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**Datasheet for the decision
of 14 July 2021**

Case Number: T 1473/18 - 3.3.03

Application Number: 12156329.0

Publication Number: 2495281

IPC: C08L33/04, C08L63/00, C08J3/00

Language of the proceedings: EN

Title of invention:
Epoxy resin imbibed polymer particles

Patent Proprietor:
Rohm and Haas Company

Opponent:
BASF SE

Relevant legal provisions:
RPBA Art. 12(2), 12(4)
EPC Art. 54, 56

Keyword:
Novelty (yes)
Inventive step objection made by mere reference to previous
submissions before the opposition division - not taken into
account (yes) ex post facto analysis

Decisions cited:

G 0003/89, G 0001/03, G 0002/10, G 0003/14



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Case Number: T 1473/18 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 14 July 2021

Appellant: Rohm and Haas Company
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 12 April 2018
revoking European patent No. 2495281 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman D. Marquis
Members: F. Rousseau
W. Ungler

Summary of Facts and Submissions

I. The appeal (by the patent proprietor) lies from the decision of the opposition division posted on 12 April 2018 revoking European patent No. 2 495 281. The decision was based on a sole set of fifteen claims submitted during the oral proceedings on 1 February 2018.

II. Independent claims 1, 9 and 12 of that request read as follows:

"1. A composition comprising a stable aqueous dispersion of thermoplastic polymer particles imbibed with a thermosettable compound having at least two oxirane groups,
which polymer particles are characterized by having a sufficient concentration of anti-agglomerating functional groups,
wherein the concentration of thermosettable compound is from 20 to 60 weight percent, based on the total weight of the thermoplastic polymer particles and the thermosettable compound,
wherein said thermosettable compound is selected from a novolac resin, a di-tri- or tetraglycidyl ether or a di-tri- or tetraglycidyl ester,
wherein said anti-agglomerating functional groups are selected from amide groups, acetoacetoxy groups, strong protic acids which are pH adjusted to form their conjugate bases, or a combination thereof, and
wherein the composition contains a substantial absence of a hardener.

9. A method for forming a cured composite comprising the steps of a) contacting the composition of any of Claims 1 to 8 with a hardener to form a curable composition b) applying the curable composition to a substrate; and c) curing the applied composition, wherein the steps a) and b) are sequential or concomitant.

12. A method comprising the steps of:

a) polymerizing an aqueous dispersion of an ethylenically unsaturated monomer containing anti-agglomerating groups under conditions sufficient to form a stable aqueous dispersion of an anti-agglomerating group functionalized polymer; and

b) mixing the anti-agglomerating group functionalized polymer with a thermosettable compound having at least two oxirane groups to form a stable aqueous dispersion of imbedded polymer particles having a weight average particle size in the range of 50 to 400 nm which is heat-age stable at 60 °C for 10 days, wherein the concentration of thermosettable compound is from 20 to 60 weight percent, based on the total weight of the thermoplastic polymer particles and the thermosettable compound,

wherein said thermosettable compound is selected from a novolac resin, a di-tri- or tetraglycidyl ether or a di-tri- or tetraglycidyl ester, wherein said anti-agglomerating functional groups are selected from amide groups, acetoacetoxy groups, strong protic acids which are pH adjusted to form their conjugate bases, or a combination thereof."

Whereas claims 2 to 8 and 15 were dependent claims of product claim 1, claims 10 and 11 were dependent on method claim 9 and claims 13 and 14 were dependent on method claim 12.

III. The decision was taken having regard to the following documentary evidence amongst others:

D2: DE 2 336 159 (Offenlegungsschrift)

D3: DE 24 27 341 (Offenlegungsschrift)

D4: US 4,314,004

D5: EP 0 578 068 A1.

IV. According to the reasons for the contested decision which are pertinent in the appeal proceedings:

(a) The subject-matter of claims 1, 9 and 12 was novel over the disclosure provided by each of D2, D3, D4 and D5.

(b) Concerning inventive step, D5 did not represent a suitable starting point for the skilled person aiming at providing stable aqueous dispersions of thermoplastic polymer particles containing high amounts of thermosettable resin, since that prior art did not relate to latex stability. Even if it were so, none of the prior art documents cited suggested to use latex particles comprising the specific anti-agglomerating groups defined in claim 1 of the main request in order to improve the heat-age stability of the dispersion. Moreover, contrary to the opinion of the patent proprietor, D3 represented the closest prior art, in particular its Example 11 which described a latex dispersion prepared from acrylic monomers comprising sulfoethyl methacrylate imbibed with an epoxy resin

as modifier. The subject matter of claim 1 of the main request differed from that example in the amount of the epoxy resin incorporated. Without defining the problem solved over the closest prior art, it was held that D2 to which it was referred to in D3 suggested amounts of epoxy resin modifier overlapping with those defined in claim 1 under consideration. The subject-matter of claim 1 of the sole claim request lacked therefore an inventive step over D3.

- V. The opponent (appellant) lodged an appeal against the above decision. With their statement of grounds of appeal (letter of 16 August 2018), the appellant submitted a main request and auxiliary requests 1 to 5, as well as the further items of evidence D14 to D18.:

D14: Experimental report of Andrew Hejl

D15: G. Dombrowski et al "Designed Hybridization A Paradigm Shift in Latex Polymers for Coatings", Physics Research & Technology, 2014, Nova Science Publishers Inc. pages 293-325

D16: Information from website of The Dow Chemical Company regarding discontinuance of Triton X-200 surfactant

D17: US 4,076,676

D18: US 4,247,439.

- VI. The main request corresponded to a re-typed version of the Main Request submitted during the oral proceedings before the opposition division, whose independent claims are indicated in above point II. The wording of the claims of auxiliary requests 1 to 5 is not relevant for the present decision.

VII. The opponent (respondent) replied to the statement of grounds of appeal with a letter of 21 December 2018.

VIII. Additional submissions were made by the appellant with letter dated 1 May 2019 to which were attached documents D19 to D26:

D19: B. Burton "Amine Curing Of Epoxy Resins: Options and Key Formulation Considerations", June 2006, available at www.pcimag.com.

D20: Website extract from Huntsman Corp. at: http://www.huntsman.com/performance_products/a/Products/Amines/Alkylalkanolamines

D21: Website extract from Eastman, at <https://www.eastman.com/Products/Pages/ProductHome.aspx?Product=71103645>

D22: Datasheet concerning Acryloid[®] solid grade acrylic resins, Rohm and Haas, 1986

D23: Datasheet concerning Paraloid[™] resin B-44 100% Solid Grade Thermoplastic Acrylic Resin, Rohm and Haas, 2007

D24: Datasheet concerning Paraloid resin B-44S 40% Thermoplastic Solution Resin, Dow Chemical, 1999-2009

D25: Website extract relating to PARALOID B-44; retrieved from "http://cameo.mfa.org/index.php?title=Paraloid_B-44&oldid=62259"

D26: US 6,362,271 B1.

IX. Further submissions by the respondent were made with letter of 3 September 2019.

X. In preparation of the oral proceedings the Board issued a communication dated 26 March 2021.

XI. Additional submissions were made by the appellant with letter of 25 May 2021.

- XII. Oral proceedings before the Board were held by videoconference on 14 July 2021.
- XIII. The appellant's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They are essentially as follows:
- (a) None of documents D2, D3, D4 and D5 anticipated the subject-matter of claim 1 of the main request.
 - (b) Starting from either D5 or Example 11 of D3 the skilled person would arrive in an obvious manner at the subject-matter of the granted patent.
- XIV. The respondent's submissions, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They are essentially as follows:
- (a) Claim 1 of the main request lacked novelty over the disclosure of each of documents D2, D3, D4 and D5.
 - (b) The subject-matter of the granted patent was not obvious for the skilled person starting from either D5 or Example 11 of D3.
- XV. The appellant (patent proprietor) requested that the decision under appeal be set aside the patent be maintained in amended form on the basis of the main request, or alternatively on the basis of any of auxiliary requests 1 to 5, all filed with letter of 16 August 2018. Furthermore the appellant requested that D14 to D26 be admitted into the proceedings.

XVI. The respondent (opponent) requested that the appeal be dismissed. Furthermore, the respondent requested that document D14 to D26 and auxiliary requests 1 to 5 be not admitted into the proceeding

Reasons for the Decision

Main request - novelty

1. The four objections for lack of novelty of claim 1 over the disclosure of each of documents D2, D3, D4 and D5 have in common that they have been made having regard to multiple separate passages of each of the documents concerned.

1.1 The Enlarged Board reminded in decisions G 1/03 (OJ EPO 2004, 413, point 2.2.2 of the Reasons) and G 2/10 (OJ EPO 2012, 376, point 4.6 of the Reasons) that the concept of disclosure must be the same for the purposes of Articles 54, 87 and 123 EPC, which concept defined in opinion G 3/89 and decision G 11/91 of the Enlarged Board of Appeal (OJ EPO 1993, 117 and 125, respectively) was reaffirmed in decision G 2/10 (OJ EPO 2012, 376, point 4.3 of the Reasons). In application of that concept, a prior art document is novelty destroying only if the skilled person would derive directly and unambiguously from the whole of that document, using common general knowledge, and seen objectively and relative to the date of said document, a subject-matter falling within the scope of what is claimed.

Novelty over D2

1.2 The respondent submitted that the skilled person would read examples 21 and 22 of D2 (Table II on pages 31 and 32) in the light of the general teaching of that document on page 12, last full sentence and claim 15, according to which the epoxy resin modifier can be used in an amount of from 0.5% to 25.0% by weight, based on the weight of total solids. However, nothing more is derivable from the bare disclosure of the specific characteristics of the compositions described in examples 21 and 22. In this respect, D2 does not contain any indication even implicit that the preparation of the film compositions of examples 21 and 22 should be repeated using any other amount of epoxy resin. In the absence of a corresponding teaching in D2 the modification of examples 21 and 22 relied on by the respondent is to be seen as the result from an *ex post facto* and therefore inadmissible interpretation of document D2 made in the light of the knowledge of the present invention. In view of the above, D2 is not prejudicial to the novelty of claim 1.

Novelty over each of D3, D4 and D5

1.3 Having regard to the list of the various passages of each of D3, D4 and D5 cited by the respondent and the presentation which was made thereof, the Board indicated in their communication of 26 March 2021 that that each of the respondent's objections for lack of novelty of claim 1 did not go beyond the mere observation that some of the features of claim 1 of the main request were at least separately and explicitly described in each of said documents. It was also pointed out in the Board's communication that

these passages alone did not show the existence of any disclosure, even implicit, that the features of any of D3, D4 or D5 addressed by the respondent, corresponding to those recited in operative claim 1, were disclosed to be used in combination in at least one of those documents.

1.4 The Board also indicated in said communication that it had not been referred to any pointer in any of those documents, i.e. one or more passages thereof inciting the skilled person, for example by way of preferences expressed or references to other passages, to inevitably read some of the passages cited by the respondent in combination. Under these circumstances, the prior art documents cited had not been shown to describe an aqueous dispersion falling within the ambit of operative claim 1.

1.5 At the oral proceedings, the respondent did not make further submissions in relation to novelty over each of D3, D4 and D5, but merely referred to their written submissions. On that basis, the Board concludes that a lack of novelty of the subject-matter of claim 1 over the disclosure of any of D3, D4 or D5 has not been demonstrated either.

1.6 Consequently, there is no reason for the Board to depart from the opposition division's conclusion that the subject-matter defined in the main request is novel (Article 54 EPC).

Inventive step

The respondent submitted that the skilled person starting from either D5 or Example 11 of D3 would

arrive in an obvious manner at the subject-matter of the granted patent.

D5 as starting point for assessing inventive step

2. The respondent did not address the reasons given in the contested decision as to why an inventive step should be acknowledged over D5. The respondent solely referred in their written submissions to unspecified previous submissions in opposition proceedings or to pages 4 to 6 of their submissions made with letter of 22 November 2017. These references to previous submissions made before the opposition division are, however, not in compliance with the substantiation requirements of Article 12(2) RPBA 2007 in which it is stipulated that the statement of grounds of appeal and the reply shall set out clearly and concisely the reasons why it is requested that the decision under appeal be reversed, amended or upheld, and should specify **expressly** all the facts, arguments and evidence relied on (Case Law of the Boards of Appeal of the European Patent Office, 9th edition, 2019, V.A.2.6.4). This was pointed out by the Board in their communication of 26 March 2021 and the respondent did not offer additional submissions during the oral proceedings. Since the present main request was only filed during the oral proceedings before the opposition division it is also unclear to the Board in which respect objections that had been made previously in writing would apply to the present main request. This is not up to Board to determine. Consequently, the respondent's submissions in relation to the issue of inventive step over D5 need not be taken into account by the Board (Article 12(4) RPBA 2007 which applies in view of the transitional provisions defined in Article 25(2) RPBA 2020).

Example 11 of D3 as starting point for assessing inventive step

3. Both parties presented their submissions on inventive steps starting from Example 11 of D3 which according to the contested decision represented the closest prior art. The Board finds appropriate to analyse first the purpose of the present invention and the disclosure of that example of D3.

Purpose of the present invention

4. Having regard to paragraphs [0001] and [0002] of the specification it was known in the art that the incorporation in latex polymer particles of a minimum amount of carboxylic acid or salts thereof obtained via the polymerization of monomers such as acrylic acid, methacrylic acid, and itaconic acid and salts thereof was required to achieve their colloidal stability, but that incorporation of epoxy resin to imbibe such colloidal stabilized particles tended to result in the epoxy resin to react with their carboxylic groups or salts thereof causing instability of the imbibed latex particles. These two types of instability are also addressed in paragraph [0017] of the specification ("*anti-agglomerating groups are effective in stabilizing the polymer because the groups are both hydrophilic and non-reactive toward epoxy groups under heat-age conditions, it has been discovered that colloidal and heat-age stability is achieved by...*") and reflected by the wording of claim 12 of the patent in suit and the corresponding paragraph [0006] of the specification, according to which step a) defines the preparation of a stable latex and step b) defines the mixing of said latex with a thermosettable compound

having at least two oxirane groups to form a stable dispersion of imbibed polymer particles.

- 4.1 According to paragraph [0003] of the specification, the purpose of the present invention was therefore to imbibe more than 10% of a thermosettable compound such as an epoxy resin into a high-solids (40-60 wt%) polymer particle dispersion while maintaining particle stability under standard industry protocols in order to provide a stable curable latex 2-pack system comprising a relatively high concentration of a thermosettable compound.
- 4.2 The stability under standard industry protocols means as shown in paragraphs paragraphs [0006], [0012] and [0040] of the specification that the dispersion of the imbibed particles must pass a heat-age stability test which is carried out by placing a sample of the dispersion in an oven at 60 °C for ten days. The appellant's submission that this test mimics the effect of storage on the stability of the dispersion of imbibed polymer particles over a long period of time is undisputed. A latex composition is meant to pass that test if the size of its particles does not increase by more than 30% beyond the particle size before testing (paragraph [0012]).
- 4.3 On that basis and in line with the definition in claim 1 of the substantial absence of a hardener, claim 1 must be understood to define the curable part of a 2-pack system such as addressed in paragraph [0003] of the specification which curable part is to be cured by introduction of a hardener. Having regard to the description of the background art addressed in paragraph [0002] of the specification (see above point 3) the primary purpose of obtaining such a stable

composition is obviously to avoid a premature reaction of the thermosettable compound during storage and therefore to guarantee the presence of enough reactive groups introduced with the thermosettable compound imbibed in the latex when the hardener component of the 2-pack system is added before use.

- 4.4 The indication in paragraph [0017] of the specification that the incorporation of anti-agglomerating groups resulted in an effective stabilization of the polymer because said groups were both hydrophilic and non-reactive toward epoxy groups under heat-age conditions, was not disputed by the respondent.

Analysis of Example 11 of D3

5. Example 11 of D3 describes the preparation in a first step of a latex by polymerizing in water a mixture of methyl methacrylate, butyl acrylate, methacrylic acid and sulfoethyl methacrylate in the presence of dibenzyl adipate, all compounds being added over a period of 2 hours during which polymerization takes place at 85°C. After an additional polymerization time of one hour at the same temperature the mixture obtained is then cooled to room temperature.

The latex obtained in Example 11 is then tested as a clear coating by combining a portion thereof with a dispersion of an epoxy resin ("Epon" 828), dimethyl ethanol amine (DMEA) and butoxyethanol. The mixture obtained is sprayed onto a steel panel, dried and baked for 10 minutes at 150°C.

6. In order to understand the process described with Example 11 of D3, it is helpful to refer to the general teaching provided in that document.

6.1 In that respect it is undisputed that the invention in accordance with D3 is defined in its claim 1 by reference to the invention described in German patent application number 23 36 159.3, i.e. D2 in the present appeal proceedings. On that basis the invention defined in claim 1 of D3 is understood by the skilled person to concern a process for producing a thermosettable aqueous dispersion of a solid, water insoluble, synthetic addition polymer produced by:

polymerizing in water at least one vinyl α,β -ethylenically unsaturated main monomer, which is slightly soluble in water, with at least one α,β -ethylenically unsaturated monomer containing a reactive group and a water-soluble, polymerizable ionic monomer selected from water-soluble salts of vinyl sulphonate and of allyl sulphonate and sulfo-esters or salts thereof of the formula $R-CO_2-Q-SO_3M$ (R, Q and M having the meaning given in claim 1 of D3),

in the presence of a material selected from surface active agents and/or suspension agents and

in the presence of at least one modifier which is non-reactive or contains at least one complementary reactive group.

6.2 In view of the second paragraph on page 5 of D3, it is understood that dibenzyl adipate which is employed in Example 11 of D3 is used as plasticizing agent. It is a non-reactive modifier within the meaning of claim 1 of D2 (D2, paragraph bridging pages 10 and 11 and last two lines of page 11) and therefore of claim 1 of D3 having regard to the explicit reference to D2 in said claim.

- 6.3 Claim 1 of D2 (and therefore also claim 1 of D3) furthermore requires when a modifier is non-reactive, as it is the case for dibenzyl adipate used in Example 11 of D3,
- (i) that the polymerisation mixture comprises at least one α,β -ethylenically unsaturated monomer containing a complementary reactive group or
- (ii) that the polymerization be completed and that thereupon the polymer be mixed with an aqueous dispersion of an external crosslinking agent containing at least one complementary reactive group.
- 6.4 Said option (ii) is further addressed in the paragraph bridging pages 15 and 16 of D2, as well as in the two subsequent paragraphs. According to those passages, after the copolymer particles have been formed it is then required for option (ii) to add an external crosslinking agent capable of reacting with the reactive groups of the copolymer. The external crosslinking agent is indicated to migrate through the aqueous phase to the copolymer particles dispersed therein. Moreover, the passage on page 17, lines 5-10 of D2 explains that the reaction between the reactive groups of the copolymer and the complementary reactive groups of the reactive modifier can take place during a baking step.
- 6.5 The epoxy resin ("Epon" 828) used in Example 11 of D3 corresponds to the modifier which contains at least one complementary reactive group (i.e. epoxy groups) within the meaning of claim 1 of D3/D2 (D3, page 5, second paragraph, last two sentences; D2, paragraph bridging pages 10 and 11 and subsequent paragraph). "Epon" 828 is added in Example 11 of D3 after completion of the

polymerization of the ethylenically unsaturated monomers. It represents therefore an external crosslinking agent within the meaning of claim 1 of D2/D3 used in accordance with option (ii) described in above point 6.3 which is capable of reacting with the reactive groups of the copolymer introduced with the methacrylic acid. Accordingly, the Board agrees with the appellant's view according to which the epoxy resin used in Example 11 of D3 must be understood to act as an external crosslinking agent.

Anti-agglomerating functional group

7. Based on the teaching provided in the paragraph bridging pages 2 and 3 of D3 and the subsequent paragraphs including the first paragraph of page 5, it can be understood that the sulfoethyl methacrylate monomer used in Example 11 of D3 is copolymerized within the particles in order to provide colloidal stability to the latex, the incorporation of said ionic comonomers into the polymer particles being described to allow to dispense with the use of contaminating surface active agents required to stabilize the polymer particles. It is undisputed that the use of a sulfoethyl methacrylate monomer results in the latex particles to comprise an anti-agglomerating functional group within the meaning of granted claim 1.

Amount of thermosettable compound having at least two oxirane groups

8. It is also undisputed that the epoxy resin ("Epon" 828) used in Example 11 of D3 is a thermosettable compound in accordance with the definition of claim 1 as granted. The opposition division's finding that the subject-matter of granted claim 1 differs from Example

11 of D3 in the amount of epoxy resin incorporated in the polymer particles is not disputed either. Based on the weight of the monomers used for preparing the latex particles and the weight of the epoxy resin used for preparing the clear coating, the concentration of epoxy resin used in Example 11 of D3 is about 3.8 weight % based on the total weight of the thermoplastic polymer particles and the thermosettable compound, i.e. well below the minimum amount targeted by the present inventors (see above point 4.1) and defined in claim 1 as granted.

9. Having regard to the last paragraph of page 20 of D2 mentioning the possible use of a catalyst to aid the crosslinking reaction between complementary reactive groups and the subsequent paragraph on page 21 specifically mentioning in line 3 DMEA as one possible catalyst to be used for dispersions containing carboxyl and epoxy groups, DMEA must be understood as pointed by the appellant to be used in Example 11 of D3 as a catalyst for promoting the reaction between the epoxy groups of the epoxy resin and the carboxylic acid groups of the latex particles prepared in the first part of that example. This conclusion can be made irrespective of the question whether DMEA used in said Example 11 of D3 constitutes a hardener within the meaning of the patent in suit, which was a point of contention between the parties.

Imbibition of the thermoplastic polymer particles with the thermosetting resin

10. The appellant in disagreement with the respondent contests the finding of the opposition division that the epoxy resin EPON 828 is imbibed into the thermoplastic polymer particles.

10.1 D3 does not provide any explicit indication as to whether the process of its Example 11 results in the epoxy resin to be imbibed in the latex particles. According to the normal meaning of the term "imbibed" used in operative claim 1, the thermosettable compound having at least two oxirane groups is required to be absorbed at least in part in the thermoplastic polymer particles. In other terms the thermosettable compound is not merely present on the surface of the thermoplastic polymer particles, but must have at least in part penetrated into such particles. This obviously requires that specific technical measures are taken to ensure that the thermosettable compound penetrates, i.e. diffuses into the particles. This is reflected in paragraph [0025] of the specification in which it is indicated that the imbibed latex is advantageously prepared by adding the thermosettable compound in the form of a micronized aqueous dispersion or when adding the thermosettable compound as a neat compound by agitation above room temperature, these techniques being applied in Examples 1 to 4 (paragraph [0039]) and 8 to 11 (paragraph [0046]) of the invention, respectively. The respondent's argument that the patent in suit teaches that mixing of the latex with the epoxy resin would be sufficient to imbibe the latex particles with the epoxy resin is not convincing. This obviously depends on the conditions used for said mixing. It can be in this context referred to paragraph [0039] of the specification cited by the appellant which describes the use of two stirring steps of 30 minutes each following the progressive addition of the latex to an epoxy emulsion prepared in an initial step.

10.2 As outlined by the appellant, D3 does not describe how in Example 11 the "Epon 828" containing dispersion is

incorporated into the latex. As a matter of fact D3 does not describe under which conditions (such as time, temperature, order of addition) the coating composition obtained by combining a portion of the latex composition prepared in Example 11 with "Epon" 828, dimethyl ethanol amine (DMEA) and butoxyethanol is prepared. It also does not describe how long the mixture prepared is allowed to stand, if at all, before it is sprayed onto the steel panel. On that basis, it cannot be concluded that the preparation of the coating composition in Example 11 of D3 is disclosed, even implicitly, to result in the latex particles to be imbibed with the epoxy resin. It is unknown whether in the coating composition ready to be sprayed onto the steel panel the epoxy resin particles of the "Epon" 828 used as an external crosslinker in D3/D2 (see above point 6.5) are in intimate contact with those of the latex, are adsorbed on their surface or have penetrated into the latex particles.

Stability under standard industry protocols

11. As indicated in above point 4.2 testing stability under standard industry protocols means placing a sample of the dispersion in an oven at 60 °C for ten days. As argued by the appellant, that kind of stability or a period of storage mimicked by that test is not described in D3. That document does not even describe as shown in above point 12.2 for how long in Example 11 of that document the epoxy resin is in contact with the latex particles, before spray coating and baking take place.

Is the Example 11 of D3 a sensible starting point for assessing inventive step?

12. Having regard to the objective of the present invention indicated in above point 4.1, which is to provide as the curable part of a 2-pack system a latex of a high-solids thermoplast (40-60 wt%) whose particles are imbided with more than 10% of a thermosettable compound such as an epoxy resin and stable under standard industry protocols, the Board is not convinced that the skilled person would have turned to the disclosure of Example 11 of D3 and take it as a starting point for the present invention. As shown above, Example 11 of D3 has not been shown to concern either latex particles imbided with an epoxy resin, let alone a composition comprising high amount of an epoxy resin, or a curable component of a 2-pack system (the order of addition of the curing catalyst and of the epoxy resin is not known), let alone a curable component which has to be stored and has to provide stability under standard industry protocols. On that basis, the Board has serious doubt that Example 11 of D3 represents a realistic starting point for the skilled person who aims at solving the problem mentioned in the patent in suit. The choice of that Example as the closest prior art which relies on the similarity of structural features of that example with operative claim 1 as far as the use an anti-agglomerating functional group is concerned, i.e. the solution preconised by the present inventors in order to imbibe the thermoplast particles with high amount of an epoxy resin, is rather tainted with hindsight.

13. Consequently, the Board agrees with the appellant's argument submitted in writing (statement of grounds of

appeal, page 6, first full paragraph) that Example 11 of D3 does not provide a sensible starting point for the present invention. This, would have been sufficient to conclude that the reasoning on inventive step offered by the opposition division and the respondent starting from Example 11 of D3 as the closest prior art cannot convince as it lacks the required objectivity.

14. Nevertheless, even if inventive step is analysed taking Example 11 of D3 as a starting point for the present invention, for which both parties presented their submissions at the oral proceedings, the respondent's objection that the subject-matter of the main request lacks an inventive step is for the following reasons not persuasive:

Distinguishing features

15. In agreement with the contested decision, both parties agreed that the composition of operative claim 1 differs from that of Example 11 of D3 in that it contains a higher concentration of thermosettable compound having at least two oxirane groups, namely in the range of from 20 to 60 weight percent, based on the total weight of the thermoplastic polymer particles.

Moreover, it results from the analysis of Example 11 of D3 provided in above points 10.1 and 10.2 that D3 does not disclose that the thermosettable compound used in Example 11 is imbibed in the thermoplastic polymer particles. This therefore constitutes an additional feature distinguishing the composition of operative claim 1 from that disclosed with Example 11 of D3, as noted by the appellant.

It results from the absence of disclosure in D3 of latex particles imbided with the epoxy resin that the stability of said imbided latex within the meaning of operative claim 1 is also not disclosed in said document.

The question as to whether a substantial absence of a hardener constitutes a further distinguishing the composition of operative claim 1 from Example 11 of D3 which discloses the use of the curing agent dimethyl ethanol amine can remain unanswered as shown below.

Problem successfully solved

16. Having regard to the composition of Example 11 of D3, the appellant and the respondent took differing positions as to which problem could be considered to be successfully solved by the composition of operative claim 1. Arguing that the imbided (i.e. unreacted) epoxy resin acts as a coalescent during the film formation, the appellant submitted that the problem successfully solved by the composition of operative claim 1 was the provision of a stable composition, providing better film formation and better film properties, without the need to subsequently add an epoxy resin. As to the respondent, the problem successfully solved by the composition of operative claim 1 was seen to merely reside in the provision of a further composition comprising a higher amount of epoxy resin.

16.1 Operative claim 1 defines that the composition is stable. In the absence of a precise definition of the kind of stability concerned and of any test to be carried out to assess whether a composition fulfills that condition, said term is ambiguous. This ambiguity

is however not open to objections under Article 84 EPC in accordance with the ruling of G 3/14 (OJ EPO 2015, A102), as it does not result from amendments to the granted patent. In order to address the objection of lack of inventive step over the composition of Example 11 of D3, it is therefore necessary to construe the meaning of that term in the light of the patent as a whole.

16.2 The stability is defined in claim 1 as granted in that of the aqueous thermoplastic polymer particles imbibed with the thermosettable compound, which polymer particles are defined to have sufficient concentration of anti-agglomerating functional groups. These anti-agglomerating groups are indicated in paragraphs [0013], [0016], [0017] and [0040] of the specification to provide stability of the latex under heat-age conditions, as they are non-reactive with oxirane groups under heat-age conditions. As highlighted by the appellant, the stability of the dispersion of imbibed particles addressed in the patent in suit is unambiguously defined in view paragraphs [0006], [0012] and [0040] of the specification to be assessed by placing a sample of the dispersion in an oven at 60 °C for ten days (see above point 4.2). A dispersion of imbibed particles is stable if the particle size does not increase by more than 30% beyond the particle size before testing (paragraph [0012]).

16.3 It is undisputed that the composition of operative claim 1 allows as the composition of Example 11 of D3 to form films. The Board has no reason to have a different view. Whether the performances of the claimed composition in comparison to that of Example 11 of D3 are improved in terms of film formation and film properties can be left unanswered as shown below. To

the respondent's benefit and for the sake of argumentation, those technical advantages which have been alleged by the appellant to constitute an improvement over the composition taken as starting point for assessing inventive step, are therefore not taken into account for the formulation of the problem successfully solved.

16.4 Concerning the formulation of the problem proposed by the respondent which would include the definition that the composition has to comprise a higher amount of epoxy resin, such formulation would at least partially anticipate the solution leading to an inadmissible ex post facto analysis of the question whether the presently claimed composition involves an inventive step (Case Law, supra, I.D.4.3.1). Therefore, that part of the problem formulation cannot be accepted.

16.5 Based on the above considerations, the technical problem solved over the composition of Example 11 of D3 is considered to reside in the provision of a latex film forming composition which is stable under standard industry protocols.

Obviousness of the solution

17. It remains to be decided whether the skilled person desiring to solve the problem identified above would, in view of the disclosure of D3, possibly in combination with other prior art, including common general knowledge, have modified the composition of Example 11 of D3 in such a way as to arrive at the composition of operative claim 1.

17.1 According to the paragraph bridging pages 2 and 3 of D3 and the preceding paragraph in which the function of

the sulfo esters groups incorporated into the polymer particles are addressed, it can be understood that those work as an internal surface active agent providing colloidal stability to the latex particles. However, D3 does not provide any indication that the sulfo esters groups present in the latex particles of Example 11 of D3 result in an effective stabilization of the polymer because said groups would be non-reactive toward epoxy groups, let alone as indicated in above points 11 and 12 under standard industry protocols mimicking a long storage of said curable composition. There is also no submissions by the parties that other anti-agglomerating groups defined in operative claim 1 would be known to bring about such advantage.

17.2 Furthermore, as indicated in paragraph [0002] of the specification the skilled person was well aware of the reactivity of epoxy groups with carboxylic acid / salts of latex particles jeopardizing the long term stability of the latex.

17.3 Under these conditions, even if starting from the teaching of Example 11 of D3 the skilled person seeking to obtain a latex film forming composition which is stable under standard industry protocols had found obvious to dispense with the curing catalyst DMEA, the skilled person would have found no motivation to increase by a factor of about 6 the amount of epoxy resin used in D3. This is especially the case when said epoxy resin is expressly described in D3 to be used as an external crosslinking agent for the latex particles. As pointed out in above point 17.1 there is also no suggestion for the skilled person that the sulfo esters groups of the latex particles should have been kept at the same time in order to provide stability under

standard industry protocols. This could be done only with the knowledge that the sulfo esters groups of the latex particles are non-reactive toward epoxy groups under heat-age conditions and that their presence in a sufficient amount provides stability under such conditions, even when the amount of epoxy resin is increased. Such knowledge, however, is only provided in the patent in suit. An indication that such knowledge was part of the prior art was not submitted either. Under these circumstances finding the claimed solution obvious, i.e. keeping the sulfo esters groups of the latex, while increasing the amount of epoxy resin to the level defined in operative claim 1 could only arise with the benefit of hindsight knowledge of the present invention. On that basis, the composition of claim 1 has not been shown to be obvious having regard to the state of the art.

17.4 This conclusion, based on the obviousness to provide a composition which is stable under industry protocols, is therefore as noted in above point 16.3 valid even if to the benefit of the respondent the allegation by the appellant that the compositions of claim 1 provides improved film formation and film properties is not taken into account. The above conclusion is also not based on items of evidence D14 to D26 submitted by the appellant to strengthen their case. There is therefore no need to address the admissibility of those documents which was contested by the respondent.

18. The parties declared at the oral proceedings that their arguments applied mutatis mutandis to all independent claims of the main request. As regards claim 9 of the main request the respondent pointed out that that claim did not require the absence of a hardener.

- 18.1 Claim 9 concerns a method using the composition of claim 1, in which a hardener is added to that composition before use. As indicated in relation to the main request, it was not obvious for the skilled person having regard to the state of the art to arrive at the curable composition defined in operative claim 1. It follows from the above that the reasoning for this finding, which is essentially based on the stability of the composition under industry protocol, is not only valid in a context for which there is no need to add a hardener to said composition. On the contrary the very aim of the stability defined in operative claim 1 is to avoid a premature reaction of the epoxy groups which otherwise would not be available for reaction upon addition of a hardener. Accordingly, the method of claim 9 is also not considered to be obvious having regard to the state of the art.
- 18.2 Claim 12 concerns a method of preparing a composition whose definition is more restricted than that of claim 1, as it specifies in addition the weight average particle size of the latex particles. It follows therefore that the reasoning provided in respect of claim 1 of the main request applies in similar manner to the method defined in claim 12. Consequently, its subject-matter has also not been shown to lack an inventive step.
19. In the absence of additional objections against the subject-matter of the main request, that request is therefore considered to be allowable. Under these circumstances it is not necessary to address the allowability of auxiliary requests 1 to 5.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent with the following claims and a description to be adapted thereto:

Claims no. 1 to 15 of the main request filed with the letter of 16 August 2018.

The Registrar:

The Chairman:



B. ter Heijden

D. Marquis

Decision electronically authenticated