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**Datasheet for the decision  
of 16 September 2008**

**Case Number:** T 0307/06 - 3.3.01

**Application Number:** 00976640.3

**Publication Number:** 1246878

**IPC:** C09D 201/02

**Language of the proceedings:** EN

**Title of invention:**

Solvent-free film-forming compositions for clear coats

**Patentee:**

PPG Industries Ohio, Inc.

**Opponent:**

Bayer MaterialScience AG  
BASF Coating AG

**Headword:**

Coating compositions/PPG

**Relevant legal provisions:**

EPC Art. 84, 101(3)

**Relevant legal provisions (EPC 1973):**

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**Keyword:**

"Clarity of the claims (no) - due to a parameter which may be determined by different methods yielding different results"

**Decisions cited:**

T 0287/97, T 0728/98

**Catchword:**

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Case Number: T 0307/06 - 3.3.01

**DECISION**  
of the Technical Board of Appeal 3.3.01  
of 16 September 2008

**Respondent:** Bayer MaterialScience AG  
(Opponent) Patents and Licensing  
D-51368 Leverkusen (DE)

**Representative:** -

**Appellant:** BASF Coatings AG  
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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
3 January 2006 concerning maintenance of  
European patent No. 1246878 in amended form.

**Composition of the Board:**

**Chairman:** P. Ranguis  
**Members:** C. M. Radke  
R. T. Menapace

## Summary of Facts and Submissions

I. BASF Coatings AG (Opponent II) has lodged an appeal against the interlocutory decision of the opposition division that the European patent no. 1 246 878 as amended in accordance with the auxiliary request filed on 3 November 2005 meets the requirements of the EPC.

II. The following documents were *inter alia* cited during the opposition procedure:

(D1) EP-A-0 899 282

(D5) K. Weinmann, farbe + lack, vol. 93, issue 6/1987, 447- 451.

III. The opposition division decided that the subject-matter of claim 1 of the Main Request (filed with the letter dated 18 March 2005) was not novel in view of the disclosure of document (D1).

However, it considered the subject-matter of the claims of the Auxiliary Request to be novel in view of document (D1) which did not disclose a polymer (1) having a glass transition temperature  $T_g$  of less than 25°C.

It considered document (D1) to represent the closest prior art. The problem solved was to provide coatings with an acceptable appearance made from water based compositions. Document (D1) did not teach to employ polymers having a  $T_g$  lower than 30°C, whereas document (D5) disclosed coating compositions but did not disclose or suggest dispersions of microparticles. The opposition division concluded that the subject-matter

of the claims of the auxiliary request involved an inventive step.

IV. During the appeal procedure *inter alia* the following documents were additionally cited:

- (D13) Römpp Chemie Lexikon, 9th edn., Georg Thieme Verlag, Stuttgart/DE, vol. 2 (1995), 1587
- (D14) H.-G. Elias, Makromoleküle, vol. 1 "Grundlagen", 5th edn. (1990), Hüthig & Wepf Verlag, Basel/CH, 848-850
- (D16) ASTM D 4419-90 (Reapproved 2005), version as published in May 2005, ASTM 3418-03, version as published in January 2004, and ASTM E 1356-03, version as published in May 2003, ASTM International, West Conshohocken/US, all downloaded on 7 November 2006
- (D17) Internet information on the "ASTM Standards on Disks, volume 14.02, issued July 2000, E1640-99 Standard Test Method for Assignment of the Glass Transition Temperature by Dynamic Mechanical Analysis", retrieved on 9 May 2008, [http://amaec.kicet.re.kr/cd\\_astm/PAGES/E1640.htm](http://amaec.kicet.re.kr/cd_astm/PAGES/E1640.htm)
- (D18) ISO 11357-2, first edn., 15 March 1999, International Organization for Standardization, Genève/CH

(D19) ASTM E 1640-04, ASTM International, West Conshohocken/US, 5 pages, version as published in July 2004, downloaded on 1 July 2008 .

V. The claims on file are

- claims 1-28 of the auxiliary request filed with the letter dated 3 November 2005 (now the new **Main Request**);
- claims 1-28 of the **First Auxiliary Request** filed with the letter dated 14 August 2008; and
- claims 1-28 of the **Second Auxiliary Request** filed with the letter dated 14 August 2008.

Claim 1 of the Main Request reads as follows:

"1. A film-forming composition which is substantially free of organic solvent, said film-forming composition comprising: at least one thermosettable aqueous dispersion comprising polymeric microparticles having a functionality adapted to react with a crosslinking agent and a mean particle size ranging from 0.01 to 10  $\mu\text{m}$ , said microparticles prepared by mixing together under high shear conditions the following components:

- (1) at least one substantially hydrophobic polymer having reactive functional groups and a  $T_g$  of less than 25°C; and
- (2) at least one substantially hydrophobic crosslinking agent containing functional groups reactive with the functional groups of the polymer (1),

wherein said film-forming composition is capable of forming a generally continuous film at ambient temperature."

Claim 1 of the First Auxiliary Request differs from the one of the Main request in that the words "as measured with the particle size analyzer Coulter N4 instrument" were inserted immediately after "and a mean particle size ranging from 0.01 to 10  $\mu\text{m}$ ".

Claim 1 of the Second Auxiliary Request differs from the one of the Main Request in that the words "and a mean particle size ranging from 0.01 to 10  $\mu\text{m}$ " were deleted.

VI. The Appellant remarked that the feature "and a  $T_g$  of less than 25 °C" had been introduced into claim 1 during the opposition stage. He argued that it rendered the claim unclear as different methods for determining the  $T_g$  existed which yield varying results (see (D13) and (D14)); in his letter dated 23 July 2008 he presented results of experiments showing that a hydrophobic polymer according to example A of the patent in suit had a  $T_g$  of 47°C when determined by dynamic mechanical analysis (DMA), and one between 20 and 33°C when determined by differential scanning calorimetry (DSC). During the oral proceedings before the Board he confirmed that said hydrophobic polymer was made from a monomer mixture exactly of the same composition as disclosed in footnote 1 under the table in paragraph [0086] of the patent in suit. In addition to that, document (D18) showed that the glass transition temperatures determined by DSC varied with the heating and cooling rates.

VII. The Respondent and Patent Proprietor argued that the person skilled in the art was aware that DSC was the commonly used method for determining  $T_g$  and would

immediately have recognised that according to the application underlying the patent in suit  $T_g$  was measured by DSC. Moreover,  $T_g$  values determined by DMA were dependent on the frequency and the use of a linear or logarithmic storage modulus. As this information was not indicated in the application, the person skilled in the art would not have considered that  $T_g$  values given therein were determined by DMA.

The experimental data submitted by the Appellant with the letter dated 23 July 2008 did not contain a test report. Hence, it could not be verified if they represented an exact reproduction of the polymer used in example A of the contested patent.

VIII. The Board issued a communication summarising the issues to be discussed and its preliminary and non-binding opinion on certain of these issues. In particular, it pointed out that methods other than DSC, namely DMA, might be used to determine the  $T_g$ .

IX. The Appellant requested that the decision under appeal be set aside and that the patent be revoked.

The Respondent and Patent Proprietor requested that the appeal be dismissed or the patent be maintained on the basis the First or Second Auxiliary Requests.

The other Respondent, Opponent I, filed neither observations nor requests during the appeal procedure.

The parties were duly summoned to the oral proceedings before the Board. The Respondent and Patent Proprietor withdrew his request for oral proceedings with the

letter dated 14 August 2008 and announced that he would not be represented during the oral proceedings. Both Respondents were absent at the oral proceedings. The proceedings were thus continued in the absence of the Respondents in accordance with Rule 115(2) EPC.

- X. At the end of the oral proceedings the decision of the Board was announced.

### **Reasons for the Decision**

1. The appeal is admissible
2. *Article 123 EPC*

The parties did not claim that the patent in suit as amended in accordance with the requests on file did not meet the requirements under Article 123 EPC; nor does the Board see a basis for such an objection. In view of the outcome of this decision it is not necessary to give detailed reasons.

3. *Clarity of the claims (Article 84 EPC)*
  - 3.1 The alleged lack of clarity of a claim is no ground for opposition under Article 100 EPC. However, Article 101(3) EPC requires an amended patent to meet the requirements of the EPC, thus including the requirement of Article 84 EPC that the claims shall be clear.

Therefore, the Board of Appeal has the power to examine whether or not amendments made in the patent during



opposition and appeal proceedings render said claims unclear, contrary to the requirements of Article 84 EPC.

The feature "and a  $T_g$  of less than 25 °C" in claim 1 of the Main Request, the First and the Second Auxiliary Requests did not form part of the claims as granted; it was first introduced into the claims during the opposition proceedings, with the letter dated 3 November 2005.

- 3.2 Document (D13) is a standard encyclopedia of chemistry. It discloses that the glass transition temperature  $T_g$  can be determined by several methods including dilatometric, dielectric, dynamic-mechanical or refractometric measurements or by means of NMR spectroscopy (see the penultimate sentence in the first paragraph under the headword "Glasübergangstemperatur": "Bestimmt werden kann die G. u. a. über dilatometrische, dielektrische, dynamisch-mechanische od. refraktometrische Messungen bzw. mit Hilfe der NMR-Spektroskopie.").

Document (D14) mentions that the  $T_g$  may be determined by various methods. These include static methods, such as the determination of the heat capacity (including differential thermal analysis), of changes of volume and index of refraction with temperature, and dynamic methods, such as NMR and the determination of mechanical or dielectric loss.

- 3.3 However, the mere fact that several methods for determining  $T_g$  exist, does not render the claims unclear, if at least one of the following conditions are met:

- a) The different methods yield essentially the same  $T_g$  values for the same material, or
- b) the person skilled in the art had associated the range of  $T_g$  values mentioned in claim 1 of all the requests with only one standard method of measurement.

3.4 As to condition a), document (D14) explains that static methods for determining the  $T_g$  (such as DTA) may yield considerably different  $T_g$ -values as compared to dynamic methods (see the bottom paragraph on page 848, and Table 22-11 and paragraphs 2 and 3 on page 850). For poly(methylmethacrylate), said Table lists  $T_g$  values of 110°C (determined by thermal expansion), 120°C (determined by penetrometry) and 160°C (determined by rebound resilience).

This is confirmed by the experimental report of the Appellant filed with the letter dated 23 July 2008. In this report the  $T_g$  of a polymer allegedly produced in accordance with example A of the patent in suit was determined by two methods. Differential scanning calorimetry (DSC) - a static method - yielded a  $T_g$  between 31 and 33°C when using the midpoint temperature, whereas the dynamic mechanical analysis (DMA) - a dynamic method - gave a  $T_g$  of 47°C at a frequency of 1 Hz.

For the assessment of clarity of the claims it is not relevant whether or not this polymer has exactly the same properties as the one used in example A of the present in suit as long as it can be regarded as a

"substantially hydrophobic polymer having reactive functional groups" (see present claim 1 in all the requests; point V above). Anyhow, the patent in suit only indicates the composition of the monomer mixture used for making said polymer; it is silent on the reaction conditions for making the polymer, on its average molecular weight and its  $T_g$ , and thus does not enable the person skilled in the art to reproduce the hydrophobic polymer used in example A (see paragraph [0086], footnote 1 under the table).

From all this it has to be concluded that there are different methods for determining  $T_g$  yielding different results for the same material.

- 3.5 As to condition b), the Proprietor argued that the person skilled in the art would have associated the  $T_g$  with one standard method of measurement, namely DSC. He referred to the three ASTM standards (D16) and the ISO standard (D18) which relate to the determination of the  $T_g$  by means of differential scanning calorimetry (DSC).
- 3.5.1 He was of the opinion that the person skilled in the art would not have considered a  $T_g$  to be determined by DMA unless it was indicated at which frequency it was measured and whether a linear or a logarithmic presentation of the storage modulus was used (see point VII above). He submitted document (D19) in this respect, which disclosed that a  $T_g$  determined by DMA varied with these parameters (see in particular formula 2 on page 4 and chapters 13 and 14). In particular, said document mentioned that the  $T_g$  determined by DMA depended on the frequency used (see formula (2) on page 4). Moreover, it disclosed that a certain epoxy

composite showed a  $T_g$  of  $120.8 \pm 3.2^\circ\text{C}$  using a linear presentation of storage modulus and one of  $118.6 \pm 2.6^\circ\text{C}$  when a logarithmic presentation of storage module was applied (see chapters 14.3.2 and 14.3.3 on pages 4 and 5).

3.5.2 When assessing clarity of a claim it has to be determined how the person skilled in the art would have read the claim at the relevant filing date, namely in the present case at the priority date of the patent in suit (see T 287/97 of 12 September 2000, point 2.2.5.2 of the reasons).

3.5.3 Document (D19) is a copy of the version of the standard ASTM E 1640 as published in July 2004, originally approved in 1994 (see footnote 1 on page 1). Hence, it does not necessarily reflect the state of the art available to the public at the priority date of the patent in suit, namely on 10 November 1999. However, even assuming in view of the arguments of the Proprietor, that the relevant parts of document (D19) were disclosed in the version of the standard as originally approved in 1994, these arguments are not convincing.

3.5.4 Document (D19) requires the frequency to be 1 Hz if no other frequencies are reported (see chapter 11.4 on page 3; formula 2 on page 4 is indicated only in order to calculate the  $T_g$  at 1 Hz if another frequency was used). Hence, if the standard frequency is required and is in fact used, there is no need to indicate any frequency.

The variation of the  $T_g$  with the linear or logarithmic presentation of storage modulus is within the measuring accuracy indicated in (D19) (see the last sentence under point 3.4.1 above). Therefore, there is no reason to believe that the person skilled in the art would have considered the indication of the type of presentation of the storage modulus to be mandatory whenever  $T_g$  data determined by DMA are presented.

- 3.5.5 Hence, the allegation of the Patent Proprietor that the person skilled in the art would not have considered a  $T_g$  to be determined by DMA unless it was indicated at which frequency it was measured and whether a linear or a logarithmic presentation of the storage modulus was used, is not well founded.
- 3.6 In consequence, there is no reason to believe that the person skilled in the art would have recognised at the priority date of the patent in suit whether a  $T_g$  value of a polymer referred to in a document had been determined by a certain method unless said method was explicitly stated.
- 3.7 Moreover, the reasoning outlined under point 3.4 above leads to the conclusion that a certain "substantially hydrophobic polymer having reactive functional groups" may show "a  $T_g$  of less than 25 °C" according to claim 1 of each request, if the  $T_g$  is determined by one possible method, but not if another method is used. This leaves doubt as to which subject-matter is covered by claim 1, and thus renders said claim unclear (cf. T 728/98, O.J. EPO 2001, 319, point 3.1 of the reasons).

4. As claim 1 of each of the requests is not clear as required in Article 84 EPC, the patent as amended does not meet the requirements of the EPC (Article 101(3) b) EPC).

## **Order**

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

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

The Registrar:

The Chairman:

M. Schalow

P. Ranguis