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**Datasheet for the decision
of 5 July 2017**

Case Number: T 0875/14 - 3.3.03

Application Number: 05741682.8

Publication Number: 1749044

IPC: C08G65/00, C10M107/34,
C10M173/02

Language of the proceedings: EN

Title of invention:

FUNCTIONAL FLUIDS CONTAINING ALKYLENE OXIDE COPOLYMERS HAVING
LOW PULMONARY TOXICITY

Patent Proprietor:

BASF SE

Opponent:

THE DOW CHEMICAL COMPANY

Relevant legal provisions:

EPC Art. 54

RPBA Art. 13(1), 13(3)

Keyword:

Novelty - Main request, first and second auxiliary requests
(no)

Late-filed auxiliary request - admitted (third auxiliary
request: no)

Late-filed argument - admitted (fourth auxiliary request: no)

Decisions cited:

G 0002/88, G 0006/88, T 1179/07, T 0304/08



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Case Number: T 0875/14 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 5 July 2017

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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 4 February 2014 rejecting the opposition filed against European patent No. 1749044 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman D. Semino
Members: O. Dury
C. Brandt

Summary of Facts and Submissions

I. The appeal by the opponent lies from the decision of the opposition division posted on 4 February 2014 rejecting the opposition filed against European patent No. 1 749 044.

II. Claims 1, 17, 19 and 26 of the granted patent read as follows:

"1. A method of reducing the inhalation toxicity of functional fluids by incorporating into a functional fluid an effective amount of a copolymer which is obtainable by copolymerizing ethylene oxide, propylene oxide and/or butylene oxide with an initiator monool or diol, said copolymer having a degree of unsaturation of less than 0.01 meq/g."

"17. A functional fluid comprising

a) 25 - 55 wt.-% of a copolymer which is obtainable by copolymerizing ethylene oxide, propylene oxide and/or butylene oxide with an initiator monool or diol, said copolymer having a degree of unsaturation of less than 0.01 meq/g;

b) 35 - 65 wt.-% water;

c) 5 - 26 wt.-% metal passivators and corrosion inhibitors such as tolyltriazole, benzotriazole, organic acids, esters thereof, nitrogen-, phosphorous- and sulfur containing compounds alkyl and aryl phosphites;

d) 0 - 5 wt.-% antioxidants such as dialkylthiopropionates, organic amines and hindered phenols, e.g. butylated hydroxytoluene;

e) 0 - 5 wt.-% antiwear and extreme pressure additives such as dithiophosphates, amine phosphates, alkyl and aryl phosphates and carboxylic acids;

f) 0 - 5 wt.-% further additives such as dispersants, defoamers and stabilizers;

wherein the functional fluid is a low inhalation toxicity water soluble metalworking fluid."

"19. A functional fluid comprising

a) 75 - 98 wt.-% of a copolymer which is obtainable by copolymerizing ethylene oxide, propylene oxide and/or butylene oxide with an initiator monool or diol, said copolymer having a degree of unsaturation of less than 0.01 meq/g;

b) 0 - 5 wt.-% metal passivators such as tolyltriazole, benzothiazole and benzotriazole;

c) 0 - 5 wt.-% antioxidants such as dialkylthiopropionates, organic amines and hindered phenols such as dilaurylthiopropionate, dioctyldiphenylamine, phenyl-naphthylamine, phenothiazine and butylated hydroxytoluene;

d) 0 - 5 wt.-% corrosion inhibitors such as organic acids, esters thereof, nitrogen-, phosphorous- and sulfur containing compounds, succinic acid derivatives, 4-nonylphenoxyacetic acid, alkyl and aryl phosphites;

e) 0 - 5 wt.-% antiwear and extreme pressure additives such as dithiophosphates, amine phosphates, phosphorothionates, carbamates, alkyl and aryl phosphates;

f) 0 - 5 wt.-% further additives such as dispersants, antifoam additives including polydimethylsiloxanes and polyalkylene glycols, and stabilizers;

wherein the functional fluid is a low inhalation toxicity compressor lubricant comprising."

"26. A functional fluid comprising

a) 5 - 35 wt.-% of a copolymer which is obtainable by copolymerizing ethylene oxide, propylene oxide and/or butylene oxide with an initiator monool or diol, said copolymer having a degree of unsaturation of less than 0.01 meq/g;

b) 65 - 95 wt.-% water;

c) 0 - 5 wt.-% corrosion inhibitors such as organic acids, alkyl amines, esters thereof, nitrogen-, phosphorous- and sulfur containing compounds, and succinic acid derivatives;

d) 0 - 5 wt.-% further additives such as dispersants, defoamers and stabilizers;

wherein the functional fluid is a low inhalation toxicity quenchant."

III. A notice of opposition to the patent was filed requesting revocation of the patent in its entirety on

the grounds of Article 100(a) EPC (lack of novelty and lack of an inventive step).

IV. In the contested decision the following documents were *inter alia* cited:

D2: US 6 429 166

D3: US 6 436 883

D4: ECETOC Technical Report No. 55; "Pulmonary Toxicity of Polyalkylene Glycols";
December 1997

D7: Excerpt from a technical memorandum "UCON[®] Fluid process and product studies - Effect of feed rate on UCON lubricant 50-HB-260";
P.L. Matlock; dated 13 May 1997

D11: Simons D.M. et al., "The Polymerisation of Propylene Oxide", J. Pol. Sci., 1960,
Vol. XLIV, pages 303-311

D14: US 4 438 001

D15: US 3 980 571

D17: US 5 010 187

D22: WO 99/55765

D23: Smith C.P. et al., "Thermoplastic Polyurethane Elastomers Made from High Molecular Weight POLY-L[®] Polyols", Journal of Elastomers and Plastics, Vol. 24, 1992, pages 306-322

In that decision the opposition division held that none of the grounds of opposition pursuant to Article 100(a) EPC in combination with both Article 54 EPC and Article 56 EPC prejudiced the maintenance of the patent. In particular, the subject-matter of granted claim 1 was held to be novel over *inter alia* D4 and to be inventive starting from D4 as closest prior art. One of the main argument retained by the opposition division for acknowledging novelty and

inventive step was that "the criteria for assessing novelty of "second-non-medical use claims" as set out in G 2/88 fully apply" i.e. considering that granted claim 1 "includes as functional feature the technical effect of reducing the inhalation toxicity of the functional fluids by incorporating the present copolymers" (see sections 4.1.1 and 5.1 of the contested decision).

V. The opponent (appellant) lodged an appeal against the above decision and requested that the decision of the opposition division be set aside and the patent be revoked. Together with its statement of grounds of appeal the following documents were filed:

- D7a: complete version of D7
- D24: Handbook of hydraulic fluid technology, Marcel Dekker, Inc., 2000, pages 918-923 and 976-982
- D25: US 5 342 531
- D26: US 4 851 144
- D27: EP-A-0 109 515

VI. In the reply to the statement of grounds of appeal dated 17 November 2014 the patent proprietor (respondent) requested *inter alia* that the the appeal be dismissed (main request) or, alternatively, that the patent be maintained in amended form according to any of the first to the third auxiliary requests filed therewith.

VII. With letter of 27 March 2015 the appellant further filed

- D28: US 4 302 343

VIII. In a communication issued by the Board issues to be discussed at the oral proceedings were specified. With respect to novelty over D4 it was in particular indicated that the Board had difficulties in seeing the feature "reducing the inhalation toxicity of the functional fluids" as a feature conferring novelty in the sense of decisions G 2/88 and G 6/88 in view of the formulation of the claim as a method claim characterised by process steps (section 5.2.2). Besides, it appeared that the subject-matter of granted claim 1 only differed from lubricant UCON[®] 50-HB-260 according to D4 in that no indication of the unsaturation degree of the copolymers contained therein was explicitly disclosed in D4 but that it seemed that it could be derived from D7a that said feature was satisfied (sections 5.2.3 and 5.2.4).

IX. With letter of 2 June 2017 the respondent requested that the appeal be dismissed (main request) or, in the alternative, that the patent be maintained in amended form according to any of the first to the fourth auxiliary requests filed therewith. The first, second and fourth auxiliary requests corresponded to the first, second and third auxiliary requests, respectively, filed with letter of 17 November 2014.

Claim 1 of the first auxiliary request was identical to claim 1 of the second auxiliary request and read as follows:

"1. Use of a copolymer which is obtainable by copolymerizing ethylene oxide, propylene oxide and/or butylene oxide with an initiator monool or diol, said copolymer having a degree of unsaturation of less than 0.01 meq/g for reducing inhalation toxicity of functional fluids comprising incorporating into a

functional fluid an effective amount of said copolymer."

Claim 1 of the third auxiliary request read as follows:

"1. A method of reducing the inhalation toxicity of functional fluids by incorporating into a functional fluid an effective amount of a copolymer which is obtainable by copolymerizing ethylene oxide, propylene oxide and/or butylene oxide with an initiator monool or diol, said copolymer having a degree of unsaturation of less than 0.01 meq/g and an average molecular weight Mw of from 2300 to 20000 g/mol."

The fourth auxiliary request comprised a set of nine claims, of which claims 1 to 3 were identical to granted claims 17, 19 and 26, respectively, and claims 4 to 9 were dependent on any of claims 1 to 3.

- X. Oral proceedings were held on 5 July 2017 in the presence of both parties.
- XI. The appellant's arguments, as far as relevant to the present decision, were essentially as follows:

Main request

- (a) Since the subject-matter of granted claim 1 was a process claim and not a use claim, the conclusions reached in G 2/88 (OJ EPO, 1990, 93) and G 6/88 (OJ EPO, 1990, 114) did not apply, contrary to the opposition division's view.
- (b) During the oral proceedings before the Board it was explained that because no sample of UCON[®] 50-HB-260 dated from 1997 (the publication date of D4) was

available anymore the appellant had to rely on D7a in order to give information related to the degree of unsaturation of lubricant UCON[®] 50-HB-260 disclosed in D4.

- (c) It was derivable from the information provided in D7a that the degree of unsaturation of lubricant UCON[®] 50-HB-260 was less than 0.01 meq/g. In that respect it was explicitly indicated in D7a that the aim of the investigations carried out therein was to produce UCON[®] 50-HB-260 and that no effect in respect of unsaturation amounts was observed as compared to said commercial product.
- (d) There was no evidence on file and it was further not credible that the main properties of the composition of UCON[®] 50-HB-260, which was a registered trademark, had changed over time.
- (e) For those reasons, the subject-matter of granted claim 1 was anticipated by the disclosure in D4 of lubricant UCON[®] 50-HB-260.

First and second auxiliary requests

- (f) Considering that all the copolymers defined in claim 1 were at some degree toxic, the wording of claim 1 "use of a copolymer ... for reducing inhalation toxicity... comprising incorporating into a functional fluid an effective amount of said copolymer" did not make sense. Besides, the teaching of the patent in suit regarding the relationship between degree of unsaturation of the copolymers and toxicity was identical to that of D4. Therefore, should the functional feature of claim 1 "for reducing ... of said copolymer" be

held to have any meaning, it could not confer novelty over D4. In particular, it was explicitly disclosed in D4 that UCON[®] 50-HB-260 showed a LC₅₀ value of more than 1000 mg/m³ i.e. according to paragraph 12 of the patent in suit. For those reasons the subject-matter of claim 1 of both the first and the second auxiliary requests was not novel over D4.

Third auxiliary request

(g) The third auxiliary request was filed in order to overcome the novelty objection over D4 and the objection in relation to inventive step according to which no problem was solved by the low molecular weight copolymers. However, those objections were already submitted in the notice of opposition and continuously pursued during both the first instance proceedings and in appeal. There was no justification for not having submitted that request together with the reply to the statement of grounds of appeal and in particular for submitting it only one month before the oral proceedings before the Board. For those reasons the third auxiliary request should be not admitted to the proceedings.

Fourth auxiliary request

- (h) The subject-matter of operative claim was not inventive in view of D2 as closest prior art in combination with either D26 or D28.
- (i) The new line of argumentation provided during the oral proceedings before the Board against operative claims 1 to 3 starting from D4 as closest prior art should be admitted to the proceedings taking into

account that, in the present case, the patent in suit was granted on the basis of a very large amount of independent claims, in particular 15 different functional fluids each differing in the nature and amounts of (optional) various additives. Therefore, it had been difficult to attack every single independent claims individually.

XII. The respondent's arguments, as far as relevant to the present decision, may be summarised as follows:

Main request

- (a) D7a dealt with a research project and was not directed to the production of the commercial product UCON[®] 50-HB-260. It was explicitly indicated therein that different reaction conditions were used than for the commercial product and that the product thus prepared was not identical to the commercial product. Therefore, no conclusion could be drawn from D7a regarding the degree of unsaturation of the commercial product UCON[®] 50-HB-260 mentioned in D4. In particular, D7a was directed to the comparison of two different feed rates on the synthesis of UCON[®] 50-HB-260 and only provided information regarding the comparison between those two processes but not with the commercial product.

- (b) It was not understood why the appellant relied on indirect evidence derived from D7a rather than having directly determined the degree of unsaturation of the commercial product UCON[®] 50-HB-260, which was marketed by himself. In that respect, since all the evidence were in the hands of the appellant, the criteria for assessing

novelty were to be very high ("beyond any reasonable doubt"), as in the case of a public prior use in which all the evidence is in the possession of the opponent.

- (c) D17 and D23 showed that low molecular weight EO-PO copolymers prepared in the presence of a KOH catalyst, as in D4, may well have a degree of unsaturation of higher than 0.01 meq/g. Therefore, it could not be excluded that the degree of unsaturation of UCON[®] 50-HB-260 was outside the range according to claim 1.
- (d) D4 further failed to disclose UCON[®] 50-HB-260 as a functional fluid and that an effective amount of UCON[®] 50-HB-260 was incorporated into a functional fluid.
- (e) Considering that UCON[®] 50-HB-260 was a trademark, it was not even sure that the composition of the product had not changed over time. Therefore, it could not be ascertained that D7a and D4 were related to the same product.
- (f) For those reasons, the subject-matter of granted claim 1 was not directly and unambiguously disclosed in D4 and was, thus, novel.

First and second auxiliary requests

- (g) The feature of claim 1 "use of a copolymer ... for reducing inhalation toxicity... comprising incorporating into a functional fluid an effective amount of said copolymer" could only be understood to mean that the whole functional fluid should have a reduced inhalation toxicity, whereby in the light

of paragraphs 12 and 16 of the patent in suit said reduced toxicity meant that the functional fluid should show a LC₅₀ value of more than 1000 mg/m³ determined as indicated therein. Although it was disclosed in D4 that UCON[®] 50-HB-260 showed a LC₅₀ value of more than 1000 mg/m³, D4 failed to teach the link between a degree of unsaturation of less than 0.01 meq/g and reduced inhalation toxicity, which was the object of the patent in suit. For that reason, the subject-matter of claim 1 of both the first and the second auxiliary requests was novel over D4.

Third auxiliary request

(h) The third auxiliary request was filed in reply to the Board's communication and obviously solved the novelty objections retained by the Board. It was not complex to understand and its admission would not require an adjournment of the oral proceedings. In particular, the assessment of the inventive step did not extend the scope of discussion as compared to the higher pending requests. In view of the above, the third auxiliary request should be admitted into the proceedings.

Fourth auxiliary request

(i) Neither D2 nor D26 and D28 dealt with the problem of reducing the inhalation toxicity as in the patent in suit. Therefore, none of those documents either alone or in combination could suggest the claimed subject-matter in order to solve that problem.

(j) The inventive step objection starting from D4 as closest prior art, which was submitted and substantiated for the first time at the oral proceedings before the Board, should be not admitted to the proceedings.

XIII. The appellant requested that the decision under appeal be set aside and that the European patent No. 1 749 044 be revoked.

The respondent requested that the appeal be dismissed (main request) or, in the alternative, that the patent be maintained in amended form according to any of the first to fourth auxiliary requests filed with letter dated 2 June 2017 (the first auxiliary request corresponding to the first auxiliary request filed with the reply to the statement setting out the grounds of appeal, the second auxiliary request corresponding to the second auxiliary request filed with the reply to the statement setting out the grounds of appeal, the fourth auxiliary request corresponding to the third auxiliary request filed with the reply to the statement setting out the grounds of appeal).

Reasons for the Decision

Main request (patent as granted)

1. Novelty of granted claim 1 over D4
- 1.1 D4 deals with the pulmonary toxicity of polyalkylene glycols (title) and discloses in particular product UCON[®] 50-HB-260, which is a butanol initiated 50:50 ethylene oxide-propylene oxide (EO-PO) random copolymer

(Table 2, page 6), which is shown to exhibit pneumonal toxicity under acute conditions, in particular a LC₅₀ value of around 4770 mg/m³ (see page 7, last sentence; Table 7, page 37; Appendix A, page 40; the LC₅₀ is known to mean "lethal concentration" and to represent the concentration that will kill 50% of the test animals). D4 further discloses that polyakylene glycols are known to be useful among others as functional fluids (page 2, end of first full paragraph) and the references "Union Carbide 1988a" and "Union Carbide 1989a" on page 54 of D4 further indicates that UCON[®] 50-HB-260 is a lubricant i.e. a functional fluid as defined in paragraph 4 of the patent in suit.

1.2 During the oral proceedings before the Board it was explicitly agreed by both parties that the expression in claim 1 "a method of reducing the inhalation toxicity of functional fluids by incorporating into a functional fluid an effective amount of a copolymer ...", when read with a mind willing to understand the patent in suit, did not mean that the copolymers defined therein were used as additives for a functional fluid (i.e. in a minor amount as compared to the whole composition) but indicated that said copolymer was in fact the main (active) component of said functional fluid i.e. the feature "incorporating into a functional fluid an effective amount of a copolymer ..." according to granted claim 1 effectively meant that the copolymers defined therein constitute the functional fluid. The Board sees no reason to depart from that view.

1.3 From the evidence on file, lubricants containing a polymer similar to those defined in granted claim 1 are usually prepared by addition of the remaining components to the polymer and mere mixing of the

various constituents (see e.g. D3: column 10, lines 51-57; examples of D14, D15, D25, D27; example 5 of D22; D24). Therefore, the availability of UCON[®] 50-HB-260 as a lubricant implicitly encompasses the feature "by incorporating into a functional fluid" of granted claim 1 and is fully in agreement with the reading of that claim made by the parties (see section 1.2).

1.4 In line with the case law and contrary to the opposition division's reasoning in section 4.1.1 of the reasons of the contested decision, the feature "for reducing the inhalation toxicity of the functional fluids" according to granted claim 1 cannot be held to constitute a feature conferring novelty in the sense of decisions G 2/88 and G 6/88 in view of the formulation of the claim as a method claim characterised by process steps, i.e. the feature is not suitable to distinguish the claimed process from a prior art disclosing the same process steps but not the "for ..." feature (see Case Law of the Boards of Appeal of the EPO, 8th edition, 2016, I.C.8.1.3.a) and b), in particular the passages related to decisions T 304/08 and T 1179/07). That conclusion, which was explicitly indicated in the Board's communication (see section VIII above) was not contested by the respondent either in writing or during the oral proceedings before the Board. Therefore, the feature "for reducing the inhalation toxicity of the functional fluids" cannot constitute a distinguishing feature of the subject-matter of granted claim 1 over D4 (see in any case the relevance of the use feature in the analysis of the first auxiliary request, below).

1.5 In view of the above, all the features of granted claim 1 apart from the degree of unsaturation of the copolymer are satisfied by the disclosure of lubricant

UCON[®] 50-HB-260 in D4. Therefore, it remains to be assessed whether or not lubricant UCON[®] 50-HB-260 satisfied the feature "having a degree of unsaturation degree of less than 0.01 meq/g" according to granted claim 1, which is not explicitly disclosed in D4.

In order to compensate for that lack of information, the appellant relied upon D7a, which is directed to the production process of UCON[®] 50-HB-260 (see the title, the first sentence of the second paragraph of the section "Summary" on page 1 and the last sentence of the section "Introduction" on page 2). It is correct that, as submitted by the respondent, D7a is not directly related to the commercial product UCON[®] 50-HB-260 but to a research project to assess the impact of a new control system to be installed in the Tarrytown experimental reactors where the commercial product is produced, in particular to investigate the effect of different feed rates (slower and faster) on the synthesis of UCON[®] 50-HB-260 (title; first sentence of the second paragraph of section "Summary" on page 1; last paragraph on page 2). However, although the effect of faster feed rates on the synthesis of UCON[®] 50-HB-260 was investigated in D7a, the aim of that study was to prepare a product which satisfies the specifications of UCON[®] 50-HB-260. This is not only derivable from the title and the passages on pages 1 and 2 of D7a indicated above (first sentence of the present paragraph), but also from the indication on page 3 of D7a that it was desired to meet the product specifications, which is not achieved in respect of the cloud point (D7a: section "3) Oxide Ratio by NMR").

In that respect, it is acknowledged in D7a that the experimental conditions are not identical to those used in the production of the commercial product (bottom of

page 2) and that it led to a product that is not identical to the commercial product (in particular, a difference in the value of cloud point such as to be "a little above the (...) specification" is explicitly indicated at page 3, section 3). However, it is also indicated in the next sentence that "This difference is not expected to effect the conclusions of this report". It is further specified at page 4, second paragraph of the section "Conclusions" that "unsaturation amounts (...) are not effected" and on the front page of D7a (Section "Summary", second paragraph) "No effects were found. Expected effects were differences (...) in the rearrangement of propylene oxide to allyl alcohol". Therefore, the statements on pages 1 and 4 of D7a cited above according to which no effect on the unsaturation degree was found are considered to be related to a comparison with the commercial product UCON[®] 50-HB-260 and not to a comparison between both runs (slow and fast feed rate) carried out in D7a, contrary to the respondent's submission. Therefore, considering that D7a aims at preparing a product that satisfies the specifications of UCON[®] 50-HB-260 and that it is derivable therefrom that no effect on the degree of unsaturation was found, it is concluded that the degree of unsaturation disclosed in D7a must be according to the specification of UCON[®] 50-HB-260.

In that respect, the unsaturation level of the products prepared in D7a under two different conditions (fast speed rate and low speed rate) is 0.0045 and 0.0051 mmol/g (Table 1, page 6), which is about 50% of the maximum value defined in granted claim 1 (0.01 meq/g). Therefore, those data show that lubricant UCON[®] 50-HB-260 satisfies the requirement in terms of degree of unsaturation defined in granted claim 1.

1.6 The respondent argued that UCON[®] 50-HB-260 was prepared with KOH as catalyst and that it was known in the art and derivable from D17 and D23 that such a preparation process could not lead to low unsaturation degree as mentioned in granted claim 1.

However, D17 (column 1, lines 10-33; examples) and D23 (page 306: first two paragraphs of the abstract; page 307: Figure 1; page 308: second and third full paragraphs) both indicate that the unsaturation degree increases together with the molecular weight but fail to disclose any absolute range of unsaturation degree that could be compared with the range of less than 0.01 meq/g specified in granted claim 1.

Also, D11 teaches that for diol initiated PO-homopolymers catalysed with KOH (see second sentence of the section "Experimental" on page 303) the unsaturation degree increases with temperature of polymerisation and molecular weight (page 308: Table 1 and paragraph above it). According to Table 1 of D11, a PO-homopolymer of molecular weight 608 was prepared at 110°C and exhibited an unsaturation degree of less than 0.01 meq/g, i.e. within the range of granted claim 1. In that respect it is noted that PO-homopolymer according to D11 comprise more PO repeating units than a 50:50 EO-PO copolymer such as UCON[®] 50-HB-260, i.e. they comprise more units which are prone to rearrangement so as to lead to unsaturation as explained in D4 (section 2.2), D7a (section 4) on page 3) or D17 (column 1, lines 23-27). Therefore, further considering that UCON[®] 50-HB-260 has a rather low molecular weight (see e.g. Table 2 of D4: 970) the conclusion cannot be drawn that the mere fact that UCON[®] 50-HB-260 was prepared with KOH as catalyst (D4: page 3: section 2.1, first paragraph) implies a degree

of unsaturation above the limit indicated in granted claim 1. This means that the clear conclusion derivable from D7a cannot be discredited by the information derivable from D17 and D23.

For those reasons, the respondent's argument is rejected.

1.7 Although UCON[®] 50-HB-260 is a trademark, there is no evidence on file that the composition of the product *per se* has changed over time, in particular not during the limited period of time between the publication date of D4 and the drafting date of D7a (December 1997 and May 1997, respectively). In that respect, should the composition of that product indeed have changed, it is not credible that one of its critical property, namely the unsaturation degree (see D7a: page 4, second paragraph of the section "Conclusions"), would have been modified while keeping the same trademark. For those reasons, the respondent's argument according to which the composition of UCON[®] 50-HB-260 may not have been identical in D4 and in D7a did not convince.

1.8 The respondent argued that the appellant had not performed a direct measurement of the degree of unsaturation of the commercial product UCON[®] 50-HB-260, although said product was marketed by the appellant.

However, the question why a direct measurement of the degree of unsaturation of UCON[®] 50-HB-260 was not made by the appellant is irrelevant. Rather, the question to be answered is whether or not the evidence provided by the appellant show that the subject-matter of granted claim 1 is directly and unambiguously disclosed in the prior art, which was done in the preceding sections. In that respect, the Board is satisfied that the

information related to the degree of unsaturation contained in D7a is "beyond any reasonable doubt".

- 1.9 For those reasons, the subject-matter of granted claim 1 is anticipated by the disclosure in D4 of lubricant UCON[®] 50-HB-260.

First auxiliary request

2. Novelty of claim 1
- 2.1 Claim 1 of the first auxiliary request corresponds to claim 1 of the main request in which the "method" claim was reformulated as a "use" claim.
- 2.2 Considering that the parties proposed different readings regarding the limitations effectively imposed by the wording of claim 1, the meaning of the wording of claim 1 "Use of (...) for reducing inhalation toxicity of functional fluids comprising incorporating into a functional fluid an effective amount of said copolymer" has to be determined.
- 2.3 The use according to claim 1 is directed to a reduction of the inhalation toxicity of functional fluids. In that respect, a "reduction" is a relative parameter which requires an unambiguous reference point for determining whether or not said reduction effectively takes place. This is of particular importance in the present case because it may be derived from the arguments submitted by the parties during the proceedings and from the information on file that various factors such as the degree of unsaturation, the molecular weight, the nature of the initiator and/or the ratio of ethylene oxide:propylene oxide monomers of the copolymers defined in claim 1 may have an effect on

the level of inhalation toxicity of those copolymers (D4: page 36, end of first full paragraph and paragraph bridging pages 35 and 36). In view of the above, in the absence of an indication of any reference point in respect of said reduction in operative claim 1, no exact meaning can be attributed to the feature "for reducing inhalation toxicity of functional fluids comprising incorporating into a functional fluid an effective amount of said copolymer", so that the feature cannot provide a distinction over the available prior art.

- 2.4 In spite of the lack of a definition of the point of reference for the reduction, during the oral proceedings before the Board the respondent argued that that feature meant that the whole functional fluid should have a reduced inhalation toxicity, whereby in the light of paragraphs 12 and 16 of the patent in suit said reduced toxicity further meant that the functional fluid should show a LC₅₀ value of more than 1000 mg/m³ determined as indicated therein.

However, even if this were accepted, it is explicitly disclosed in D4 that UCON[®] 50-HB-260 shows a LC₅₀ value of about 5000 mg/m³ (D4: page 7, last line and Table 7 on page 37), which is well above the limit of 1000 mg/m³ according to paragraph 12 of the patent in suit. Therefore, were claim 1 to be read as contemplated by the respondent, the feature of claim 1 "for reducing inhalation ... of said copolymer" would still not distinguish the subject-matter of claim 1 from lubricant UCON[®] 50-HB-260 as disclosed in D4.

- 2.5 The respondent also argued that D4 failed to provide the teaching of a link between a degree of unsaturation of less than 0.01 meq/g and reduced inhalation

toxicity, which was the object of the patent in suit.

However, said link is not reflected by the wording of operative claim 1 and, as explained in section 2.3 above, other features specified in claim 1 and which are different from the degree of unsaturation may be related to a variation in the level of inhalation toxicity. Therefore, that argument is rejected.

- 2.6 In view of the above the effect of reducing inhalation toxicity may not be seen as a technical feature of the use claim pursuant to decision G 2/88 which can confer novelty over D4. Therefore, operative claim 1 still lacks novelty over the disclosure of lubricant UCON[®] 50-HB-260 in D4 as is the case for claim 1 of the main request.

Second auxiliary request

3. Claim 1 of the second auxiliary request being identical to claim 1 of the first auxiliary request it is not allowable pursuant to Article 54 EPC for the same reasons as detailed above (section 2).

Third auxiliary request

4. Admittance
- 4.1 Claim 1 of the third auxiliary request corresponds to granted claim 1 in which it was specified that the copolymer having a degree of unsaturation of less than 0.01 meq/g further has "an average molecular weight Mw of from 2300 to 20000 g/mol".
- 4.2 The third auxiliary request was filed with letter of 2 June 2017, i.e. about one month before the oral

proceedings before the Board. Therefore, it represents an amendment to a party's case pursuant to Article 13(1) RPBA and its admission to the proceedings is subject to the Board's discretion (Article 13(1) RPBA) and underlies the additional stipulations of Article 13(3) RPBA.

- 4.3 According to the respondent, the third auxiliary request was submitted to address some concerns identified in the Board's communication in respect of inventive step regarding the low molecular weight copolymers defined e.g. in granted claim 1 and was submitted once it had been informed of the Board's preliminary opinion regarding novelty.

However, both the novelty objection over D4 and those concerns regarding inventive step had already been raised by the appellant in the notice of opposition and continuously defended afterwards both during the oral proceedings before the opposition division and in the statement of grounds of appeal. The patent proprietor was, thus, well aware of those objections already when filing its reply to the statement of grounds of appeal but has decided to wait until the Board's communication to react, which is contrary to the stipulations of Article 12(1)b) and 12(2) RPBA according to which the respondent should present its complete case in its reply to the statement of grounds of appeal.

In that respect, it is emphasized that the question whether the problem to be solved as formulated by the respondent was effectively present for low molecular weight copolymers was not raised *ex officio* by the Board but by the appellant (see e.g. statement of grounds of appeal: page 8, line 26 to page 9, line 4; page 11, lines 11-14). Also, no new line of

argumentation was raised by the appellant after filing the statement of grounds of appeal. Therefore, in the present circumstances of the case, it was not shown that an unexpected development of the case may have justified the late filing of the third auxiliary request (see Case Law, *supra*, IV.E.4.4.1 and 4.4.3). In addition it could be expected that the amendment would change the inventive step analysis of the parties in a way which was not yet developed fully in writing.

For those reasons the Board finds it appropriate to exercise its discretion by not admitting the third auxiliary request into the proceedings (Article 13(1) RPBA).

Fourth auxiliary request

- 5. Inventive step
 - 5.1 D2 as closest prior art
 - 5.1.1 The first line of argumentation put forward by the appellant in writing and not further developed at the oral proceedings was based on the combination of the teaching of D2 as closest prior art with either D26 or D28.
 - 5.1.2 According to the standard criteria, the closest prior art for assessing inventive step is a prior art document disclosing subject matter conceived for the same purpose or aiming at the same objective as the claimed invention and having the most relevant technical features in common, i.e. requiring the minimum of structural modifications.

- 5.1.3 In that respect, the patent in suit deals with functional fluids formulations having low pulmonary toxicity, in particular on aerosol formation (paragraphs 1, 11, 61, 66).
- 5.1.4 D2, which was taken by the appellant as starting point for its objection for lack of inventive step, discloses methods for making double metal catalysts ("DMC catalysts"; see claims 1-10; column 2, line 62 to column 7, line 17) and methods for polymerising alkylene oxide(s) in the presence of those DMC catalysts (column 2, lines 54-57; column 7, line 17 to column 8, line 14; examples). Also, it is disclosed at column 8, lines 15-22 that the polymers prepared according to the invention may be used as hydraulic fluids, among other possible uses. However, D2 is not directed to hydraulic fluids as such, let alone to the problem of pulmonary toxicity addressed in the patent in suit and only discloses hydraulic fluids as a generic term (and not the specific water soluble metalworking fluids, compressor lubricants and quenchants according to operative claims 1 to 3), which was not contested by the appellant, in particular during the oral proceedings before the Board.
- 5.1.5 Although D26 (claim 1; column 2, line 51 to column 3, line 22) and D28 (claim 1; example 1) are both directed to lubricants for compressors containing polyalkylene glycol i.e. to the same kind of functional fluids as defined in operative claim 2, it was not contested by the appellant that those documents also do not deal with the problem of pulmonary toxicity addressed in the patent in suit and were in any case cited as complementary documents and never considered as possible candidates for the closest prior art.

5.1.6 Therefore, considering that neither D2, nor D26 and D28 are relevant for the problem addressed in the patent in suit, the skilled person would have had no motivation either to consider or to combine those documents when having the problem addressed in the patent in suit in mind. Under such circumstances, the line of reasoning proposed by the appellant for analysing inventive step cannot lead to the conclusion that the subject-matter of operative claims 1 to 3 is obvious. In the Board's view, choosing D2 as starting point for judging inventive step in the first place and combining it with either D26 or D28 in addition may only be arrived at by artificially relying on technical similarities between the claimed invention and the features of those documents, i.e. with knowledge of the claimed invention (hindsight), which is not allowable.

5.2 D4 as closest prior art - Admittance

5.2.1 The second line of argumentation starting from D4 as closest prior art was put forward by the appellant for the first time during the oral proceedings before the Board. Therefore, it represents an amendment to a party's case pursuant to Article 13(1) RPBA and its admission to the proceedings is subject to the Board's discretion (Article 13(1) RPBA) and underlies the additional stipulations of Article 13(3) RPBA.

5.2.2 It was not disputed by the appellant that operative claims 1-3 are identical to claims 17, 19 and 26 of the main request i.e. of the granted patent and that operative claims 4 to 9 correspond to granted claims 29 to 34 (with the corresponding dependency). Therefore, the subject-matter of the operative set of claims corresponds to that of granted claims, which could and should have been objected to from the beginning of the

first instance proceedings and during the written phase of the appeal proceedings, which was not done, as explicitly agreed upon by the appellant during the oral proceedings before the Board.

5.2.3 It was also confirmed by the appellant during the oral proceedings before the Board that no inventive step objection starting from D4 as closest prior art had been made before the oral proceedings before the Board.

5.2.4 Therefore, the submission of the objection of lack of inventive starting from D4 as closest prior art put forward by the appellant during the oral proceedings before the Board not only contravenes the stipulations of Article 12(1)b) and 12(2) RPBA but also cannot be held to be justified by an unexpected development of the case. The fact that in the present case the granted patent contained a rather large number of independent claims cannot justify to offend the stipulations of Article 12(2) RPBA according to which the statement of grounds of appeal should contain the appellant's complete case. In addition, the respondent would be confronted with a new objection, which he could not reasonably be expected to deal with without adjournment of the oral proceedings.

5.2.5 In view of the above, the objection of lack of an inventive step starting from D4 as closest prior art is not admitted into the proceedings (Article 13(1) and (3) RPBA).

5.3 For those reasons, the appellant's objections pursuant to Article 56 EPC raised against operative claims 1-3 are not successful. The same is valid regarding operative claims 4-9, which are dependent on any of claims 1 to 3.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of the first instance with the order to maintain the patent on the basis of the claims of the fourth auxiliary request filed with letter dated 2 June 2017 and after any necessary consequential amendment of the description.

The Registrar:

The Chairman:



B. ter Heijden

D. Semino

Decision electronically authenticated