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**Datasheet for the decision
of 21 February 2007**

Case Number: T 0001/04 - 3.3.03

Application Number: 95942738.6

Publication Number: 0799265

IPC: C08G 59/12

Language of the proceedings: EN

Title of invention:
Epoxy-functional polyethers

Patentee:
SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V.

Opponent:
THE DOW CHEMICAL COMPANY

Headword:

-

Relevant legal provisions:
EPC Art. 54(2), 56, 87(1), 113(1), 150(3)
EPC R. 71(2)
RPBA Art. 10b(1)

Keyword:
"Validity of the claimed priority (no)"
"Inventive step - obvious combination of known features"

Decisions cited:
G 0004/92, G 0002/98, T 0016/87, T 0073/88

Catchword:

-



Case Number: T 0001/04 - 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 21 February 2007

Appellant:
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office dated
18 September 2003 and posted 17 October 2003
concerning maintenance of the European patent
No. 0799265 in amended form.

Composition of the Board:

Chairman: R. Young
Members: A. Däweritz
C. Heath

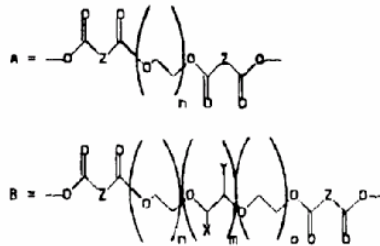
Summary of Facts and Submissions

I. The grant of European patent No. 0 799 265 in respect of European patent application No. 95 942 738.6, based on International patent application PCT/EP95/05161, filed on 20 December 1995, published as WO-A-96/19516 on 27 June 1996 and claiming a priority of 21 December 1994 of an earlier application in the USA (361076), was announced on 29 July 1998 (Bulletin 1998/31). The patent was granted with 6 claims, reading as follows:

1. An aqueous based epoxy resin composition, comprising an epoxy resin and as emulsifier and/or reactive diluent a product produced by reacting (a) a carboxylic acid having the formula:

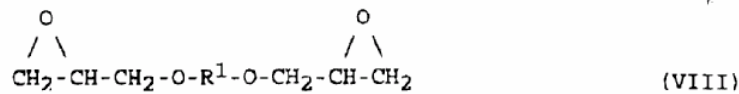


(VI)



wherein Q is A or B, Z is a C₁₋₂₀ hydrocarbylene moiety, X and Y are independently a hydrogen, methyl or ethyl group with the provision that if X is methyl or ethyl, Y is hydrogen or if Y is methyl or ethyl, X is hydrogen, and n or n+m+o is a positive real number from 1 to 450 and (b) an epoxy resin having a functionality of at least 1.5 epoxide group per molecule in a carboxylic acid to epoxy resin mole ratio of from 1:2 to 1:20.

2. The aqueous epoxy resin composition of claim 1, wherein n or n+m+o is a positive real number from 6 to 200.
3. The aqueous epoxy resin composition according to claims 1 and 2, wherein the epoxy resin reactant (b) is a hydrophobic epoxy resin.
4. The aqueous epoxy resin composition of claims 1-3, wherein the epoxy resin has the formula



wherein R¹ is divalent aliphatic, divalent cycloaliphatic, divalent aryl, or divalent arylaliphatic group.

5. The aqueous epoxy resin composition of claims 1-4 wherein the epoxy resin is a diglycidyl ether of a dihydric phenol or a diglycidyl ether of a hydrogenated dihydric phenol.
6. Aqueous coating composition, comprising a composition of claims 1-5.

In this decision, any reference to passages in the patent in suit as granted will be given underlined in squared brackets, eg [Claim 1]. References in *italics* concern passages in the application as filed, eg *page 1, lines 5 to 10*, and those in underlined *italics*, eg *page 1, line 10*, are based on the priority document.

II. On the basis of initially five documents referred to R1 to R5 (during the opposition proceedings, all cited documents were referred to as R1 etc.), a Notice of Opposition was filed on 27 April 1999 referring only to the following ground:

(a) the subject matter of each and every claim of the opposed patent does not involve an inventive step having regard to the state of the art immediately before the claimed priority date, or before the filing date for any claimed subject matter not entitled to the priority date.

(1) In a letter dated 2 July 2003, the Opponent expanded its argumentation then to lack of novelty.

(2) Furthermore, experimental reports were filed by the Patent Proprietor with a letter dated 4 November 1999 to demonstrate an improvement in emulsification in comparison with the prior art and by the Opponent with a letter dated 29 July 2002 to show that such an improvement was not reached (section III(5), below).

(3) Moreover, both parties cited additional documents in the course of the written opposition proceedings, in order to support their respective positions.

(4) Subsequent to previous modifications of the patent claims during the written proceedings, the Patent Proprietor filed a new "Main Set of Claims" and three additional sets of claims titled "First", "Second" and "Third Set of Auxiliary Claims" with a letter dated 5 September 2003. These sets of claims will be referred to herein as the Main Request and as Auxiliary Requests 1 to 3, respectively.

In each of these new requests, the word "reactive" before "diluent" had been omitted from Claim 1 and,

furthermore, [Claim 3] had been deleted, which resulted in the renumbering of the remaining subsequent claims.

(5) Apart therefrom, the only further amendments in the new Main Request were the replacement of the initial lower limits of the definitions of "n or n+m+o" of "1" and "6", respectively, (section I, above) by a new common value of "106" in both Claims 1 and 2.

These amendments were also carried out in Claims 1 and 2 of the new Auxiliary Request 2, whereas, in Claims 1 and 2 of Auxiliary Request 1, the initial lower limits of "1" and "6", respectively, had been maintained.

(6) Furthermore, in Claim 1 of all three auxiliary requests, the definition of Z was limited to a "moiety originating from 4-methyl hexahydrophthalic anhydride", which, in the examples of the patent in suit, was abbreviated to "MHHPA". This abbreviation will be used herein below for the anhydride in general, irrespective of the position of its methyl substituent, which will, where needed, additionally be indicated by the corresponding prefix "4-MHHPA", as opposed to "3-MHHPA".

(7) Moreover, in Auxiliary Request 3, the last claim to the coating composition had also been deleted, the remaining four claims had been reformulated as use claims, and the lower limits of the definitions of "n or n+m+o" had been given new values of "100" in Claim 1 and of "106" in Claim 2.

(8) On 18 September 2003, oral proceedings were held before the Opposition Division. These proceedings were based on the above new requests and on a total of

twenty cited documents. In the hearing, not only the previously raised objections of lack of novelty and lack of inventive step were dealt with, but also a further objection under Article 123(2) EPC, which had been raised by the Opponent in a letter dated 29 August 2003 in particular with regard to the amendments in the "Auxiliary Claims" mentioned in sections II(5) and (7), above, and the question of whether the claimed subject-matter was entitled to the priority date of 21 December 1994. At the end of the hearing, the Patent Proprietor submitted a new version of the description adapted to the wording of the claims of Auxiliary Request 1.

(9) Only a number of the documents cited during the opposition proceedings were referred to by the parties again in the appeal proceedings of this case in a different order. Therefore, as far as the documents have played a role for this decision, a concordance of the reference numbers is given below for those documents referred to again by the parties:

- D1:** (R12) JP-A-07-309 954 (English translation),
- D2:** (R13) JP-A-07-206 982 (English translation),
- D3:** (R11) JP-A-07-309 929 (English translation),
- D4:** (R3) US-A-5 118 729,
- D5:** (R4) GB-A-2 113 690,
- D9:** (R9) EP-A-0 311 894, and
- D15:** Certified copy of the earlier U.S. Patent application No. 361076 (see section I, above).

(10) Of these documents, only D4/R3 and D5/R4, had been cited within the nine-months opposition period and from all the further documents cited by the parties later only D9/R9 was, according to the interlocutory decision

terminating the opposition stage, introduced into the proceedings, whilst the others were disregarded under Article 114(2) EPC (item II.6 of the decision).

III. In the interlocutory decision announced at the end of the above oral proceedings and issued in writing on 17 October 2003, the Opposition Division came to the conclusion that the patent in suit and the invention to which it related, as amended in Auxiliary Request 1, met the requirements of the EPC.

(1) By contrast, the Main Request was held not to fulfil the requirements of Article 123(2) EPC, because the new lower limit of 106 of the feature "n or n+m+o" (section II(5), above) had had no basis in the *application as filed*. Nor did the Opposition Division accept that this new limit could be considered to be an allowable disclaimer against D9/R9 (section II(9), above), which document was deemed highly pertinent to either novelty or inventive step (items II.3.1 and 3.2).

(2) The limitation of the definition of Z to moieties derived from 4-MHHPA, however, was found to have a basis at *page 4, lines 17 to 22, and in all examples*. Therefore and undisputed by the Opponent (Minutes of the above hearing, item 2.4), Auxiliary Request 1 was held to fulfil the requirements of Article 123(2) EPC.

(3) The next item in the decision concerned the validity of the priority claim, which had been disputed by the Opponent in connection with a novelty objection raised in a letter of 29 August 2003, last page, on the basis of three Japanese documents D1/R12, D2/R13 and D3/R11 published only after the claimed priority date.

Based on the priority document D15, the Opposition Division took the view that, although aqueous epoxy resin compositions had not explicitly been mentioned therein, the core of the invention had not been amended in the patent in suit beyond what had been disclosed in the priority document, because the epoxy-modified polyoxyalkylene ethers were obviously designed for use as emulsifiers enhancing the compatibility of hydrophobic epoxy resins in a hydrophilic, aqueous solvent. This argumentation appeared, furthermore, according to the Opposition Division, to be in line with the case law of the technical boards of appeal (for example T 73/88, OJ EPO 1992, 557; T 16/87, OJ EPO 1992, 212). Consequently, the priority claim was acknowledged, which led to the decision that none of D1/R12, D2/R13 and D3/R11 was state of the art in the sense of Article 54(2) EPC, so that there was no need to take them into account.

Since a novelty objection against the latest version of the claims had only be based on these documents, novelty was also acknowledged.

(4) For inventive step, D4/R3 was considered to be the closest piece of prior art, because it was concerned with the same technical field of providing water based epoxy resin dispersions using particular epoxy-functional emulsifiers. Those emulsifiers were based on polyoxyalkylene ethers functionalised by an epoxy-group containing moiety. The linking group was based on a dicarboxylic acid or a dicarboxylic anhydride. Amongst the list of preferred anhydrides 3-MHHPA was mentioned.

The features distinguishing the claimed subject-matter of the patent in suit from D4/R3 were seen in the facts that (i) the emulsifiers of D4/R3 were derived from polyoxyalkylene monoalkyl ethers and were, therefore, mono-epoxy-functional and (ii) the patent required a linking group in the emulsifier derived from 4-MHHPA.

(5) With respect to the technical problem to be solved vis-à-vis D4/R3, the Opposition Division accepted the results in the experimental report of the Opponent and, on this basis, also its argument, that the additional experimental results of the Patent Proprietor submitted to demonstrate an improvement in the emulsifying power of the di-epoxy-functional compounds of the patent in suit over that of the mono-epoxy-functional emulsifiers of D4 had not been convincing (cf. section II(2), above). Therefore, the technical problem to be solved vis-à-vis D4/R3 was "merely to provide alternative compositions for the same purpose".

(6) Whilst the further document D5/R4 disclosed the preparation of a compound comprising a central hydrophilic segment based on a polyoxyalkylene chain and two terminal segments based on multifunctional epoxy resins linked via dicarboxylic acid moieties, these compounds were only used as additives to impart flexibility to epoxide resins and "are therefore not related to the technical field of the disputed patent. Therefore, a skilled person would not have considered this document when looking for an alternative aqueous epoxy resin composition."

(7) In the preparation of aqueous dispersions in D9/R9, the reaction products of mono- or dihydroxyfunctional

polyethers with dicarboxylic acids or their derivatives could equally be further reacted with an excess of an epoxy compound having more than one epoxide group per molecule. However, whilst, in the list of suitable dicarboxylic acids, a general hint to methylhexahydro-phthalic acid was given without indication of the position of the methyl group, maleic anhydride was preferred. Therefore, the Opposition Division concluded that more than two specific choices within the teaching of D9/R9 had to be made by the skilled person including the selection of dihydroxyfunctional polyethers and of 4-MHHPA, which compound had not even been mentioned in D9 nor in any other relevant prior art document. Moreover, the technical field of the document (the aqueous dispersions were used as sizing agents for glass fibres) was seen to be only marginally related to the technical field of the patent in suit. Consequently, the Opposition Division saw no incentive for the skilled person starting from D4/R3 "to modify the alternative solutions offered by the other documents in order to arrive at the subject-matter of the disputed patent according to the first auxiliary request. The subject-matter of claims 1-5 according to the first auxiliary request involves an inventive step (Art. 56 EPC)." (sections II.4.3 to 4.4 of the decision).

(8) Nor did the Opposition Division agree to the suggestion of the Opponent that D9/R9 would be the closest piece of prior art.

IV. On 23 December 2003, a Notice of Appeal was filed against this interlocutory decision by the Opponent/Appellant, who requested that the decision under appeal

be set aside and the patent in suit be revoked. The prescribed fee was paid on the same date.

(1) In the Statement of Grounds of Appeal, received on 27 February 2004, the Appellant reiterated its arguments on the basis of D15, eg pointing out that in D15 no mention was made of water, and referred to Opinion G 2/98 (OJ EPO 2001, 413) in order to support its view, that the patent in suit could not benefit under Article 87(1) EPC from the priority of D15.

(2) With regard to inventive step, it based its arguments primarily on D1 as closest prior art in combination with D4. A second argument to assert lack of inventive step was based on similar compositions disclosed in D2, eg on its Examples 1 to 10, in particular, on Example 8 in combination with manufacturing Examples 24 and 15. A third argument to this end was based on D4 in combination with D1. The novelty objection was not further pursued.

V. In a letter of 7 July 2004, the Respondent disputed these arguments and requested that the appeal be dismissed and that the decision under appeal be confirmed. In particular, the Respondent argued in favour of its priority claim and took the view that documents D1 to D3 would not, therefore, be relevant. It also contested the Appellant's arguments that 4-MHHPA would have been preferred over other possible diacid or anhydride starting materials or would have been the most readily available compound.

(1) With regard to the question of priority, the Respondent referred to G 2/98 (above) and stated:

As is known, the President of the EPO referred the following point of law to the Enlarged Board of Appeal: 1a) *“Does the requirement of the same invention in Article 87(1) EPC mean that the extent of the right to priority derivable from a priority application for a later application is determinedly, and at the same time limited to, what is at least implicitly disclosed in the priority application?”*.

Then the Respondent continued that this question had been answered in the Opinion in the affirmative and that it, therefore, disagreed with the interpretation of the Appellant "from which it could be concluded that the subject-matters of the claims have to be explicitly disclosed in the priority application. This conclusion of the Appellant is contrary to the opinion of the Enlarged Board of Appeal" (page 1 of the letter).

(2) Furthermore, the Respondent referred to a passage in G 2/98, that the problem underlying the claimed subject-matter could not be determined once and for all at any given point of time. Then it argued that the problem to be solved would have been in both D15 and the *application* "to provide an improved emulsifier/ reactive diluents, showing a specifically attractive hydrophobic/hydrophilic balance and enabling an improved efficient emulsification of epoxy resins." Every person skilled in the art would immediately have appreciated "that the use of such emulsifier for dispersion of epoxy resin would advantageously take place in water, based on the available knowledge before the claimed priority date. More in particular this was known to said skilled person from e.g. Document D4 from which Appellant seems to be able to derive the same teachings for very similar emulsifier according to Appellant's expressed opinion, ... Therefore there is NO reason to deny that there is one and the same inventive conception in the priority document and the subsequent European patent application which finally led to the contested patent. As is clearly admitted in

the herein before discussed paragraph (v) in Decision G 02/98 (pages 9 and 10) such inventive conception could be allowed to be reworded if necessary. Therefore in this case indeed a right of priority shall be enjoyed by the Patent Proprietor for the same invention." (page 1, last two lines to page 2, paragraph 4 of the letter). In this context, the Respondent also referred to further documents which had been cited in the opposition proceedings, but had not been admitted to the proceedings by the Opposition Division under Article 114(2) EPC (section II(10), above).

- VI. A summons to oral proceedings was issued on 8 December 2006.

- VII. In a letter dated 11 January 2007, the Respondent informed the Board that it would not attend the oral proceedings on 21 February 2007, but that it maintained its previous arguments.

- VIII. On 31 January 2007, the Board issued a fax communication informing the parties that the amended claims as upheld by the Opposition Division and as further pursued by the Respondent would have to be examined with regard to the requirements of both Article 123(2) and (3) EPC. At that time, it would have appeared that Claim 1 of the "First Set of Auxiliary Claims" extended, however, beyond the scope of its granted version, due to the deletion of the word "reactive" (cf. section II(4), above).

- IX. In reply to this communication, three new sets of claims were received with a letter dated 6 February

2007. These new sets differed from the Auxiliary Requests 1 to 3 (sections II(4) to (6), above) only by the reinstatement of "reactive" between "and/or" and "diluent" in the first paragraph of each Claim 1.

In order to support this amendment, the Respondent additionally submitted a copy of page 2 of the amended description to Auxiliary Request 1 (section II(8), above) and pointed to line 14 of this page.

X. The oral proceedings were held on 21 February 2007 before the Board in the absence of the Respondent.

(1) Since the question of the validity of the claimed priority was seen as the key for any further decision on the merits in this case, the Appellant was invited to present its arguments in this respect at first.

(2) The Appellant put emphasis on the argument that D15 had not disclosed the concept of an aqueous dispersion, but had referred only to epoxy-functional polyethers as such. Reference to compounds useful in epoxy resin applications, eg as emulsifiers or diluents, could only be found in the "Background of the Invention". This part of a description would not, however, generally be used to disclose the particulars of the claimed subject-matter. Although accepting that mention was made in this part of D15 (i) of functional groups, which were to render the compounds more compatible with the epoxy resin matrix, and (ii) of "predefined hydrophilic and hydrophobic segments", both of which statements could also be found in the *application*, the Appellant argued that this did not amount to a clear and unambiguous teaching in D15 to the preparation of

aqueous dispersions made with the above epoxy-functional polyethers. Nor were aqueous dispersions addressed anywhere else on the twenty-four pages of D15.

Additionally, the Appellant pointed out that the compounds mentioned in the above Background section of D15 were described as emulsifiers **or** diluents and that, therefore, the question of compatibility was not necessarily linked to their use as an emulsifier, let alone to their use in aqueous dispersions, but could rather be seen in the context of their use as a **reactive** diluent (see [Claim 1], section I, above). However, the concept of providing a **reactive** diluent had not explicitly been disclosed in D15 either.

Moreover, the Appellant stressed that in D15 and in the *application*, within the definition of group B only the sum of $n+m+o$ was defined, so that both n and o could be zero. This would, however, mean that B could be limited to a totally hydrophobic polyoxyalkylene chain composed exclusively of oxypropylene and/or oxybutylene groups, preventing the compounds from acting as emulsifiers in aqueous dispersions, but allowing them to act, instead, as diluents in the hydrophobic epoxy matrix.

Even in the *application as filed*, the claims had been directed to a composition comprising the epoxy-functional polyethers as such and to a method for producing them. The gist of the claimed subject-matter was, according to the Appellant, shifted to aqueous based epoxy resin compositions only during the PCT preliminary examination of the case in order to establish novelty and inventive step, as could be derived from section V of the International Preliminary

Examination Report. This could eg be seen in Table 1 of D5/R4, referred to as D1 in that Report. A reference to this feature, ie to an aqueous composition, which was important for the further pursuit of the application, had, however, only been made on *page 1* of the *application as filed* for the very first time.

Moreover, decisions T 73/88 and T 16/87 (section III(3), above), as relied upon by the Opposition Division for its decision on priority, would no longer be applicable in view of G 2/98 (above).

In summary, the Appellant took the view that the claimed subject-matter in the present case could not be derived from D15 in a direct and unambiguous way as required by the Enlarged Board of Appeal in G 2/98 for the acknowledgement of a prior application as being directed to the same invention as the subsequent patent application. Consequently, the claimed subject-matter could not, according to Art 87(1) EPC, benefit from the priority of D15.

(3) After deliberation, the Board gave its decision that the claims were not entitled to the priority claimed.

(4) In view of this decision, the Appellant informed the Board that it had no objections as to the question of novelty of the claimed subject-matter and, furthermore, confirmed that it maintained its objections of lack of inventive step on the basis of documents D1, D2 and D4 as presented in its Statement of Grounds of Appeal (section IV(2), above).

(5) Whilst stating that the disclosures in D1, D2 and D3 were similar to each other, so that each could equally serve as the starting point (ie as the closest state of the art) for the problem-solution approach, the Appellant then referred, in particular, to the following passages of D2:

- page 4, last two lines and page 5, lines 1 to 8, where reference was made (i) to a water-soluble resin made by reacting the reaction product of a poly(oxyethylene polyol) and an acid anhydride compound with an epoxy resin and (ii) an auto-emulsifiable epoxy resin composition obtained by mixing the above water-soluble resin with an epoxy resin; and
- page 7, line 12, where explicit mention was made of MHHPA within a broad range of dicarboxylic acids and their anhydrides, all conceivable as components for the preparation of the compounds in question.

In the Appellant's opinion, the only difference could be seen in the failure of D2 (or D1 or D3) to recite the position of the methyl substituent.

(6) With regard to the problem to be solved vis-à-vis this closest state of the art, the Appellant pointed out that no technical effect related to the position of the methyl substituent, ie either the 3- or 4-position, had been shown. Nor would any such effect have been expected by a person skilled in the art.

(7) This view would, furthermore, be supported by D4, wherein in column 14, lines 33 to 35, 4-MHHPA was *expressis verbis* mentioned and identified as a commercial product, which was reacted in Example 1 of

the document together with a methyl ether of poly(ethylene oxide) in the first step of the preparation of a mono-epoxy-functional product useful for the same purpose as in the patent in suit, ie the emulsification of an epoxy resin in water.

(8) Whilst, admittedly, there was a difference between the mono-epoxy-functional compounds of D4 and the di-epoxy-functional compounds of the patent in suit, this difference would be of no significance for the use of compounds of these two types as emulsifiers for aqueous based epoxy resin compositions.

(9) This could be seen from D9 relating to aqueous based dispersions of mixtures of epoxy resins and polyesters, the latter having been modified by polyether units and epoxy groups. The Appellant referred in particular to page 4, lines 5 and 6 of D9 to demonstrate that both the polyethers and the monoethers of the polyethers could equally be used as starting compounds for making the modified polyesters for the specific aqueous coating compositions for fibres, based on the emulsification according to the same concept as in D1 to D4 and the patent in suit.

(10) The Appellant concluded that the claimed subject-matter was not based on an inventive step.

(11) Finally, the Appellant came back to a fact already addressed in the discussion about the priority issue (section X(2), above) that the claims of the patent in suit would not even require the reaction product to have emulsifying properties. Rather, it could, in the alternative, only be a reactive diluent.

- XI. The Appellant requested that the decision under appeal be set aside and that the patent in suit be revoked.

According to its letter of 7 July 2004, the Respondent had requested that the appeal be dismissed and that the decision under appeal be confirmed (section V, above).

Reasons for the Decision

1. The appeal is admissible.
2. *Procedural matters*
 - 2.1 In view of the letter dated 11 January 2007 of the Respondent, who had also duly been summoned, the Board decided to continue the proceedings in accordance with Rule 71(2) EPC (sections VI, VII and X, above).
 - 2.2 The Respondent's request, mentioned in section XI, above, could only mean that the patent in suit should be maintained on the basis of Auxiliary Request 1 (sections II(4) to (6) and III, above). Apart therefrom, the wording used by the Respondent to formulate its request in that letter of 7 July 2004 (sections V and XI, above) leaves no room for an interpretation that Auxiliary Requests 2 and 3 had been pursued further.
 - 2.2.1 However, with its letter of 6 February 2007, the Respondent submitted not only an amended version of Auxiliary Request 1, but also two additional sets of claims titled "Second" and "Third Set of Auxiliary Claims", respectively (section IX, above).

2.2.2 In the Board's view, these additional sets of claims filed only in reply to a communication from the Board, that Claim 1 of Auxiliary Request 1 apparently contravened Article 123(3) EPC (section VIII, above), shortly before the scheduled hearing, can only be regarded as late-filed in the sense of Article 10b(1) of the Rules of Procedure of the Boards of Appeal:

(1) Any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the complexity of the new subject matter submitted, the current state of the proceedings and the need for procedural economy.

2.2.3 Apart from the introduction of the word "reactive" in the first paragraph of each Claim 1, these additional new sets were identical to the claims of the previous Auxiliary Requests 2 and 3 and, just like the previous Main Request, which had been rejected in the decision under appeal for non-compliance with Article 123(2) EPC, each of these new sets contains at least one claim wherein the lower limit of "n or n+m+o" is 106 (cf. sections II(4) to (7), above) (section III(1), above).

2.2.4 Consequently, the Board decided to make use of its discretion under the above Article and not to admit these additional new sets of claims to the proceedings, but to limit the subject-matter considered in these appeal proceedings to the amended claims of the "First Set of Auxiliary Claims" as submitted with the letter dated 6 February 2007, comprising Claims 1 to 5 (cf. sections II(4) to (6) and IX, above).

3. *Priority*

3.1 In the decision under appeal, the Opposition Division had come to a positive decision on the claimed priority. In support of that decision, reference was made to decisions T 73/88 and T 16/87 (section III(3), above).

3.2 By contrast, the Appellant referred to Opinion G 2/98 (section IV(1), above) and quoted several passages from No. 9 of the reasons for the Opinion to show that a narrow and strict interpretation of the concept of the "same invention" was to be applied in the assessment of priority, which should not, therefore, in the Appellant's view, have been acknowledged.

3.3 In its reply (section V, above) to the appeal, the Respondent had also referred to G 2/98, in particular to the President's question 1a), and disagreed with the interpretation of G 2/98 by the Appellant, which it found to be contrary to the Opinion of the Enlarged Board of Appeal (section V(1), above).

3.4 In view of these arguments, it appears necessary to decide, whether the approach made by the Opposition Division was appropriate to the present situation.

3.4.1 In answering the question 1a) of the President, as mentioned above, the Enlarged Board of Appeal chose the following language in the Conclusion of the Opinion G 2/98 (above):

The requirement for claiming priority of "the same invention", referred to in Article 87(1) EPC, means that priority of a previous application in respect of a claim in a European patent application in accordance with Article 88 EPC is to be acknowledged only if the skilled person can derive the subject-matter of the claim directly and unambiguously, using common general knowledge, from the previous application as a whole.

3.4.2 Moreover, from the detailed considerations of different aspects affected by priority, in particular in Nos. 8.1 to 8.3 of the Reasons for the Opinion, it is clear "that an extensive or broad interpretation of the concept of 'the same invention', for example along the lines as set out in decision T 73/88 (...) ..." was not to be applied in the assessment of the validity of the claimed priority, because otherwise "... it could thus give rise to arbitrariness".

3.4.3 Furthermore, the Respondent referred to a further passage in G 2/98 (section V(2), above), in order to support its view concerning the claimed priority. This argument included a reference to a point made in the President's submissions ("paragraph (v)" as quoted in section V(2), above, concerns No. III.(v) of the Summary of the Proceedings), that the technical problem to be solved with regard to the closest state of the art may be reformulated at the different stages of procedure before the EPO.

3.4.4 This point had also been dealt with by the Enlarged Board of Appeal in No. 8.3 of the Reasons where the difficulties were discussed which would be encountered when applying the approach of T 73/88 (above) to the assessment of priority:

Furthermore, as pointed out in the referral of the President of the EPO (cf. point III. (v) supra), it has to be borne in mind that the assessment by these different deciding bodies of whether or not certain technical features are related to the function and effect of the claimed invention may completely change in the course of proceedings. This is the case, in particular, if new prior art is to be considered, with the possible consequence that the validity of a hitherto acknowledged right of priority could be put in jeopardy. Such dependence would, however, be at variance with the requirement of legal certainty.

3.4.5 Consequently, the Enlarged Board of Appeal concluded in No. 9 of the Reasons:

From the analysis under point 8 supra, it follows that an extensive or broad interpretation of the concept of "the same invention" referred to in Article 87(1) EPC, making a distinction between technical features which are related to the function and effect of the invention and technical features which are not, with the possible consequence that a claimed invention is considered to remain the same even though a feature is modified or deleted, or a further feature is added (cf. point 8.3 supra), is inappropriate and prejudicial to a proper exercise of priority rights. Rather, according to that analysis, a narrow or strict interpretation of the concept of "the same invention", equating it to the concept of "the same subject-matter" referred to in Article 87(4) EPC (cf. point 2 supra), is necessary to ensure a proper exercise of priority rights in full conformity *inter alia* with the principles of equal treatment of the applicant and third parties (cf. point 8.1 supra) and legal certainty (cf. point 8.3 supra) and with the requirement of consistency with regard to the assessment of novelty and inventive step (cf. point 8.1 supra). Such interpretation is solidly supported by the provisions of the Paris Convention (cf. point 5 supra) and the provisions of the EPC

(cf. point 6.8 supra), and is perfectly in keeping with opinion G 3/93 (cf. point II.(vi) supra). It means that priority of a previous application in respect of a claim in a European patent application in accordance with Article 88 EPC is to be acknowledged only if the person skilled in the art can derive the subject-matter of the claim directly and unambiguously, using common general knowledge, from the previous application as a whole.

3.4.6 In the present Board's view, the above considerations clearly show that an approach following the lines of decisions T 73/88 and T 16/87 (above) could no longer be considered as appropriate for the assessment of priority after the issuance of Opinion G 2/98 (OJ EPO 2001, 413).

3.5 In substance, the decision under appeal had held that all the examples of D15 had been transferred identically to the experimental part of the patent in suit, and that the passage on its page 1, lines 8 to 18 (concerning the background of the invention) would have appeared to reflect the motivation of the Applicant for developing a particular kind of epoxy-modified polyoxyalkylene ethers intended to be particularly useful as emulsifiers and diluents in epoxy resin applications due to well defined hydrophilic and hydrophobic properties. These considerations were the basis of the finding that the claimed subject-matter of Auxiliary Request 1 would have fully been based on the priority document D15 (cf. section III(3), above).

3.5.1 As mentioned in section V(2), above, the Respondent argued along the same lines and relied in addition to further documents, which had not been admitted, to support its case with regard to common general knowledge.

3.5.2 By contrast, the Appellant, in addition to its arguments on the basis of G 2/98 (above), which required that the claimed subject-matter be able to be directly and unambiguously derived from the priority document, had pointed out that the subject-matter claimed in the patent in suit related to a composition comprising compulsorily water, and that D15 contained no such disclosure (section IV(1), above).

Moreover, at the hearing, the Appellant presented further arguments on the basis of those facts and documents already in the proceedings, namely D15 and the *application* (section X(2), above), ie in accordance with Opinion G 4/92 (OJ EPO 1994, 149; in particular No. 10 of the Reasons) and, hence, with Article 113(1) EPC.

3.5.3 In the Board's view, it is noteworthy that the question on priority focused completely on the content of the "Background" section on page 1 of D15 and on page 1 of the application, respectively, because a reference to the use of the reaction products of the epoxy-modified polyether acids of formula (VI) as defined in *Claim 1* in aqueous based epoxy resin compositions could not be found elsewhere in either document. Likewise, a reference to water or to the term "aqueous" itself can only be found on page 1 of the application as filed. These facts were not in dispute between the parties.

However, the opinions of the parties are divided as to whether the reference in D15 (page 1, lines 8 to 18) to "emulsifiers or diluents", to "compounds to have epoxy functional groups to increase the compatibility with

the cured epoxy matrix", to "predefined hydrophilic and hydrophobic segments depending on the desired applications" and to "the hydrophilic and hydrophobic properties of the compounds" could provide the required basis for the validity of the claimed priority as asserted by the Respondent.

- 3.5.4 In view of the findings in G 2/98 and the conclusions which must be drawn therefrom (see sections 3.4 to 3.4.6, above), the Board is not, however, in a position to refute the arguments of the Respondent (sections IV(1), X(2) and 3.5.2, above).

In particular, in D15, no mention is made of the presence of "water" or of an "aqueous" system. Even when assuming that the word "hydrophilic" as used on page 1, lines 14 to 18 (previous section, last paragraph) is related to water, this amounts neither to a disclosure of water-based compositions as such nor to the ability of the epoxy-functional polyethers according to formula (VI) in Claim 1 to act as emulsifiers in water-based compositions. Rather, D15 only refers to the possibility that the ratio of hydrophilicity and hydrophobicity may be controlled. This includes the possibility to provide a compound within the terms of Claim 1, which may have no emulsifying power but may eg change the surface properties of a shaped article made therewith in such a way, that it is not completely water-repellent.

Nor does the disclosure in D15 provide a basis for aqueous based epoxy resin compositions suitable for coating purposes (as referred to on page 1, last paragraph for the very first time) or an "Aqueous

coating composition comprising a composition of claims 1 to 5" in [Claim 6] or "... to 4" in Claim 5 of the sole request under consideration, respectively (section 2.2.4, above).

- 3.6 On the basis of these facts, arguments and findings, the Board came to the conclusion that the claims under consideration were not entitled to the priority claimed.

Hence, the effective filing date of the patent in suit is the international filing date of the *application* (20 December 1995) (Article 150(3) EPC), which is later than the publication dates of D1 (28 November 1995), D2 (8 August 1995) and D3 (28 November 1995), respectively. Therefore, these documents are comprised within the state of the art as defined in Article 54(2) EPC.

4. *Novelty*

As mentioned in section X(4), above, the Appellant had no objections concerning the novelty of the claimed subject-matter. Nor does the Board have any reason to take a different view.

The requirements of Article 54 EPC are therefore met.

5. *Problem and solution*

- 5.1 The patent in suit seeks to provide epoxy-functional polyethers suitable as emulsifiers and/or reactive diluents for aqueous based epoxy resin compositions [page 2, lines 3 and 4].

5.2 Polyethers fulfilling this task in epoxy resin dispersions were already disclosed as component (B) in the claim of D1 (see also D1: [0010]).

This component "epoxy resin (B)" is described further in paragraphs [0016] to [0022] of D1. Moreover, its preparation is described in great detail in paragraphs [0023] to [0032]. Thus, according to [0023], a polyhydric alcohol containing a polyoxyethylene chain in the molecule is reacted in a first step with a polycarboxylic acid or the acid anhydride thereof to obtain a polyester resin having two or more carboxylic groups. These carboxylic groups are then further reacted in a second reaction step with an epoxy resin having two or more epoxy groups. In paragraph [0025], reference is made *inter alia* to methyl hexahydrophthalic acid. In the same paragraph, it is additionally made clear that the anhydrides of the different acids mentioned there can equally be used as the polycarboxylic compound to be reacted with the polyhydric alcohol in the first step.

More particularly, this preparation is exemplified in Reference Example 2 (paragraph [0042]), wherein MHHPA was reacted with polyethylene glycol. The reaction product thereof was then reacted with an epoxy resin of a bisphenol type to give "epoxy resin b)".

This "epoxy resin b)" was used in Example 4 [0051] to prepare an aqueous based epoxy resin composition (in the form of a storage-stable dispersion) further comprising an bisphenol A type epoxy resin, an alcohol and water.

The only difference imparting novelty to the claimed subject-matter in comparison therewith is apparently the fact that MHHPA was used, but not 4-MHHPA.

- 5.3 In Claim 1 of D2, a water-soluble epoxy resin was prepared by reacting a carboxylic compound (A) with an epoxide (B) containing two or more epoxy groups per molecule in a proportion of 0.75 to 1.5 moles of the epoxy resin (B) per equivalent of the carboxyl groups in the above compound (A), which had been obtained before by reacting a poly(oxyethylene polyol) (A-1) with an acid anhydride (A-2).

In its claim 2, the preparation of an autoemulsifiable epoxy resin composition is disclosed by mixing an amount of the water-soluble epoxy resin of its Claim 1 with another epoxy resin.

The compounds (A-1) are further described on page 5, last two paragraphs, and the compounds (A-2) on page 7, second complete paragraph. The list of the compounds (A-2) includes MHHPA (page 7, line 12).

Like D1, D2 is silent with regard to the position of the methyl group in the MHHPA.

- 5.4 This is also true for D3, wherein reference can, in particular, be made to Example 2 ([0033] and [0034]).
- 5.5 As pointed out above, and as emphasised by the Appellant (sections X(5) and (6), above), the only difference between the claimed subject-matter and the disclosure in these documents resides in the failure of

these documents to identify the position of the methyl group in the MHHPA.

Moreover, the Appellant pointed out that no technical effect related to the 4-position as opposed to the 3-position had been shown, nor would such an effect have been expected by the person skilled in the art. Therefore, the technical problem to be solved with regard to any one of the above documents D1 to D3 could only be seen in the provision of an alternative water-based epoxy composition.

5.6 No statement to the contrary has been made by the Respondent. Nor does the Board see any basis for a different formulation of the technical problem underlying the patent in suit with respect to the above documents, even more because neither does the patent in suit contain any example demonstrating such an aqueous based epoxy resin composition, nor has the Respondent filed any evidence to this end during the opposition or appeal proceedings.

6. *Inventive step*

It remains to be decided whether the claimed solution of this problem derives in an obvious way from the cited documents.

6.1 It is evident from the previous paragraphs that in none of D1 to D3 can any reference to 4-MHHPA be found. Hence, the question may arise whether the selection of 4-MHHPA from the group of 3- and 4-MHHPA would be based on an inventive step when seeking an alternative.

6.2 However, this question can be left aside, because D4 (in its abstract) also discloses a compound (in Claim 1, it is referred to as "composition") useful for emulsifying an epoxy resin in water. This compound is prepared from a polyoxyethylene monoalkyl ether containing such an amount of oxyethylene moieties that the composition is emulsifiable in water. At first, polycarboxylic compound, preferably a dicarboxylic acid or an anhydride thereof, was reacted with the above polyoxyethylene monoether, and the reaction product was then further reacted with a compound providing a 1,2-glycidyl ether moiety (D4: a list of suitable carboxylic compounds can be found in column 7, line 17 to column 8, line 4). In particular, reference can be made to Example 1 wherein 4-MHHPA was used, despite the statements at the top of Column 8, referring to 3-MHHPA. In Example 1, 4-MHHPA is clearly identified as having been a commercial product available from Huels AG, whilst no such information has been given for 3-MHHPA.

As pointed out by the Appellant (section X(7), above, and in view of this clear and unambiguous disclosure in Example 1 of D4, the Board has no doubt that 4-MHHPA would have been recognised by the skilled person as being suitable in the preparation of an emulsifier for the same purpose as in the patent in suit, just like MHHPA as described in any one of D1 to D3 (sections 5.2 to 5.4 and 6.1, above).

6.3 In the Board's view, this finding is not even called into question by the fact that D4 does not refer to a compound containing epoxy groups at both of its ends as in the patent in suit, but has only one epoxy group (section X(8), above).

6.4 This view is further supported by D9, as referred to by the Appellant (section X(9), above). This document concerns aqueous dispersions of epoxy resins, which are suitable as sizing agents for glass fibres, ie compositions forming coatings on these specific substrates. Besides the epoxy resin, these dispersion additionally comprise polyesters modified by polyether moieties and epoxy groups (abstract of D9).

As disclosed on page 4, last paragraph, of D9, these modified polyesters are prepared by reacting polyethers with dicarboxylic acids and/or their derivatives (cf. the list of such compounds on page 5, lines 47 to 54) followed by the reaction of the intermediate products of that first reaction in a second stage with epoxy compounds having more than one epoxy group per molecule.

According to page 4, lines 5 and 6 of D9, mono- or bi-hydroxy-functional polyethers are equally suitable as preferred starting materials.

6.5 In summary, it is evident that each of the above documents deals with the same type of reaction, in which epoxy-functional compounds have been prepared by reacting in a first step the terminal hydroxy end groups of poly(oxyalkylene) compounds with a carboxylic compound, and by subsequent reaction of the intermediate products obtained thereby with epoxy compounds having at least two epoxy groups. None of these documents indicates that the particular restriction would apply with regard to the nature of the carboxylic starting compound, except for the requirement that it has more than one carboxylic group

which can react with, on the one hand, the polyoxyalkylene compound and, on the other hand, the epoxy-functional compound. Moreover, the resulting products in all the above documents were clearly used in aqueous based epoxy resin compositions.

6.6 Therefore, the Board takes the view that the skilled person, when seeking an alternative to the disclosure of either D1, D2 or D3, would have derived at least from D4, that 4-MHHPA was a suitable starting compound for the linking group in preparing such compounds.

6.7 Furthermore, as pointed out by the Appellant (sections X(2) and (2)(11), above), Claim 1 does not require the compounds in question to have emulsifying properties, nor is it clear that all such compounds would fulfil such a requirement (section 3.5.4, above, paragraph 2). Therefore, the only critical property of the compound which would appear to be common to all these compounds would be their compatibility with the cured epoxy matrix. This property has never been disputed with regard to the products of any one of the documents taken into account for inventive step, herein before. Nor does the Board see any reason for any doubts in this respect.

6.8 In view of these facts and findings, the Board takes the view that the subject-matter of Claim 1 of the patent in suit is not based on an inventive step.

7. Since a decision can only be made on a request as a whole, it follows that the other claims share the fate of Claim 1, and the sole request on file cannot, for

the above reasons, succeed. Consequently, the patent cannot be maintained as requested by the Respondent.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The Patent is revoked.

The Registrar:

The Chairman:

E. Görgmaier

R. Young