

**Internal distribution code:**

- (A)  Publication in OJ  
(B)  To Chairmen and Members  
(C)  To Chairmen

**D E C I S I O N**  
of 9 July 1998

**Case Number:** T 0786/96- 3.3.3

**Application Number:** 87114258.4

**Publication Number:** 0264675

**IPC:** C08G 18/20

**Language of the proceedings:** EN

**Title of invention:**  
Moisture curable sealant compositions

**Patentee:**  
Essex Specialty Products, Inc.

**Opponent:**  
Henkel Teroson GmbH

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 54(2), 56, 113(1)

**Keyword:**  
"Novelty (yes) - new ground of opposition (no) - already in proceedings - first instance finding on this point *per in curiam*"  
"Inventive step (yes) - prior art documents not combinable except with hindsight"

**Decisions cited:**  
G 0010/91, T 0325/93

**Catchword:**  
-



Europäisches  
Patentamt

European  
Patent Office

Office européen  
des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

47

Case Number: T 0786/96 - 3.3.3

**D E C I S I O N**  
of the Technical Board of Appeal-3.3.3  
of 9 July 1998

**Appellant:**  
(Opponent)

Henkel Teroson GmbH  
Postfach 10 56 20  
69046 Heidelberg (DE)

**Representative:**

Mathes, Nikolaus, Dr.  
Henkel KGaA  
Patente (TTP)  
Henkelstrasse 67  
40589 Düsseldorf (DE)

**Respondent:**  
(Proprietor of the patent)

Essex Specialty Products, Inc.  
1333 Broad Street  
Clifton  
New Jersey 07013 (US)

**Representative:**

Raynor, John  
W.H. Beck, Greener & Co.  
7 Stone Buildings  
Lincoln's Inn  
London WC2A 3SZ (GB)

**Decision under appeal:**

Decision of the Opposition Division of the  
European Patent Office dated 4 June 1996, issued  
in writing on 9 July 1996 rejecting the  
opposition filed against European patent  
No. 0 264 675 pursuant to Article 102(2) EPC.

**Composition of the Board:**

**Chairman:** C. Gérardin  
**Members:** R. Young  
J. A. Stephens-Ofner

## Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 264 675, on the basis of 21 claims, in respect of European patent application No. 87 114 258.4, filed on 30 September 1987 and claiming a US-priority of 20 October 1986 (US 920747) was announced on 14 October 1992 (Bulletin 92/42). Claim 1 reads as follows:

"A moisture curable sealant having good stability in the absence of moisture and a rapid cure rate in the sole presence of atmospheric moisture, characterized in that it comprises a polyurethane prepolymer having an isocyanate functionality between 2.3 and 2.7 and a molecular weight of 3,000 to 10,000, and, admixed therewith as a catalyst, from 0.2 to 1.75 percent, by weight of said sealant, of dimorpholinodiethyl ether."

Claims 2 to 9 are dependent claims directed to elaborations of the sealant according to Claim 1.

Claim 10, an independent claim, reads as follows:

"A method for preparing a moisture curable sealant having good stability in the absence of moisture and a rapid cure rate in the sole presence of atmospheric moisture, characterized in that a polyurethane prepolymer having an isocyanate functionality between 2.3 and 2.7 and a molecular weight of 3,000 to 10,000 is mixed with, from 0.2 to 1.75 percent by weight of said sealant, of dimorpholinodiethyl ether as a catalyst."

Claims 11 to 18 are dependent claims directed to elaborations of the method according to Claim 10.

Claim 19, an independent claim, is worded as follows:

"A method of bonding an article to a substrate, characterized by applying therebetween a moisture curable sealant comprising a polyurethane prepolymer having a molecular weight of 3,000 to 10,000 and an isocyanate functionality between 2.3 and 2.7, and, as a catalyst, from 0.2 to 1.75 percent, by weight of said sealant, of dimorpholinodiethylether.

Claims 20 and 21 are dependent claims directed to elaborations of the method of Claim 19.

II. Notice of Opposition was filed on 13 July 1993 on the ground of lack of inventive step. The opposition was supported *inter alia* by the documents:

E1: EP-A-0 194 742; and the later filed, but admitted  
E3: EP-A-0 086 621.

III. By a decision which was given at the end of oral proceedings held on 4 June 1996 and issued in writing on 9 July 1996, the Opposition Division rejected the opposition.

(i) According to the minutes of the oral proceedings, the issue of lack of novelty had not been discussed, following a protest by the Patentee against its admission after the final date under Rule 71a EC., since it had never been originally substantiated in the Notice of Opposition. The decision nevertheless found that novelty was present.

(ii) In relation to inventive step, furthermore, it was clear from comparative data provided in the patent in suit as well as in an affidavit filed during examination, that the claimed compositions showed

improved properties of Lap Shear Strength balanced with high shelf life stability, owing to the selection of a specific NCO-functionality in combination with a specific amount of the dimorpholinodiethyl ether (DMDEE) catalyst, which was not to be expected from the state of the art.

- IV. On 29 August 1996, a Notice of Appeal against the above decision was filed, the prescribed fee being paid on the same day.

In the Statement of Grounds of Appeal, filed on 4 November 1996, the Appellant (Opponent) reiterated that there was lack of novelty, specifically in the light of E3. In relation to inventive step, he submitted that there was no unexpected effect compared with that disclosed in E1, wherein the catalyst was merely disclosed as a dimorpholinodialkyl ether. This was because a combination of good storage stability and quick hardening had been shown, during opposition proceedings, to be obtainable with a DMDEE or even with a conventional tin-containing catalyst, at NCO functionalities above the range claimed. He submitted that the relevant comparative experiments filed by the Patentee had used an unjustifiably large amount of catalyst, so that the claimed subject-matter thus arose in an obvious manner.

- V. The Respondent (Patentee) argued, in a submission filed on 20 March 1997, that the problem addressed by the patent in suit was that of producing a "one package" system having a sufficiently rapid cure and an acceptable shelf life, which was solved by the use of a specific catalyst, in a particular concentration range, as well as by the choice of a particular molecular weight and a particular functionality in the polyurethane prepolymer. This was suggested in none of the cited documents. With regard to the Appellant's

criticism of the amount of catalyst used in the comparative experiments, a comparison of shelf life without curing rate was meaningless, and the amount of catalyst added had merely been that necessary to achieve the relevant curing rate. Even though a shelf life suitable for some purposes might be achievable at a functionality of 3, this was not within the scope of Claim 1 of the patent in suit.

VI. Following the issue, on 13 May 1998, of a communication by the Board, drawing the parties' attention to the need for the Respondent's consent before a new ground of opposition (lack of novelty) could be admitted, oral proceedings were held before the Board on 9 July 1998.

Before any formal submissions during the appeal hearing commenced, the Respondent was asked whether he stood by his above-mentioned formal objection against the presence of the ground of lack of novelty in the proceedings. The Board also drew his attention to the seeming contradiction between the statement (page 3, §4a) of the decision of the first instance that novelty had neither been raised in writing nor discussed during the oral proceedings, and the subsequent specific finding of law (page 4, §4b) that novelty was present. In addition, the Board pointed out that without written or oral comment on this point, the part of the decision appeared to infringe Article 113(1) EPC, so that the finding of novelty could not be the basis of the decision under appeal, nor of the decision resulting from the appeal within the meaning of G 0010/91 (OJ EPO 1993, 420).

Both the Respondent and the Appellant strenuously asserted that discussion had indeed taken place before the first instance on this ground - albeit restricted to the cited documents. In these circumstances the Respondent expressly consented to the presence of the

ground of novelty in the appeal proceedings, which the Board therefore admitted, on the basis that, in reality, it had already been present in the Opposition Proceedings, so that the decision under appeal had made its comments in this respect *per in curiam*.

In the discussion of the issues of novelty and inventive step which followed, both parties relied on arguments already presented in their written submissions.

VII. The Appellant requested that the decision under appeal be set aside and the patent be revoked in its entirety.

The Respondent requested that the appeal be dismissed.

#### **Reasons for the Decision**

1. The appeal is admissible.
2. *Novelty*

The patent in suit is concerned, in its product aspect, with a moisture curable sealant having good storage stability in the absence of moisture and a rapid cure rate in the sole presence of atmospheric moisture. The sealant comprises a polyurethane prepolymer having an isocyanate functionality between 2.3 and 2.7 and, admixed therewith as a catalyst, from 0.2 to 1.75 percent, by weight of the sealant, of a specific dimorpholino ether (Claim 1). One important use of such sealants is in the automotive industry for adhering windshields to a metal chassis (page 2, lines 12 to 14).

Although there was some discussion, during the oral proceedings before the Board, as to whether E1 or E3 was the closest state of the art, the Appellant only alleged lack of novelty in relation to the disclosure of E3.

- 2.1 According to E3, there is disclosed a water-curable polyurethane prepolymer containing 0.1 to 10% of a dimorpholinodiethylether as catalyst. The prepolymer is coated on an open-weave fibrous substrate to form an orthopaedic cast bandage which is dipped in water to initiate curing. The prepolymer comprises an aromatic polyisocyanate and a polyol in an equivalent ratio of from 2:1 to 15:1 (Claim 1; page 7, lines 16 to 18). The most preferred polyols are poly(oxypropylene) diols and triols, having a molecular weight of from 400 to 2 000 (page 5, lines 1 to 15). The components are combined so that there is an excess of 5% to 30% NCO groups in the prepolymer (page 5, lines 17 to 28). According to a typical example (Example I), using the relevant dimorpholinodiethyl ether catalyst at a level of 1.0% concentration with a polyurethane prepolymer prepared from diphenylmethanediisocyanate containing carbodiimide groups and mixed polyols coated on a polyester/cotton substrate, a long gel time and a short set time are obtained (page 8, lines 16 to 31; page 9, Table I; Experiment 17).

- 2.1.1 It is quite clear that E3 relates to a different kind of product from that of the patent in suit, since the cast bandages according to E3 require liquid water, as opposed to atmospheric moisture alone, for curing, and are strongly hardening, as opposed to elastomeric as would be normal for a sealant. There is in any case no disclosure in E3 of an application requiring sealant properties.



2.1.1.1 The argument of the Appellant at oral proceedings, that the term "sealant" in the patent in suit should be broadly interpreted in the light of the reference to "bonding" an article to a substrate as in Claim 19 of the latter, and the fact that the prepolymer according to E3 "bonded" the fibres of the fibrous substrate to one another, does not convince the Board, firstly because even Claim 19 requires the use of the claimed "sealant" as the characterising feature; and secondly because, whilst a sealant may arguably always "bond" to some extent, the converse is not necessarily true, especially where, as here, the cured product has a hard, as opposed to an elastomeric character. Consequently, the disclosure in E3 of an adhesive does not amount to a disclosure of a sealant in the sense of Claim 1 of the patent in suit.

2.1.1.2 The further argument of the Appellant, that even a hardening bandage such as that according to E3 is not excluded from having some elastomeric, and therefore "sealant" character, is beside the point, since there is no specific reference in E3 to such elastomeric properties. Consequently, E3 cannot make available a "sealant".

2.1.2 Finally, whilst the product according to E3 has a number of features in common with that of the patent in suit, the isocyanate prepolymer has not been shown to have a molecular weight lying within the range claimed in Claim 1.

2.1.2.1 In this connection, there is no explicit disclosure in E3 of the molecular weight of the prepolymers used. Since, however, a polyurethane prepolymer is cured with the relevant catalyst in the relevant amounts, and even at an isocyanate functionality which was admitted by the Respondent at the oral

proceedings before the Board to lie within the range claimed in Claim 1 of the patent in suit, the difference must lie, in the Board's view, in the molecular weight, given the difference in character of the products. Indeed, the strongly hardening, rather than elastomeric character of the compositions disclosed in E3 speaks for a much higher density of cross-linking than in the case of the products claimed in the patent in suit. This is confirmed by the reference in E3 to an excess of 5% to 30% NCO groups, in contrast to about 1 to 4% by weight, stated in the patent in suit to characterise the prepolymers used in the sealants claimed (page 3, lines 5 to 8). Consequently, it is inevitable that the molecular weight of the prepolymers according to E3 is significantly lower than the range claimed in the patent in suit.

2.1.2.2 The argument of the Appellant at the oral proceedings, that if a diol or triol having the maximum molecular weight disclosed in E3 (2 000) were reacted with a diisocyanate at even the minimum stoichiometric ratio disclosed (2:1), this would result in a prepolymer having the claimed molecular weight, is beside the point, since no reaction having these characteristics is disclosed. On the contrary, it is stated in E3 that the molecular weight of the polyols is usually below 2 000 (page 5, lines 13 to 15).

2.1.2.3 Consequently, not only is there no direct and unambiguous disclosure in E3 of a polyurethane prepolymer having a molecular weight in the range claimed in the patent in suit, but, on the contrary, the molecular weight of the prepolymers according to E3 is evidently much lower than this.

2.1.3 In summary, the divergence of the compositions according to E3 from those claimed in the patent in suit in respect of molecular weight results in the former being incapable of functioning as sealants. Thus, the subject-matter of Claim 1 of the patent in suit is novel over the disclosure of E3.

2.1.4 Furthermore, and as referred to above, no objection of lack of novelty was raised in respect of E1. Nor does the Board see any reason to raise an objection of its own.

2.1.5 Consequently, the subject-matter of Claim 1 of the patent in suit is held to be novel.

It follows from this, furthermore, that the subject-matter of independent Claim 10, which is directed to the preparation of a sealant having the properties and components defined in Claim 1, and therefore contains the corresponding relevant limitations, is also novel. Furthermore, the subject-matter of independent Claim 19, which is directed to a method requiring the application of a sealant having properties and limitations corresponding to those defined in Claim 1, is likewise novel. Finally, the subject-matter of dependent Claims 2 to 9, 11 to 18, 20 and 21 is, by the same token, also novel. In other words, the subject-matter claimed in the patent is novel.

3. *The technical problem*

It is quite clear that E3 is not the closest state of the art, since it neither relates to the arena in which the problem addressed by the patent in suit can

be expected to occur (sealants) nor to a product capable of functioning as a sealant (section 2.1.3, above). Such a product is, however, known from E1, which is consequently regarded as representing the closest state of the art.

- 3.1 According to E1, there is disclosed a one-part moisture-curable polyurethane adhesive, coating, sealant or casting composition containing a blend of isocyanate functional prepolymer, terpene-phenolic resin and silane compound (page 2, lines 2 to 22; Claim 1). The compositions have excellent adhesion to unprimed metal, glass and concrete, and can be used for the bonding of windshields of laminated safety glass to vehicles such as automobiles, to provide rapid drive-away times following glass installation (page 2, lines 7 to 10; page 7, lines 26 to 34). The isocyanate functional prepolymer contains sufficient isocyanate groups to enable the composition to be cured upon exposure to atmospheric or added moisture (page 2, lines 23 to 27). The compositions can furthermore contain other adjuvants, including catalysts. Suitable catalysts include dibutyltin dilaurate, dimethyl piperazine, bis[2-(N,N-dialkylamino)alkyl]ethers and dimorpholinodialkyl ethers (page 6, lines 15 to 17 and 30 to 36).

According to preferred embodiments, "Prepolymer 1" is prepared by combining 315 pbw of 4,4'-diphenylmethanediisocyanate and 400 pbw of a 6 000 molecular weight triol containing secondary OH groups, heating to melt the diisocyanate and then adding 1 000 pbw of a 2 000 molecular weight diol. To 1 500 pbw of the resulting "Prepolymer 1" is then added, in addition to filler and tackifier, 3 pbw of (bis[2-N,N-dimethylamino)ethyl]ether and 0.4 pbw dibutyltindilaurate as catalyst, to yield "Filled

Prepolymer A" (page 8, line 14 to page 9, line 13). Furthermore, "Prepolymer 3" is prepared by combining 348 pbw toluene diisocyanate, 1 500 pbw of a 3 000 molecular weight diol and 2 000 pbw of a 6 000 molecular weight triol. To 1 000 pbw of the resulting "Prepolymer 3" is then added, in addition to filler and tackifier, 0.24 pbw dibutyltindilaurate as catalyst, to yield "Filled Prepolymer D" (page 10, lines 17 to 34).

Then, according to Examples 1 and 6, "Filled Prepolymer A", and "Filled Prepolymer D", respectively, are applied to glass, both with and without the addition of silane and terpene-phenolic resin, the composition cured at 25°C and 50% relative humidity for seven days, immersed in water for an additional seven days, and then tested for adhesion. A very low peel strength of <0.2 kg/cm was observed in each case for the filled prepolymer alone, compared with 4.5 or 3.9 kg/cm with the addition of both silane and terpene-phenolic resin (pages 11, 12 and 16, 17).

- 3.2 Whilst there is no explicit disclosure in E1 of the NCO functionalities or the molecular weights of the prepolymers, the Respondent at the oral proceedings did not contest the assertion of the Appellant that the NCO functionalities of "Prepolymer 1" and "Prepolymer 3" were 2.1 and 2.4 respectively, the latter falling within the range required in the patent in suit. Whilst similarly admitting that the molecular weight of "Prepolymer 1" lay within the required range, the Respondent nevertheless contested that the molecular weight of Prepolymer 3 fell within this range.

3.3 Consequently, the sealant composition according to E1, which is curable by atmospheric moisture alone, has the same general applications as those set out the patent in suit (including sealing automobile windshields into a vehicle, to provide "rapid drive away times"). Furthermore, whilst there is no explicit disclosure in E1 of the problem of improving curing rates and storage stability, it is evident that such inadequacies, and consequently, the relevant technical problem, will inevitably become evident to the skilled person in the use of the compositions for the stated purpose. Finally, in the light of the suitability of the prepolymers for sealant use, as well as the Respondent's admission that the NCO functionality, at least in the case of "Prepolymer 3" lay within the claimed range, it is evident that the molecular weight, whether or not falling precisely within the claimed range, is at least of the same order of magnitude.

3.4 Compared with this state of the art, the technical problem may be seen in the search for a composition having a faster curing time combined with good shelf stability.

The solution is (i) to replace the (bis[2-N,N-dimethylamino)ethyl]ether and dibutyltin dilaurate catalyst of "filled Prepolymer A", or the dibutyltin dilaurate catalyst of "filled Prepolymer D", respectively, by a dimorpholinodiethyl ether catalyst, and (ii) either to increase the NCO functionality of "Prepolymer 1" to above 2.3, or to ensure that the molecular weight of "Prepolymer 3" is in the range of 3 000 to 10 000.

3.5 It can be seen from the comparative data in the patent in suit, and in particular Examples 6 to 13, that the choice of catalyst has a strong effect on the shelf stability (measured as "Flow Ratio") and the cure rate (measured as Lap Shear Strength after curing for 2.7 h: at 24°C and 50%-humidity (Table I in conjunction with page 3, lines 17 to 26)), with the dimorpholinodiethyl ether catalyst providing far superior results compared with conventional catalysts, and in particular in relation to N,N'-dimethylpiperazine and 2-dimethylaminoethyl-3-dimethylaminopropyl ether, the catalysts most similar to those mentioned in E1, the latter in fact gelling and thus not being storage stable at all (Table 1, runs 6, 7, 12). It is furthermore clear from the data of Examples 14 to 27, wherein the same DMDEE catalyst is used with various prepolymers, that a functionality of the prepolymer within the required range is also crucial for obtaining the appropriate combination of Lap Shear Strength and storage stability (Tables II, III).

3.5.1 The argument of the Appellant, that the same curing rates could be achieved using a tin catalyst is not supported by the disclosure of E1, since the comparative values are given in the examples of E1 in terms of the time for "loss of tack", or formation of a skin which is no longer sticky to the touch. On the one hand, this does not give any indication of the cure rate as measured by the more fundamental criterion build up of Lap Shear Strength, as required by the solution of the stated problem. On the other hand, the shortest cure rate mentioned specifically in E1 which is comparable with that relevant to the solution of the stated problem (full curing) is three days (Example 9). Thus, the comparison is irrelevant, and it has consequently not been shown that similar curing rates could be achieved with another catalyst.

- 3.5.2 The further argument of the Appellant, that acceptable stability values combined with fast curing were obtainable with a dimorpholinodiethyl ether catalyst also at a functionality outside the required range, is based on evidence filed during the proceedings before the Opposition-Division (Comparative tests accompanying submission filed on 13 October 1994). Not only is the curing rate expressed in terms of "Hautbildungszeit" (time for formation of a skin), equivalent to "time to loss of tack", which is irrelevant for the reasons given above, but also the only measure of storage stability given is purely qualitative, the compositions merely being stated to have "ausgezeichnete Lagerstabilität" ("excellent storage stability"). Consequently, this argument carries little weight.
- 3.5.3 On the contrary, according to the evidence of counterexperiments, filed by the Respondent ("Report of experiments carried out by the Patentee", accompanying submission filed on 23 March 1996), using a dibutyltindilaurate catalyst at a NCO functionality of 2.66, i.e. within the required range, the amount of such catalyst necessary to achieve a cure rate comparable with the compositions exemplified in the patent in suit (158 psi after 2.7 h) amounts to 0.5% of the composition. In an accelerated aging test, however, a composition containing this amount of catalyst showed a significantly shorter shelf life than a composition of corresponding cure rate, having a dimorpholinodiethyl ether catalyst.
- 3.5.4 The argument of the Appellant, that 0.5% catalyst corresponded to five times the conventional amount, is irrelevant, since, at lower catalyst loadings,



evidently the curing rate would have been slower. Thus, it has not been shown that both fast curing rates and acceptable stability values are obtainable at functionalities outside the relevant range or with a different catalyst.

3.5.5 Even if one or other of the qualities of good storage stability and fast cure rates could be shown to be achieved outside the claimed ranges, this would have no significance, because the aim is to obtain both these qualities simultaneously.

3.5.6 Consequently, it is credible to the Board that the claimed measures provide an effective solution of the technical problem.

4. *Inventive step*

To assess the question of inventive step, it is necessary to consider whether the skilled person, in possession of E1, would have expected an improved combination of faster cure rate and acceptable storage stability to be obtained by the measures of replacing the catalyst and providing the relevant functionality or molecular weight of the isocyanate prepolymer (section 3.4, second paragraph, above).

4.1 There is no hint to do this in the disclosure of E1, since the aim of the latter is not to obtain faster curing times or good storage stability, but, rather, a satisfactory extent of strength build up in the absence of a separate silane primer. This is obtained by adding further components which are not stated to be catalysts. That the presence of a catalyst does not play a significant role is confirmed by the examples, in which almost zero peel strength is obtained, in spite of the presence of a preferred

catalyst, even after a curing time of seven days (section 3.1, last two sentences, above). Consequently, there is no hint arising from E1 that a relevant improvement in performance could depend on the choice of catalyst.

4.1.1 Even if the attention of the skilled person were nevertheless to fall, for some reason, on the choice of catalyst, the most preferred catalysts exemplified in E1 are dimethylaminoethyl ethers and dibutyltindilaurate, and not dimorpholino ethers. The latter are only disclosed in general terms in a list (section 3.1, above). In other words, they are less preferred. Consequently, there is no incentive to replace the exemplified catalyst with one of these.

4.1.2 Even if this latter option were considered, the unspecific nature of the terminology ("dimorpholinodialkyl ether" as opposed to "dimorpholinodiethyl ether") means that such a course of action would still fall short of the claimed solution of the technical problem.

4.1.3 The argument of the Appellant, that the skilled person would understand the general term "dimorpholinodialkyl ether" as meaning, in practice, the relevant dimorpholinodiethyl ether, pre-supposes that the skilled person would in fact have some good reason (a) to replace the catalyst of E1 and (b) to replace it specifically with the less preferred dimorpholino alkyl ether. This is, however, for the reasons given above, not the case, and the argument is consequently irrelevant.

4.1.4 Nor would the skilled person have any incentive to choose such an option from any consideration other than the stated problem, such as ready availability,

since a dimorpholinodiethyl ether catalyst is, according to the uncontested submission of the Respondent, extremely expensive. Thus, there is no "one way street" leading to the relevant catalysts in any case.

4.1.5 In summary, there is no hint to the solution of the stated problem in E1.

4.2 As regards E3, the lack of relevance of its area of application (section 3., above) means that the disclosure of this document would not have any apparent relevance to the skilled person confronted with the stated problem.

4.3 Even if the attention of the skilled person were for some reason or other to fall upon its teaching, the fact that the products are neither stated to be curable with atmospheric moisture alone (section 2.1.1, above) nor to have any sealant capability (section 3., above) would mean that there would have been no incentive to pursue the matter further.

4.3.1 The argument of the Appellant, that the combination of "long gel times" and "short set times" referred to in E3 (page 9, lines 31 to 34, following Table I) would provide an automatic incentive to the skilled person to adopt the relevant dimorpholinodiethyl ether catalyst in the composition according to E1, is not convincing, precisely because of the very different nature of the compositions and the conditions of curing as between E1 and E3, referred to above.

4.3.2 The further argument of the Appellant, submitted during the oral proceedings before the Board, that the compositions according to E3 would also cure in the sole presence of atmospheric moisture, is not

supported by the disclosure of E3, which contains no such information. On the contrary, the only means disclosed of curing the products according to E3 is by immersion in water (page 7, lines 17 to 19).

- 4.3.3 The still further argument, that the activation energies for the curing reaction were the same as in E1, and the question of the rate of cure was merely one of diffusion, is also not convincing, because the prepolymers according to E3 are different from those of E1, for reasons analogous to those given in relation to the patent in suit (section 2.1.2.3, above), in particular as to their molecular weight. Consequently, similar curing behaviour cannot be expected.
- 4.3.4 Even if the argument were to be accepted at face value, however, it would have to be assumed that the curing rate would be correspondingly slower, which would consequently destroy the incentive of providing a faster curing rate.
- 4.3.5 To sum up, the mutual remoteness of the disclosures of E1 and E3 means that they are not combinable with each other, except with hindsight.
- 4.3.6 In other words, the solution of the stated problem does not arise in an obvious way starting from E1.
- 4.4 Nor would the result have been different if one had started, instead, from E3 as "closest state of the art". In this connection, the finding that E3 does not relate to a sealant, or to a product capable of functioning as a sealant (sections 2.1.3, 3., above) means that the relevant technical problem is not

66

recognisable from its disclosure. Nor, in view of the very different nature of the application disclosed in E3, would the skilled person otherwise become aware of the relevant problem, e.g. when using the compositions for the stated purpose.

4.4.1 In this connection, the Board cannot concur with the statement of the relevant problem as formulated by the Appellant during the oral proceedings, as being "to provide a wider field of application for the compositions of E3", since it neglects the fact that the prepolymers according to E3 are substantially different from those of the patent in suit, in particular as to their molecular weight and hence their physical character (section 2.1.2.3, above).

4.4.2 Thus, neither the problem nor the solution disclosed in E3 is closely oriented to the claimed subject-matter. In the Board's view, such a state of the art, taken on its own, can neither point in the relevant direction (problem) nor, *a fortiori* to the differing solution. In other words, any attempt by the skilled person to establish a chain of considerations leading in an obvious way to the claimed subject-matter gets stuck at the start for lack of an identifiable relevant problem (T 0325/93 of 11 September 1997, not published in OJ EPO: Reasons for the decision, point 6.1).

4.4.3 Nor would the skilled person have been led to combine with E3 a prior art disclosure more directly relating to the relevant problem than that of E3, such as E1, since, in view of the above, the relevance of such a disclosure would not have been apparent.

4.4.4 The argument of the Appellant during the oral proceedings before the Board, that the mention, in E1, of a series of applications, including both

"casting" and "sealing" would alert the skilled person to the possible relevance of E1, is not convincing in view of the widely differing character and purpose of the compositions (section 4.4, above), since the effect of a modification which by definition would fundamentally alter the character and use of the composition could practically never be predicted in a remotely reliable way by the skilled person.

4.4.5 In other words, the claimed subject-matter does not arise in an obvious way starting from E3, either.

4.5 Hence, the subject-matter of Claim 1 and, for the reasons given in relation to novelty (section 2.1.5, above), the subject-matter of Claims 2 to 21 as well, involves an inventive step.

## Order

**For these reasons it is decided that:**


The appeal is dismissed.

The Registrar:

  
E. Gorgmaier



The Chairman:

  
C. Gérardin