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**D E C I S I O N**  
**of 7 December 2004**

**Case Number:** T 1150/02 - 3.3.3

**Application Number:** 96100581.6

**Publication Number:** 0723975

**IPC:** C08F 2/24

**Language of the proceedings:** EN

**Title of invention:**

Chemical composition, redispersible in aqueous media, containing a copolymer and a protective colloid, its aqueous polymer dispersion, methods for their production and the use thereof

**Patentee:**

Elotex AG

**Opponent:**

Wacker Polymer Systems GmbH & Co. KG

**Headword:**

Redispersible composition with reactive epoxide groups/Elotex

**Relevant legal provisions:**

EPC Art. 54, 56, 107, 108  
EPC R. 65(1)(2)

**Keyword:**

"Novelty (yes)"  
"Inventive step (yes)"  
"Parties to appeal - entitlement to appeal"

**Decisions cited:**

T 0012/81, T 0340/92

**Catchword:**

-



Case Number: T 1150/02 - 3.3.3

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.3**  
**of 7 December 2004**

**Appellant:**  
(Opponent)

Wacker Polymer Systems GmbH & Co. KG.  
Johannes-Hess-Strasse 24  
D-84489 Burghausen (DE)

**Representative:**

Schuderer, Michael, Dr.  
Wacker-Chemie GmbH  
Zentralabteilung Patente  
Marken und Lizenzen  
Hanns-Seidel-Platz 4  
D-81737 München (DE)

**Respondent:**

(Proprietor of the patent)

Elotex AG  
CH-6203 Sempach-Station (CH)

**Representative:**

Hagemann, Heinrich, Dr.rer.nat., Dipl.-Chem.  
Meissner, Polte & Partner  
Postfach 86 03 29  
D-81630 München (DE)

**Decision under appeal:**

**Decision of the Opposition Division of the  
European Patent Office posted 2 October 2002  
rejecting the opposition filed against European  
patent No. 0723975 pursuant to Article 102(2)  
EPC.**

**Composition of the Board:**

**Chairman:** R. J. Young  
**Members:** M. C. Gordon  
R. Moufang

## Summary of Facts and Submissions

I. The grant of European patent No. 0 723 975 in respect of European patent application No. 96100581.6, filed on 16 January 1996 and claiming the priority of 26 January 1995 of earlier German patent application DE 19502435 was announced on 12 May 1999 (Bulletin 1999/19) on the basis of a set of 18 claims, independent claims 1, 10 and 18 of which read as follows:

- "1. Chemical composition which is redispersible in aqueous media, containing a) a copolymer based on styrene and/or at least one alkyl (meth)acrylate the alkyl group of which has a chain length of 1 to 14 carbon atoms, the amount of styrene and/or alkyl(meth)acrylate being  $\geq 50\%$  by weight, based on the total monomers, as well as at least one further comonomer, and b) a water-soluble polymeric protective colloid, wherein 2 to 30 parts by weight of the water-soluble polymeric protective colloid are allotted to 100 parts by weight of the copolymer, as well as c) optional further additives, characterized in that the copolymer comprises 0.1 to 50% by weight units of an epoxide group-containing ethylenically unsaturated comonomer and said units contain reactive epoxide groups, wherein polymeric acrylic protective colloids are excluded which have monomer units with at least one aldehyde or ketone group.
10. Method for producing dispersions having a chemical composition according to at least one of claims 1 to 9, which method comprises

- i) polymerizing monomers of  $\geq 50\%$  by weight, based on the total monomers, of styrene and/or alkyl (meth)acrylate, 0.1 to 50% by weight, based on the total monomers, of an epoxide group-containing ethylenically unsaturated comonomer, and, optionally, further additives, in an aqueous phase as dispersion medium in the presence of the water-soluble polymeric protective colloid and a radical initiator wherein the pH value is kept at 4 to 9, to produce an aqueous polymer dispersion,
  - ii) spray drying the aqueous dispersion to produce a solid composition in powdery form, wherein the dispersion particles are maintained at a temperature of not more than 100°C.
18. Use of the chemical composition according to at least one of claims 1 to 9 in cement bonded systems containing plastic, preferably in mortar, cement paints and adhesives, and plastic-bonded cement-free binders, preferably in gypsum mortar, casts, carpet-, wood- and floor-adhesives as well as in wallpaper glues, dispersion paints and glass-fiber-reinforced composite systems."

Claims 2 to 9 and 11 to 17 are dependent on claims 1 and 10 respectively.

II. Notice of Opposition was filed on 10 February 2000 by

Wacker Polymer Systems GmbH & Co. KG  
Johannes-Hess-Strasse 24  
84489 Burghausen.

Revocation of the patent in its entirety on the grounds of Article 100(a) EPC was requested because the subject matter of the claims lacked novelty and inventive step. The grounds of opposition under Article 100(a) EPC were supported by the following documents:

D1: EP-B1-62 106

D2: EP-A1-601 518

D3: JP-A-58-162 611

D4: JP-A-04-185 606

D5: JP-A-04 185 607.

III. By a decision announced orally on 25 July 2002 and issued in writing on 2 October 2002, the Opposition Division rejected the opposition.

According to the decision, in order to arrive at the subject matter claimed it was necessary to execute a two-fold selection from the disclosure of D1, involving firstly the choice to include an optional monomer in addition to the minimum of 60% of (meth)acrylic acid esters and/or styrene, and secondly the selection of epoxide group containing monomers from the list of possible additional monomers disclosed in D1. It was further held that D1 did not disclose any process

conditions (pH during polymerisation, temperature during spray drying) which could be considered to indicate the preservation of epoxide functionality if such monomers were in fact to be employed.

Regarding inventive step, it was considered that the underlying problem of the patent-in-suit was to provide improved redispersible systems which after reconstitution in water resembled the properties, such as adhesive pull strength, of the initial dispersion and were superior to prior art products. It was considered that closest prior art D1 did not mention this problem, but rather dealt with the provision of aqueous dispersions having improved water resistance. Further, while D1 mentioned generally redispersible polymer powders, the citation did not indicate problems in connection with redispersible polymers, nor did it teach that the presence of a certain comonomer was of any importance.

There was no indication in D1 that the selection of a specific class of monomer would lead to any effect nor, in the case that an epoxide functional monomer were to be employed, was there any indication that it would be desirable to maintain the epoxy groups in a reactive state.

D1 furthermore did not contain any teaching that the reaction parameters and drying conditions identified in the patent-in-suit (pH and temperature) were of any importance, or that any effect could be obtained by selecting specific parameters.

The argument of the Opponent that the skilled person would always try to maintain the epoxide groups

unreacted depended on the problem to be solved, which was not discussed in any of the other prior art documents cited, there being no indication that this had in fact been done in the prior art, apart from which the hydrolysis of epoxide groups might be desirable.

The further argument of the Opponent that the reaction parameters (pH value and spray-drying temperature) would be selected as for comparable prior art reactions, e.g. D2 were dismissed as being the result of hindsight analysis.

Consequently it was not obvious from the prior art to select epoxide containing comonomers and to keep the epoxide groups reactive.

- IV. On 21 November 2002 an appeal against the decision of the Opposition Division was lodged with simultaneous payment of the prescribed fee.

The Notice of Appeal did not explicitly identify the Appellant but had a letterhead of Wacker-Chemie GmbH and had been signed by the professional representative, Dr Michael Schuderer, reference being made to a General Authorisation also for Wacker-Chemie GmbH.

- V. The statement of Grounds of Appeal was submitted on 3 February 2003. An additional document, deriving from the Internet entitled "Citric Buffer Calculation" was cited (hereinafter "D6").

The arguments presented by the Appellant may be summarised as follows:

- (a) (i) The finding of the Opposition Division that the subject matter of the patent-in-suit was novel due to the existence of a multiple selection from the disclosure of D1 was disputed.
  
- (ii) In particular the relevant question was whether a final product defined by its starting materials (comonomers) was new when all the starting materials are mentioned but the specific combination as a copolymer is not described. Applying the approach adopted in the decision T 12/81 (OJ EPO 1982, 296) that a selection is new when it arises from a combination of two lists of varying starting materials, in the present case there would be no selection from the first list of monomers in D1 because each of the members listed fell under claim 1 and also no selection from the second list of monomers because there was no "immense range" of possibilities offered.
  
- (iii) As to the maintenance of the epoxide functionality further relied upon for establishing novelty, it was considered simply not credible that the skilled person upon employing such monomers, which were expensive, would take steps that would result in loss of the functionality during polymerisation and spray drying. On the contrary, the skilled person would incorporate such functional monomers in order to be able to make use of the functionality, and so select conditions to ensure preservation thereof.
  
- (b) (i) Regarding inventive step, the formulation of the problem as set out in the patent and cited by the Opposition Division was followed. The finding in the



decision according to which the stated problem was in fact solved by the features of independent claims 1 and 10 was not challenged.

- (ii) Since however D1 taught related co-polymers which could contain up to 40% of e.g. glycidyl functional comonomers, which were stabilised with polyvinyl alcohol (PVOH) and could be formulated as redispersible powders for use as binders, in particular in hydraulic cements, which co-polymers were taught as having high adhesive power, and D3 disclosed glycidyl functional copolymers stabilised with PVOH also for use as adhesives, it was considered obvious to solve the problem of providing redispersible powders with good adhesive properties by applying those epoxides known from D1 and D3 accordingly.
- (iii) That is, unless it was assumed that the copolymers known from D1 and D3 did not contain any reactive epoxide groups.

It was submitted that glycidyl functional comonomers were known as copolymerisable comonomers and that it was also known that epoxides tended to undergo crosslinking at extreme pH values and under conditions of elevated temperature. Hence, it would be obvious, and within the abilities of the skilled person, to select reaction conditions that would lead to maintenance of the epoxide functionality.

- (iv) For the case that the skilled person would not be aware of how to achieve this, the missing information was provided by example 1 of D3. This demonstrated the copolymerisation of styrene, acrylic ester, acrylic

ester and glycidyl methacrylate in the presence of polyvinyl alcohol employing a citrate buffer. It was argued, on the strength of D6 that the presence of this buffer showed that the pH during the reaction was maintained in the range of 3-6, i.e. within the range identified as necessary in the patent-in-suit. This document thus provided the necessary information, in particular with regard to the pH value, to arrive at glycidyl functional copolymers retaining the epoxy functionality.

- (v) Regarding the temperature of the spray drying step, reference was made to D2 which disclosed the preparation of a redispersible (meth)acrylate polymer involving spray drying employing "conventional techniques at 100°C".

Accordingly it was considered that neither claim 1 or claim 10 was founded on an inventive step.

- VI. In a communication of the Board, issued on 28 February 2003, the issue of admissibility of the appeal was raised since the Notice of Appeal appeared to have been filed on behalf of Wacker-Chemie GmbH whereas the Opponent in the case was Wacker Polymer Systems GmbH & Co. KG, which appeared to be a different legal person. A reply to this was filed by Wacker Polymer Systems GmbH & Co. KG on 11 March 2003 in which it was explained that this company was a subsidiary of Wacker-Chemie GmbH, 20% of which subsidiary was owned by Air Products Chemical Industry. The polymer business of Wacker-Chemie GmbH was carried out via this subsidiary. The patent operations of both the parent and subsidiary were carried out in the central patent department of

Wacker-Chemie GmbH (Zentralbereich Patente, Marken und Lizenzen (PML)). The naming of Wacker-Chemie GmbH in the Notice of Appeal was the result of an administrative oversight.

It was requested to correct the error by changing the name of the Appellant to:

Wacker Polymer Systems GmbH & Co.KG  
Johannes-Hess-Straße 24  
84489 Burghausen.

In support of this request reference was made to decision T 340/92.

VII. The arguments of the Respondent (Patentee) submitted in a letter dated 4 August 2003 may be summarised as follows:

(a) Novelty

- (i) The finding of the Opposition Division that epoxide containing polymers were not "directly and unambiguously" derivable from D1 was fully supported.
- (ii) It was emphasised that the copolymer defined in claim 1 of the patent-in-suit contained 0.1 to 50 wt% of epoxide group containing unsaturated monomers and contained them in reactive form whilst being redispersible in aqueous medium or in the form of a redispersible powder. This required special preparative process conditions as set out in

claim 10 to ensure that reactive epoxide groups remained, which was not to be expected especially since the polymerization took place in aqueous conditions with the risk of hydrolysis destroying the epoxide groups. The conditions defined in feature (i) of claim 10 ensured the epoxide groups were retained during polymerisation. The subsequent spray drying (feature ii) also had to be controlled according to the teaching of the patent-in-suit to ensure preservation of the reactive groups. D1 contained no corresponding teaching or disclosure to that effect.

- (iii) It was observed that according to examples 12 and 13 of D1 reactive groups (N-methylol acrylamide (NMA) being reactive in acidic conditions) could be polymerised. The advantages of these in the dispersions were emphasised as shown by claim 3 of D1. This would lead the skilled person to expect advantages in dispersions containing such copolymers but not for redispersible powders since removal of water in the course of drying would lead to irreversible cross-linking. The same conclusions were valid for the other reactive groups disclosed in D1. It was furthermore emphasised, as acknowledged by the Opponent, that the skilled person was aware that epoxide groups underwent crosslinking at elevated temperature, and hence it was to be expected that spray drying at temperatures up to

100°C would lead to all residual epoxide groups undergoing crosslinking, especially in view of the presence of other reactive groups (e.g. the OH groups of the polyvinyl alcohol).

- (iv) With regard to the question of a selection invention in the sense of T 12/81, it was argued that even if the specific combination of monomers was disclosed novelty would still exist due to the absence of any details of the reaction and spray-drying conditions necessary to ensure maintenance of the epoxide groups.
- (v) The argument that the skilled person would select reaction conditions so as to maintain the epoxide functionality was rejected as an inadmissible *ex post facto* analysis.
- (vi) The citation by the Appellant of T 12/81 could be regarded as contradicting its own arguments, particularly in view of the (non-cited) paragraph 13 of the reasons, according to which the disclosure by description in a cited document of the starting material as well as the reaction process is always prejudicial to novelty because these data unalterably establish the end product. Even if one were to assume that the starting materials had been defined, the necessary reaction conditions of reaction in aqueous medium followed by spray drying, in both cases while maintaining specific

conditions to preserve the epoxide functionality was not disclosed in D1. Hence a full reading of paragraph 13 of the cited decision would not directly lead to the conclusion of the Appellant.

This viewpoint was not changed by the fact that D1 contained the abstract indication that the dispersions were dryable (to be rendered into a powdered form) and subsequently redispersible since the concept of active process control via two corresponding method features to achieve this was not referred to in D1 and the missing information was not disclosed in D1.

(b) Inventive step

- (i) Applying the problem and solution approach, the objective technical problem arising from the success actually achieved by the patent-in-suit (see page 3, line 18 to 27, examples and comparative examples) could be seen as "to provide improved redispersible systems which are [*sic*] after reconstitution in water resemble the properties, e.g. adhesive pull strength, of the initial dispersion and are superior compare [*sic*] to prior art products".

D1, however, did not provide any indications to such a problem. Rather D1 solely concerned the production of stable aqueous dispersions of finely dispersed copolymers

of styrene and/or methacrylic esters having, as a result of the process employed, improved water resistance. D1 only contained a passing reference to the fact that the dispersions could be dried to provide redispersible powders. Hence D1 did not provide any hints to select a specific class of monomers, and to take steps to ensure that after the complex preparation procedure the epoxide functionality thereof was maintained in the final product.

- (ii) The relevance of the other documents cited was also disputed. D3, while it related to a PVOH stabilised copolymer of glycidyl functional monomers used as an adhesive, related to an **emulsion** and did not concern the step of spray drying immediately after preparation. This had the consequence that the epoxide functionality would be retained. It was emphasised that D3 was not concerned with providing a redispersible composition.
- (iii) It was also disputed that the adhesive composition of D3 bore any relationship to the specific adhesive compositions (containing sand, Portland cement, calcium hydroxide and methylcellulose) or measurement conditions (DIN 18156) of the patent-in-suit.
- (iv) Regarding the reaction conditions it was argued that buffering only occurred in D3 after conclusion of the polymerisation in

order to provide a stable emulsion with 50% solids and pH 8. In contrast, the patent-in-suit required control of the pH from 4 to 9 during the polymerisation in order to obtain a dispersion.

- (v) With regard to spray drying according to the patent-in-suit, (which was not disclosed in D3), it was stated that initially a stable dispersion was produced, preferably employing stabilisation by PVOH. Under spray drying the latex particles approached each other until contact was attained. It was surprising that under these conditions the epoxide groups were retained and did not react. This was in contrast to D3, where a film was formed upon removal of the water, indicating crosslinking of the epoxide groups, which was undesired in the patent-in-suit. This showed that the PVOH stabilised epoxide group containing dispersions of D3 were not spray dryable or redispersible. It was in any case generally known that hydroxyl groups, such as those of PVOH could react with epoxide groups.
  
- (vi) D2 did not teach obtaining a product which was comparable to that of the patent-in-suit in particular as regards the epoxide functionality.

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



The Respondent requested that the Appeal be dismissed, and, as an auxiliary request, the appointment of oral proceedings.

## **Reasons for the Decision**

### 1. *Admissibility of the appeal*

1.1 Concerning the admissibility of the appeal, the question arises as to whether or not the appeal has been filed by a person entitled to appeal (Article 107 EPC).

1.2 According to Article 107 EPC an appeal may only be filed by a party to the proceedings who is adversely affected by a decision. If this requirement is not met within the two-month time limit set out in Article 108 EPC, the appeal must be rejected as inadmissible under Rule 65(1) EPC.

1.3 The Notice of Appeal bore the name and address of Wacker-Chemie GmbH. The Notice of Appeal was signed by Dr Michael Schuderer acting as Representative authorised by General Authorisation 34138. This is the general authorisation for Wacker-Chemie GmbH.

In contrast, the Opposition was filed by Wacker Polymer Systems GmbH & Co. KG, also represented by Dr Schuderer, authorised according to GA number 39328, which is the general authorisation for this legal entity.

1.4 In response to the communication from the Board, the Appellant explained that the patent matters of both Wacker-Chemie GmbH and Wacker Polymer Systems GmbH & Co. KG were conducted from the same office, with the same representative being responsible for both legal entities. The deficiency in the Notice of Appeal as identified by the board was ascribed to an internal oversight.

1.5 The Notice of Opposition and the Notice of Appeal Address give the same name of the Representative and the same address for correspondence. This is consistent with the argument of the Appellant that the affairs of both legal entities are discharged from a common location.

This in turn lends credence to the argument that the filing of an appeal in the name of Wacker-Chemie GmbH was indeed due to an error committed in the common office by the common representative.

1.6 The Patentee has not challenged the explanation of the Opponent.

1.7 In view of the evidence and arguments, the Board can accept that the intention was to file the Appeal on behalf of the Opponent in the First Instance proceedings, and therefore that the deficiency under Rule 65(2) EPC has been satisfactorily rectified.

1.8 Accordingly, in the present case, the deficiencies pursuant to Article 107 EPC noted by the Board were remedied within the stipulated time period.

It is therefore found that the Appeal is admissible.

2. *The Patent-in-suit; the closest state of the art.*

According to the patent-in-suit there is provided a

- composition
- which is redispersible in aqueous media containing
- a copolymer based on
  - styrene and/or
  - at least one C<sub>1</sub>-C<sub>14</sub> alkyl (meth)acrylate
- the amount of styrene and/or alkyl (meth)acrylate being greater than or equal to 50 weight % and
- the composition containing a water soluble colloid.

The composition is envisaged for use in plastic-containing cement bonded systems.

- 2.1 Such a composition is known from D1 which, by common consent, represents the closest state of the art. D1 relates to a process for preparing dispersions of (co)polymers derived from at least 60 wt% of (meth)acrylic ester and/or styrene units in the presence of polyvinyl alcohol.

The compositions prepared according to D1 may consist entirely of the polymers of styrene and/or (meth)acrylate esters (claim 1, page 2, line 31, page 2 line 35). Optional monomers may be present in an amount of up to 40 wt% (page 2, line 35).

2.2 D1 presents the monomers that can be employed in the process in three blocks or lists:

The first list of monomers (page 2 lines 31 to 34) discloses the monomers from which the mandatory component (that which is present to an extent of at least 60 wt%) may be selected and includes styrenes and/or esters of (meth)acrylic acid with straight-chain, branched-chain or cyclic alcohols with 1-20 carbon atoms or with araliphatic alcohols with 7-20 carbon atoms. Alkanols are preferred.

The second list of monomers (at page 2, lines 37 to 43) corresponds to those from which the optional (up to 40%) monomers are to be selected. This is indicated by the explicit reference to the amount which can be present (line 35: "...in einer Gesamtmenge bis zu 40, vorzugsweise bis zu 20 Gew.%") and by the wording "weitere Monomereinheiten" in line 36. This list does not contain a reference to epoxide functional compounds.

The third list is located at page 2 from lines 44 to 53 and appears to disclose preferred monomers of either of the two above identified groups of monomers ("mandatory" or "optional"). Glycidyl compounds feature at the end of this list.

There exists agreement between the parties that the glycidyl compounds belong to the group from which the "optional" monomers may be selected. The Board shares this understanding of the disclosure of the relevant passages of D1.

2.3 The only optional monomer exemplified (examples 12 and 13) is however N-methylol acrylamide. This is stated (page 4 line 4) to provide compositions with adhesive properties. According to example 13, a copolymer of 80 wt% methyl acrylate, 2.5 wt% N-methylolacrylamide and 0.7 wt% acrylic acid (apparently erroneously indicated as "HAS" in the table).

3. *The technical problem and solution*

3.1 Compared with this state of the art, the technical problem may be seen, consistently with the corresponding finding in the decision under appeal, in the provision of improved redispersible systems which after reconstitution in water resemble the properties, such as adhesive pull strength when employed e.g. as tile adhesives, of the initial dispersion and are superior to prior art products.

3.2 The solution proposed according to claim 1 of the patent-in-suit is to utilise a specific copolymer having  $\geq 50$  wt%, based on the total monomers of styrene and/or at least one alkyl ( $C_1$ - $C_{14}$ ) (meth)acrylate, and 0.1-50 wt% units of an epoxide-group containing ethylenically unsaturated comonomer, these units containing reactive epoxide groups.

3.3 The examples show that incorporation of an epoxide group-containing ethylenically unsaturated co-monomer gives rise to improved adhesive pull strength after both wet and dry storage. Hence the examples render it credible that the above problem is effectively solved by the claimed measures.

4. *Novelty*

The subject matter of claim 1 is novel over the disclosure of D1:

4.1 Concerning the monomers which may be employed:

(a) The patent-in-suit is restricted to C<sub>1</sub>-C<sub>14</sub> alkyl (meth)acrylates whereas D1, encompassing straight-chain, branched-chain and cycloaliphatic C<sub>1</sub>-C<sub>20</sub> alkyl and C<sub>7</sub>-C<sub>20</sub> araliphatic groups as substituents in the (meth)acrylate polymers is of broader scope.

(b) D1 and the patent-in-suit define the "styrene" monomers in general terms. D1 employs the term "Styrolen" (page 2, line 32). Claim 1 of the patent-in-suit defines "styrene". The description in paragraph [0013] indicates, however, that (non-defined) substituted styrenes may be employed. Hence the term "styrene" in claim 1 of the patent in suit must be given the same broad interpretation as the corresponding term in D1 and does not represent a distinguishing feature.

4.2 As explained above, the compositions prepared according to D1 may consist entirely of the polymers of styrene and/or (meth)acrylate esters (claim 1, page 2 line 31, page 2 line 35).

(a) In contrast, the patent-in-suit mandatorily contains 0.1-50 weight % of units of an epoxide group-containing ethylenically unsaturated comonomer, containing reactive epoxide groups,

(i.e. whereby the epoxide functionality is maintained in the final co-polymer).

This requires two selections from the disclosure of D1:

- the selection of the alternative of including an "optional" monomer;
  - the selection of epoxide functional monomers from the (two) lists of such monomers as the optional monomer to employ.
- (b) With regard to the presence of reactive epoxide groups, it is further noted that the claim defines a redispersible composition, indicating that the claim is directed to the copolymer both in a dispersed state and also in a non-dispersed (dried) state. Hence it is appropriate to include a consideration of the properties of the copolymer upon drying in the assessment of novelty.

While D1 includes a reference of a general nature to spray drying and redispersibility (page 4, line 7), there are no examples demonstrating these measures. Hence a further distinguishing feature is that there is no disclosure in D1 that were epoxide containing monomers (or indeed any other reactive group containing monomers) in fact to be employed, the functionality would be preserved both in the initial reaction and in a subsequent spray drying step.

4.3 The argument of the Appellant that the subject matter claimed involved only a single selection, namely that of the vinyl compound of glycidyl alcohol from the list of possible monomers for the second co-monomer is not convincing, since as is apparent from the preceding analysis of D1 in fact a two stage selection is required.

(a) In the latter connection, the case law cited by the Opponent leads to the conclusion that the present subject matter is in fact novel as it involves a selection from each of two lists. The flaw in the Appellant's argument is that the optional aspect of the second group of monomers is overlooked. Rather, it is argued as if a combination of monomers from the two groups were mandatory.

(b) The further argument of the Appellant that the skilled person would in any case choose the conditions so as to maintain the epoxide groups firstly during the polymerisation and secondly throughout any spray drying of the redispersible composition is speculative and is not supported by any evidence.

4.4 It is therefore concluded that the subject matter of claim 1 is novel over the disclosure of D1. This conclusion also applies to dependent claims 2 to 9.

4.5 Process claim 10 is directed to a process for preparing compositions of claims 1 to 9, and hence the conclusions on novelty reached for claim 1 are also valid for claim 10 and dependent claims 11 to 17.



4.6 Claim 18 defines the use of the composition of claim 1. Accordingly, by the same reasoning as for claim 1 it is concluded that this subject matter is also novel over the disclosure of D1.

4.7 The Opponent has raised no novelty objections based on any of the other documents. The Board, based on the above analysis also comes to the conclusion that none of the further documents cited D2-D5 raises issues of lack of novelty.

Consequently, the subject matter claimed in the patent-in-suit is novel.

## 5. *Inventive step*

It remains to be decided whether the measures constituting the solution to the technical problem (Section 3.2 above) involve an inventive step.

### 5.1 Claim 1

Epoxide functional monomers are disclosed in D1 as possible comonomers for the optional component (that which is present to the extent of up to 40%). There is no discussion relating specifically to the epoxide functional monomers and no teaching in D1 relating to any specific advantages or technical effects to be expected from the use of such monomers.

With regard to the technical problem of increasing adhesion, D1 draws attention only to N-methylolacrylamide containing co-polymers. There are no examples in D1 in which adhesion is measured or

- otherwise demonstrated. There is no suggestion in D1 that any other classes of monomers would be useful in providing compositions with improved adhesion. A *fortiori*, D1 does not teach that, were epoxide functional monomers to be used, the functional groups would be retained in the final product.
- 5.2 Hence taken on its own, D1 does not provide any indications to the claimed solution to the technical problem. On the contrary, information crucial to the solution of the problem, both as regards the appropriate choice of monomer and as regards measures designed to preserve the functional activity of such a monomer, is conspicuously absent from its teaching.
- 5.3 The argument of the Appellant, that the skilled person would in any case seek to provide reaction conditions which would retain **any** epoxide groups in functionally reactive form is unconvincing for the reasons set out under 4.3 (b) above.
- 5.4 The other documents cited cannot provide the information which is lacking from D1:
- 5.4.1 Document D3 discloses an emulsion copolymer for use as adhesive in a paper-aluminium laminate, prepared by emulsion polymerising a mixture of an acrylate ester, styrene, a glycidyl monomer and carboxyl monomer in the presence of acetyltributyl citrate. Sulphonate modified PVOH is employed as a protective colloid. According to D3, the sulphonate modified PVOH provides the final products with improved stability and adhesive properties under exposure to heat (translation, page 3 lines 4 to 5). Reaction is carried out at 80°C. The pH

during production of the emulsion co-polymer is not disclosed and there is no statement to the effect that the epoxy functionality is maintained in the final copolymer.

The reference by the Appellant to D6 cannot make good this deficit. D6 relates to systems of citric acid and sodium citrate, not the compound employed in D3. D6 states that "It's best to buffer at a pH close to one of the Pk's [of citric acid], so use citrate buffers only in the pH range 3-6". This statement can be interpreted as a clear recommendation, but leaves open the possibility of employing the buffers at a pH outside this range. Hence the position of the Appellant that this document would indicate that the pH during the polymerisation step of D3 is within the range defined in claim 10 of the patent-in-suit must be dismissed as speculation.

Spray-drying and redispersion of the emulsion is not mentioned. The use of the dispersions in construction, e.g. hydraulic cements, ie likewise not disclosed.

The absence from D3 of any teaching regarding redispersibility of the compositions and hence a *fortiori* of the conditions necessary to achieve such redispersibility means that the disclosure in D3 is deficient as regards the solution of the technical problem in a respect identical with that of D1 (cf section 5.2 above).

Thus the aggregate of the teachings of D1 and D3 cannot point the way to the solution of the technical problem.

5.4.2 Document D2 relates to the preparation of a redispersible (meth)acrylate copolymer powder starting from a preformed polymer. The materials are stated to be useful in cements (page 2 line 4). Epoxide groups are not present and indeed are not referred to at all in D2.

Spray-drying is accomplished at a temperature of 100 to 200°C (page 3 lines 47 to 53).

Thus D2 fails to teach compositions containing epoxide groups in any form. Further the temperature taught for spray drying is above the maximum level permitted by the patent-in-suit. Hence D2 also cannot combine with the teaching of D1 to indicate a route to the claimed solution to the technical problem.

5.4.3 None of the remaining documents can provide the missing information. Although documents D4 and D5 concern redispersible emulsion copolymers of acrylic ester monomers and comonomers e.g. styrene, in the presence of PVOH (protective colloid), which emulsions are spray dried at 100 to 150°C they do not disclose epoxide groups, let alone that the activity of any such groups is to be maintained. The temperature disclosed for spray drying is in any case above the maximum defined in the patent-in-suit.

Hence also D4 and D5 cannot provide the information that is missing from D1 in order to arrive at the claimed solution to the technical problem.

5.5 In summary, the solution of the technical problem provided according to the patent-in-suit does not arise in an obvious way from the cited state of the art.

- 5.6 It is therefore concluded that the subject matter of claim 1 involves an inventive step in the sense of Article 56 EPC. This conclusion applies equally to independent claims 10 and 18 (cf sections 4.5 and 4.6 above) and by the same token to dependent claims 2 to 9 and 11 to 17.
6. The grounds of opposition alleged by the Appellant are not supported by the facts. Hence the appeal cannot succeed.

## **Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmeier

R. J. Young