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DECISION
of 3 September 2003

Case Number: T 0982/00 - 3.3.3
Application Number: 90309949.7
Publication Number: 0418039
IPC: C08G 18/08
Language of the proceedings: EN

Title of invention:

Polyurethane and/or polyurea dispersions in active hydrogen-containing compositions, a process for preparing same, and reaction products thereof with polyisocyanates

Patentee:

THE DOW CHEMICAL COMPANY

Opponent:

Huntsman International LLC

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 113(1), 123(2)

Keyword:

"Maintenance - in amended form"
"Amendments - broadening of claims (no)"
"Basis of Decision -. opportunity to comment (yes)"
"Novelty (yes)"
"Inventive step - problem and solution (yes)"

Decisions cited:

G 0009/92, G 0001/99

Catchword:

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Case Number: T 0982/00 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 3 September 2003

Appellant:
(Opponent)

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Decision under appeal:

Interlocutory decision of the Opposition
Division of the European Patent Office dated
8 June 2000 and issued in writing on 28 July
2000 concerning maintenance of European patent
No. 0418039 in amended form.

Composition of the Board:

Chairman: R. Young
Members: A. Däweritz
J. Van Moer

Summary of Facts and Submissions

I. The grant of European patent No. 0 418 039 in respect of European patent application No. 90 309 949.7, filed on 11 September 1990 and claiming the priority of 12 September 1989 of an earlier application in the United States of America (406000), was announced on 3 April 1996 (Bulletin 1996/14) on the basis of 11 claims.

Claims 1 and 9 to 11 as granted read as follows:

- "1. A process for preparing a product dispersion of a polyurethane [*sic*] and/or polyurea comprising reacting
- (A) a polyisocyanate with
 - (B) a coreactant material having an equivalent weight of up to 400 and a plurality of active hydrogen atoms attached to oxygen or nitrogen atoms, in the presence of
 - (C) a preformed solution or dispersion of a material containing urethane and/or urea groups in an isocyanate-reactive material which has an equivalent weight greater than 400, wherein
 - (i) the total of component (A), component (B), and the urethane/urea containing material of component (C) together comprises from 0.5 to 40 weight percent of the product dispersion, and
 - (ii) the material containing urethane and/or urea groups dissolved and or dispersed in the preformed solution or dispersion constitutes from 0.5 to 50 percent by

weight of the total of the said material, component (A), and component (B)."

- "9. A dispersion prepared according to the process of any of the foregoing claims.
10. A dispersion according to Claim 9, which is a dispersion of polyurethane and/or polyurea particles in an isocyanate-reactive material having an equivalent weight greater than 400, wherein said particles have a bimodal particle size distribution wherein at least 60 volume percent of the particles fall into two discrete size ranges, 5 to 75 volume percent of said particles in said discrete size ranges being larger particles having an average particle size, as measured by hydrodynamic chromatography (HDC), of at least 200 nm, and 25 to 95 volume percent of the particles in said discrete size ranges being smaller particles having average particle size, as measured by HDC, of 10 to 700 nm.
11. A reaction product of a polyisocyanate with an active hydrogen-containing composition comprising the dispersion of Claim 10."

The remaining Claims 2 to 8 were dependent claims relating to specific embodiments of the process according to Claim 1.

- II. On 19 December 1996, a Notice of Opposition was filed in which revocation of the patent in its entirety was requested on the grounds of lack of novelty and of

inventive step. In order to support these objections, the Opponent relied on three documents, including:

D1: US-A-4 452 923, and

D2: GB-A-2 072 204.

- (a) In reply to the objections raised in the Notice of Opposition, a first Main Request containing an amended version of Claim 1 was submitted by the Patent Proprietor by letter dated 11 June 1997.
- (b) In a further letter dated 3 May 2000, the Opponent cited an additional document and raised objections under Article 123(2) and (3) EPC with respect to Claim 1, as amended (page 1, item A). A further objection under Article 83 EPC raised in this letter was withdrawn in the appeal proceedings.
- (c) According to the Minutes of oral proceedings held on 8 June 2000 (which will be referred to as "Minutes" in this decision), the Patent Proprietor withdrew, at the start of the proceedings, the above amended claims and requested maintenance of the patent as granted. In the course of a discussion about novelty, (i) a "First Auxiliary Request" "attempting to clarify the issue of 'preformed'" (in the definition of component (C)) was submitted and later made the Main Request, and (ii) the description was adapted to this latter request (annex to the Minutes: page 1, last two lines; page 4, lines 4 to 6).

- (d) In this new Main Request, Claim 1 had been amended, whilst the remaining Claims 2 to 11 were maintained in their granted form.

Independent Claim 1 as amended reads:

- "1. A process for preparing a product dispersion of a polyurethane and/or polyurea, comprising

preforming in a first reaction step a solution or dispersion of a material containing urethane and/or urea groups in an isocyanate-reactive material which has an equivalent weight greater than 400,

and, in a second reaction step, reacting

- (A) a polyisocyanate with
- (B) a coreactant material having an equivalent weight of up to 400 and a plurality of active hydrogen atoms attached to oxygen or nitrogen atoms, in the presence of
- (C) the said preformed solution or dispersion of a material containing urethane and/or urea groups in an isocyanate-reactive material which has an equivalent weight greater than 400, wherein
 - (i) the total of component (A), component (B), and the urethane/urea containing material of component (C) together comprises from 0.5 to 40 weight percent of the product dispersion, and
 - (ii) the material containing urethane and/or urea groups dissolved and or dispersed in the preformed solution or dispersion

constitutes from 0.5 to 50 percent by weight of the total of the said material, component (A), and component (B)."

III. In an interlocutory decision dated 8 June 2000, issued in writing on 28 July 2000, the Opposition Division held that the patent in suit according to the Main Request met the requirements of the EPC and that the grounds of opposition did not prejudice maintenance of the patent as amended.

- (a) In particular, the decision held that the requirements of Article 83 EPC were met and that the amendments in Claim 1 of the new Main request were admissible under Articles 123(2) and 123(3) EPC. The basis for the feature "performing in a first step ..." was found in Example 1 of the application documents as originally filed.
- (b) As regards novelty, there was preformed, according to the patent in suit, a solution or dispersion (C) of a material containing urethane and/or urea groups in an isocyanate-reactive material which had an equivalent weight of greater than 400 in a first reaction step. Then, in a second step, a polyisocyanate (A) was reacted with a coreactant material (B), such as triethanolamine, in the presence of 0.5 to 50 % by weight of this component (C), relative to the total amount of the three components (A), (B) and (C).

According to D1, on the one hand, a one-step reaction of components (A) and (B) was carried out during which a preformed solution of type (C) could form (Example 1) and, on the other hand, a two-step such process (Example 3). However, the amount of preformed solution of the reaction product of (A) and (B) in Example 3 of D1 was outside the claimed range. Hence, novelty was acknowledged with regard to D1.

Since none of the other cited documents disclosed a two-step reaction as referred to above either, novelty was also acknowledged over each of these documents.

- (c) As regards inventive step, it was held that, as there was no hint in D1 to the use of a lower amount of up to 50% of such a preformed dispersion in order to improve the shrinkage behaviour of polyurethane foams prepared on the basis of these polyols and no hint in the other documents cited in these proceedings for the solution of the problem of high shrinkage behaviour of polyurethane foams based on PIPA polyols, the claimed subject-matter could not be rendered obvious by one or more of the cited prior art documents.

IV. On 29 September 2000, a Notice of Appeal was filed by the Opponent (Appellant) with simultaneous payment of the prescribed fee.

- (a) In the Statement of Grounds of Appeal, received on 22 November 2000, the Appellant maintained its

previous objections. In particular, the amendments in Claim 1 (as quoted in section II, above) violated Article 123(2) EPC and the claims lacked novelty and inventive step with respect to D1.

- (b) In reply to the appeal (letter dated 24 May 2001), the Respondent disputed that its former Main Request, directed to the maintenance of the patent in suit in the form as granted, had been abandoned in the oral proceedings before the Opposition Division. With reference to the minutes of the oral proceedings dated 8 June 2000, it was argued that, in the course of those proceedings, the Opposition Division had held that the Main Request lacked novelty in the light of Example 1 of D1 and that, subsequent to that decision, a "First Auxiliary Request" had been filed by the Patentee, which had then formed the basis for further discussions.

Consequently, it was to be understood from these facts that the main request had been that the patent in suit be maintained on the basis of the claims as granted. This request did not conflict with the principle of Decision G 9/92 of the Enlarged Board of Appeal (OJ EPO 1994, 875), "because the amendments requested by the Opposition Division were neither necessary nor helpful, in order to distinguish the invention as claimed from the cited reference D1". In the alternative, the patent should be maintained in the form in which it had been upheld by the Opposition Division (points 1 to 4 of that letter).

(c) In a letter dated 29 January 2002, these statements were disputed by the Appellant on the basis of the "Minutes" and the decision under appeal according to which the original main request of the Patent Proprietor had been withdrawn during the oral proceedings before the Opposition Division. Hence, the Patent Proprietor was not adversely affected by the decision under appeal. Moreover, the present case did not correspond to the exception recited in Decision G 1/99 of the Enlarged Board of Appeal (OJ EPO 2001, 381), where, otherwise, the Patentee would have been barred from amending the claims to meet a ground arisen only during the appeal procedure. Consequently, the Respondent was only entitled to defend the patent as maintained by the Opposition Division and the Board of Appeal was to apply the principles of the *reformatio in peius* for the benefit of the sole Appellant/Opponent.

V. By letter dated 11 July 2003, the Board was informed that the Respondent did not envisage being represented at the oral proceedings arranged for the 3 September 2003.

VI. The oral proceedings were held as scheduled in the presence of the Appellant, whose arguments may be summarised as follows:

(a) The reworded version of Claim 1 contravened Article 123(2) EPC, if it meant something different, when referring to a first reaction step for the preparation of component (C), than the

wording of its granted version (reaction of components (A) and (B) in the presence of "preformed" component (C)), as indicated in the decision by the different positions as to novelty of the two versions discussed. According to the Minutes, the Patentee had argued in favour of such a difference that "The skilled man would take 'preformed' to imply something other than the continuous addition ...". However, this was inconsistent with the statement on page 6, line 7 of the specification, that the process could be carried out continuously, since, according to page 4, last three lines of the specification, this statement applied to the entire process.

Hence, the amendment either brought in the concept of discontinuity between the first and second steps, which was not supported by the application as originally filed and therefore not allowable under Article 123(2) EPC, or it did not change the meaning of the claim, in which case the previous arguments to lack of novelty, which had been accepted by the Opposition Division, were also valid for reworded Claim 1.

To support this position, reference had already been made to the explanations of "to preform" (meaning "to form or shape beforehand") and "beforehand" (meaning "in anticipation, in advance; early") in Webster's New Collegiate Dictionary (1976, G. & C. Merriam Co., pages 100 and 907). These definitions made it clear that "preformed" did not provide support for two distinct separate reaction steps, but encompassed

the situation at some transient stage when, in a reaction process of the above reactants, the polyisocyanate was metered in slowly eg for a period of 5 to 10 minutes. Such a preformed solution or dispersion would also be formed in a continuous process in a tube or similar reactor where the individual reactants were added at different spots along the flow of the reaction mixture. Moreover, a staged addition of the polyisocyanate (continuously over a period of time or in separate portions) was also already referred to in D1 (column 3, line 30 *et seq.* and column 4, lines 34 to 63).

- (b) Hence, the reference to a preformed solution or dispersion (C) did not render Claim 1 novel over D1, since it would also occur as a transient product in D1. In the procedure described in Example 1 of the document, the situation defined in Claim 1 of the patent in suit would occur after about 2, 3, 4 or up to 5 minutes, since the particulars of the addition of the reactants in column 5, line 66 *et seq.* fulfilled the stoichiometric requirements of Claim 1. Moreover, analogously to the procedure as described in the examples of D2, the polyolamine would react with the polyisocyanate in a fast reaction, still during the feed of the polyisocyanate in Example 1 of D1. Hence, the second reaction step in the sense of Claim 1 would start in the latter example after about 5 minutes.

(c) With regard to inventive step, it was pointed out that D1 representing the closest state of the art addressed shrinkage of foams prepared with PIPA polyols (column 4, line 15), and the results of D1 were at least close enough to those in the patent in suit that it could be concluded that the properties would be the same.

VII. The Appellant requested that the decision under appeal be set aside and that the patent be revoked or, in the alternative, that the case be referred back to the first instance for further prosecution.

According to the written submissions, the Respondent requested maintenance of the patent, as granted, or, in the alternative, in the form in which it was upheld by the Opposition Division.

Reasons for the Decision

1. The appeal is admissible.
2. Since all the parties had been summoned to the oral proceedings in due time, the proceedings were continued in the absence of the Respondent in accordance with Rule 71(2) EPC.
3. *Sufficiency of disclosure*

The objection under Article 83 (or 100 (b)) EPC, which had already been held unsuccessful in the decision under appeal (point 5 of the reasons; cf the "Minutes", page 3, last paragraph), was withdrawn by the

Appellant. Therefore, the Board holds the requirements of Article 83 EPC to be met.

4. *Admissibility of Requests of the Respondent*

4.1 According to Decision G 9/92 (above; point 2 of the Order), the Patent Proprietor is primarily restricted during appeal proceedings to defending the patent in the form in which it was maintained by the Opposition Division in its interlocutory decision, if the opponent is the sole appellant. However, Decision G 1/99 (OJ EPO 2001, 381; Order) defines an exception from this principle in order to meet an objection put forward by the opponent/appellant or the Board during the appeal proceedings, in circumstances where the patent as maintained in amended form would otherwise have to be revoked as a direct consequence of an inadmissible amendment held allowable by the Opposition Division in its interlocutory decision.

4.2 In the present case, the initial request of the Patent Proprietor in the oral proceedings before the Opposition Division had been directed to the rejection of the opposition and maintenance of the patent as granted ("Minutes", page 1: "Requests"). According to the last two lines of the same page, "A First Auxiliary Request attempting to clarify the issue of 'preformed' was introduced." Thereafter, once it had been made clear that the main request lacked novelty, the oral proceedings were continued with a discussion of the case on the basis of the First Auxiliary Request.

The last page (page 4) of the annex to the "Minutes", directly above the reference to the decision, contains a paragraph with the heading "First Request -> Main Request." which reads:

"The Patentee agreed to making the First Auxiliary Request his Main Request and adapted the description to this request during the proceedings."

Annexed to the "Minutes" are three sheets containing amended pages 2 and 3 of the printed description and an insert with the wording of Claim 1 as amended, and one sheet showing Claim 1 as amended, each initialled or signed by the Representative. On the sheet containing Claim 1, the heading "First Auxiliary Request" has been amended in handwriting to "Main Request".

- 4.2.1 Hence, it would indeed appear that the form in which the Opposition Division maintained the patent was, in fact, that requested as Main Request by the Respondent at the oral proceedings.
- 4.2.2 This view is reinforced by the absence of any complaint by the Respondent that the decision under appeal involved a procedural violation - as would have been the case if the request for maintenance of the patent as granted had been maintained up to the point of decision and then ignored in the decision itself - and in particular by the fact that no appeal in this respect was filed.
- 4.2.3 Since, furthermore, the Respondent chose not to attend the oral proceedings before the Board, and the representatives of the Appellant who were present were

not the same as those recorded as having been present at the oral proceedings before the Opposition Division, the Board is forced to rely on the written statements on the file.

- 4.2.4 In the present case, in view of the written evidence before it, the Board concludes that the decision under appeal correctly reflects the requests of the Patent Proprietor/Respondent when the decision was announced.
- 4.3 It follows from this that the return, by the Respondent, to a request for maintenance of the patent as granted, in the letter dated 24 May 2001 (section IV(b), above), corresponds to a request for "*reformatio in peius*", ie an amendment of the decision under appeal to the disadvantage of the Appellant which is normally to be rejected (sections IV(c) and 4.1, above).
- 4.4 Moreover, the present case does not correspond to the exception recited in G 1/99 (above). According to items 7 and 8 in the Statement of Grounds of Appeal and the last sentence of item 1 in the reply thereto, dated 24 May 2001, the request already formed the basis of detailed discussions during the oral proceedings before the Opposition Division.

Consequently, the main request insofar as it calls for maintenance of the patent as granted, is not admissible (G 9/92; section 4.1, above).

Therefore and by default, the set of claims as annexed to the decision under appeal (ie Claim 1 forming the Main Request as submitted during the oral proceedings on 8 June 2000, and Claims 2 to 11 as granted) forms

the basis for these appeal proceedings and this decision.

5. *Admissibility of amendments*

References to the application as originally filed are printed in *italics*.

5.1 The Appellant disputed that Claim 1 as maintained by the Opposition Division complied with Article 123(2) EPC because Example 1 of the patent in suit was clearly not sufficient to establish a support for Claim 1 as amended in the description as filed. (Items 7 and 10 of the Statement of Grounds of Appeal).

5.2 On the other hand, the Respondent argued that "the language 'preformed solution or dispersion' taken together with the functional limitation that the 'material' must constitute from 0.5 to 50 % of the mixture" (feature (ii) of Claim 1) clearly required that the solution or dispersion had been made in a previous reaction step (letter dated 24 May 2001, item 7).

5.3 Moreover, in the "Minutes" (page 1, last sentence) the "First Auxiliary Request is classified as to "attempting to *clarify the issue* of 'preformed'" (emphasis added), ie the meaning of the original expression.

5.4 In this connection, a distinction is made in the application as filed and in the patent in suit between a dispersion made according to the claimed process and one of like composition, "but which is prepared in a

conventional one-step process" (page 3, lines 14 to 16; page 5, lines 25 to 30).

Moreover, it is stated that "The preformed solution or dispersion is advantageously prepared according to the same general procedure as described hereinafter, except of course it is not necessary to use a preformed solution or dispersion in its manufacture" (page 4, last complete sentence; page 12, lines 24 to 28). According to a preferred embodiment, "The reaction of the coreactant with the polyisocyanate is ... done by mixing the preformed dispersion and the coreactant, and then admixing the polyisocyanate to the resulting mixture" (page 6, lines 1/2; page 17, lines 4 to 7). Moreover, it is possible "to remove some or all of the particulate matter, if desired," from the preformed solution or dispersion (page 5, lines 6/7; page 13, lines 10 to 12). Finally, in all the examples, a route of preparation is followed involving two separate reaction steps A and B, described explicitly in Example 1, by reference to Example 1 in all the other examples.

- 5.5 Hence, it is clear that these passages in connection with condition (ii) of Claim 1, indicate that the "preformed solution or dispersion" as defined as component (C) of Claim 1 as granted has meant more than just the presence of a transient polymer in certain amounts at some undefined moment in the course of a continuing reaction (ie in a "conventional one-step reaction" yielding "a standard dispersion" as expressed by the Appellant, Statement of Grounds of Appeal: item 9; which would at least be similar to Comparative Dispersion A in the patent in suit: page 8, lines 30 to

32; page 26, last paragraph). Rather, the process of Claim 1 already required that the chemical entity was identifiable, in the sense that the above preformed solution or dispersion (which was referred to in the letter of the Respondent dated 11 June 1997, page 2, 2nd complete paragraph as a "seed polyol") was formed or shaped beforehand (cf the dictionary, section VI(a) above) and, consequently, was manifestly present in certain amounts when the reaction between components (A) and (B) in the second reaction step started. This set of circumstances has not been changed by the amendments in Claim 1.

- 5.6 Hence, the Board has come to the conclusion that the amendment of Claim 1 serves only "to clarify the issue of 'preformed'" and does not, therefore, change the meaning of the claim. This is also supported by the Respondent who had not regarded the amendments as being necessary or helpful, in order to distinguish the claimed subject-matter from D1 (section IV(b), above).
- 5.7 Consequently, the Board is satisfied that the wording of Claim 1 complies with Article 123(2) EPC.
- 5.8 The question of compliance with Article 123(3) EPC has not been addressed by the Appellant. In view of the wording of Claim 1, the Board sees no reason to raise this question either.
- 5.9 Hence, the requirements of Article 123(2) and (3) EPC are met.

6. *Relevant state of the art*

6.1 The patent in suit concerns "Polyurethane and/or polyurea dispersions in active hydrogen-containing compositions, a process for preparing same, and reaction products thereof with polyisocyanates". This type of dispersion will be referred to in this decision as "PIPA polyol".

6.2 Such dispersions are known from document D1.

6.2.1 They are "obtained by reacting a polyisocyanate with a tertiary-N-polyolamine in the presence of a first polyol in amounts such that the weight of the reaction product of the polyisocyanate and the polyolamine is from 40 to 80% of the combined weight of the reaction product and first polyol and subsequently diluting the reaction product with a second polyol, which is the same or different to the first polyol, to less than 40% by weight of the reaction product on the combined weight of the reaction product and polyols" (Claim 1 of D1).

According to a specific embodiment, this process can be carried out in such a way that the polyisocyanate is added in separate portions or different polyisocyanates are fed in the course of the reaction with intermediate or subsequent dilution with the same or different polyol (Claim 10). This specific method assists processing and avoids gelling when larger amounts of isocyanate are used (column 4, lines 34 to 64).

On the basis of this passage in column 4 and a further reference to the molar ratios of the reactants involved

(D1: column 3, lines 15 to 20), the Appellant had presented calculations to demonstrate that the procedure according to Claim 10 would result in product dispersions fulfilling feature (ii) of Claim 1 and, hence, to prove lack of novelty with regard to D1 (Statement of Grounds of Appeal, items 17 to 22). In accordance with a request of the Appellant to this effect in the oral proceedings, these calculations are, however, disregarded.

During the oral proceedings, the Appellant focused its arguments entirely on Example 1 of the document.

6.2.2 In this example, the preparation of two PIPA polyols ("Polyols A and B") is described.

In the preparation of Polyol A, described in the first part of the example, TELA (triethanolamine) was thoroughly mixed with Polyether X (an oxypropylated glycerol polyether tipped with ethylene oxide groups). To this mixture, TDI (toluene diisocyanate) was added over 5 to 10 minutes with good agitation. The reactants were used in such amounts which resulted in a high strength (50%) dispersion of Polyol A. No catalyst was used. The product dispersion was then diluted with further Polyether X to a solids content of 10%.

Then in its second part, the example goes on to state, "By way of comparison, ... Polyol B was prepared in the same way as Polyol A except that it was made directly as a 10% dispersion by adding 5.33 parts by weight of the TDI to a mixture of 90 parts by weight of Polyether X and 4.67 parts by weight of triethanolamine. 0.03 parts by weight of dibutyl tin dilaurate were required

to form the isocyanate [sic]/polyolamine polyaddition reaction product" (column 5, line 64 to column 6, line 3).

According to the Tables in column 6 of D1, the tensile properties of a foam obtained with Polyol B were inferior to those achieved with Polyol A. This is in line with the statement that high resilience (HR) polyurethane foams prepared from "high strength" (40 to 80 %) PIPA polyols after dilution to less than 40%, preferably 1 to 15%, exhibit better tensile properties than those prepared from diluted dispersions of low strength PIPA polyols (column 4, lines 21 to 30; column 6, the tables and lines 45 to 50).

- 6.2.3 In particular, the tensile properties are the properties of HR polyurethane foams to be improved by using the PIPA polyols according to D1 (column 1, lines 33 to 36).

Advantages are also achieved by using the PIPA polyols of D1 (ie those prepared according to Claim 1) "in respect of increased hardness and shrinkage properties" (column 4, lines 12 to 15). Properties, exemplified in the tables of the document relating to Examples 1 and 2, are the densities (core and overall), compression set, tensile strength, elongation at break, tear strength, compression hardness and resilience of some foamed products.

7. *Novelty*

- 7.1 In the oral proceedings, the Appellant relied essentially on the second part of Example 1 of D1

(section 6.2.2, above), because its product "Polyol B" having a solids content of 10% would directly and unambiguously fulfil feature (i) of Claim 1 under consideration.

When presenting its case, emphasis was put by the Appellant on the argument that this embodiment was carried out in the same way as for Polyol A, including the addition of the TDI over a period of 5 to 10 minutes. Moreover, due to the slow addition of the TDI to the TELA/Polyether X mixture and the fast reaction (within seconds or only a few minutes) between the two reactants TDI and TELA (as known from the examples of Document D2), it would be highly likely that all the features of the process according to Claim 1 were fulfilled at an intermediate stage of the reaction, ie after 2 or 3 or 4 minutes of the feeding of the TDI. Consequently, the claimed process lacked novelty.

7.2 The above interpretation of Example 1 by the Appellant forces the conclusion that the procedure followed in the preparation of Polyol B differed from that in the first part of the example relating to Polyol A only in the matters specifically referred to in the clause governed by the phrase "... in the same way ... except that ...", namely the amounts of the three components TDI, Polyether X and TELA (D1: column 5, lines 64 to 68) and nothing else.

7.3 It clearly follows therefrom, however, in particular in view of the statement that the Polyol A preparation was done without a catalyst, that the preparation of Polyol B was also carried out without a catalyst, at least initially. The question then arises as to the meaning

of the sentence immediately following, which states that "0.03 Parts of dibutyl tin dilaurate catalyst were required to form the isocyanate [*sic*]/polyolamine polyaddition reaction product".

In the Board's view, this can only mean that the 0.03 parts of dibutyl tin dilaurate (DBTL) were added after the procedure of preparing "in the same way as Polyol A" had been completed. This is consistent both with the requirement of "the same way" as with Polyol A, that no catalyst was used initially, and with the view that it only became apparent after completion of the "Polyol A" procedure, that no reaction had taken place during the entire feed of the TDI which took 5 to 10 minutes. This would presumably be due to the much lower level of solids concentration (10% instead of 50% with Polyol A).

This view is also supported by analogy with the disclosure of D2, Example 1, where, similarly to the preparation of Polyol B, a 10% dispersion of the reaction product of TDI and TELA in a polyether polyol was prepared. In this example of D2, it is stated that after the addition of the TDI within 5 seconds, the same catalyst DBTL as in the second part of Example 1 of D1 "was then added and a fast reaction took place and the temperature rose ... over a period of three minutes from the time of completion of addition of the catalyst" (D2: page 4, lines 45 to 55). This is also reflected by the comparison of D1 and D2 made by the Appellant in the letter dated 3 May 2000, page 2, item B.1.

The argument of the Appellant during the oral proceedings, that the skilled person would have added the catalyst to the mixture of TELA and Polyether X before the addition of the TDI cannot prevail, since no such information is contained in the second part of Example 1, nor elsewhere in D1.

- 7.4 From these considerations and findings, it is evident that in D1, irrespective of the duration of the "continuous" TDI feed, under the conditions of the second part of Example 1, a fast reaction took place only after the addition of the catalyst.

Hence, the argument of the Appellant that the slow feed of TDI in the preparation of Polyol B in Example 1 would automatically result in a course of the reaction which meets all the requirements of Claim 1 is not convincing.

Nor does this example, or indeed any other part of the disclosure of D1 provide any other information allowing the conclusion that a "preformed solution or dispersion" as defined in Claim 1 and fulfilling feature (ii) of the claim is formed.

- 7.5 Furthermore, no experimental data have been provided by the Opponent/Appellant, on whom the onus of proof lay, which would have supported its assertions of lack of novelty.

- 7.6 Consequently, the Board is satisfied that D1 does not anticipate the process of Claim 1, the subject-matter of which is therefore novel with regard to this document.

7.7 The finding in the decision under appeal that none of the other cited documents anticipated the claimed subject-matter has not been contested in the appeal proceedings. The Board sees no reason to take a different view.

7.8 Consequently, Claim 1 is novel.

8. *Problem and solution*

8.1 In line with the introduction of the description in the patent in suit, in particular page 2, lines 24 to 29 and 37 to 41, and page 3, lines 14 to 19, the technical problem underlying the patent in suit with respect to D1, which represents the closest state of the art, may be seen as the definition of a process for the preparation of PIPA polyol dispersions which allow to prepare polyurethane foams having reduced shrinkage, lower compression set and better cure rating. The process further aims at PIPA polyol dispersions which avoid (high) viscosities which would make these dispersions difficult to process and limit the solids content of the dispersions.

8.2 These aspects of the technical problem are solved by a process wherein a solution or dispersion (C) of a material containing urethane and/or urea groups in an isocyanate-reactive material, which has an equivalent weight of greater than 400, is preformed, and (A) a polyisocyanate is reacted with (B) a coreactant material having an equivalent weight of up to 400 and a plurality of active hydrogen atoms attached to oxygen or nitrogen atoms are reacted with each other in the

presence of this preformed solution or dispersion (C), so that (i) the total of components (A) and (B) and the urethane and/or urea containing material of component (C) together comprises from 0.5 to 40 weight percent of the product dispersion, and (ii) the material containing urethane and/or urea groups dissolved and/or dispersed in the preformed solution or dispersion constitutes from 0.5 to 50 % by weight of the total of the said material, component (A) and component (B) (Claim 1).

In view of the results of the examples and the comparative example of the patent, the results of which have not been disputed, the Board is satisfied that the above technical problem is effectively solved by the claimed subject-matter.

9. *Inventive step*

It remains to be decided whether the solution found was obvious to a person skilled in the art.

- 9.1 As discussed above (sections 6.2 to 6.2.3, *supra*) D1 refers to improvements of the tensile properties of polyurethane foams in comparison to foams prepared with previous polymer polyol dispersions. The solution found in D1 was the preparation of high strength dispersions of reaction products of a polyisocyanate with a tertiary-N-polyolamine in the presence of a polyol which were subsequently diluted with further polyol. The foams obtained with these dispersions had also advantages in respect of hardness and shrinkage properties.

- 9.1.1 According to the Appellant, the closest part of D1 is found in the second part of Example 1, the results of which (ie Polyol B) would at least be close enough to those in the patent in suit that it could be concluded that the properties would be the same (section VI(c), above).
- 9.1.2 On the other hand, it had been argued in the Statement of Grounds of Appeal, item 9, with respect to a comparison, in the patent in suit, between the subject-matter claimed and the results obtained with a Comparative Dispersion A: "the comparative example in the attacked patent is merely a foam obtained starting from a standard dispersion, i.e. a dispersion that is not obtained according to D1".
- 9.1.3 Whilst, in the preparation of Comparative Dispersion A, the catalyst had been added to the isocyanate-reactive material ("Polyol A"), before it was mixed with TELA, and prior to the final TDI feed to this mixture (patent in suit: page 8, lines 30 to 32 and 17 to 19), it has, however, become evident from the discussion about novelty (in particular in section 7.3, above) that, in the preparation of Polyol B in D1, no catalyst was initially charged, contrary to the suggestion by the Appellant during the novelty discussion.
- 9.1.4 In view of these facts and findings, it must, therefore, be concluded that Example 1 of D1 is even further remote from the claimed subject-matter than the comparative example in the patent in suit (on the basis of Comparative Dispersion A, which had been a standard dispersion obtained in a conventional one-step process)

and that, consequently, the latter comparative example is meaningful for the assessment of inventive step.

- 9.2 In comparison to the comparative example in the patent in suit, the goal of improving shrinkage, compression set and cure rating, ie the solution of the technical problem aimed at, has been achieved by means of the process of Claim 1 to a significant extent, as demonstrated by the results in the tables in the patent in suit.

Apart from the general statement in column 4, lines 12 to 15, relating to shrinkage properties in comparison to the previous state of the art, Document D1 is completely silent about any such improvements.

- 9.3 Hence, D1 does not provide any hints that these properties could be improved further, let alone how such improvements could be achieved.

- 9.4 No arguments were put forward as to why any of the other documents should be regarded as having any relevance to the question of inventive step.

- 9.5 Consequently, the Board is satisfied that the solution of the technical problem represented by the process of Claim 1 does not arise in an obvious way from the state of the art. The subject-matter of Claim 1 is, therefore, based on an inventive step.

10. Since it is evident that the way of its preparation has an effect on the composition and the properties of the resulting dispersion, the dispersion according to

Claim 9 is, by the same token, novel and inventive with regard to D1.

The same conclusion is also valid for the reaction product according to Claim 11, irrespective of the further limitation as defined in dependent Claim 10 (section I, above), which is not addressed in the cited prior art at all, and for the process claims 2 to 8, which are directly or by reference appendant to Claim 1.

11. *Auxiliary request of the Appellant*

11.1 Towards the end of the oral proceedings, and upon being invited to formulate its final requests, the Appellant returned to the arguments provided by the Respondent with respect to its main and auxiliary requests (letter dated 24 May 2001), and represented the view that it had not, after all, been clear which version of the claims (as granted or as maintained in the decision under appeal) would form the basis for the discussion in the oral proceedings and the decision of the Board and how these claims would be interpreted by the Board, and requested referral of the case to the first instance for further prosecution.

11.2 As far as the Board is concerned, however, the Appellant had already expressed a clear and firm position to the question that only the claims as maintained in the decision under appeal could be considered in the appeal proceedings (letter dated 29 January 2002, item 36), which the Board had accepted.

Indeed, the entire oral proceedings up to this point had been conducted on the basis of the acceptance of the Appellant's previous position in this connection, including the discussion on the issues of Articles 123(2), 123(3), 54 and 56 EPC.

The Appellant is not entitled, in the Board's view, to resile from a position which had been maintained throughout as representing the only reasonable view of the case, and this in a final phase of the proceedings after all the substantive points have been dealt with.

Even if this had not been the situation, however, no further arguments were submitted which would put the results of the previous discussions in question (section 4, above).

As regards the more general question of whether it would have been appropriate for the Board to decide to continue the proceedings in writing, in order to allow the Appellant an opportunity to file comparative experiments (section 7.5 above), the Appellant had had ample opportunities to comment on all issues to be decided in this case prior to and in the oral proceedings and to provide, in due time, evidence in support of its submissions and arguments to the different issues, each of which had already been considered and decided upon by the Opposition Division.

11.3 In view of these facts, the Board has come to the conclusion that the requirements of Article 113(1) and (2) EPC have been met and the case has been ready for final decision at the end of the oral proceedings.

11.4 Consequently, the auxiliary request of the Appellant is refused.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Young