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**Datasheet for the decision
of 15 March 2022**

Case Number: T 2271/17 - 3.3.02

Application Number: 09754828.3

Publication Number: 2295438

IPC: C07D487/08, C07D295/08

Language of the proceedings: EN

Title of invention:

PROCESS FOR PRODUCING HYDROXYALKYLTRIETHYLENEDIAMINE COMPOUND,
AND CATALYST COMPOSITION FOR THE PRODUCTION OF POLYURETHANE
RESIN USING THE HYDROXYALKYLTRIETHYLENEDIAMINE COMPOUND

Patent Proprietor:

Tosoh Corporation

Opponent:

Air Products and Chemicals, Inc.

Headword:

Relevant legal provisions:

EPC Art. 56

RPBA 2020 Art. 13(1), 13(2)

Keyword:

Inventive step
Amendment after summons

Decisions cited:

Catchword:



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Case Number: T 2271/17 - 3.3.02

D E C I S I O N
of Technical Board of Appeal 3.3.02
of 15 March 2022

Appellant: Air Products and Chemicals, Inc.
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
24 July 2017 concerning maintenance of the
European Patent No. 2295438 in amended form.**

Composition of the Board:

Chairman M. O. Müller
Members: P. O'Sullivan
M. Blasi

Summary of Facts and Submissions

I. The appeal of the opponent (hereinafter appellant) lies from the decision of the opposition division according to which European patent 2 295 438 in amended form, and the invention to which it relates, met the requirements of the EPC.

II. The following documents were among those cited in opposition proceedings:

D1: US 5,710,191
D3: US 6,057,321
D4: WO 2009/030649 A2
D7: US 2003/0083393 A1
D8b: English language translation of
JP 2003-82052 A (D8)
D12: US 4,026,840
D13: US 3,520,835

In the contested decision the opposition division decided that the subject-matter of the claims of the main request involved an inventive step over either of D1 or D4 as closest prior art.

III. Requests relevant to the present decision

The appellant requested that the contested decision be set aside and that the patent be revoked in its entirety.

The respondent requested that the appeal be dismissed, i.e. that the patent be maintained in amended form as found allowable by the opposition division. Alternatively, it requested maintenance of the patent

in amended form on the basis of one of the sets of claims of auxiliary requests 1 to 3 filed with the reply to the statement of grounds of appeal.

- IV. With a communication pursuant to Article 15(1) RPBA 2020, the board *inter alia* expressed the preliminary view that the subject-matter of claim 1 of the main request lacked inventive step over D1 as closest prior art.
- V. Oral proceedings by videoconference were held on 15 March 2022.
- VI. The appellant's case, insofar as relevant to the present decision, may be summarised as follows:

Main request

Admittance - the respondent's experimental data

- The experimental data submitted in point 1 of the respondent's letter dated 22 February 2022 was not to be admitted into the proceedings pursuant to Article 13(2) RPBA 2020.

Inventive step, Article 56 EPC

- The subject-matter of claim 1 of the main request lacked inventive step over D1 as closest prior art.

Auxiliary request 2

Admittance - appellant's submissions dated
25 November 2020

- The submissions of the appellant dated
25 November 2020 in relation to auxiliary request 2
were to be admitted into the proceedings.

Inventive step, Article 56 EPC

- The subject-matter of claim 1 of the main request
lacked inventive step over D1 as closest prior art
in combination with D4.

Auxiliary request 3

Inventive step, Article 56 EPC

- The subject-matter of claim 1 lacked inventive step
over D1 as closest prior art in combination with
any of D4, D7, D8b or D12.

Admittance - inventive step objection based on D4 in
combination with D3

- The objection of lack of inventive step starting
from D4 as closest prior art in combination with D3
was to be admitted into the proceedings.

VII. The respondent's case, insofar as relevant to the present decision, may be summarised as follows:

Main request

Admittance - the respondent's experimental data

- The experimental data submitted in point 1 of the respondent's letter dated 22 February 2022 was to be admitted into the proceedings pursuant to Article 13(2) RPBA 2020.

Inventive step, Article 56 EPC

- The subject-matter of claim 1 of the main request involved an inventive step over D1 as closest prior art.

Auxiliary request 2

Admittance - appellant's submissions dated 25 November 2020

- The submissions of the appellant dated 25 November 2020 in relation to auxiliary request 2 were not to be admitted into the proceedings.

Inventive step, Article 56 EPC

- The subject-matter of claim 1 involved an inventive step over D1 as closest prior art in combination with D4.

Auxiliary request 3

Inventive step, Article 56 EPC

- The subject-matter of claim 1 involved an inventive step over D1 as closest prior art in combination with any of D4, D7, D8b or D12.

Admittance - inventive step objection based on D4 in combination with D3

- The objection of lack of inventive step starting from D4 as closest prior art in combination with D3 was not to be admitted into the proceedings.

Reasons for the Decision

Main request - Inventive step, Article 56 EPC

1. Background

The patent as granted is concerned with a catalyst composition for the preparation of a polyurethane resin which has no volatile amine catalyst (patent, paragraph [0004]). According to the patent, the use of a volatile amine causes an odour problem (paragraph [0015]). In this context, to avoid the odour problem, it was known to use an amine catalyst having a hydroxy group reactive with a polyisocyanate, since the catalyst was incorporated into the polyurethane resin backbone during the reaction (paragraphs [0016] - [0017]). Such a reactive catalyst is however inferior in the gelling

reaction (the reaction of a polyol with an isocyanate), and therefore leads to polyurethane resins with inadequate physical properties, such as hardness (paragraphs [0017] - [0018]). The patent thus sets out to provide a catalyst composition capable of obtaining a polyurethane product with good productivity and moldability, without bringing about an odour problem (paragraph [0025]).

Independent claim 1 of the main request is directed to a catalyst composition for the production of a polyurethane resin, which, in summary, comprises

- a hydroxyalkyltriethylenediamine or hydroxytriethylenediamine (A) chosen from one or more compounds defined by structure (2a), (2b), (2c), and (2d), and
- an amine compound (B), chosen from a list of specific compounds, or
- a tertiary amine compound (C) having a value of blowing reaction rate constant / gelling reaction rate constant of at least 0.5, chosen from a list of specific compounds.

The blowing reaction mentioned in claim 1 refers to the reaction of the isocyanate with water to generate carbon dioxide, which is incorporated into the polyurethane foam (see e.g. D4, column 1, lines 34-55).

Contested claim 1 therefore concerns catalysts compositions comprising either (A) and (B), or (A) and (C).

2. Admittance - the respondent's experimental data
 - 2.1 With the letter dated 22 February 2022, the respondent submitted, in point 1, experimental data comparing the selectivity and activity of a catalyst composition according to D1, example 1, and a catalyst according to present claim 1. The data was submitted in the context of inventive step vis à vis D1, and according to the respondent, was intended to support the formulation of the objective technical problem vis à vis D1 as the provision of an alternative catalyst composition to the composition of example 1 of D1.
 - 2.2 The appellant requested that the respondent's experimental data not be admitted into the proceedings pursuant to Article 13(2) RPBA 2020. There were no exceptional circumstances nor cogent reasons which could justify admittance, and its submission approximately three weeks before oral proceedings represented a tactical abuse of procedure.
 - 2.3 The board's view is as follows. According to Article 24 and 25(3) RPBA 2020, where the summons to oral proceedings has been notified before the date of the entry into force of the revised version of the Rules of Procedure of the Boards of Appeal, i.e. before 1 January 2020, Article 13(2) RPBA 2020 shall not apply. In the present case, a summons to oral proceedings (first scheduled to take place on 23 November 2021 and subsequently cancelled) was issued dated 27 November 2020, and was thus notified after the entry into force of the revised version of the RPBA. Consequently, Article 13(2) RPBA 2020 applies to the admittance of the respondent's experimental data.

According to this provision, any amendment to a party's appeal case made after notification of a summons to oral proceedings shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.

- 2.4 The respondent first argued that the experimental data did not represent an "amendment to the party's appeal case" in the context of Article 13(2) RPBA 2020. Rather, the data was fully in line with the position of the respondent set out earlier in written appeal proceedings. The data was submitted due to the perceived "*risk of considering an alternative [objective technical problem] as something having worse efficiency*". This issue was clarified by the new experimental data, which demonstrated that a catalyst composition according to claim 1 provided similar results, in terms of selectivity and conversion, to the catalyst composition of D1, and would support the respondent's submissions regarding inventive step.
- 2.5 The board cannot follow the respondent's position. If the experimental data were not to add anything to the respondent's case as argued, it must be questioned why it was submitted in the first place, and why the respondent would seek to have it admitted into the proceedings. Furthermore, by arguing that the experimental data demonstrated a specific effect, namely that the catalyst of claim 1 had a similar efficiency to that of D1 as set out above, the respondent indicted that the data is in fact relevant in the assessment of inventive step, and indeed in the formulation of the objective technical problem. Consequently, the filing of the experimental data can only be understood as an amendment to the respondent's

appeal case, and is therefore subject to the requirements of Article 13(2) RPBA 2020 in relation to its admittance.

2.6 As justification for the submission of the experimental data at such a late stage of the appeal proceedings, the respondent argued that it had been triggered by the surprising preliminary opinion of the board in relation to inventive step vis à vis D1, set out in the communication pursuant to Article 15(1) RPBA 2020. The respondent further argued that it was in the interest of the proceedings to have the experimental data admitted.

2.7 However, as stated by the board during oral proceedings and accepted by the respondent, the board's communication in relation to inventive step vis à vis D1 was based only on aspects of the case already comprised within the written submissions of the parties in appeal proceedings. In this regard, the board also notes that the relevant inventive step objections starting from D1 as closest prior art were addressed extensively in the appellant's statement of grounds of appeal, submitted in November 2017 (Section 3.1, pages 4-13). Furthermore, the fact that the board in its communication expressed a preliminary opinion to the disadvantage of the respondent cannot be seen as a surprising development justifying further submissions, but rather as a conceivable eventuality for which parties to appeal proceedings must be prepared. Finally, the question of whether the admittance of the experimental data was in the "interest of the proceedings" as argued by the respondent is not an exceptional circumstance justifying admittance pursuant to Article 13(2) RPBA 2020, since it in no way explains or justifies the late filing.

- 2.8 No other reasons for the late filing of the experimental data were submitted by the respondent. Consequently, the respondent failed to demonstrate any exceptional circumstances justifying admittance in accordance with Article 13(2) RPBA 2020.
- 2.9 In relation to the timing of the filing of the experimental data, the respondent submitted that although it was available on 19 November 2021, it had not been possible to file it in a written submission before oral proceedings, initially scheduled for 23 November 2021 (and subsequently cancelled at short notice). When asked during oral proceedings why the experimental data was submitted only with the letter of 22 February 2022, shortly before the rescheduled oral proceedings, and not as soon it was available, the respondent expressed the view that there was no difference between November 2021 and February 2022 in terms of the applicability of Article 13(2) RPBA 2020. The experimental data was filed only on the later date because the respondent had chosen to take additional time to evaluate whether the experimental data was relevant or not.
- 2.10 While it is correct that Article 13(2) RPBA 2020 would apply independently of whether the experimental data was submitted in November 2021 or February 2022, the circumstances are not the same. In particular, the respondent's admission that it purposely withheld the experimental data and chose to take additional time to evaluate the data also indicates an implicit choice, whether conscious or not, to deprive the appellant of said additional time it would otherwise have had to consider the data. This unnecessary delay at least contributed to the appellant having insufficient time

before oral proceedings to prepare an appropriate response, and has no acceptable justification. In the view of the board, the withholding of the experimental data by the respondent from November 2021 until its submission with the letter of 22 February 2022 represents a strategic measure employed by the appellant to improve its case against the adverse party, and thus amounts to an abuse of procedure. This in itself is sufficient grounds not to admit the experimental data into the appeal proceedings.

Accordingly, the board decided not to admit the experimental data contained in point 1 of the respondent's letter dated 22 February 2022 into the proceedings in accordance with Article 13(2) RPBA 2020.

3. Closest prior art

The appellant submitted that the subject-matter of claim 1 of the main request lacked inventive step over D1.

It was not contested by the respondent that document D1 constituted a suitable starting point for the assessment of inventive step. The board sees no reason to differ.

D1 discloses tertiary amine catalyst compositions for preparing polyurethane foams (column 1, lines 11-13), and addresses the same issue as the present patent, namely odour problems associated with volatile amines (D1, column 1, lines 24-28). D1 proposes the use of catalyst compositions comprising a family of hydroxy-functional amines such as 3-hydroxymethyl quinuclidine (column 2, lines 47-54). In example 1, two polyurethane foams were prepared and compared:

- using a first catalyst composition comprising 3-hydroxymethyl quinuclidine ("3-HMQ" in D1, table 1) and bis(dimethylaminoethyl)ether ("DABCO BL-11" in table 1 of D1), and
- using a second catalyst composition differing from the first in that 3-hydroxymethyl quinuclidine was replaced with triethylenediamine (DABCO 33LV in D1, table 1)

Example 3 of D1 discloses a comparison of the selectivities and activities of 3-hydroxymethyl quinuclidine with those of *inter alia* triethylenediamine and 2-hydroxymethyltriethylenediamine.

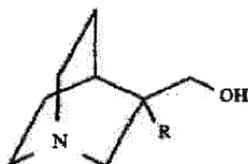
The parties were in agreement that the first catalyst composition of example 1 of D1 referred to above, comprising 3-hydroxymethyl quinuclidine and bis(dimethylaminoethyl)ether, represented a suitable starting point for the assessment of inventive step of the claimed subject-matter. The board also sees no reason to differ.

4. Distinguishing feature

That bis(dimethylaminoethyl)ether disclosed in example 1 of D1 is the same compound as bis(2-dimethylaminoethyl)ether listed in claim 1 as a compound (C) was not disputed.

Compound (A) of claim 1 includes under its definition the compound 2-hydroxymethyltriethylenediamine. This compound was employed in the examples of the patent (e.g. table 6). It differs from the compound 3-hydroxymethyl quinuclidine of example 1 of D1 in that it comprises a nitrogen atom in place of the carbon

atom in the bridgehead position (the carbon atom which is shared by the rings of the bicyclic system). The structure of 3-hydroxymethyl quinuclidine is as follows (R = H):



Therefore the distinguishing feature of contested claim 1 is the structure of compound (A). This corresponds to the distinguishing feature over D1 as put forward by the respondent (reply, page 21, third paragraph).

5. Problem solved

- 5.1 According to the respondent, the technical effect of the distinguishing feature set out above was that an alternative catalyst composition having a similar efficiency to the composition of D1 had been provided. This was demonstrated in particular by the results of example 35 (patent, table 6) and comparative examples 22 and 23 of the patent (table 7).
- 5.2 However, there is no data on file directly comparing the catalyst composition of claim 1 with that of D1, and thus no direct evidence of an effect linked to the distinguishing feature. This was not disputed by the respondent. Example 1 of D1 however showed that catalyst compositions comprising either 3-hydroxymethyl quinuclidine or triethylenediamine, in combination with bis(2-dimethylaminoethyl)ether, were similar in terms of efficiency on an equimolar level (D1, table 1; "DABCO 33LV" corresponding to triethylenediamine; see also column 6, lines 40-49). Therefore, the respondent reasoned, if efficiency on a equimolar level were also to be demonstrated for a composition comprising either

2-hydroxymethyltriethylenediamine (a compound (A) of claim 1) or triethylenediamine, in combination with bis(2-dimethylaminoethyl)ether, then it could indirectly be concluded that the composition of claim 1 was similar to that of example 1 of D1 comprising 3-hydroxymethyl quinuclidine in terms of efficiency on an equimolar level. In the view of the board, if demonstrated, such an effect could in principle serve as sufficient indirect evidence of the alleged effect of providing a catalyst with similar efficiency to that of example 1 of D1.

- 5.3 In this context, the respondent compared the results of example 35 of the patent comprising 2-hydroxymethyltriethylenediamine, i.e. compound (A), and bis(2-dimethylaminoethyl)ether, i.e. compound (C) according to claim 1 with the composition of comparative examples 22 and 23 of the patent comprising triethylenediamine and bis(2-dimethylaminoethyl)ether. The reagents and results of these examples, among others, were tabulated by the appellant in the letter of 25 November 2020 on page 5:

| | Example 35 | Comparative example 22 | Comparative example 23 | Example 33 |
|---|------------|------------------------|------------------------|------------|
| | [wt.-%] | | | |
| TEDA* | | 0.35 | 0.21 | |
| 2-HMTEDA** | 0.24 | | | 0.69 |
| 2-(dimethylamino-ethyl)ether | 0.24 | 0.17 | 0.21 | 0.17 |
| | in [mmol]* | | | |
| TEDA | | 3.12 | 1.87 | |
| 2-HMTEDA | 1.69 | | | 4.85 |
| 2-(dimethylamino-ethyl)ether ("TOYOCAT-ET") | 1.50 | 1.06 | 1.31 | 1.06 |
| Cream time | 8 | 11 | 11 | 10 |
| Gel time | 61 | 62 | 62 | 61 |
| Rise time | 63 | 78 | 70 | 76 |

* TEDA = triethylenediamine ("DABCO 33LV" in D1)

** 2-HMTEDA = 2-hydroxymethyl triethylenediamine

*** 2-(dimethylamino-ethyl)ether ("TOYOCAT-ET" in the contested patent and DABCO BL-11 in D1)

**** molecular weights: TEDA 112,2 g/mol; 2-HMTEDA 142,2 g/mol, 2-(dimethylamino-ethyl)ether 160.2 g/mol

As noted by the appellant however, example 35 differs from comparative examples 22 and 23 not only in the nature of the gelling catalyst (2-hydroxymethyltriethylenediamine or triethylenediamine), but also in the amount thereof, both in terms of wt.% (0.24, 0.35 and 0.21 wt.% respectively) and concentration in mmol (1.69, 3.12 and 1.87 respectively). Furthermore, the respective compositions also differ in the amount of bis(2-dimethylaminoethyl)ether (the blowing catalyst corresponding to compound (C) of contested claim 1), both in terms of wt.% (0.24, 0.17 and 0.21 respectively) and concentration in mmol (1.50, 1.06 and 1.31). Therefore, even though the results in terms of cream time, gel time and rise time for these examples may indicate a similarity in the efficiency of the respective catalysts, these effects cannot be

attributed to the mere replacement of triethylenediamine by 2-hydroxymethyltriethylenediamine.

5.4 Furthermore, in contrast to example 35 of the patent, as noted by the appellant, example 33 thereof does not differ from comparative example 22 in terms of the amount of bis(2-dimethylaminoethyl)ether (both 1.06 mmol), and differs only in the amount of triethylenediamine or 2-hydroxymethyl triethylenediamine employed (3.12 and 4.85 mmol, respectively). Therefore, despite the respondent's arguments to the contrary, these examples are more suitable for demonstrating an effect, or a lack thereof, linked to the replacement of triethylenediamine with 2-hydroxymethyltriethylenediamine. In this context, the results for examples 33 and comparative example 22 are very similar in terms of cream time, gel time and rise time. However, in order to achieve these similar results, a larger amount of 2-hydroxymethyltriethylenediamine is required in example 33, amounting to more than 50% in millimolar terms, and approximately 100% in terms of wt.% (0.35 versus 0.69%).

5.5 Consequently, the respondent failed to demonstrate that 2-hydroxymethyltriethylenediamine in a composition according to claim 1 has a similar efficiency to the same composition comprising triethylenediamine in place of 2-hydroxymethyltriethylenediamine. Therefore, it also cannot be concluded that catalyst compositions according to contested claim 1 possess a similar efficiency to that comprising 3-hydroxy quinuclidine disclosed in example 1 of D1, as alleged by the respondent. On the contrary, the examples in the patent

demonstrate that the use of 2-hydroxymethyltriethylenediamine is inferior to the use of triethylenediamine, and therefore also 3-hydroxy quinuclidine, in terms of catalyst efficiency. As set out by the appellant (e.g. statement of grounds of appeal, page 10, second paragraph - page 11, sixth paragraph, and letter dated 25 November 2020, page 6, first paragraph), this amounts to a disadvantageous modification compared to closest prior art D1.

5.6 Consequently, the objective technical problem underlying the subject-matter of contested claim 1 is at best the provision of a further low odour catalyst composition for the production of polyurethane foams.

6. Obviousness

6.1 As set out above, example 3 of D1 concerns a comparison of the selectivity and activity of 3-hydroxymethyl quinuclidine (as used in example 1 of D1) with further gelling catalysts, including 2-hydroxymethyltriethylenediamine (as defined in contested claim 1 as compound (A)).

6.2 Hence, D1 itself discloses 2-hydroxymethyltriethylenediamine as an alternative to 3-hydroxymethyl quinuclidine. The skilled person faced with the above mentioned problem of providing a further catalyst composition would thus have replaced 3-hydroxymethyl quinuclidine by 2-hydroxymethyltriethylenediamine and would thereby have arrived at the subject-matter of claim 1.

The board acknowledges that according to the above example of D1, 2-hydroxymethyltriethylenediamine has a

lower initial selectivity to the gelling reaction than 3-hydroxymethyl quinuclidine (e.g. 0.58 compared to 0.36 after 0.5 minutes), and a lower activity after a given time period (e.g. 54.8% isocyanate conversion after 8 minutes compared to 79.4%). The skilled person would thus have learned from D1 that 2-hydroxymethyltriethylenediamine is inferior to 3-hydroxymethyl quinuclidine in terms of providing, on an equimolar level, a reactivity match for triethylenediamine (D1, paragraph bridging column 8 and 9), i.e. it is inferior in catalyst efficiency. This result was also acknowledged by the appellant.

- 6.3 However, the board does not agree to the respondent's argument that in view of this teaching in D1, the skilled person would not have replaced 3-hydroxymethyl quinuclidine by 2-hydroxymethyltriethylenediamine.

As set out above, the objective technical problem underlying the subject-matter of contested claim 1 does not include the achievement of a similar efficiency with triethylenediamine, but merely requires the provision of a further catalyst composition to that of example 1 of D3, thus including one that is inferior.

- 6.4 Consequently, the above statement in D1 concerning the inferiority of 2-hydroxymethyltriethylenediamine over 3-hydroxymethyl quinuclidine would not have prevented the skilled person, wishing to solve the objective technical problem as set out above, from replacing 3-hydroxymethyl quinuclidine in the composition of example 1 of D1 with 2-hydroxymethyltriethylenediamine tested in example 3 of D1. In doing so, the skilled person would have arrived at the subject-matter of claim 1.

Consequently, the subject-matter of claim 1 lacks inventive step pursuant to Article 56 EPC.

Auxiliary request 1

7. The set of claims of auxiliary request 1 differs from that of the main request in that in claim 1, the compound "N-methylpiperazine" is deleted from the list of compounds (B).

The deletion of "N-methylpiperazine" was submitted by the respondent to overcome an objection in relation to sufficiency of disclosure. This amendment is of no relevance to the conclusion in relation to inventive step for claim 1 of the main request. Therefore, the subject-matter of claim 1 of auxiliary request 1 lacks inventive step pursuant to Article 56 EPC for the same reasons as provided for claim 1 of the main request.

Auxiliary request 2

The set of claims of auxiliary request 2 differs from that of the main request in that in claim 1, "bis(2-dimethylaminoethyl)ether" is deleted from the list of compounds (C).

8. Admittance
 - 8.1 Appellant's submissions dated 25 November 2020
 - 8.1.1 The respondent requested that the submissions of the appellant in the letter dated 25 November 2020 (section 2.1) in relation to auxiliary request 2 not be admitted into the proceedings pursuant to Article 13(1) RPBA 2020. Since the set of claims of auxiliary request 2 was submitted with the reply to the

statement of grounds of appeal, it was in its reply dated 4 July 2018 that the appellant should have set out its complete case in relation to this claim request. The further submissions in the letter dated 25 November 2020 were therefore late filed, and not to be admitted.

- 8.1.2 Since the appellant's letter was filed after the reply to the statement of grounds of appeal, Article 13(1) RPBA 2020 applies to the admittance thereof. This provision stipulates *inter alia* that any amendment to a party's appeal case after it has filed its grounds of appeal or reply is subject to the party's justification for its amendment and may be admitted only at the discretion of the board.
- 8.1.3 The board notes that in the letter dated 4 July 2018 (section 2.2), the appellant had previously commented on inventive step with regard to auxiliary request 2. Therein, the appellant stated that "[s]ince all compounds listed under compound (C) are known blowing catalysts, deletion of bis(2-dimethylaminoethyl)ether cannot provide inventive step for the claims of Auxiliary request 2" . It was also submitted (albeit in relation to auxiliary request 3) that all compounds (B) of claim 1 were also known blowing catalysts.
- 8.1.4 In the further letter dated 25 November 2020, in the section related to auxiliary request 2 (section 2.1), the appellant submitted that the listed amines of compound (B) of claim 1 were disclosed in D4, D7 and D8, while the listed compounds (C) of claim 1 were disclosed as blowing catalysts in D4, D7, D8b, D12 and D13. Finally, it was argued that the skilled person starting from D1 would have known to exchange 2-dimethylaminoethyl)ether used as a blowing catalyst

in example 1 of D1 with the known blowing catalysts in the art.

8.1.5 The board, acknowledges that, compared to the earlier submission of 4 July 2018, new facts are presented in terms of the references to specific documents disclosing the blowing catalysts of contested claim 1, i.e. compounds (B) and (C). Therefore, the appellant's submission represents an amendment to the appellant's case within the meaning of Article 13(1) RPBA 2020. However, the appellant's submissions merely develop the objections already outlined with the letter of 4 July 2018 further. Moreover, the documents cited in this regard are limited in number. Furthermore, the submission is not complex in nature, and having been filed almost a year before the originally scheduled oral proceedings, the respondent had been provided with adequate time to study it and to react thereto.

8.1.6 The respondent furthermore argued that these submissions were filed one day after EPO order Form 3010 was published in the register on 24 November 2020, indicating that oral proceedings were to be held. The first summons to oral proceedings in the present case was issued with a date of 27 November 2020. Therefore, it was credible that the submissions were ready before this date, and that the appellant had purposely awaited the publication of said order to facilitate the filing of its submissions as late as possible, but before Article 13(2) RPBA 2020 applied.

These allegation are however mere circumstantial speculation, are not supported by any evidence, and therefore were not taken into account.

8.1.7 For these reasons, pursuant to Article 13(1) RPBA 2020, the board decided to admit the appellant's submissions in relation to auxiliary request 2, filed with the letter dated 25 November 2020.

8.2 Admittance of appellant's submission concerning "pentamethyldiethylenetriamine"

The respondent argued during oral proceedings that the appellant's submission concerning the specific compound pentamethyldiethylenetriamine, disclosed in D4, had not been raised in written proceedings, and therefore was not to be admitted into the proceedings.

However, as clarified by the board during oral proceedings, the appellant's submission based on this disclosure was part of the appellant's letter of 25 November 2020 (page 7, first paragraph) and was thus part of the appeal proceedings.

9. Inventive step - Article 56 EPC

9.1 The appellant submitted that the subject-matter of claim 1 of this claim request lacked inventive step over the disclosure in example 1 of D1 in combination with document D4.

9.2 Distinguishing features and problem solved

It was undisputed that claim 1 of this request is distinguished from example 1 of D1 in that

- a compound (A), which may be 2-hydroxymethyltriethylenediamine, is employed in replacement of 3-hydroxymethyl quinuclidine used in D1 (as for claim 1 of the main request, above); and

- a compound (C) is employed, chosen from a list not including bis(dimethylaminoethyl)ether used in D1.

No specific technical effect was attributed by the respondent to the use according to contested claim 1 of a compound (C) compared to the use in example 1 of D1 of bis(dimethylaminoethyl)ether. Consequently, the objective technical problem underlying the subject-matter of claim 1 of auxiliary request 2 remains the same as provided for claim 1 of the main request as set out above, namely the provision of a further low odour catalyst composition for the production of polyurethane foams.

9.3 Obviousness

9.3.1 As set out above in relation to claim 1 of the main request, the skilled person would have replaced 3-hydroxymethyl quinuclidine with 2-hydroxymethyltriethylenediamine according to compound (A) of claim 1 in order to solve this problem.

9.3.2 Moreover, the skilled person wishing to solve said problem would also have replaced bis(2-dimethylaminoethyl)ether used in example 1 of D1 with a compound listed as compound (C) of contested claim 1. D1 is focused on the nature of the gelling catalyst and sets out to provide specific catalysts, such as 3-hydroxymethyl quinuclidine, which promote the gelling reaction (D1, column 2, line 47 - column 3, line 12). Although bis(dimethylaminoethyl)ether was used in example 1, there is no indication in D1 that this particular blowing catalyst possesses any specific effect, nor that there is any limitation in the nature of the blowing catalyst which may be employed.

As also submitted by the appellant, suitable blowing catalysts were known in the art at the priority date claimed in the present patent. D4, a patent document also concerned with the production of polyurethanes, discloses pentamethyldiethylenetriamine as a "suitable blowing catalyst" (column 7, lines 16-18). This compound is the same as N,N,N',N'',N''-pentamethyldiethylenetriamine, listed in claim 1 as a compound (C).

- 9.3.3 Consequently, starting at example 1 of D1, the skilled person seeking to solve the above objective technical problem, in addition to replacing 3-hydroxymethyl quinuclidine as set out for claim 1 of the main request, would have replaced the blowing catalyst of example 1 with any known blowing catalyst, such as pentamethyldiethylenetriamine disclosed in D4, and thereby would have arrived at the subject-matter of claim 1.
- 9.3.4 Further arguments of the respondent failed to convince the board. It was argued that only an ex post facto analysis could lead to the conclusion that the skilled person would have combined D1 with D4 in order to arrive at the subject-matter of contested claim 1. Specifically, there would have been no reason for the skilled person to chose to replace 3-hydroxymethyl quinuclidine used in example 1 of D1 with a lower efficiency compound, namely 2-hydroxymethyltriethylenediamine as compound (A) of claim 1, and at the same time choose a blowing catalyst from D4 without knowing whether it could be applied in the process of D1.
- 9.3.5 However, to reiterate what was stated above in relation to the main request, in order to solve the objective

technical problem of providing of a further catalyst composition for the production of polyurethane foams, the skilled person would have substituted 3-hydroxymethyl quinuclidine in example 1 of D1 with 2-hydroxymethyltriethylenediamine from example 3 thereof. Furthermore, in order to provide a further blowing catalyst, in the absence of an indication in D1 that only a specific blowing catalyst or catalysts were appropriate, there is no reason why the skilled person would not have looked to prior art disclosures teaching suitable alternative blowing catalysts which may be used as a replacement. Consequently, the respondent's arguments in this regard must fail.

- 9.4 For the sake of completeness, in the context of this issue, the respondent had requested that the appellant's submissions dated 29 September 2021 relating to the auxiliary requests not be admitted into the proceedings under Article 13(2) RPBA 2020.

Since the board reached the conclusion that the subject-matter of claim 1 lacked inventive step over D1 without taking these submissions into account, no decision on admittance was required (minutes of oral proceedings, page 7, second paragraph).

- 9.5 It follows that the subject-matter of claim 1 of auxiliary request 2 lacks inventive step pursuant to Article 56 EPC.

Auxiliary request 3

The set of claims of auxiliary request 3 differs from that of the main request in that the catalyst composition of claim 1 is limited to compound (A) and (B), i.e. compound (C) is deleted.

10. Admittance - appellant's submissions dated 25 November 2020

Similarly to that set out above for auxiliary request 2, the respondent requested that the submissions of the appellant in the letter dated 25 November 2020 (section 2.2) in relation to auxiliary request 3 not be admitted into the proceedings pursuant to Article 13(1) RPBA 2020.

The board decided to admit these submissions in relation to auxiliary request 3 into the proceedings, for the same reasons as provided for in relation to the submissions in the same letter concerning auxiliary request 2, above.

11. Inventive step - Article 56 EPC

The appellant submitted that the subject-matter of claim 1 of this request lacked inventive step over D1 as closest prior art in combination with document D4, D7, D8b, or D12.

11.1 Distinguishing features and problem solved

It was undisputed that claim 1 of this request is distinguished from example 1 of D1 in that

- a compound (A), which may be
2-hydroxymethyltriethylenediamine, is employed in

replacement of 3-hydroxymethyl quinuclidine used in D1 (as for claim 1 of the main request, above);
and

- a compound (B) is employed, chosen from a list not including bis(2-dimethylaminoethyl)ether used in D1.

No specific technical effect was attributed by the respondent to the use according to contested claim 1 of a compound (B) compared to the use in example 1 of D1 of bis(dimethylaminoethyl)ether. Consequently, the objective technical problem underlying the subject-matter of claim 1 of auxiliary request 3 remains the same as provided for the respective claim 1 of the main request and auxiliary request 2 as set out above, namely the provision of a further low odour catalyst composition for the production of polyurethane foams.

11.2 Obviousness

11.2.1 The solution proposed in claim 1 of auxiliary request 2 was found to be obvious on the basis that the skilled person would have recognised that the specific blowing catalyst used in example 1 of D1 could be replaced by other suitable blowing catalysts known in the art, such as that disclosed in D4 as set out above.

11.2.2 The appellant argued that the same applied in relation to claim 1 of auxiliary request 3, because also the listed compounds (B) of claim 1 were known to the skilled person. Specifically, D4 disclosed N,N-dimethylethanolamine (column 7, lines 5-6), which was the same compound as N,N-dimethylaminoethanol listed in claim 1 as a compound (B).

11.2.3 However, even if it is accepted that the respective compounds are identical, which was disputed by the

respondent, N,N-dimethylethanolamine in D4 is disclosed in a list of compounds provided as examples of "suitable gelling catalysts" (D4, column 7, lines 1-6). In view of the fact, as set out above, that the skilled person starting at example 1 of D1 would have sought an alternative blowing catalyst to bis(dimethylaminoethyl)ether, there would have been no reason for the skilled person to replace this compound with a gelling catalyst such as N,N-dimethylethanolamine with a view to solving the above-mentioned problem.

11.2.4 The appellant also argued that the compounds (B) of claim 1 were disclosed in D7 (paragraphs 0017] to [0021]) and D8b (paragraph [0017]). However, even accepting that an overlap exists between the amine catalysts of these documents and those listed in claim 1 as compound (B), neither of these documents teaches that the catalysts in question are blowing catalysts. Therefore, similarly as for D4, there would have been no reason for the skilled person to chose any of these compounds to replace the bis(dimethylaminoethyl)ether blowing catalyst of example 1 of D1.

11.2.5 The appellant also referred to patent document D12, which disclosed N,N,N'-trimethylaminoethylethanolamine (a compound (B) according to claim 1) as an amine catalyst in claim 2. The appellant argued that the skilled person would have chosen this catalyst to replace the blowing catalyst of example 1 of D1, in particular in view of the fact that D12 taught the skilled person that this catalyst could be combined with others (D12, column 2, lines 37-41).

However, even if there was a general teaching in D12 that the catalyst thereof could be combined with other catalysts, D12 does not provide any indication to the skilled person that it may be used to replace the blowing catalyst used in example 1 of D1.

- 11.2.6 The appellant, referring to D4 (column 1, lines 32-38) and the respondent's reply to the statement of grounds of appeal (page 15-16) further submitted that a balance had to be found between the gelling and blowing reactions, and the skilled person knew that amines having particular groups could be used interchangeably as both gelling and blowing catalysts. However, as noted by the respondent, there is no evidence on file supporting this allegation. In particular, there is no evidence on file demonstrating that specific catalysts known from the prior art cited by the appellant (i.e. D4, D7, D8b and D12) and listed in claim 1 under compound (B) were known to the skilled person to have such interchangeable properties. D4 for example provides a list of compounds suitable as gelling catalysts, and there is no indication that any of the gelling catalysts may also serve as blowing catalysts. Even if catalysts exist which promote both the gelling reaction and the blowing reaction equally, as set out in the appellant's reply to the statement of grounds (page 16, second paragraph), what is stated in said reply does not necessarily represent evidence of the common general knowledge of the skilled person at the effective date of the claimed subject-matter. More importantly however, even if accepted, no evidence has been provided showing that the skilled person would have considered the specific catalysts of D4, D7, D8b or D12 referred to by the appellant to have such properties, and that the skilled person would therefore have known that they could substitute the blowing

catalyst used in example 1 of D1. This argument therefore failed to convince the board.

11.2.7 Consequently, the subject-matter of claim 1 of auxiliary request 3 involves an inventive step pursuant to Article 56 EPC starting from D1 in combination with any of D4, D7, D8b or D12.

12. Admittance - inventive step objection based on D4 in combination with D3

During oral proceedings before the board, the appellant also submitted that the subject-matter of claim 1 of auxiliary request 3 lacked inventive step over D4 as closest prior art in combination with D3.

The appellant conceded that this objection had not been raised in the written submissions in relation to auxiliary request 3. It therefore represents an amendment to the appellant's case, and its admittance into the proceedings is governed by Article 13(2) RPBA 2020. This provision stipulates that any amendment to a party's appeal case made after notification of a summons to oral proceedings shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.

The appellant argued that the objection was raised in reaction to the board's earlier conclusion during oral proceedings on the inventive step in relation to claim 1 of auxiliary request 3 starting from D1, which was not foreseeable.

The board disagrees. It is for the appellant to present all objections in a timely manner. Therefore,

independently of whether the board's opinion with regard to D1 was foreseeable, it was the responsibility of the appellant to prepare for the possibility that the board may decide against it in relation to a specific objection, and accordingly, to submit all objections it considered relevant at the earliest possible stage in the proceedings. As noted by the respondent, despite filing additional submissions regarding the auxiliary requests in three successive letters (dated 4 July 2018, 25 November 2020, and 29 September 2021), none referred to an objection starting from D3 as closest prior art, let alone D3 in combination with D4.

Consequently, since no exceptional circumstances justified the submission during oral proceedings of the objection starting from D3 in combination with D4, the board decided not to admit it into the proceedings pursuant to Article 13(2) RPBA 2020.

13. The subject-matter of claim 1 of auxiliary request 3 therefore involves an inventive step pursuant to Article 56 EPC.

14. Since there were no further objections from the appellant in relation to inventive step or any other requirement of the EPC, the set of claims of auxiliary request 3 is allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent in amended form with the following claims and a description to be adapted thereto:

claims 1 to 5 of auxiliary request 3 filed with the reply to the statement of grounds of appeal.

The Registrar:

The Chairman:



N. Maslin

M. O. Müller

Decision electronically authenticated