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**Datasheet for the decision
of 17 September 2010**

Case Number: T 1044/08 - 3.3.01

Application Number: 00122732.1

Publication Number: 1199339

IPC: C09D 5/10

Language of the proceedings: EN

Title of invention:

Water-reducible coating composition for providing corrosion protection

Patentee:

Metal Coatings International Inc.

Opponent:

Ewald Dörken AG

Headword:

Coating compositions/METAL COATINGS INT. INC.

Relevant legal provisions:

EPC Art. 100(a)(b), 56, 54
EPC R. 76(2)(c)

Relevant legal provisions (EPC 1973):

EPC Art. 99(1)
EPC R. 55(c)

Keyword:

"Novelty (yes) - state of the art does not disclose all the features of the invention without any doubt"

"Inventive step (no) - improvement not shown - obvious alternative"

Decisions cited:

G 0010/91, G 0009/91, T 0002/89, T 0197/86, T 0222/85

Catchword:

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Case Number: T 1044/08 - 3.3.01

DECISION
of the Technical Board of Appeal 3.3.01
of 17 September 2010

Appellant:
(Opponent) Ewald Dörken AG
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Respondent:
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 31 March 2008
rejecting the opposition filed against European
patent No. 1199339 pursuant to Article 101(2)
EPC.

Composition of the Board:

Chairman: P. Ranguis
Members: J.-B. Ousset
L. Bühler

Summary of Facts and Submissions

I. The appeal lies from the decision of the opposition division rejecting the opposition filed against European patent No. 1 199 339.

II. Claim 1 of the sole and main request reads as follows:

"1. A stable and water-reducible, chrome-free and resin-free coating composition for application to, and heat curing on, a substrate for providing corrosion protection thereto, said composition comprising:

(A) water in an amount supplying from about 20 to about 70 weight percent of said coating composition;

(B) low-boiling organic liquid;

(C) particulate metal;

(D) water-reducible, organofunctional silane binding agent containing alkoxy groups, which silane binding agent contributes from about 3 to about 20 weight percent of said coating composition; and

(E) wetting agent;

and with the proviso that said coating composition has a molar ratio of water to silane alkoxy groups of greater than 4.5:1."

III. The opponent sought revocation of the patent in suit in its entirety on the basis of Article 100(a) EPC for lack of novelty and lack of inventive step and on the basis of Article 100(b) EPC (see EPO Form 2300 1). However, in the statement setting out the grounds of opposition, claim 15 was attacked explicitly only for lack of novelty.

IV. The opposition division found that the main request (claims as granted) did comply with the requirements of Article 100(b) EPC. The opponent had regarded only claim 15 as not novel. Claim 15 was however dependent on claim 1. As novelty of claim 1 was not contested, the subject-matter of this claim is novel. The disclosure of document (4) (US-A-4 218 354) alone or in combination with the disclosure of document (5) (EP-A-0 808 883) did not render the claimed subject-matter obvious for the person skilled in the art.

V. Additionally to documents (4) and (5) cited above, the following document is relevant for the present decision:

(1) M. Brand and al, "NMR-spektroskopische Untersuchungen zur Hydrolyse von funktionellen Trialkoxysilanen", Zeitschrift für Naturforschung 54b, Seite 155-164, 1999 (received on 8. September 2008).

VI. The appellant-opponent's arguments, in so far they are relevant for the present decision, may be summarised as follows:

- Opposition based on lack of novelty was not limited to claim 15 but also encompassed claim 1 (see last but one paragraph of the statement setting out the grounds of opposition, page 16). The arguments presented against claim 15 are clearly relevant for claim 1. The examination of an opposition cannot be limited to a formal reading which does not address the substance of the arguments.

- Example 1 of document (5) has disclosed all the features of claim 1 of the patent in suit, with the exception of the presence of a low-boiling organic liquid. The ratios of water silane in example 1, at least for the three first compositions, in which the proportions of silane were 50, 100, and 150 wt%, were within the range of 20 to 70 weight percent of water and 3 to 20 wt% of the silane in the coating composition of claim 1 of the patent in suit. The molar ratio of water to silane alkoxy groups was also greater than 4.5 in example 1 of document (5) as required in the compositions of claim 1 of the patent in suit.

- Document (1) disclosed that alkoxy silane derivatives were hydrolysed in presence of water continuously at room temperature within a period of several minutes to several hours. 3-glycidyoxypropyltrimethoxysilane (GLYMO), as mentioned in document (5), was also hydrolysed at neutral pH. During the hydrolysis, methanol and GLYMO were together present at the same time in the composition. According to document (1), hydrolysis inevitably took place. All the features of the composition of claim 1 were disclosed.

- The ageing of the pre-blended mix in document (5) (see col. 10, line 59 to col. 11, line 12) was made to change the properties of the composition and to allow the reaction between water and the silane to take place.

- Although the reaction conditions were different in document (1) and in the patent in suit and although the silane derivatives were binding agents (see column 6, lines 16 to 34 of document (5)) and could passivate the particulate metal, it could not be concluded that their hydrolysis has not taken place.

- The problem in document (5) was identical to the one of the patent in suit.

- It was obvious for the person skilled in the art to vary the nature of the solvent, because the use of high boiling liquids in document (5) did not teach not to use other solvents.

- Since the high boiling solvents were not optimal to ensure good dispersibility and/or solubility in water (see column 4, lines 12 to 17 of document (5)), the person skilled in the art was motivated to look for solvents having low molecular weights, the latter having generally a lower boiling point, to obtain good dispersibility and/or solubility. The said solvents were used in document (4) (see column 3, lines 5 to 12) in addition to high boiling solvents in coating compositions.

- The temperature ranges for the pre-curing step were identical in document (5) (see, column 11, lines 49 to 53) and in the patent in suit (see column 14, lines 6 to 10).

VII. The respondent-patentee's arguments, in so far they are relevant for the present decision, may be summarised as follows:

- During opposition proceedings, the appellant merely objected to lack of novelty of claim 15. The lack of novelty objection against claim 1 was a new reason for opposition and was not admissible in the appeal proceedings, since the patentee did not give consent to it.
- The hydrolysis of GLYMO was dependent on several factors according to document (1) and more particularly on pH. An acidic pH favoured the hydrolysis. The compositions disclosed in document (5) and in the patent in suit had a pH around 7.
- If GLYMO was hydrolysed to give methanol as a low boiling organic liquid, then GLYMO was converted into other intermediate products. This was confirmed by the disclosure of document (1) (see Fig. 2).
- Even if silane derivatives have undergone hydrolysis in simple systems as in document (1), it could not be asserted without any experimental data that such a hydrolysis had taken place in a complex system like that in example 1 of document (5).
- It was no longer maintained that document (4) was to be considered as the structurally closest prior-art document.

- Different silane derivatives were disclosed in documents (4) and (5) as well as different solvents.
- There was no hint to combine the teachings of documents (4) and (5). Such a combination resulted from an ex post facto analysis.
- The replacement of the high boiling solvents of document (5) by low boiling solvents was not obvious. There was only a single example in document (4) using a low boiling solvent.
- Document (5) taught away from the claimed invention, since the solvents used therein had a boiling point above 100°C and it was also intended in this document to reduce volatile solvents (see column 4, line 29 to 31).
- The test panels run in example 1 in document (5) (see column 18, lines 29 to 41) could be compared to the test panels of the patent in suit (see column 21, lines 2 to 14) and showed that the pre-curing step was made using less energy (lower temperature) in the patent in suit. The low boiling solvent had evaporated during this step.
- The curing step could not be used for comparison, because the composition had already been hardened after the pre-curing step.
- The amounts of compositions applied to the test panels were comparable in document (5) (see

column 16, lines 24 to 42) and in the patent in suit (see column 20, lines 27 to 29).

- VIII. The appellant (opponent) requested that the decision under appeal be set aside and that European patent No. 1199339 be revoked.
- IX. The respondent (patent proprietor) requested that the appeal be dismissed.
- 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. *Lack of novelty of claim 1 - Admissibility of the ground of opposition*
 - 2.1 The appellant argued that the ground for opposition under Article 100(a) EPC in combination with Article 54 EPC had been substantiated as required in Rule 55(c) EPC 1973, now Rule 76(2)(c) EPC, within the time limit prescribed in then applicable Article 99(1) EPC 1973. In support of this position the appellant referred to page 16 of the notice of appeal filed on 29 September 2005. The appellant submitted further that the novelty objection to claim 1 raised in the statement setting out the grounds of appeal was based on facts and arguments which had been set out in the cited passage of the notice of opposition.

The respondent maintained that the ground for opposition under Article 100(a) EPC in combination with Article 54 EPC should be disregarded since the opponent, in his notice of appeal, had merely objected to dependent claim 15 lacking novelty. Since novelty of an independent claim had not been in dispute during opposition proceedings, that ground for opposition had not formed part of the legal framework of those proceedings. The objection under Article 100(a) EPC in combination with Article 54 EPC against claim 1 had to be considered a fresh ground for opposition. As the patentee, he did not agree to its introduction at the appeal stage.

- 2.2 Hence, it has to be examined whether or not the objection of lack of novelty against claim 1 was substantiated in the statement setting out the grounds of opposition which, therefore, did not require the consent of the patentee to examine it in the appeal proceedings. As to the required substantiation of the ground(s) of opposition, the function of Rule 55(c) EPC 1973 (now Rule 76(2)(c) EPC) is, *inter alia*, to establish the legal and factual framework within which the substantive examination of the opposition is in principle to be conducted, thereby giving the patentee a fair chance to consider his position at an early stage of the proceedings (see G 9/91, OJ EPO 1993, 408). Therefore, according to established case law, an objection raised in opposition must be substantiated in the notice of opposition in such a way that the facts and arguments are sufficient for the EPO and the patent proprietor to understand the case against the patent without further investigation (T 2/89, OJ EPO 1991, 51, point 3 of the Reasons). In decision T 222/85 (OJ EPO

1988, 128, point 4 of the Reasons), the board held that the requirement in Rule 55(c) EPC was only satisfied if the contents of the notice of opposition were sufficient for the opponent's case to be properly understood on an objective basis, from the point of view of a reasonably skilled man in the art to which the opposed patent related.

2.3 Regarding the extent to which the European patent is opposed, the appellant on page 1 of the notice of opposition as well as on page 2 of Form 2300, both filed on 29 September 2005, requested revocation the patent in its entirety. The grounds for opposition were indicated on page 1 of the notice of opposition as well as on page 2 of Form 2300 as being Article 100(a) EPC in combination with Article 54 EPC (lack of novelty) and Article 56 EPC (lack of inventive step), as well as Article 100(b) EPC.

2.4 The issue of novelty was explicitly addressed on page 16 in the context of dependent claim 15. In this passage it is stated that example 1 of document (5) had disclosed all the features of claim 1 of the patent in suit with the exception of the presence of a low-boiling organic liquid. The appellant further argued that, since silanes undergo hydrolysis, low-boiling organic liquids like methanol and ethanol are formed that remain in the composition. Thus, due to hydrolysis of 3-glycidyloxypropyltrimethoxysilane (GLYMO) mentioned in example 1 of document (5), methanol and GLYMO were both present in the composition. As a consequence, the coating composition according to example 1 of document (5) contained more than 1 weight percent of a low-boiling organic liquid as required.

2.5 As the appellant appropriately pointed out, the novelty objection to claim 1 raised in the statement setting out the grounds of appeal was based on the facts and arguments set out on page 16 of the notice of opposition summarised in the previous paragraph. Although the presentation of the objection under Article 100(a) EPC in combination with Article 54 EPC in the context of dependent claim 15 was not straightforward, the skilled reader, giving full consideration to the explicit reference to example 1 of document (5) and the arguments regarding hydrolysis of silanes, was able to recognise and understand the gist of the attack on the patent under said ground of opposition which included the subject-matter of claim 1. Inferring from page 16 of the notice of opposition that the opponent had acknowledged novelty of claim 1 and merely objected to dependent claim 15 is not an objective assessment of the appellant's submissions. Therefore, the board is of the opinion that, in so far as the ground for opposition under Article 100(a) EPC in combination with Article 54 EPC is concerned, the opponent's submissions were sufficient for the opposition division and the patent proprietor to understand the appellant's case without further investigation.

2.6 It follows that in the present case the ground for opposition under Article 100(a) EPC in combination with Article 54 EPC was substantiated as required by Rule 55(c) EPC 1973 (now Rule 76(2)(c) EPC) and did not constitute a fresh ground for opposition. Therefore, its consideration by the board of appeal did not

require the respondent's approval (see decision G 10/91).

3. *Novelty*

3.1 All the features of example 1 of document (5) with the exception of the low boiling organic liquid are identical to the features of the compositions claimed in claim 1 of the patent in suit.

3.2 Therefore, the question to be answered is whether in example 1 of document (5) (see column 17, line 39 to column 18, line 21) GLYMO is hydrolysed in the aqueous composition described in this example, leading thus to the formation of methanol, which is considered as a low boiling organic liquid.

Document (1) represents an analysis of the conditions under which several trialkoxysilane derivatives are hydrolysed. Different characteristics have an influence on the hydrolysis, such as the reaction temperature, the agitation and the concentration ratio between the silane and the solvent. However, the pH of the solution appears to be the most important factor affecting the hydrolysis of the silane derivatives (see page 157, right-hand column, three last paragraphs) as well as the chemical structure of said silane derivatives (see page 159, middle of the last full paragraph). It is clear that hydrolysis of GLYMO in a concentration of 2% in water takes place even at neutral pH without agitation (see page 159, Table III, line 4a). The formation of methanol was not questioned during the proceedings. Furthermore, due to the speed of hydrolysis at neutral pH, the board is also convinced

that both species, namely methanol and GLYMO, are present in the aqueous mixtures of document (1). Although it is probable that hydrolysis of GLYMO could take place in the composition of example 1 of document (5), it cannot however be excluded without any doubt, due to the presence of other constituents in the reaction mixture (e.g. zinc flakes, wetting agent,...), that GLYMO reacts faster with another constituent, thus preventing any hydrolysis and hence formation of methanol.

3.3 Contrary to the appellant's assertion, if the hydrolysis takes place in document (1), namely only in presence of water and optionally an acid, it cannot be concluded that it will inevitably take place in the mixture of example 1 of document (5) due to the different constituents of the composition and the possible faster reactions between GLYMO and another or other constituent(s). Without the provision of experimental data such as the reproduction of example 1 of document (5), and the proof that methanol and GLYMO are both present in the said mixture at the same time (e.g. by gas chromatography analysis), the technical information allegedly inferable from example 1 of document (5) is left to speculation which is not suited as a basis for a decision in favour of the appellant. The mere assertion that hydrolysis of GLYMO will inevitably take place in the reaction conditions of example 5 of document (5) is not sufficient to discharge the appellant's evidentiary burden of proof.

The assertion concerning the ageing of the pre-blended mix in document (5) (see column 10, line 59 to column 11, line 12) does not constitute conclusive

evidence either. Document (5) mentions that this ageing helps to provide better coating performance (see column 10, lines 49 to 50) but it cannot be regarded as established fact that the improvement of performance results from the presence of methanol obtained via the alleged hydrolysis of GLYMO.

The same conclusion has to be drawn concerning the appellant's assertion according to which, although the silane derivative binds to and passivates the particulate metal, hydrolysis could take place. The appellant did not submit conclusive evidence in this respect establishing that hydrolysis of GLYMO in the reaction mixture of example 1 of document (5) occurred as asserted.

3.4 Since no other argument was presented to question the novelty of claim 1 of the patent in suit and since the remaining claims 2 to 22 are all dependent on claim 1, the board acknowledges novelty of the claimed subject-matter (Article 54 EPC).

4. *Inventive step*

4.1 Closest prior art

4.1.1 The board and the parties agree that document (5) is to be regarded as the closest state of the art, since it aims at the same objective as the patent in suit and there is only one single distinguishing feature between example 1 of document (5) and the subject-matter of claim 1. Example 1 of document (5) discloses all the features of claim 1 of the patent in suit with the exception that a low boiling organic liquid is required

for the compositions of the patent in suit. Furthermore, document (5) relates also to coating compositions (see column 2, lines 36 to 38). It should be noted that the problem defined in document (5) (see column 2, lines 26 to 32) is identical to the problem intended to be solved by the patent in suit (see column 2).

4.2 Technical problem to be solved

4.2.1 Starting from document (5), the respondent contended that the problem to be solved can be seen in the provision of coating compositions which are more easily processable and require less energy when applied on a substrate.

It was submitted that the problem underlying the patent in suit had been solved convincingly in view of the experimental results presented in the patent in suit (see column 21, lines 2 to 14) when compared to the results displayed in document (5) (see column 18, lines 22 to 41).

4.2.2 According to the jurisprudence of the boards of appeal of the EPO, any advantageous effect should have its origin in the distinguishing feature of the invention (presence of a low boiling organic liquid in the claimed composition versus a high boiling organic liquid in example 1 of document (5)) when comparative tests are used (see T 197/86, OJ EPO 1989, 371).

4.2.3 In example 1 of document (5), the composition of example 1 is pre-cured for the same period of time as in example 2 of the patent in suit, namely 10 minutes (see column 21, line 7 in the patent in suit and

column 18, lines 25 to 26 of document (5)).

Nevertheless this pre-curing step is performed at a lower temperature for the coating compositions of the patent in suit (65.6°C in the patent in suit, column 21, line 8 and 93.3°C in document (5), column 18, line 27). This pre-curing step is immediately followed in example 1 of document (5) as well as in the patent in suit by a curing step, which is run at roughly the same temperature of 315.6°C in the patent in suit (see column 21, line 9) and 320°C in document (5) (see column 18, line 25). However, this curing step requires twice as much time in the patent in suit to obtain adhesion of the cured coating composition on the substrate, namely 30 minutes (see column 21, line 8) compared to example 1 of document (5) in which only 15 minutes (see column 18, line 27) are necessary to achieve the same result.

Although the comparison was made between example 1 of document (5) representing the closest prior art with example 2 of the patent in suit, the same conclusions would be drawn using example 1 of the patent in suit.

The respondent argued that the composition had already been hardened after the pre-curing step and thus the curing step is not to be considered for the comparison.

However, this assertion is unsubstantiated. From the wordings of example 1 of document (5) as well as in example (2) of the patent in suit, it cannot be deduced in the absence of evidence that after the pre-curing step the coating composition had been hardened.

It was also emphasised that less energy is required in the patent in suit when performing adhesion tests.

If it is undisputed that less energy is used when carrying out the pre-curing step in the patent in suit compared to document (5), more energy is required in the curing (heating 30 minutes instead of 15 minutes). The respondent's contention is therefore, not supported by the facts.

The assertion that the amounts of coating compositions applied to the test panels in example 1 of document (5) and example 2 of the patent in suit are comparable is also not convincing. According to the patent in suit (see column 20, line 29), the amount of coating composition to be cured is 2.408 mg/ft^2 whereas in document (5) the corresponding amounts of coating composition deposited on the test panels are 2.611 mg/ft^2 , 2.073 mg/ft^2 and 2.279 mg/ft^2 (see column 18, line 35). The variations between the amount of the patent in suit compared to the ones disclosed range from 5% to 14%. Such variations in the amounts of coating composition to be cured have also an influence on the time and/or temperature required to obtain the desired adhesion of the compositions on the test panels.

Since the difference between either example 1 or 2 of the patent in suit with example 1 of document (5) lies not only in the temperature applied during the pre-curing phase but also in the amounts of composition applied onto the plates and the time required during the curing phase, the alleged improved effect of the claimed invention (use of less energy) has not been substantiated.

4.2.4 In view thereof, the problem defined in point 4.2.1 above has not been solved.

4.2.5 The problem underlying the patent in suit should thus be reformulated in the provision of further stable chrome-free, resin-free and water-reducible compositions.

In view of the experimental process described in the patent in suit (see column 20, lines 15 to 29), the board considers that this problem has been solved.

4.3 Obviousness

4.3.1 It should thus be assessed whether the person skilled in the art would find an incentive in the available prior art to arrive at the claimed compositions to solve the technical problem defined above.

From document (5), the person skilled in the art would notice that the high boiling organic liquids to be used in the compositions must preferably be water-soluble (see column 4, lines 6 to 7) and must contain carbon, hydrogen and oxygen and have at least one oxygen-containing constituent that may have a hydroxyl or an oxo group (see column 4, lines 7 to 10). Furthermore, water dispersibility and water solubility are desired properties for these solvents (see column 4, lines 12 to 13). Therefore, hydrocarbon compounds containing less than 15 carbon atoms and having a molecular weight lower than 400 are advantageous (see column 4, lines 15 to 17). The person skilled in the art would also remark that no specific

properties and/or advantages are linked to the boiling point of the solvents of document (5). The teaching of document (5) does not mention that the boiling point value 100°C (see column 4, line 6) is a strict limit under which the compositions are not appropriate to be used to protect metals against corrosion (see column 4, line 6, "...above about 100°C..."). Hence, seeking to make alternative coating compositions able to protect metals, the person skilled in the art would consider document (4), which also deals with coating compositions protecting metals (see column 1, lines 26 to 27). Among the suitable solvents, ketones like acetone (containing an oxo group as mentioned in document (5)) and alcohols like hexanol (containing a hydroxyl group as mentioned in document (5) and having a boiling point of 158°C) can be used in the compositions of document (4) and, more particularly, the nature of the solvents may be selected when adjusting the drying time and/or the viscosity of the coating compositions (see column 5, lines 5 to 16). In view thereof, the person skilled in the art seeking to make alternative coating compositions available would thus use, without any inventive skills, the solvents described in document (4) in the compositions of document (5), thus arriving at the claimed compositions.

Contrary to the respondent's assertion, document (5) does not teach away from the claimed invention. The passage in column 4, lines 31 to 33 referred to by the respondent only mentions that for ease of preparation and in order to reduce volatile constituents dipropylene glycol is preferably used. This passage relates only to a specific solvent but cannot be

applied to any solvent used in the compositions of document (5). As mentioned in the previous paragraph and in column 4, lines 12 to 13 of document (5), the solvents to be used therein should provide water dispersibility and/or water solubility.

The respondent also added that the silane derivatives used in document (4) are different from the ones used in document (5). This objection does not convince the board, since the silane derivatives of the claim 1 must be water-reducible and the respondent has not shown that the silane derivatives of these documents are not water-reducible.

The claimed subject-matter of claim 1 is therefore not based on an inventive step (Article 56 EPC). Since the board can only decide on a request as a whole, the present and sole request to maintain the patent as granted is to be rejected.

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