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**D E C I S I O N**  
**of 28 April 2003**

**Case Number:** T 0599/02 - 3.3.5  
**Application Number:** 92310515.9  
**Publication Number:** 0566801  
**IPC:** C03C 25/02  
**Language of the proceedings:** EN

**Title of invention:**

Organic solvent and water resistant, thermally, oxidatively and hydrolytically stable radiation-curable coatings for optical fibers, optical fibers coated therewith and processes for making same

**Patentee:**

BORDEN CHEMICAL, INC.

**Opponent:**

DSM N.V.

**Headword:**

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**Relevant legal provisions:**

EPC Art. 83, 111(1)

**Keyword:**

"Insufficiency of disclosure - not proven"  
"Remittal to department of first instance for further prosecution"

**Decisions cited:**

T 0225/93, T 0805/93, T 0172/99

**Catchword:**

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Case Number: T 0599/02 - 3.3.5

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.5  
of 28 April 2003

**Appellant:** BORDEN CHEMICAL, INC.  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 10 April 2002  
revoking European patent No. 0566801 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** M. M. Eberhard  
**Members:** A-I. Liu  
H. Preglau

## Summary of Facts and Submissions

I. European patent No. 0 566 801 was granted with a set of 25 claims, of which claim 1 was directed to a radiation-curable coating composition with claims 2 to 21 depending thereon; claim 22 was directed to a process for preparing a coated optical fibre, with claim 23 depending thereon; and claim 24 was directed to a coated optical fibre with claim 25 depending thereon.

II. Claim 1 read as follows:

"A radiation-curable coating composition for an optical fibre comprising

(A) from 10% to 90% by weight of a reactively terminated urethane oligomer which is the reaction product of (i) a polyether polyol; (ii) an aliphatic polyisocyanate; and (iii) an endcapping monomer capable of providing a reactive terminus;

(B) from 5% to 80% by weight of one more monomer diluents which are terminated with at least one end group capable of reacting with the reactive terminus of (A);

(C) from 0.1% to 3.0% by weight of an organofunctional silane adhesion promoter; and

(D) optionally, from 1.0% to 10% by weight of a photoinitiator,

characterised in that the one or more monomer diluents in (B) are soft-curing monomers selected from:

- (i) hexyl acrylate; hexyl methacrylate; 2-ethylhexyl acrylate; 2-ethylhexyl methacrylate; isooctyl acrylate; isooctyl methacrylate; octyl acrylate; octyl methacrylate; decyl acrylate; decyl methacrylate; isodecyl acrylate; isodecyl methacrylate; lauryl acrylate; lauryl methacrylate; tridecyl acrylate; tridecyl methacrylate; palmitic acrylate; palmitic methacrylate; stearyl acrylate; stearyl methacrylate; C<sub>14</sub>-C<sub>15</sub> hydrocarbon diol diacrylates; C<sub>14</sub>-C<sub>15</sub> hydrocarbon diol dimethacrylates; and mixtures of the above,
- (ii) monomers having (1) an aromatic moiety, (2) a moiety containing acrylic or methacrylic unsaturation, and (3) a hydrocarbon moiety, which monomer (ii) is capable of increasing the refractive index of the composition relative to that of a composition containing only (A), (C) and (D), and
- (iii) mixtures thereof,

wherein all of the stated percentages are percentages by weight based on total weight of (A),(B),(C) and (D), wherein the composition, after radiation cure, exhibits an increase in length from swelling of no more than about 40 percent when soaked in gasoline for four hours at room temperature and a water absorption value of no more than about 5% by weight and wherein said silane adhesion promoter (C) is selected from amino-functional silanes; mercapto-functional silanes; methacrylate-functional silanes; acrylamido-functional silanes; allyl-functional silanes; vinyl-functional silanes; acrylate-functional silanes; and mixtures thereof."

III. An opposition was filed on the grounds of Article 100(a) and (b) EPC. Of the thirteen documents filed by the parties during the opposition proceedings, reference shall be made to the following in the present decision:

D9: Experimental Report I, filed by the opponent with the letter of 29 September 1999

D10: Experimental Report II, filed by the opponent with the letter of 29 September 1999

D11: Declaration by the inventor, Mr P. J. Schustack dated 31 August 1995

D12: Experimental Report by Mr T. E. Myers, filed by the patentee via telefax dated 8 March 2002

D13: ASTM Standard D471-98

IV. Amended claims were filed by the patentee at the opposition proceedings, as basis for a first and a second auxiliary request.

V. Remarking that the technical feature concerning the swelling in gasoline was comprised in the claims as granted and as amended according to the auxiliary requests, the opposition division held that the feature concerned was not disclosed in the patent in suit in a manner sufficiently clear and complete for the skilled person to determine it within a reasonable degree of accuracy.

VI. The present appeal was lodged against the decision of the opposition division revoking the patent on the ground of insufficiency of disclosure.

Oral proceedings before the Board of appeal took place on 28 April 2003.

VII. The appellant's arguments were essentially the following:

- The test methodology for determining the "gasoline swelling" parameter is very similar to that described in D13.
- Although the patent in suit did not specify the type and grade of the gasoline to be used for testing, the skilled person would recognise that certain considerations must always be taken into account. The skilled person would use a gasoline causing the greatest swelling, i.e. a high-octane gasoline.

VIII. The respondent's submissions could be summarised as follows:

- The swelling of a cured optical fibre coating in gasoline was a new parameter in the technical field concerned, for which there was no existing standard test procedure.
- Although the swelling test as defined in the claims was strongly affected by the gasoline used, as shown in D9, D10, D12 and D13, the opposed

patent did not contain information as to which kind of gasoline should be used in the test.

- The skilled person could not clearly and unambiguously derive from D13 which gasoline to use.
- Due to lack of information with respect to the gasoline used in the swelling test, the skilled person did not have any way of knowing whether or not a certain coating composition was within the ambit of the claims. The claimed subject-matter was therefore not sufficiently disclosed.

IX. The appellant requested that the decision under appeal be set aside and the case be remitted to the first instance for further prosecution.

The respondent requested that the appeal be dismissed.

### **Reasons for the Decision**

1. Construction of the "gasoline swelling" parameter.

Claim 1 of the main request is directed to a radiation-curable coating composition for an optical fibre defined in terms of its chemical composition and further characterised in that the composition, after radiation cure, exhibits *inter alia* "an increase in length from swelling of no more than about 40 percent when soaked in gasoline for four hours at room temperature" (see item II above). It is undisputed that the stipulated "gasoline swelling" parameter is an additional technical feature imposing further

restrictions to the chemical composition which is also defined in the same claim.

- 1.1 As is indicated in the decision under appeal and not refuted by the appellant, a standard test procedure does not exist for determining the "gasoline swelling" of optical fibres. D13, which was filed by the appellant, is an ASTM standard for test procedures to evaluate the comparative ability of rubber and rubber-like compositions to withstand the effect of liquids (see D13 page 90, paragraph 1.1). Although the test methodology set out in D13 (page 91, paragraph 3.1 and page 95, paragraph 2) is essentially the same as that used for the patent in suit, it is not a standard method commonly applied to optical fibre coatings. This fact was indicated by both the respondent and the appellant at the appeal stage. Furthermore, D13 was published after the filing date of the patent in suit and the patent in suit does not contain any reference to a previous edition of the standard method D471.
  
- 1.2 Following the discussions at the oral proceedings, it is common ground that the temperature and duration conditions of the test method are sufficiently disclosed in the patent in suit and also correctly stipulated in the claim ("when soaked ... for four hours at room temperature"). It is, however, uncontested that the results are dependent on the type of gasoline used in the swelling test. This fact is sufficiently documented in the experimental reports submitted by the parties (D9, D10 and D12). Accordingly, the objection of insufficiency of disclosure raised by the respondent and addressed in the decision under appeal specifically concerns the fact that the patent



in suit does not indicate the type of gasoline which is to be used for the swelling test.

- 1.3 The appellant's line of argument is that the patent in suit contains a number of examples and therefore enough information for making products according to the claim. For determining the "gasoline swelling" parameters, the skilled person could repeat these examples and use different grades of gasoline from a filling station for testing. By trial and error, he would be able to determine the type of gasoline which gives the "gasoline swelling" values as indicated in the examples without undue burden.

The respondent has not disputed that the examples of the patent in suit are reproducible without undue burden to the skilled person. However, as submitted by the respondent and not contested by the appellant, it was well known before the priority date of the patent in suit that gasoline is a mixture of about 150 hydrocarbons, which may comprise varying amounts of alkenes, cycloalkanes, cycloalkenes and aromatic hydrocarbons in addition to alkanes leading to fluctuations in the composition of gasoline. This is also confirmed by D13 (page 91, paragraph 6.1). In the Board's judgment, the skilled person would, under these circumstances, recognise that, even if the same result as in the examples is obtained with a particular grade of gasoline, one cannot make the reverse conclusion that this is necessarily the type of gasoline used in the examples of the patent in suit.

1.4 The appellant has also submitted that, in order to determine the "gasoline swelling" of the claimed composition, the skilled person would carry out the experiment in good faith according to the best practice. In the present case, this would mean that he will choose a gasoline which will cause the maximum swelling. The "gasoline swelling" value to be retained for the composition under consideration would then be the one obtained with that gasoline.

The Board is, however, of the opinion that nothing in the application documents gives support for this particular approach. The patent in suit does not explicitly indicate which type of gasoline is used to perform the swelling test. It is however observed in the description that, when the fibres are routed near filling stations, gasoline leakage may result in solvent exposure. According to the next sentence, the coating "should exhibit an increase in length due to swelling of less than about 40%, and more preferably, less than about 35%, after soaking in gasoline at room temperature for four hours, as a measure of organic solvent absorption" (patent in suit, page 2, lines 53 to 56). In the Board's judgement, this statement would suggest that for determining the "gasoline swelling" parameter, any kind of gasoline which is available at any filling station, and not only one which is to give the maximum swelling, can be used for testing.

1.5 The appellant has also made reference to the experimental data submitted to the opposition division and admitted into the proceedings as document D12. In this report, the values of "gasoline swelling" for each composition are calculated as average from the results

obtained with different types of gasoline. Not only is the averaging of swelling values inconsistent with the above approach also suggested by the appellant (see item 1.4), but also the Board observes that this approach cannot be derived from the description. Indeed, the patent in suit does not contain any suggestion that the "gasoline swelling" values are based on measurements conducted with different types of gasoline.

- 1.6 As a corollary to the above, the Board interprets claim 1 as granted as relating to a composition characterised *inter alia* by a "gasoline swelling" parameter which is determined by the test method as stipulated in the claim and wherein the gasoline used for carrying out the stipulated method is not restricted to a particular type or grade of gasoline. In other words, claim 1 is construed as relating to a composition which, *inter alia*, exhibits after radiation cure an increase in length from **swelling of no more than about 40 percent** when soaked in gasoline for four hours at room temperature, **whatever be the grade of gasoline used in that swelling test** (emphasis added).

2. *Sufficiency of disclosure*

- 2.1 The respondent has submitted that a composition which comprises the specific ingredients as defined in the claim may exhibit an increase in length from swelling of more or less than 40%, depending on the gasoline used for soaking the sample according the test method as stipulated. The skilled person therefore does not know whether that composition may or may not be within the ambit of the claim.

The Board notes that the respondent has not alleged that the skilled person is not in the position to determine the "gasoline swelling" parameter or undue burden is required to carry out such swelling tests. He has not disputed that the skilled person would be able to reproduce the examples of the patent in suit. Neither has he argued that the skilled person is not in a position to find a gasoline which would allow to produce compositions having swelling values within the ambit of claim 1. In fact, the respondent has submitted a document (D10) reporting "gasoline swelling" data obtained with a number of known compositions. According to the report, the respondent has reworked examples of prior art documents and followed the procedure described in the patent in suit in order to determine the "gasoline swelling" of these compositions after curing, using three different types of commercial gasoline, namely Amoco 93, Shell 93 and Marathon 93. As is established above, the use of these types of gasoline is encompassed by the wording of claim 1 (see point 1.6 above). Furthermore, the respondent has been able to obtain "gasoline swelling" values which all fall within the claimed range of no more than 40 percent, for comparison with the claimed compositions (see Table II of D10). As a consequence, the respondent's argument that the skilled person does not know whether a composition comprising the ingredients defined in claim 1 may or may not be within the ambit of the claim is not validated by his own experimental report.

- 2.2 The respondent has submitted a report on a composition prepared in accordance with the limitations of claim 1 of the patent in suit, corresponding to the composition

described in paragraph 15 of D11. The composition is then applied and cured as in Example 1 of the patent in suit and the gasoline swelling of the cured sample measured according to the description (D9). The tested composition also corresponds to the one identified as Ref. 15 in D12, the experimental report filed by the appellant. The respondent has then pointed out that, not only the data in both D9 and D12 show considerable variations when different brands of gasoline are used for the test, even the data obtained with the same brand of gasoline as reported by either party in D9 and D12 are not consistent (compare D9, Table I and D12, Sheet B, Ref. 15a to Ref. 15f). He has gone on to conclude that the swelling values are unreliable since they are not reproducible even when the same gasoline is used.

As can be derived from the appellant's introductory observations in D12, the gasolines for the swelling tests reported in D9 and D12 were obtained at different places and times (see D12: "Although the Patentee's intention was to test the swelling of the film samples in Amoco gasoline (in order to duplicate the testing of Opponent as set out in D9) no Amoco gasoline of any grade was available in Cincinnati metropolitan area where the Patentee's testing was conducted"). It is further an undisputed fact that, in such case, one can expect that these gasoline samples do not necessarily have the same composition. Therefore, it does not appear surprising to the Board that the swelling tests results in D9 on the one hand and in D12 on the other hand show some discrepancy even when the same brand of gasoline is involved, taking into account that the gasoline samples used may have different compositions.

The Board further observes in this context that, despite said discrepancy, both the respondent's report D9 and the appellant's report D12 show that the tested coating composition exhibits swelling values falling within the claimed range (see D9, test with Amoco 93 and D12, sheet B, average of Ref 15a to 15f).

The respondent has also submitted that the appellant has not been able to reproduce his own experiments since the swelling values determined in D12 are different to those given in D11 for the same coating compositions. The Board observes, however, that D11 does not even indicate the brand, let alone the composition of the gasoline(s) used for the test (D11, paragraphs 17 to 19). It is quite possible that the swelling tests in D11 and D12 were performed with gasolines with different compositions. As already remarked in the preceding paragraph, deviations in the "gasoline swelling" values are to be expected when the gasolines used for the tests have different compositions. In the Board's judgment, the different values obtained in D11 and D12 are therefore not a proof that the experiments are irreproducible.

2.3 In consequence of the above, the Board holds that the respondent has not submitted any convincing argument to prove that the invention as claimed is not sufficiently disclosed.

3. *Cited case law*

The respondent has cited the unpublished decisions T 225/93, T 805/93 and T 172/99 in support of his objections of insufficiency of disclosure. The Board

is, however, of the opinion that the cited case law is not applicable to the present circumstance for the following reasons.

- 3.1 In the case T 225/93, the claimed product is characterised *inter alia* by its specific surface area. On the one hand, it is commonly known that this parameter may be determined by (i) the permeability method, (ii) the photometric method or (iii) the adsorption method and that these methods lead to different results. On the other hand, however, neither the description nor the claim contains an indication as to the method which is actually used according to the patent in suit (see item I: claim 1 and items 2 and 2.1 of the decision). This situation is therefore different from the present one in which there is no question as to the method being used, the only factor left in doubt here being the kind of gasoline used for the test.
- 3.2 In the case T 805/93, the claim is directed to an adhesive comprising the reaction product of a curative and a polyisocyanate, characterised in that the viscosity of its components is below a specified limit. As is stated in the cited decision, the adhesive reaction product no longer reflects the viscosities of the starting components and for that reason, cannot be characterised by these (see item I: Claim 1; items 2 2.1 and 2.2 of the decision). In contrast thereto, the test to determine the "gasoline swelling" parameter is in the present case performed on the final product and not on the starting materials. Therefore, the respondent's argument on page 5 of the letter dated 30 December 2002, namely that, "in analogy to the ruling in T 805/93 the skilled person would be left in

considerable doubt as to which compounds to select when choosing the reactive components in order to obtain a product falling within the terms of the claimed coated composition", is not convincing.

- 3.3 Finally, in the case T 172/99, the claimed rubber-modified styrene-based resin composition comprises a diene-based rubbery polymer defined *inter alia* by a "peripheral parameter". It is undisputed that this peripheral parameter  $C_i$  is formulated for the first time in the patent concerned. According to the description,  $C_i$  is "a value obtained from a transmission-type electron microscopic photograph showing the state of the dispersed rubber particles in the matrix of the styrene-based resin. Namely, the value is obtained from the total of the peripheral lengths of the rubber particles in a unit area given in the unit of  $(\text{m})^{-1}$  divided by the content of the rubbery polymer in the composition given in the unit of % by weight". No requirement is, however, made as to the number of particles to be present in a chosen unit area (A), nor to the minimum size of the particles necessary for qualifying them as contributing to the measurement of the total peripheral length (L). In principle, even a single particle of any size could be chosen and the area A in which this particle was found could be determined accordingly. It is therefore remarked in the decision that, "under such conditions of freedom of choice of particle populations and area "A", the resulting values of both "L" and "A" are not subject to any sensible limitation". It is then concluded that "due to the complete freedom of choice of particle population and hence of "L" and "A", allowed by the definition (5) in the patent in suit, the value of "C<sub>i</sub>"



generated by any sample composition is essentially unrestricted (see item I: claim 1 and items 3.4(I)), 4.5.2, 4.5.3 and 4.5.7 of the decision). The cited decision is therefore not applicable to the present case where the parameter concerned, namely the "gasoline swelling", is not unrestricted but stipulated to be of no more than about 40 percent.

4. The decision of the opposition division to revoke the European patent was based solely on the ground that the technical feature concerning the "gasoline swelling" was not sufficiently disclosed. The other issues raised by the opponent, in particular the questions of lack of novelty and lack of inventive step were not discussed at the oral proceedings before the opposition division (see decision under appeal, point 5). The Board therefore exercises its power under Article 111(1) EPC to remit the case to the first instance for further prosecution in respect of the matters still requiring attention. In the prosecution of the case on the basis of the claims as granted, the opposition division's specific attention is drawn to the remarks made in point 1.6 above.

**Order**

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

The decision under appeal is set aside and the case is remitted to the first instance for further prosecution.

The Registrar:

The Chairman:

U. Bultmann

M. Eberhard