.V.

Relevant legal provisions:
RPBA 2020 Art. 12(6), 13(1)
EPC Art. 56

Keyword:

Late-filed evidence - error in use of discretion at first instance (yes) - admitted (yes)
Late-filed evidence - should have been submitted in first-instance proceedings (yes)
Inventive step - combination of known features - obvious to try

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Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 1766/21 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 27 March 2024

Appellant: (Opponent)	SABIC Global Technologies B.V. Plasticslaan 1 4612 PX Bergen op Zoom (NL)
Representative:	Sabic Intellectual Property Group Sabic Intellectual Property Department P.O. Box 3008 6160 GA Geleen (NL)
Respondent: (Patent Proprietor)	Idemitsu Kosan Co., Ltd. 1-1, Marunouchi 3-chome Chiyoda-ku Tokyo 100-8321 (JP)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 3 August 2021 concerning maintenance of the European Patent No. 3070125 in amended form.**

Composition of the Board:

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

Summary of Facts and Submissions

I. The appeal of the opponent lies against the interlocutory decision of the opposition division concerning maintenance of European Patent No. 3 070 125 in amended form on the basis of the claims of the main request filed with letter of 10 March 2021 and an adapted description.

The opposition proceedings were based on the grounds for opposition in Article 100(a) EPC, in relation to novelty (Article 54 EPC) and inventive step (Article 56 EPC), and those in Article 100(b) and (c) EPC.

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

D11: US 2009/0162628 A1
D12: US 7,071,284 B2
D13: EP 2 522 697 A1
D14: Product brochure of Doverphos® S-9228 and Doverphos® S-9411
D16: US 5,364,895
D17: EP 2 799 200 A1

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

(a) documents D14 and D17 were not admitted into the proceedings;

(b) the subject-matter of claim 1 of the main request involved an inventive step starting from document D13 as the closest prior art.

IV. With their statement of grounds of appeal, the opponent (appellant) filed the following documents:

D19: JP 2006/169451
D19t: Machine translation of D19

V. With their letter dated 18 March 2022, the appellant filed the following document:

D20: EP 2 792 711 A1

VI. The patent proprietor (respondent) filed eleven sets of claims as auxiliary requests 1 to 11 with their rejoinder to the statement of grounds of appeal.

VII. Oral proceedings were held before the Board on 27 March 2024.

VIII. The appellant requested that the decision under appeal be set aside and the patent be revoked.

The respondent requested that the appeal be dismissed and the patent be maintained on the basis of the main request considered allowable by the opposition division. In the alternative it was requested that the patent be maintained in amended form on the basis of one of auxiliary requests 1 to 11, filed with the rejoinder to the statement of grounds of appeal.

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

"1. A polycarbonate resin molding material, comprising:

(i) an aromatic polycarbonate resin (A),

(ii) at least one selected from a polyether compound (b1) having a polyoxyalkylene structure and an acid-generating compound (b2), and
(iii) an antioxidant (C);

wherein:

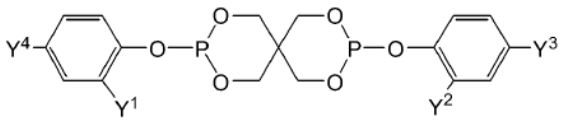
a content of the polyether compound (b1) is from 0.01 part by mass to 5 parts by mass with respect to 100 parts by mass of the aromatic polycarbonate resin (A);

the acid-generating compound (b2) is at least one selected from a boronic acid anhydride having an aromatic ring and a sulfonate having an aromatic ring,

a content of the acid-generating compound (b2) is from 0.0001 part by mass to 0.5 part by mass with respect to 100 parts by mass of the aromatic polycarbonate resin (A), and

the total content of acid-generating compound is from 0.0001 part by mass to 0.5 part by mass with respect to 100 parts by mass of the aromatic polycarbonate resin (A);

the antioxidant (C) is a pentaerythritol diphosphite compound represented by the following general formula (III),



(III)

in the formula, Y^1 to Y^4 each independently represent a hydrocarbon group having 6 or more carbon atoms;

the polycarbonate resin molding material has a nitrogen atom content of 15 ppm or less;

the polycarbonate resin molding material has:

a content of *o*-hydroxyacetophenone measured by the following Method (1) of 1 ppm by mass or less; and

a YI value measured by the following Method (2) of 1.21 or less:

Method (1): a molded body measuring 50 mm by 80 mm by 0.3 mm thick is produced through use of the polycarbonate resin molding material by an injection molding method at a cylinder temperature of 360°C and a die temperature of 80°C for a cycle time of 20 seconds, the molded body is pulverized and dissolved in chloroform, and *o*-hydroxyacetophenone in the solution is determined by high-performance liquid chromatography;
Method (2): a molded body measuring 50 mm by 90 mm by 5 mm thick is produced through use of the polycarbonate resin molding material by an injection molding method at a cylinder preset temperature of 360°C and a die temperature of 80°C for a cycle time of 50 seconds, and the YI value of the molded body is measured with a spectrophotometer under conditions of a C light source and a two-degree field of view."

Claim 1 of auxiliary requests 1 to 5 was identical to claim 1 of the main request.

Claim 1 of auxiliary request 6 differed from claim 1 of the main request essentially in that the following feature was deleted while the remaining features were reordered:

> "the total content of acid-generating compound is from 0.0001 part by mass to 0.5 part by mass with respect to 100 parts by mass of the aromatic polycarbonate resin (A)"

Claim 1 of auxiliary requests 7 to 11 was identical to claim 1 of auxiliary request 6.

The remaining claims of these requests are not relevant to this decision.

X. The appellant's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They were essentially as follows:

(a) Late filed documents

Documents D14, D16, D17, D19, D19t and D20 should be admitted into the proceedings.

(b) Inventive step

The subject-matter of claim 1 of the main request lacked an inventive step over document D13 taken as the closest prior art. The same applied to claim 1 of auxiliary requests 1 to 11.

XI. The respondent's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They were essentially as follows:

(a) Late filed documents

Documents D14, D16, D17, D19, D19t and D20 should not be admitted into the proceedings.

(b) Inventive step

The subject-matter of claim 1 of the main request involved an inventive step over document D13 taken as the closest prior art. The same applied to claim 1 of auxiliary requests 1 to 11.

Reasons for the Decision

1. Admittance of late filed documents

1.1 Documents D14 and D17

1.1.1 D14 and D17 were submitted by the appellant with letter dated 19 June 2020 but not admitted into the proceedings by the opposition division (page 15, point 26 of the decision under appeal).

1.1.2 The appellant contests the decision of the opposition division and requests that these documents be admitted into the appeal proceedings (statement of grounds of appeal, pages 9 to 11, point 4). Specifically, said documents were filed in reaction to the amendments made by the patent proprietor during the opposition proceedings. They furthermore pertained to the pentaerythritol based antioxidant used in the examples of the patent and specified in claim 1 of the present main request.

1.1.3 The respondent considered that documents D14 and D17 could and should have been filed earlier during the opposition proceedings. Furthermore, these documents were not *prima facie* relevant (rejoinder to the statement of grounds of appeal, pages 4 to 6, point 2).

1.1.4 According to the established case law, in particular decision G 7/93 (OJ EPO 1994, 775, point 2.6 of the reasons), Boards of Appeal should only overturn discretionary decisions of the first instance department if it is concluded that said department exercised its discretion according to the wrong

principles, or without taking into account the right principles or in an unreasonable way. This case law has been codified in Article 12(6) RPBA. In accordance with this provision, the board shall not admit items of evidence which were not admitted in the proceedings leading to the decision under appeal, "unless the decision not to admit them suffered from an error in the use of discretion".

1.1.5 In the contested decision (page 15, point 26.2 of the Reasons), the opposition division considered that D14 and D17 were late-filed and not *prima facie* relevant since they did not pertain to moulding processes at temperatures exceeding 300°C.

1.1.6 While the principle applied by the opposition division is correct, the Board does not consider that its application is reasonable in the present case (Case Law of the Boards of Appeal, 10th edition 2022, in the following "Case Law", IV.C.4.5.1).

1.1.7 It is first noted that the patent proprietor filed amended sets of claims with the reply to the notice of opposition. In particular, the proprietor introduced in claim 1 a new limitation according to which the moulding material further comprised an antioxidant (C) which was a pentaerythritol diphosphite compound represented by general formula (III) (emphasis here and below added by the Board). This new feature was, however, not present in the granted claims and therefore not considered by the opponent in the notice of opposition under novelty or inventive step.

In addition, the opposition division indicated in its preliminary opinion annexed to the summons to oral proceedings that an inventive step could be

acknowledged because, *inter alia*, "*none of the cited documents disclose an antioxidant of formula (III)*" (page 7, last paragraph).

In reply thereto, the opponent filed D14 and D17 to specifically address this new feature. It is furthermore noted that these documents were filed within the time limit set under Rule 116(1) EPC and specified in the first summons to oral proceedings.

In view of the new feature introduced into the claims, which had been taken from the description, and the preliminary opinion of the opposition division considering that said new feature contributed to the establishment of an inventive step, the Board considers that the filing of documents D14 and D17 within the time limit set under Rule 116(1) EPC addressing that new feature is a legitimate and timely reaction to an unforeseeable amendment of the claims.

1.1.8 The respondent argued that the opponent should have observed a reasonable degree of vigilance and filed D14 and D17 in "direct response" to the new main request and not shortly before the final date set in the summons (rejoinder, page 5, first paragraph). While the Board does not contest that a proactive approach is always preferable in order to allow all parties involved to prepare the further procedure and thus avoid admittance issues, it is pointed out that under the circumstances of the present case the appellant acted within a reasonable time frame, also considering that no time limits were set. Instead, also taking into account the limited time span between the reply to the notice of opposition and the summons (5 months), it is considered in the present case sufficient for the opponent to file additional submissions addressing the

amendment of the patent proprietor taken from the description within the time limit indicated by the opposition division in the summons in accordance with Rule 116(1) EPC. Therefore the Board neither considers that the filing of D14 and D17 constitutes an abuse of procedure nor that these documents should have been submitted at an earlier stage of the opposition proceedings.

1.1.9 Furthermore, as noted previously, these documents were not admitted into the proceedings because "*they concern the effect of a molding temperature lower than in the patent in suit namely 280°C versus 360°C*". The Board does not consider that the *prima facie* assessment of these documents is reasonable as it requires a deep consideration of the alleged effect of the claimed invention which goes beyond a *prima facie* assessment. More importantly, it is not reasonable to dismiss these documents although they related to antioxidants of formula III, indeed the new feature of the amended sets of claims taken from the description.

The Board does not dispute that the high temperature during moulding is a central aspect of the claimed invention. However, whether the disclosure of D14 and D17 is indeed relevant in this context is not considered to be a *prima facie* assessment of these documents, but should be addressed in its substance, in the framework of inventive step.

1.1.10 Accordingly, the Board decided to overturn the decision of the opposition division and to admit D14 and D17 into the proceedings (Article 12(6) RPBA).

1.2 Document D16

The admittance of document D16 was not addressed in the contested decision. However, D16 was filed together with D14 and D17 with the same purpose as these two documents. Therefore the Board considers that the above considerations apply *mutadis mutandis* to D16 (points 1.1.7 to 1.1.9 above).

Consequently, the Board found it appropriate to exercise its discretion under Article 12(4) RPBA by admitting D16 into the proceedings.

1.3 Documents D19 and D19t

1.3.1 D19 and its English translation D19t were filed by the appellant with the statement of grounds of appeal. Their admission to the proceedings, which is contested by the respondent, is subject to the discretionary power of the Board in accordance with Article 12 paragraphs (4) and (6) RPBA.

1.3.2 These documents are directed to establishing that the subject-matter of claim 1 of the main request lacks an inventive step over D13 as the closest prior art. In particular, the appellant argued that D19, which was cited in D13 (paragraph [0025]), suggested to use an antioxidant (C) as defined in the claims (statement of grounds of appeal, page 40, last paragraph to page 41, second paragraph).

1.3.3 The admittance of D19 and D19t was contested by the respondent for the following reasons (rejoinder, pages 7 to 9, points 3.1 a) and 3.2.1):

> D19 and D19t could have been filed during the opposition proceedings;

D19 and D19t were not *prima facie* relevant.

1.3.4 In the present case, the Board notes that the appellant did not provide reasons for submitting D19 and D19t in the appeal proceedings contrary to the requirements of Article 12(4) RBPA. Moreover, as pointed out by the appellant, D19 was cited in D13. Thus, independently of the relevance of this document, the reference to D19 in D13 shows that this document could and should have been filed during the opposition proceedings, in particular with documents D14, D16 and D17.

1.3.5 Under these circumstances, the Board finds it appropriate to exercise its discretion under Article 12(6) RPBA by not admitting documents D19 and its English translation D19t into the proceedings.

1.4 Document D20

1.4.1 D20 is a new item of evidence submitted by the appellant with letter dated 18 March 2022 and therefore after filing the statement of grounds of appeal. Its admission to the proceedings, which is contested by the respondent, is subject to the discretionary power of the Board in accordance with Article 13(1) RPBA.

1.4.2 This document is directed to establishing that the choice of an antioxidant (C) as defined in the claims of the main request was obvious to a person skilled in the art. In particular, D20 was filed to show that a composition containing Doverphos S9228 as an antioxidant has a lower Yellowness Index (YI) than a composition based on the antioxidant ADK STAB PEP-36 (letter dated 18 March 2022, page 2, last paragraph to page 3, first paragraph).

1.4.3 According to the appellant, they became aware of D20 and its content while preparing submissions in different opposition proceedings (against European patent No. 3 070 126 corresponding to appeal case T 1891/22).

1.4.4 The respondent contested the admittance of D20 for the following reasons (rejoinder, pages 8 to 10, points 3.1 b) and 3.2.2):

> D20 was also late-filed in the other opposition case and could have been filed earlier during both proceedings;
>
> D20 was not *prima facie* relevant.

1.4.5 In the present case, the Board holds that the mere fact that the appellant submitted D20 in another opposition case cannot justify its admittance in the present appeal proceedings. Admittance of a document is made under due consideration of the individual circumstances of the relevant case and subject to the procedural rules applicable at the specific stage reached in those proceedings. As to the argument that D20 was *prima facie* relevant to the inventive step assessment of antioxidant (C), the Board has no reason to depart from the view that the documents relating to this issue should have been filed at an earlier stage of the proceedings, particularly in response to the preliminary opinion of the opposition division.

1.4.6 Under these circumstances, the Board finds it appropriate to exercise its discretion under Article 13(1) RPBA not to admit document D20 into the proceedings.

Main request (patent as maintained by the opposition division)

2. Inventive step

2.1 The claimed invention relates to polycarbonate moulding materials having good optical properties even after moulding at temperatures above 300°C (opposed patent, page 3, paragraphs [0010] and [0013]). For the exact wording of claim 1 of the main request reference is made to point IX. above.

2.2 In the decision under appeal, the opposition division came to the conclusion that the subject-matter of present claim 1 involved an inventive step starting from document D13 as the closest prior art.

These findings were contested by the appellant.

2.3 Closest prior art

The appellant and the opposition division considered that document D13 could be selected as the closest prior art for the subject-matter of claim 1.

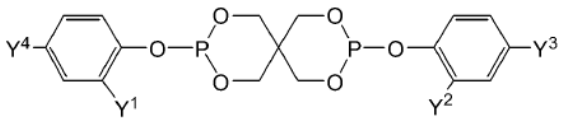
The respondent suggested D11 as the closest prior art but did not explain why the choice of D13 by the opposition division would not be reasonable (rejoinder to the statement of grounds of appeal, page 29, point 12.1.1 a)).

In the absence of any argument against D13 as the closest prior art, the Board has no reason to deviate from the conclusion of the opposition division that this document is a suitable starting point for assessing inventive step (contested decision, point 25.2 of the Reasons).

2.4 Distinguishing features

During the oral proceedings before the Board (minutes, page 3, third and fourth paragraphs), there was agreement between the parties that the subject-matter of claim 1 differed from the material of example 12 of D13 in that the polycarbonate moulding material comprised:

(i) an antioxidant (C) of formula (III)



(III)

(ii) a nitrogen atom content of 15 ppm or less and

(iii) a content of *o*-hydroxyacetophenone (oHAP) of 1 ppm by mass or less.

It was also common ground that D13 did not explicitly disclose a material having a yellowness index (YI) measured after moulding at 360°C of 1.21 or less which constituted therefore a further distinguishing feature (feature (iv)) between claim 1 and the closest prior art document.

The Board has also no reason to depart from that view.

2.5 Objective problem to be solved

As regards the formulation of the objective technical problem, there was agreement that this could be formulated as the provision of a polycarbonate resin

moulding material with improved (reduced) YI and improved light transmission properties.

The respondent added that the problem should also take into account that these improved properties had to be achieved after processing the material at a temperature of 300°C or more. In view of the fact that the properties of the claimed compositions were measured after injection moulding at 360°C (see opposed patent, table 1 and claim 1), the Board agrees with the respondent's submission.

Consequently, the objective problem to be solved is formulated as the provision of a polycarbonate resin moulding material with improved (reduced) YI and improved light transmission properties after processing at temperatures above 300°C.

2.6 Obviousness

2.6.1 It remains to be evaluated whether, in view of the disclosure of D13, and possibly in combination with other prior art documents or common general knowledge, the skilled person desiring to solve the above problem would have modified the material of example 12 of D13 in such a way as to arrive at the material of operative claim 1.

2.6.2 At this stage, it should first be noted that the obviousness of features (i) and (ii) was disputed between the parties. However, it was not contested that the oHAP content and the Yellow Index (features (iii) and (iv)) were not independent parameters which could be controlled independently of the other features of claim 1 (such as the nitrogen content or the type of antioxidant). Instead, as shown in the examples of the

opposed patent (see table 1), the oHAP content and the YI are properties of the material measured after injection moulding at 360°C and therefore the result of a polycarbonate-based composition comprising the essential components defined in the present claim 1. It follows that if all other features of claim 1 are met (including a nitrogen content below 15 ppm), an oHAP content of 1 ppm or less and a YI of 1.21 or less should automatically be achieved. This view is further supported by paragraphs [0018] and [0023] of the opposed patent. Consequently, if features (i) and (ii) are found to be obvious, then features (iii) and (iv) resulting thereof are also obvious.

2.6.3 As regards distinguishing features (i) and (ii), it was the appellant's position that the skilled person would have found it obvious:

in view of the teaching of D14, D16 and D17 to use an antioxidant (C) of formula (III) (distinguishing feature (i)) and

in view of the teaching of D12 to reduce the nitrogen content below 15 ppm (distinguishing feature (ii)).

2.6.4 In the rejoinder to the statement of grounds of appeal, the respondent argued that none of the cited documents related the use of an antioxidant of general formula (III) such as Doverphos S-9228 to any technical advantage. Furthermore, these documents would not teach or suggest that using an antioxidant (C) of formula (III) in combination with a polyether compound (b1) and/or an acid-generating compound (b2) as defined in claim 1 and/or adjusting the nitrogen content could provide a moulding material leading to a moulded body

having low yellowing and superior light transmission properties (rejoinder, page 40, point d)).

During the oral proceedings before the Board, the respondent submitted for the first time that when assessing obviousness account should be taken of the fact that the opposed patent showed a positive interaction of distinguishing features (i) and (ii), which was not disclosed in the cited prior art. Furthermore, it was argued that documents D14, D16 and D17 taught away from replacing the antioxidant of example 12 of D13 (ADEKA STAB PEP36) with Doverphos S9228, due to a high volatility of the antioxidant Doverphos S9228 at 360°C appearing from these documents. The thermogravimetric analysis of Doverphos in D14 and D16 confirmed this high volatility. Similarly, D12 did not relate to the problem of yellowing at temperatures above 300°C. In addition, the YI of the materials disclosed in that document was relatively high (higher than the limit defined in claim 1 of the main request). The skilled person would therefore have no reason to expect that D12 could provide any useful teaching to solve the objective technical problem formulated above.

2.6.5 As a first step, the Board should determine whether the obviousness of the antioxidant C and of the nitrogen content can be assessed separately, or whether a potential positive interaction between these features must also be considered, as argued by the respondent.

(a) During the oral proceedings before the Board, the respondent stated that the positive interaction was not a synergistic effect, contrary to the findings in the contested decision. Instead, their argument in this respect was that the significant

improvement attributed to the nitrogen content in the opposed patent could not have been anticipated by a skilled person. To support this argument, the respondent pointed out that while the examples of D12 only showed a 10% reduction in YI due to nitrogen limitation, the examples in the patent demonstrated a substantial 40% reduction (see opposed patent, table 1, example 1 versus comparative example 3).

(b) Regarding the quantification of the effect of the nitrogen content, the Board finds that a direct comparison between the examples of D12 and those of the opposed patent to show an interaction between the distinguishing features is problematic for two main reasons:

(c) Firstly, the examples of D12 concern polycarbonate alone while the compositions of the opposed patent comprise multiple additives. Secondly, the YI index measurement conditions differ between D12 and the opposed patent, notably in the moulding temperature (specifically, in the opposed patent, YI is measured after injection moulding at 360°C). Consequently, it cannot be concluded that the YI reduction in D12 and in the opposed patent can be directly compared.

(d) Therefore, in assessing the obviousness of features (i) and (ii), the Board has no reason to consider any specific interaction between these features (such as an effect going beyond the individual effects of each feature).

2.6.6 It remains to be assessed whether features (i) and (ii) were obvious for a skilled person wishing to reduce the

YI and to improve the light transmission properties (after moulding at temperatures above 300°C) of the materials of D13.

For the sake of completeness, it should be added that the parties' arguments mainly concerned the question of whether the state of the art suggested means to reduce the YI. The other part of the problem, concerning light transmission properties in general, did not receive separate argumentation. In any case, it is clear to the Board that if the YI index is reduced, this can only have a positive effect on light transmission. Therefore, if a technical solution allows for reducing this index, the skilled person would have no reason to assume that such a solution would not be suitable for solving the second part of the aforementioned problem.

2.6.7 Obviousness of feature (i) (antioxidant C of formula (III))

(a) Example 12 of D13 discloses a composition comprising the phosphoric antioxidant "ADK STAB PEP36" instead of an antioxidant C of formula III. According to the appellant, it was known from D14, D16 and D17 that the antioxidant "Doverphos S-9228" (corresponding to an antioxidant C) led to improved yellowing resistance compared to ADK STAB PEP36. It would therefore be obvious for a person skilled in the art wishing to reduce the YI of the composition of example 12 of D13 to replace the antioxidant used in that material by Doverphos S-9228.

(b) The respondent argued that D14, D16 and D17 did not relate to materials moulded at temperatures above 300°C. Furthermore, the thermogravimetric analysis

of Doverphos S-9228 in D14 and D16 would teach away from using this compound in high temperature processes due to a significant weight loss of the antioxidant above 300°C. Last but not least, document D14 would show that the antioxidant of D13 (ADK STAB PEP36) created black specks which was clearly not a problem in D13 because the material of example 12 was transparent. For these reasons, the skilled person would have no reason on the basis of these documents to replace the antioxidant of D13 with Doverphos S-9228 in order to solve the objective technical problem formulated above.

(c) As regards the obviousness of feature (i), the Board agrees with the appellant for the following reasons:

D14 is a commercial brochure relating to the performances of two phosphite antioxidants, one of them being Doverphos S-9228 (D14, page 1). On the second page of this document, it is taught that these antioxidants provide processing stabilisation for high temperature polymers such as polycarbonates. Moreover, the picture on that page illustrates that Doverphos S-9228 is characterised by the best resistance to thermal degradation and discoloration (albeit at a temperature of 280°C) compared to other phosphite based antioxidants and in particular in comparison to Bis(2,6-di-t-butylphenyl-4-methyl pentaerythritol) diphosphite corresponding to ADK STAB PEP36 used in example 12 of D13. In fact, while Doverphos S-9228 remains transparent and seemingly colourless after heating at 280°C for 120 minutes, ADK STAB PEP36 becomes almost black. For the Board, this teaching is a clear invitation for the skilled person to replace

the ADK STAB PEP36 with Doverphos S-9228 in order to improve the optical properties including the YI of the compositions of D13.

While it is true that D13 does not mention that black specks would be present in the composition of example 12, this is not directly relevant to the question of obviousness. Again, the problem to be solved is to reduce the YI and improve the optical properties of the composition of example 12, and it is undeniable that Doverphos S-9228 can provide this type of benefit from the picture on page 2 of D14.

It is also true that D14 does not specify that Doverphos S-9228 can be used at temperatures above 300°C. Furthermore, the thermogravimetric analysis of this compound shows a loss of mass above 300°C. However, among the antioxidants tested in D14, Doverphos S-9228 has the best thermal stability and the lowest volatility (D14, page 4, thermogravimetric stability). This is also highlighted at the bottom of page 5 of D14:

> "*Doverphos® S-9228 withstands polycarbonate processing temperatures where most phosphites degrade or volatilize, and provides color and shear stability over extended test conditions.*"

For the Board, even in the absence of precise teaching on the maximum temperature of use, it is therefore an obvious option to replace ADK STAB PEP36 with Doverphos S-9228 in order to solve the objective technical problem ("obvious to try"). In other words, obviousness is not only at hand when the effect of Doverphos S-9228 is clearly

predictable but also when there is a reasonable expectation of success at temperatures above 300°C.

Consequently, feature (i) is obvious in view of D13 in combination with D14.

2.6.8 Obviousness of feature (ii) (nitrogen atom content of 15 ppm or less):

(a) The exact nitrogen content in the moulding material of example 12 of D13 is not known. The appellant argued that it was obvious in view of D12 to reduce the nitrogen content in a polycarbonate composition in order to improve its YI.

(b) The respondent contended that D12 was silent on the issue of yellowing during high temperature processing. In addition, the improvement of the YI in D12 was limited compared to that observed in the examples of the opposed patent. The person skilled in the art would therefore have no incentive to consider the teachings of this document in order to provide a solution to the objective technical problem.

(c) D12 pertains to a process for the continuous preparation of polycarbonates. A key aspect of the invention disclosed in this document is that the nitrogen content (present in the form of a tertiary amine catalyst) of the polycarbonate should remain between 3 and 20 ppm (see D12, claim 1). In particular, the examples of D12 show that a continuous reduction of the nitrogen content from 42 ppm (comparative example 3) to 3 ppm (example 3) is accompanied by a continuous decrease of the YI.

While it is true that D12 does not directly address the issue of processing polycarbonate at temperatures above 300°C, it is clear to the Board that the skilled person would immediately recognise that nitrogen-based substances cause yellowing of polycarbonates. It is therefore an obvious option in view of this clear teaching of D12 to reduce the nitrogen-content to less than 15 ppm (as suggested in the examples of D12) in order to solve the objective technical problem ("obvious to try").

With respect to the respondent's criticism that the level of YI reduction in D12 was limited compared to the opposed patent, this argument was not found convincing for the reasons given above (see point 2.6.5 (c)).

(d) Consequently, feature (ii) is obvious in view of D13 in combination with D12.

2.6.9 Thus, in light of the foregoing analysis, the Board concludes that features (i) and (ii) were obvious modifications for a skilled person seeking to enhance the optical properties (in particular the YI) of the material of example 12 of D13. Furthermore, it was not contested that features (iii) and (iv), pertaining to the oHAP content of 1 ppm or less and a YI of 1.21 or less, respectively, are the mere consequence of the choice of features (i) and (ii) (see point 2.6.2 above).

2.7 Consequently, the subject-matter of claim 1 of the main request lacks an inventive step starting from example 12 of D13 in combination with D12 and D14.

Auxiliary requests 1 to 5

3. As claim 1 of auxiliary requests 1 to 5 is identical to claim 1 of the main request, its subject-matter does not involve an inventive step over document D13 as the closest prior art for the same reasons as outlined above (point 2. of the present decision).

Auxiliary requests 6 to 11

4. The amendments in claim 1 of auxiliary requests 6 to 11 (which are identical in wording in all these requests), apart from the rearrangement of some features, consist only in the deletion of the total content of acid generating-compound. The respondent indicated that the amendments in claim 1 of these requests had no substantial impact on their argumentation on inventive step made for the main request (minutes of the oral proceedings, page 4, penultimate paragraph). Consequently, the Board finds no reason to depart from its conclusions regarding the main request. It follows that the subject-matter of claim 1 of auxiliary requests 6 to 11 lacks an inventive step starting from example 12 of D13 as the closest prior art for the same reasons as set out above (point 2. of the present decision).

5. As none of the respondent's requests is allowable due to lack of inventive step, there is no need to deal with any other issue and the patent is to be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

D. Hampe D. Semino

Decision electronically authenticated