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# Datasheet for the decision of 12 May 2017

**Case Number:** T 1401/14 - 3.3.09

**Application Number:** 06801079.2

**Publication Number:** 1945453

**IPC:** B32B27/36

**Language of the proceedings:** EN

**Title of invention:**
Bisphenol A and aromatic glycidyl ether-free coatings

**Patent Proprietor:**
Valspar Sourcing, Inc.

**Opponents:**
Grace Darex Packaging Technologies
PPG Industries, Inc.

**Headword:**

**Relevant legal provisions:**
EPC Art. 56

**Keyword:**
Inventive step (yes)

**Decisions cited:**

**Catchword:**

Europäisches Patentamt
European Patent Office
Office européen des brevets

**Beschwerdekammern**
**Boards of Appeal**
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**Case Number: T 1401/14 - 3.3.09**

# D E C I S I O N
# of Technical Board of Appeal 3.3.09
# of 12 May 2017

| | |
|---|---|
| **Appellant 01:**<br>(Opponent 01) | Grace Darex Packaging Technologies<br>62 Whittemore Avenue<br>Cambridge MA 02140 (US) |
| **Representative:** | Uexküll & Stolberg Partnerschaft von<br>Patent- und Rechtsanwälten mbB<br>Beselerstrasse 4<br>22607 Hamburg (DE) |
| **Appellant 02:**<br>(Opponent 02) | PPG Industries, Inc.<br>One PPG Place<br>Pittsburgh, Pa.15272 (US) |
| **Representative:** | Appleyard Lees IP LLP<br>15 Clare Road<br>Halifax HX1 2HY (GB) |
| **Respondent:**<br>(Patent Proprietor) | Valspar Sourcing, Inc.<br>901 3rd Ave. South<br>P.O. Box 1461<br>Minneapolis, MN 55440-1461 (US) |
| **Representative:** | Vossius & Partner<br>Patentanwälte Rechtsanwälte mbB<br>Siebertstrasse 3<br>81675 München (DE) |
| **Decision under appeal:** | **Decision of the Opposition Division of the European Patent Office posted on 17 June 2014 rejecting the opposition filed against European patent No. 1945453 pursuant to Article 101(2) EPC.** |

**Composition of the Board:**

| | |
|---|---|
| **Chairman** | M. O. Müller |
| **Members:** | J. Jardón Álvarez |
| | F. Blumer |

## Summary of Facts and Submissions

I. This decision concerns the appeals filed by both opponents against the decision of the opposition division to reject the oppositions filed against European patent No. 1 945 453.

II. Both opponents had requested revocation of the patent in its entirety on the grounds that the claimed subject-matter was not inventive (Article 100(a) EPC).

The documents submitted during the opposition proceedings included:

D1: WO 03/022944 A1;

D3: WO 00/55265 A1;

D4: US 2005/0014012 A1; and

D13: "DYNAPOL® L 651", Degussa AG, 22.07.02 (2 pages).

III. The claims as granted included ten claims, independent claims 1, 8 and 9 reading as follows:

"1. A hardenable packaging coating composition, comprising:

an under-coat composition, containing:

a polyester (co)polymer, and
an under-coat cross-linker; and

an over-coat composition, containing:

a poly(vinyl chloride) (co)polymer dispersed in a substantially nonaqueous over-coat carrier liquid,
an over-coat cross-linker, and
a functional (meth)acrylic (co)polymer;

wherein the packaging coating composition is substantially free of mobile BPA, BPF, BADGE and BFDGE."

"8. A method of coating a metal substrate with a hardenable packaging composition comprising:

applying an under-coat composition to a metal substrate, said under-coat composition containing:

a polyester (co)polymer, and
an under-coat cross-linker;

applying an over-coat composition to the under-coated metal substrate, said over-coat composition containing:

a poly(vinyl chloride) (co)polymer dispersed in a substantially nonaqueous over-coat carrier liquid,
an over-coat cross-linker, and
a functional (meth)acrylic (co)polymer; and

curing the under-coat and over-coat compositions to provide a hardened film of the under-coat and over-coat compositions on the metal substrate;

wherein the hardenable packaging composition and hardened film are substantially free of mobile BPA, BPF, BADGE and BFDGE."

"9. A metal foodstuffs container having at least an interior surface coated with a hardened packaging composition produced according to the method of claim 8."

The remaining claims were dependent claims.

IV. The opposition division acknowledged an inventive step for the subject-matter of the granted claims. The decision can be summarised as follows:

- Starting from D1 as the closest prior art, the objective technical problem to be solved by the patent was to find an alternative coating composition with at least similar resistance to acidic foodstuffs and with sufficient integrity when coated on metal substrates to allow a shaping process such as deep-drawing and stamping.

- This problem was solved by the claimed coating composition comprising an under-coat polyester in addition to the polyvinyl chloride based over-coat as illustrated in the examples of the patent. This solution was not obvious because there were no pointers to it in the cited documents. The claimed solution was not a merely arbitrary choice but an attempt to maintain or even improve the properties of the coating compositions of D1. Although the prior art cited by the opponents taught that polyester resins were particularly preferred as primers because these resins exhibited particularly good adhesion to metal substrates, the skilled person would not have considered applying a polyester primer without hindsight knowledge, especially because D1 taught that its coating

system met all the requirements and that a primer was not necessary.

V. This decision was appealed by both opponents (hereinafter: appellant 01 and appellant 02). The statement of grounds of appeal of appellant 01 included the following new documents:

D24: Product brochure "PR 1159-01-01" dated 12 January 1994 (1 page); and

D25: Declaration of Mr Wiegmann dated 13 October 2014 (3 pages).

VI. In its response to the statements of grounds of appeal the patent proprietor (hereinafter: the respondent) requested that the appeals be dismissed (main request) or, alternatively, that the patent be maintained in amended form based on the claims according to auxiliary requests 1 to 5 submitted therewith. The respondent also filed the following further evidence:

D26: Datasheet "DEGALAN® LP 64/12" dated 14 October 2009 (2 pages); and

D27: Declaration of Mr Paulson dated 27 April 2015 (2 pages).

VII. A further submission was filed by appellant 02 including the following experimental evidence:

D28: Declaration of Mr Maral dated 5 July 2016 (3 pages).

VIII. In a communication the board indicated the points to be discussed during the oral proceedings.

IX. All parties replied to the communication of the board. The replies of the appellants included further evidence, namely:

D29: Further declaration of Mr Maral dated 13 January 2017 (2 pages), filed by appellant 02; and

D30: US 2006/0100366 A1, referred to by appellant 01.

X. Oral proceedings were held before the board on 12 May 2017.

XI. The arguments of the appellants, insofar as they are relevant for the present decision, may be summarised as follows:

- Document D1 represented the closest prior art. It disclosed coating compositions corresponding to the "over-coat" layer of claim 1 of the patent and having also very good adhesive properties and corrosion resistance.

- The evidence filed by both appellants, namely D25 and D28/D29, convincingly showed that no improvement had been achieved over the teaching of D1. The additional "under-coat" layer required by claim 1 and containing a polyester had no substantial effect on the properties of the coating. Even though the experimental evidence did not exactly represent embodiments according to D1, the experiments nevertheless showed the lack of improvement compared to this document, in

particular a lack of improvement over the whole scope of the claims. The experiments of the respondent, which compared a "one layer coating" with a "two layer coating" with a significantly different total thickness, were not suitable to demonstrate any improvement due to the distinguishing feature, the polyester under-coat.

- In view of this lack of improvement, the problem to be solved by the patent in suit had to be reformulated in a less ambitious manner, merely as the provision of an alternative coating. The claimed solution, namely the use of a polyester under-coat, was clearly hinted at in D13.

- Even if an improvement was acknowledged, the claimed subject-matter still lacked inventive step because D13 taught the skilled person that beneficial properties were to be expected when the polyester Dynapol® L651 containing stoving enamel was used for deep drawable sterilisable stamping enamels for can coatings.

XII. The arguments of the respondent, insofar as they are relevant for the present decision, may be summarised as follows:

- Starting from D1 as closest prior art, the objective technical problem to be solved by the patent was to provide a coating for foodstuffs containers which were suitable for storing acidic foodstuffs and beverages, where the coating exhibited excellent corrosion resistance as well as superior adhesion during container fabrication. The experimental evidence D27 showed that the claimed coatings had improved adhesion over the coatings of

D1. Indirectly, the results in the patent showed further that the claimed coatings had excellent resistance to acidic testing conditions.

- The evidence provided by the appellants could not demonstrate that the claimed coating was not an improvement over those of D1, because neither D25 nor D28/D29 reproduced the teaching of D1.

- The solution according to claim 1 involved an inventive step essentially because the skilled person would not modify D1 by introducing an under-coat. In fact the idea of the introduction of an under-coat was contrary to the teaching of D1, because the coating used in D1 adhered well to metal. The skilled person would therefore not be motivated by D1 to provide an under-coat, but instead would have modified the coating, as had been done in D3 and/or D4 that dealt with the same problem. The objection of the appellants that the skilled person would have combined the teaching of D1 with D13 was clearly made with hindsight, because the coating disclosed in D1 did not need an under-coat. Even a combination of D1 with D13 would not suggest the claimed solution, the reason being the surprising finding of an excellent corrosion resistance and a better adhesion of the claimed compositions when compared with those of D1.

XIII. Both appellants requested that the decision under appeal be set aside, and that European patent No. 1 945 453 be revoked in its entirety. Appellant 02 further requested that auxiliary requests 2 to 5 not be admitted into the proceedings.

XIV. The respondent requested that the appeals be dismissed (main request) or, subsidiarily, that the patent be maintained on the basis of one of auxiliary requests 1 to 5, filed on 30 April 2015 with the reply to the statement of grounds of appeal.

## Reasons for the Decision

MAIN REQUEST (granted claims)

1. *Inventive step*

1.1 The appellants' only attack against the claims of the main request is based on lack of inventive step in view of D1 as the closest prior art.

1.2 The invention relates to protective coating compositions and methods for coating metal substrates useful in fabricating, for example, packaging containers (see [0001] of the patent specification).

The coating compositions should be free from bisphenol A (BPA), bisphenol F (BPF) and aromatic glycidyl ether compounds such as bisphenol A diglycidyl ether (BADGE) and bisphenol F diglycidyl ether (BFDGE). These undesired compounds may be present in epoxy-based coatings ("gold lacquers"). The claimed coating compositions are said, after curing, to exhibit chemical and corrosion resistance comparable to the known epoxy-based coatings (see examples and comparative examples in the patent specification, Tables IX to XII).

1.3 Closest prior art

1.3.1 All the parties agreed that D1 was the closest prior-art document.

1.3.2 Like the patent, D1 aims to provide coating compositions essentially or entirely free of epoxy functional compounds and intermediates used to make epoxy functional compounds, such as epoxy novolac, BPA, BPF, BADGE and BFDGE (see paragraph [0010]). This is said to be achieved by the coating compositions comprising (a) an epoxy functionalised stabiliser comprising a monomeric unit derived from a glycidyl ester of an α,β-unsaturated acid, or an anhydride thereof; and (b) a thermoplastic dispersion (see claim 1).

1.3.3 The cured coatings of D1 adhere well to metal and provide substrates with high levels of resistance to corrosion or degradation that may be caused by food or beverage products (see paragraph [0042]).

1.3.4 It was undisputed that the difference between the coating compositions of claim 1 and the coating compositions of D1 was the presence of a polyester under-coat, namely "an under-coat composition, containing: a polyester (co)polymer, and an under-coat cross-linker" in the wording of claim 1.

1.4 Problem to be solved and its solution

1.4.1 According to the respondent, the technical problem to be solved by the invention in view of D1 was to provide a coating for foodstuff containers which were suitable for storing acidic foodstuffs and beverages, where the

coating exhibited excellent corrosion resistance as well as superior adhesion during container fabrication.

1.4.2 The question whether this problem was solved was hotly disputed during the proceedings and indeed is crucial for the present decision.

1.4.3 There is no comparison in the patent between the coatings used in D1 and those now claimed in the patent specification. During the appeal proceedings all parties filed experimental evidence aiming to provide such a comparison. Thus, the respondent filed a declaration by Mr Paulson (D27), one of the inventors of the patent, and the appellants filed counter-evidence in the form of a declaration by Mr Wiegmann (D25, by appellant 01) and two declarations by Mr Maral (D28 and D29, by appellant 02).

1.4.4 D27 was filed by the respondent to show an improvement derived from the difference between the claimed coating compositions and those of D1. The results in D27 show that the use of a polyester under-coat significantly improves the substrate adhesion of a polyvinyl chloride-based over-coat.

Thus, the respondent compared one-layer coatings containing a polyvinyl chloride (co)polymer, an over-coat (phenolic) cross-linker, and an oxirane-functional(meth)acrylic (co)polymer according to the teaching of D1 with two-layer coatings as presently claimed further including the distinguishing feature of the invention, the polyester under-coat. After drawn can fabrication, the adhesion of the two-layer coatings according to claim 1 was said to be perfect, while for the samples according to the teaching of D1, lacking the polyester under-coat, the coatings lost adhesion to

such an extent that an adhesion test could not be conducted (cf. table of D27, last two entries).

Although no direct comparison of corrosion resistance was provided, the respondent argued that table XII of the patent also showed that the claimed compositions had excellent corrosion resistance, comparable to those fabricated using epoxy-based "gold lacquers". Such good results could not be achieved by D1 as the coating did not adhere well to the metal as shown in D27.

1.4.5 The appellants filed D25 and D28/D29 to show that no improvement was obtained when adding a polyester under-coat to a coating composition comprising a polyvinyl chloride.

Thus, in D25 the adhesion to a tinplate substrate of a coating said to be based on example 13 of D1 and applied as a single coat (one-layer coating) was compared to the adhesion of a two-layer coating further including a polyester under-coat. The results showed that both coatings provided good substrate adhesion with no improvement for the two-coat layer (see table on pages 2/3 of D25).

Additionally, in D28/D29 cans that had undergone a shaping process were tested and appellant 02 concluded that "the results show that the polyester undercoat does not have an effect on the substrate adhesion of the PVC-based overcoat even when the substrate has undergone a shaping process by forming an easy open end (EOE) from the coated sheet. The results also show that the polyester undercoat has no material effect on the porosity of the coatings" (see D28, page 3, lines 1 to 4; see also table 1).

1.4.6 According to established jurisprudence, if comparative tests are chosen to demonstrate inventive step on the basis of an improved effect, the nature of the comparison with the closest state of the art must be such that the alleged advantage or effect is convincingly shown to have its origin in the distinguishing feature of the invention compared with the closest state of the art (see Case Law of the Boards of Appeal of the EPO, 8th Edition 2016, Chapter I.D.10.9).

1.4.7 The board agrees with the respondent that the tests carried out by the appellants cannot provide any indication as to whether the claimed coating compositions exhibit better or worse properties than the coating compositions of D1.

Indeed, the coating composition used in D25 has not been prepared in accordance with example 13 of D1 because, as admitted by appellant 01 itself, several components have been replaced for legal, health and/or availability reasons. In particular, the replacement of the "acrylic polymer from example 4" of D1 by Degalan® LP 64/12 results in a coating that no longer reproduces the teaching of D1. As indicated in point 1.3.2 above, the key feature of the coating composition of D1 is precisely the use of "an epoxy functionalized stabilizer comprising a monomeric unit derived from a glycidyl ester of an α,β unsaturated acid, or an anhydride thereof" (claim 1 of D1, emphasis by the board) and this polymer has been replaced by a quite different polymer, namely Degalan® LP 64/12 (a bead polymer based on methacrylates, see D26, page 1, line 3). It follows that the comparative results in D25 are not suitable to demonstrate the presence or absence

of an improvement of the compositions of claim 1 over those of D1.

Similar considerations apply to the comparative experiments in D28/D29. In this case the over-coat comprised, *inter alia*, "a carboxyl functional (meth)acrylic (co)polymer" (see D28, page 1, 5th paragraph) that again is not a glycidyl ester of an α,β unsaturated acid as required by claim 1 of D1. Consequently, no valid information can be obtained from the comparisons in D28/D29 because they have not been made using coatings like those of D1.

1.4.8 Unlike the experiments in D25 and D28/D29, the coatings used in the respondent's evidence D27 have indeed been made using a copolymer according to claim 1 of D1. They contain an oxirane-functional (meth)acrylic (co)polymer (see table on page 2 of D27, referring back to examples 16 and 17 of the patent in suit and paragraph [0157] of the patent). These experiments thus do support the achievement of superior adhesion than in D1.

Furthermore, in view of the results in the patent, the board concurs with the respondent that the corrosion resistance of the claimed coating is excellent.

1.4.9 The appellants argued that the examples of the respondent differed in terms of the overall coating thickness and should therefore be disregarded because the improvement observed was due to the different overall thickness of the two-layer coating compared to the one layer coating, rather than to the presence of the polyester under-coat.

The board does not agree. The distinguishing feature of the claimed coatings over those of D1 is the presence of an extra coating (the polyester under-coat) and this further coating needs to have a given thickness. So, the difference in overall thickness in the respondent's experiments and comparative experiments does not invalidate its finding that the presence of the polyester under-coat leads to excellent corrosion resistance and improves adhesion.

1.4.10 To summarise, in view of the explanations above the board concludes that the experiments in D27 in conjunction with the results in the patent show an excellent corrosion resistance and a significant improvement of the claimed coatings in adhesion over those of D1. This finding is not called into question by the experiments in either D25 or D28/D29, because the comparative coatings used in these documents do not represent the teaching of D1.

1.4.11 The appellants argued further that D25 and D28/D29 showed at least that the problem of providing excellent corrosion resistance and superior adhesion had not been credibly solved over the entire scope of the claim because, even if they did not represent the teaching of D1, they at least showed that the use of a polyester under-coat did not necessarily improve the adhesion of the polyvinyl chloride coatings.

The board cannot accept this argument either. Since the experiments in these documents do not represent the teaching of D1, they give no information about whether or not an improvement over D1 can be achieved.

1.4.12 For these reasons, the board is satisfied that the above problem of providing a coating for foodstuff

containers which are suitable for storing acidic foodstuffs and beverages, where the coating exhibits excellent corrosion resistance as well as superior adhesion during container fabrication, has been credibly solved over the whole scope claimed.

1.5 Obviousness

1.5.1 It remains to be decided whether, in view of the available prior art, it would have been obvious for the skilled person to solve the technical problem as defined above by the means claimed.

1.5.2 Certainly D1 itself does not give any hint to the claimed solution.

1.5.3 The appellants relied on D13, which is a data sheet of the polyester DYNAPOL® L 651, a saturated, high molecular, linear copolyester soluble in aromatic hydrocarbons having good PVC-compatibility (see D13, page 1, first paragraph after "General description").

They argued that D13 gave a clear hint to a person skilled in the art to use stoving enamels comprising a polyester and a cross-linker as an under-coat in combination with a PVC-based system as top coat for can coating. They relied on the disclosure of D13 under the heading "uses" indicating that Dynapol® L 651 is intended for use in deep-drawable sterilisable stamping enamels for can coating, and on the disclosure in the second paragraph of the "General description" disclosing that stoving enamels based on Dynapol® L 651 provide good intercoat adhesion to PVC top systems.

1.5.4 The board, however, considers that the combination of D1 with D13 is made with knowledge of the invention.

Thus, the coatings of D1 do not use a polyester under-coat, although multiple layers can be used (cf. D1, page 11, lines 24 to 25). Furthermore, the cured coatings of D1 are said to adhere well to metal and to provide substrates with high levels of resistance to corrosion or degradation that may be caused by food of beverage products (see page 11, lines 27 to 29) and to be sufficiently flexible for use in deeply drawn metal containers (see page 3, lines 9 to 10). In fact, they already show similar adhesion to those coatings made with epoxy resins (cf. D1, comparative example 5). There would thus not have been any reason for the skilled person to modify the coatings of D1 to solve the above technical problem.

Furthermore, D13 does not relate to the problem underlying the patent in suit, namely to provide a coating for foodstuffs containers suitable for storing acidic foodstuffs, exhibiting excellent corrosion resistance and superior adhesion during container fabrication. It merely describes that the copolyester Dynapol® L651 shows good intercoat adhesion to PVC top systems in general. The skilled person would find no motivation in D13 to use the copolyester therein disclosed in order to achieve excellent corrosion resistance and to improve adhesion of the coatings of D1. No improvement is suggested in D13 itself and its use would be against the explicit teaching of D1 that the coating it discloses already adheres well to metal.

1.5.5 In summary, there is no incentive in the prior art for the skilled person to modify the coatings of D1 by adding a polyester under-coat to solve the above technical problem. The objection of the appellants is made with knowledge of the invention.

1.6 For these reasons, the subject-matter of claim 1 involves an inventive step. This conclusion also applies to the subject-matter of claim 8, which is directed to a method of coating a metal substrate with the composition according to claim 1, to the metal container of claim 9 produced according to the method of claim 8 and, for the same reasons, to the preferred embodiments defined in dependent claims 2 to 7 and 10.

AUXILIARY REQUESTS 1 TO 5

2. Since the main request is allowable, there is no need for the board to deal with these requests.

**Order**

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

The appeals are dismissed.

The Registrar: The Chairman:

I. Aperribay M. O. Müller

Decision electronically authenticated