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**Datasheet for the decision
of 5 July 2023**

Case Number: T 0813/20 - 3.3.03

Application Number: 12166282.9

Publication Number: 2484708

IPC: C08G18/38, C08L63/00,
C08L63/02, C08L75/00,
C09D163/00, C09D163/02,
C09D175/02, C09D175/04

Language of the proceedings: EN

Title of invention:

Novel fast curing ultra high solids low voc epoxy primer
compositions for aggressive corrosive environments

Patent Proprietor:

Hempel A/S

Opponent:

Akzo Nobel Coatings International B.V.

Relevant legal provisions:

EPC Art. 100(c), 100(a), 56
RPBA 2020 Art. 12(4)

Keyword:

Grounds for opposition - subject-matter extends beyond content of earlier application (no)

Amendment to case - amendment within meaning of Art. 12(4) RPBA 2020

Inventive step - main request and first to third auxiliary requests (no) - Fourth auxiliary request (yes)



Beschwerdekammern

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Case Number: T 0813/20 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 5 July 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
31 January 2020 concerning maintenance of the
European Patent No. 2484708 in amended form.**

Composition of the Board:

Chairman F. Rousseau
Members: D. Marquis
A. Bacchin

Summary of Facts and Submissions

I. The appeal lies against the decision of the opposition division concerning the maintenance of European patent No. 2 484 708 on the basis of auxiliary request II. The patent in suit was filed as a divisional application of the earlier European patent application no. 09749928.9. The decision was also based among others on the patent as granted as the main request.

II. Independent claims 1, 9, 10 and 13 as granted read as follows:

"1. A zinc epoxy primer composition comprising an epoxy-based binder system and 20-40 % by solids volume of the primer composition of zinc; said primer composition having a volume solids % determined according to ISO 3233 with the modification that drying is carried out at 23 °C and 50 % relative humidity for 7 days of at least 82 %".

"9. Use of a zinc epoxy primer composition according to any one of the preceding claims in a coating system consisting of:

(i) the first layer of said zinc epoxy primer composition, said zinc epoxy primer composition being in wet form when applied to the surface of a substrate and having a volume solids % of at least 82 %; and

(ii) the second layer of a top-coat composition comprising a polyurea-based binder system, said top-coat composition being in wet form when applied to the surface of a substrate and having a volume solids % of at least 82 %;

wherein the weighted average volume solids % of the coating system is at least 84 %;
and wherein the volume solids is determined according to ISO 3233 with the modification that drying is carried out at 23 °C and 50 % relative humidity for 7 days".

"10. Use of a zinc epoxy primer composition according to any one of the claims 1-8 in a coating system consisting of:

- (i) the first layer of said zinc epoxy primer composition, said zinc epoxy primer composition being in wet form when applied to the surface of a substrate and having a volume solids % of at least 86 %; and
- (ii) the second layer of a top-coat composition comprising a polyurea-based binder system, said top-coat composition being in wet form when applied to the surface of a substrate and having a volume solids % of at least 78 %;

wherein the weighted average volume solids % of the coating system is at least 82 %;
and wherein the volume solids is determined according to ISO 3233 with the modification that drying is carried out at 23 °C and 50 % relative humidity for 7 days".

"13. The use of a zinc epoxy primer composition according to any one of the claims 1-8 in a method for the establishment of a coated structure using a coating system consisting of the zinc epoxy primer composition and a top-coat composition, said top-coat composition comprising a polyurea-based binder system, said method comprising:

- (i) applying said zinc epoxy primer composition in wet form onto a predetermined part of the surface of the structure thereby forming a curable primer film on said surface,
- (ii) allowing said curable primer film to at least partially cure thereby forming an epoxy primer coat,
- (iii) applying the top-coat composition in wet form onto the epoxy primer coat thereby forming a curable top-coat film on said epoxy primer coat, and
- (iv) allowing said curable top-coat film to cure, and if necessary allowing said epoxy primer coat to fully cure, thereby forming a cured coating system consisting of the epoxy primer coat and a polyurea top-coat;

wherein said zinc epoxy primer composition has a volume solids % of at least 82 %, said top-coat composition having a volume solids % of at least 82 %; and the weighted average volume solids % of the coating system being at least 84 %; or

wherein said zinc epoxy primer composition has a volume solids % of at least 86 %, said top-coat composition having a volume solids % of at least 78 %; and the weighted average volume solids % of the coating system being at least 82 %;

and wherein the volume solids is determined according to ISO 3233 with the modification that drying is carried out at 23 °C and 50 % relative humidity for 7 days".

III. The decision under appeal was based, *inter alia*, on the following documents:

D2: EP 0 846 710 A1

D3: EP 1 788 048 A1

D11: WO 2006/131359 A1

D15: Thomas Bäker, Polyaspartics- Modern binders for highly efficient 2K PUR systems, slides of the presentation held at the European Coatings Show in Nürnberg on 10 May 2007

D16: Product Data Sheet of Intercure® 99

D17: Product Data Sheet of Interzinc® 52

D18: Marc Broekaert, Polyurea Spray Coatings, The Technology and Latest Developments, Paints & Coatings Industry Magazine, October 2002

D23: Compounded documentation about "Engineering Materials", the definition of White spirit from Wikipedia, a table about "Anti-sagging Agents (anti-sagging/Thixotropic Agent)", Datasheets of the products K-Flex XM-B301, Moldaflow® resin, BYK-333, Disperbyk-163, Disperbyk-180, (3-Aminopropyl)-trimethoxysilane and Vinyltrimethoxysilane

D24: Calculations concerning example 1 of D11

D25: Calculations concerning example 1 of D11

IV. The opposition division concluded in their impugned decision that claim 5 of the main request met the requirements of Article 76(1) EPC but that its claims 9, 10 and 13 did not meet the requirements of Articles 123(2) and 76(1) EPC. There were no objections under Rule 80 EPC or Article 123(2) EPC against the claims of auxiliary request II. Claim 1 of that request was inventive over each of D2, D3 and D11 taken as the closest prior art. The same conclusion applied to claims 8, 9 and 12 objected by the opponent to lack an inventive step over D15, D16, D17 and D18 as closest prior art, since the primer coating of claim 1 was inventive.

V. Both the patent proprietor and the opponent lodged an appeal against that decision.

VI. The patent proprietor filed first to seventh auxiliary requests with the statement setting out the grounds of appeal. The second auxiliary request corresponds to auxiliary request II underlying the contested decision.

VII. Oral proceedings took place on 5 July 2023.

VIII. The final requests of the parties were as follows:

The patent proprietor requested that the decision under appeal be set aside and that the patent be maintained on the basis of the granted claims (main request) or on the basis of any of the first to seventh auxiliary requests filed with the statement setting out the grounds of appeal.

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

IX. The claims of the auxiliary requests which are relevant for the present decision are as follows:

Claim 1 of the first auxiliary request corresponds to claim 1 of the main request.

Claim 1 of the second auxiliary request corresponds to claim 1 of the main request amended by addition of the following feature "and wherein the epoxy-based binder system comprises one or more curing agents selected from compounds or polymers comprising at least two reactive hydrogen atoms linked to nitrogen, such curing agents being selected from aliphatic amines and polyamines, polyamido amines, polyoxy alkylene amines, aminated polyalkoxy ethers, alkylene amines, aralkyl amines, aromatic amines, Mannich bases, and including epoxy adducts and derivatives thereof".

Claim 1 of the third auxiliary request corresponds to claim 1 of the second auxiliary request further amended in that the range of the solids volume of the primer composition of zinc was limited to "20-30 % by solids volume".

The wording of use claims 1, 2 and 5 of the fourth auxiliary request correspond to that of claims 9, 10 and 13 of the main request in that, due to the deletion of claim 1 in the latter, the back-references "according to anyone of the preceding claims" and "according to anyone of the claims 1-8" for defining the zinc epoxy primer composition in said claims 9, 10 and 13 of the main request have been replaced by the definition in accordance with granted claim 1, i.e. "comprising an epoxy-based binder system and 20-40 % by solids volume of the primer composition of zinc; said primer composition having a volume solids % determined according to ISO 3233 with the modification that drying is carried out at 23 °C and 50 % relative humidity for 7 days of at least 82 %".

X. The patent proprietor's arguments, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They are essentially as follows:

- Granted claims 5, 9, 10 and 13 found a basis in the application as filed and did not contain subject matter going beyond what was disclosed in the application as filed and in the earlier application as filed.
- The objection of lack of inventive step against granted claim 1 starting from document D11 should

not be admitted into the proceedings.

- Claim 1 of the main request involved an inventive step over D11. The same conclusion applied to claims 1 of the first to third auxiliary requests.
- The objection of lack of inventive step against claim 1 of the fourth auxiliary request starting from D11 should not be admitted into the proceedings.
- Claim 1 of the fourth auxiliary request involved an inventive step over D11 as closest prior art in combination with D15 or D18 and claims 2 and 5 of the fourth auxiliary request involved an inventive step over D16/D17 as closest prior art in combination with D2, D11 or D3.

XI. The opponent's arguments, in so far as they are pertinent to the present decision, may be derived from the reasons for the decision below. They are essentially as follows:

- Granted claims 5, 9, 10 and 13 did not find a basis in the application as filed and contained subject matter going beyond what was disclosed in the application as filed and in the earlier application as filed.
- The objection of lack of inventive step against granted claim 1 starting from document D11 should be admitted into the proceedings.
- Claim 1 of the main request did not involve an inventive step over D11. The same conclusion applied to claims 1 of the first to third auxiliary

requests.

- The objection of lack of inventive step against claim 1 of the fourth auxiliary request starting from D11 should be admitted into the proceedings.
- Claim 1 of the fourth auxiliary request did not involve an inventive step over D11 as closest prior art in combination with D15 or D18 and claims 2 and 5 of the fourth auxiliary request did not involve an inventive step over D16/D17 as closest prior art in combination with D2, D11 or D3.

Reasons for the Decision

Main request (claims as granted)

1. Added subject-matter
 - 1.1 The opponent argued that the subject-matter of granted claim 5 did not find a basis in the application as originally filed and earlier application as filed because granted claim 5 resulted from the combination of features belonging to different embodiments. Also, granted claims 9, 10 and 13 resulted from a combination of features originally disclosed in different embodiments of the application as filed.
 - 1.2 Granted claim 1 corresponds to claim 1 of the application as filed and it corresponds, in the earlier application as filed, to claim 12 (to which the method for the determination of the volume solids disclosed on page 5 was added). The zinc epoxy primer composition of granted claim 1 is also disclosed on page 25, lines 10-12 of both the application as filed and the earlier application as filed without the reference to the

method for the determination of the volume solids. There is therefore a basis for the subject matter of granted claim 1 in the application as filed and in the earlier application as filed, which is undisputed. Granted dependent claim 5 further limits the subject-matter of granted claim 1 to a list of curing agents present in the epoxy-based binder system.

- 1.3 A list of curing agents is disclosed on page 7, lines 13-21 of the application as filed (also corresponding to page 7, lines 13-21 of the parent application as filed). The opponent argued that the curing agents listed on page 7 of the description were only disclosed for the coating systems disclosed in pages 3-25, for which the epoxy primer was defined to contain 20-35 % by solids volume of zinc (on page 10, lines 21-22 of the application as filed and earlier application as filed). The curing agents listed on page 7 were not disclosed in the context of an epoxy-based binder system containing 20-40 % by solids volume of zinc as defined on page 25, lines 10-11 of the application as filed and of the earlier application as filed.

- 1.4 There are two instances in the application as filed, one on page 10 and one on page 25 that disclose an epoxy primer containing different amounts of zinc (20-35 % by solids volume on page 10, line 22 and 20-40 % by solids volume on page 25, line 11). The wording "primer composition" on page 10, line 21 of the application as filed when read in the context of the entire section preceding that passage implicitly refers to an epoxy primer comprising an anticorrosive constituent, which on page 10, lines 21-22 is specified to be zinc. The application as filed (and the earlier application as filed) however do not give reasons to conclude that these epoxy primers relate to different

types of zinc epoxy primer compositions, all the more since the amount specified on page 10, lines 21-22 of the application as filed can be seen as a preferred amount within the broader range of 1-65% defined in the preceding sentence on page 10, lines 19-20, when used is made of zinc as anticorrosive constituent.

1.5 The opponent's argument relied on the different values defining the maximum amount of zinc in the epoxy primer but the ranges of zinc defined on pages 10 and 25 do not mutually exclude one another. In fact, the amount of zinc defined on page 10 as a preferred embodiment lies within the broader range of 20-40 % solids volume that is defined on page 25.

1.6 Moreover, it is unambiguous from the sentence "*In view of the details disclosed above and the preliminary results obtained, it is believed that certain of the primer compositions (see above) which are useful in the coating system and in the method disclosed herein are novel per se*" under the heading "*Novel Primer Compositions*" and the immediately following paragraph starting with "*Hence, the present invention also provides*" which defines the zinc epoxy primer of granted claim 1 apart from the method for the determination of the volume solids (see point above 1.2) that the applicant not only intended to seek protection for the embodiment on page 25, lines 10-12 defining the zinc primer composition comprising an epoxy-based binder system containing 20-40 % by solids volume of zinc, but that this embodiment was also to be read in "view of the details disclosed above" mentioned in said sentence, which includes the use of the curing agents listed on page 7 of the application as originally filed (and on the same page of the earlier application as filed). This is also implicitly

confirmed by the sentence on page 26, lines 3/4 of the application as filed and of the earlier application as filed "*for a further specification of the zinc epoxy primer composition and the epoxy primer composition, see further above*" which can only refer to the details of the zinc epoxy primer composition and the epoxy primer composition disclosed on pages 3-25. The list of curing agents defined on page 7 of the application as originally filed (and on the same page of the earlier application as filed) is therefore directly and unambiguously applicable to the zinc epoxy primer composition of page 25 comprising 20-40 % by solids volume of zinc.

- 1.7 The list of curing agents defined in granted claim 5 only differs from the list given on page 7 as originally filed in that the "*amino functional silicones or silanes*" were deleted. The deletion of these two elements from that list of curing agents does not affect the generic character of the subject-matter defined. It does not result in new technical information and therefore extension of subject matter beyond the content of the application as filed (or the earlier application as filed).
- 1.8 The Board concludes that granted claim 5 finds a direct and unambiguous disclosure in the application as filed and in the corresponding passages of the earlier application as filed. The requirements of Article 123(2) EPC and Article 76(1) EPC are thus met.
- 1.9 Granted claims 9 and 10 concern the use of a zinc epoxy primer composition in a coating system and granted claim 13 concerns the use of a zinc epoxy primer composition in a method for the establishment of a coated structure using a coating system consisting of

the zinc epoxy primer composition and a top-coat composition, said top-coat composition comprising a polyurea-based binder system. Granted claims 9, 10 and 13 all refer to the zinc epoxy primer of granted claims 1 to 8 in which the amount of zinc is 20-40% by solids volume.

- 1.10 The objection of the opponent with regard to these claims was that they concerned the coating system and a method for the establishment of a coated structure using a coating system addressed in pages 3-25 of the application as filed and that therefore there was no basis for the presence of 20-40% by solids volume of zinc in the epoxy-based binder system of the zinc epoxy primer disclosed as a stand-alone embodiment on pages 25/26 in the section entitled "*Novel Primer Compositions*".
- 1.11 It has however been established above in points 1.4-1.6 that it was directly and unambiguously derivable from the application as filed that epoxy-based binder system defined on pages 25/26, including an amount of zinc of 20-40% by solids volume, was disclosed in the context of the coating systems of pages 3-25. It follows that the opponent's objection that granted claims 9, 10 and 13 are in contravention of Article 123(2) EPC is not convincing.
- 1.12 Since the passages cited in the application as filed and in the earlier application as filed are the same with respect to the zinc content, the coating systems and the method for the establishment of a coated structure, the Board also concludes that the additional objection that the subject-matter of granted claims 9, 10 and 13 extends beyond the content of the earlier application as filed in contravention of Article 76(1)

EPC is not convincing either.

2. Admittance of the objection of inventive step starting from document D11 (main request)
 - 2.1 The statement of grounds of appeal of the opponent (section 4.4) contains an objection of lack of inventive step based on D11 as closest prior art against claim 1 of auxiliary request II underlying the contested decision. That objection was maintained in the rejoinder of the opponent (section 4.4, item 42), as the present second auxiliary request corresponds to said auxiliary request II. An objection based on D11 as closest prior art was also raised in the rejoinder of the opponent against the main request, the first auxiliary request, and the third auxiliary request in appeal (rejoinder of the opponent, sections 4.3 and 4.5, item 53). The objection against the main request, which corresponds to the patent as granted, is to be regarded as an amendment to the opponent's case within the meaning of Article 12(4) RPBA 2020. Its admittance is at the discretion of the Board.
 - 2.2 The patent proprietor contested the admittance of the inventive step objection starting from D11 as closest prior art on the grounds that that objection had only been raised towards the end of the oral proceedings before the opposition division and therefore late into the opposition proceedings (statement setting out the grounds of appeal, sections 77-87).
 - 2.3 It is apparent from the minutes of the oral proceedings (section 6.5) that the objection of lack of inventive step over D11 against auxiliary request II was indeed first raised towards the end of the oral proceedings before the opposition division. It is however apparent

from the minutes that the admittance of the objection was discussed between the parties at the oral proceedings proceedings, after which the opposition division admitted the objection into the proceedings. The parties provided their arguments relating to that objection and the impugned decision is based on that objection (section 3.1.3).

- 2.4 Under Article 12(1)(a) RPBA 2020, any such facts, having become part of the contested decision, are basically part of the appeal proceedings too (see also Case Law of the Boards of Appeal, 10th Edition, 2022, in the following "Case Law", V.A.3.4.4). The Board concludes therefrom that the objection of lack of inventive step against auxiliary request II (corresponding to the second auxiliary request in appeal) over D11 is part of the appeal proceedings (Article 12(4) RPBA 2020) and there is no legal basis for retroactively rejecting it on appeal. Therefore, it has to be taken into account. It is also immediately apparent that the objection of lack of inventive step over D11 submitted against claim 1 of the second auxiliary request is also relevant for the main request whose claim 1 is more broadly defined, because it does not comprise any definition of the curing agent. In addition, that amendment of the opponent's case does not add complexity or goes against procedural economy. On that basis, the objection that claim 1 of the main request lacks an inventive step over D1 is admitted into the proceedings (Article 12(4) RPBA 2020).

3. Inventive step of granted claim 1 starting from document over D11

Closest prior art and distinguishing feature(s)

- 3.1 The decision of the opposition division identified example 1 of D11 as the closest prior art (section 3.1.3).

D11 relates to the same problem as that addressed in the patent in suit, i.e. provision of coating compositions in aggressively corrosive environment (D11, page 4, lines 4-6).

- 3.2 While D11 concerns compositions that are based on a specific class of epoxy compounds that are not specifically mentioned in the patent in suit, i.e. epoxy silanes or epoxy silicones (claim 1 of D11), these specific classes of epoxy compounds are nevertheless relevant to the question of inventive step of granted claim 1 as the claim does not limit the type of epoxy compounds comprised in the epoxy-based binder.

- 3.3 In this respect, the patent proprietor argued at the oral proceedings in appeal that epoxy silanes or epoxy silicones as used in D11 did not represent an epoxy resin which could be part of the epoxy-based system in accordance with granted claim 1. Contrary to the opponent's submissions, this argument had not been presented for the first time during the oral proceedings, but already with the rejoinder of the patent proprietor (page 6, section 34). There is therefore no ground for the Board not to take that line of argument into account. The patent proprietor relied on the definition of the term "epoxy-based binder system" said to comprise an "epoxy resin" in paragraph

39 of the patent in suit. The patent proprietor also relied on the definition of an epoxy resin provided on pages 226 and 233 of D10a that would exclude the epoxy silane present in the compositions of D11 (Claim 1).

3.4 The wording of granted claim 1 however does not require the presence of an "epoxy resin" in the zinc epoxy primer. The reference to D10a and its definition of an "epoxy resin" therefore lacks relevance. Granted claim 1 only refers to an "epoxy-based binder system" which is a broad term that does not exclude the epoxy silane components of D11. Besides epoxy silane components are "epoxy-based" since they contain epoxy groups. Furthermore, the term "epoxy-based binder system" is broad but it is not unclear or ambiguous in itself such that the skilled reader would have to turn to the patent in suit or its common general knowledge for an interpretation of the unclear term (Case Law, supra, II.A.6.3.3). In fact, the term "epoxy-based binder system" corresponds to the term epoxy binder component ("Epoxybindemittelkomponente") used to define the system of claim 1 of D11. The Board therefore does not find that the term "epoxy-based binder systems" constitutes a distinguishing feature over example 1 of D11.

3.5 Furthermore, in accordance with the contested decision (first paragraph on page 13), there is in example 1 of D11 no disclosure of the volume solids % of the composition. However, the opponent contended (section 60 of their statement setting out the grounds of appeal) that even if D11 did not disclose a measured value of the volume solids %, it would be unreasonable to conclude that it was less than 82% on the grounds that the composition of example 1 of D11 was not explicitly disclosed to contain solvents. That

argumentation, on the basis of the disclosure of D11, was found to be reasonable by the Board as indicated in the communication pursuant to Article 15(1) RBPA 2020 (section 8.5.2).

3.6 It is only at the oral proceedings before the Board that the patent proprietor raised the question of whether the epoxy binder system of example 1 of D11 contained solvents. In particular, the argument of the patent proprietor relied on the presence of methanol mentioned on page 20, line 29 of D11 and the possible presence of solvents in the commercially available Disperbyk 163 whose use is disclosed on page 21, line 19 of D11, reference being made to D23. This argument of the patent proprietor ultimately concerns the question of whether some solvent could be present in the composition of example 1 of D11 to such a level that the volume solids % of the composition of example 1 of D11 could be below the amount defined in operative claim 1. It did not introduce a new or surprising issue in the proceedings, as the question of presence of solvent in the composition of example 1 of D11 had been already brought up by the opponent with their statement of grounds of appeal (point 3.6 above). There was therefore no reason for the Board to disregard that argument brought up by the patent proprietor.

3.6.1 It is apparent from example 1 D11 and the preparation of the epoxy silane component 1 disclosed on page 21 of D11 that methanol is generated in the course of the preparation of the epoxy silane through reaction of γ -Glycidyloxypropyltrimethoxy silane (GPTS) and Bisphenol-A. Methanol is mentioned in that passage but only to show that it was removed (distilled) from the reaction mixture. There is no indication in D11 that methanol remains in the epoxy silane component 1 after

that step nor did the patent proprietor, who raised that argument only before the Board at the oral proceedings, provide evidence that methanol was present in the composition of example 1 of D11.

3.6.2 The patent proprietor further argued that the composition of example 1 disclosed on page 21 of D11 could contain solvents which affected the volume solids % of the primer composition. The patent proprietor relied on the commercially available compound Disperbyk 163 present in the composition. D23 cited by the patent proprietor contains a part relating to that compound (twenty-first page of D23) and shows that it indeed contains solvents (Xylene/Butylacetate/Methoxypropylacetate). Disperbyk 163 however is present in an amount of 0.5 g, representing 0.5 % by weight of the composition (see Table in D24). Any amount of solvent in that compound alone therefore is not sufficient to bring the volume solids % of the composition below 82 %. As to the other compounds of the composition, the patent proprietor did not even show that they indeed contained solvents. The Board therefore does not see any reason to depart from its preliminary opinion and concludes that the range of volume solids % defined in granted claim 1 does not constitute a distinguishing feature over example 1 of D11.

3.7 In view of the above, the composition of example 1 of D11 which represents a reasonable starting point for the skilled person seeking to achieve the objectives mentioned in the patent in suit is taken as the closest prior art.

3.8 It also results from the above that the composition of operative claim 1 differs from that of example 1 of D11

only in that zinc is present in an amount of 20-40 % by solids volume.

Problem successfully solved

- 3.9 The examples of the patent in suit do not contain a comparison with a composition that could be seen as representing the composition of example 1 of D11 nor is there a valid comparison that could establish the presence of an effect resulting from the distinguishing feature identified in point 3.8 above. That was also not in dispute between the parties. On that basis, the patent proprietor's contention that a primer with higher dry film thickness would be obtained (statement of grounds of appeal, page 11, item 89) is not convincing in the absence of any evidence in this respect. The problem solved by the subject-matter of claim 1 over example 1 of D1 is therefore seen as the mere provision of alternative zinc epoxy primer compositions.

Obviousness of the solution

- 3.10 The argument of the opponent in appeal with regard to the obviousness of the solution was that D11 teaches a zinc content of 30-70 wt.-% (page 4, lines 14-15) which, when converted to % by solids volume, as shown in D24 and D25, would encompass the range of 20-40 % by solids volume defined in granted claim 1. In particular, the composition of example 1 in D11 contained zinc in an amount of 40 wt.-% (40 g of zinc in 100 g of composition), which corresponded to an amount of zinc of 10.8 % by solids volume of zinc (decision under appeal, page 13, first paragraph and D24, Table, first line).

- 3.11 D11 suggests that zinc can be used in the composition of D11 in an amount of up to 70 wt.-% (page 4, lines 15-22 and page 7, lines 15-21). D25 furthermore shows that an amount of 55 wt.-% of zinc (and adapted amounts of other components of the composition) would correspond to an amount of 20 % solids volume of zinc in a composition analogous to that of example 1 of D11. 55 wt.-% of zinc in the composition of example 1 of D11 would therefore already correspond to the minimum amount of zinc according to granted claim 1 (20 % by solids volume). Therefore varying the amount of zinc in the composition of example 1 up to level from 55 wt.-% to 70 wt.-%, as is suggested by the teaching of D11, results in a composition according to granted claim 1. Besides, D11 teaches that the amount of solvent should be kept as low as possible (page 13, lines 8-15).
- 3.12 In view of the above, the skilled person aiming at solving the problem defined in point 3.9 above would have found obvious in view of D11 to use higher amounts of zinc, thereby arriving in an obvious manner at primer compositions falling within the ambit of claim 1 of the main request.
- 3.13 At the oral proceedings before the Board, the patent proprietor argued for the first time that the calculation of the zinc amount in % by solids volume for the composition of example 1 of D11 that was provided in D24 was not accurate because it relied on a value of the density of 1.25 g/ml for the epoxy compound (found on the first page of D23) that did not correspond to the density of the epoxy silane of example 1 of D11. D23 indeed discloses a density of 1.25 g/ml for a generic epoxy compound that does not necessarily correspond to an epoxy silane. It can however be accepted that the value of 1.25 g/ml found

in D23, which appears to be given for a generic epoxy compound, represents a first valid approximation of the density of an epoxy silane. The same approximation was made in D25 for an estimation of the amount of zinc by solids volume which would result from the use of 55.5 wt.% of zinc instead of 40 wt% like in example 1 of D11. Even if the exact value of the density of the epoxy silane is only an approximation, meaning that the amount by solids volume of zinc corresponding to 55.5 wt% is not exactly 20.0% as determined in D25, based on that approximation, it can nevertheless be accepted that using an amount of 70 wt% of zinc in the composition of example 1 of D11 does indeed result in an amount of zinc by solids volume within the range defined in granted claim 1. On that basis, the argument of the patent proprietor concerning the validity of the approximation made in D23 has no effect on the conclusion drawn in point 3.11 above.

- 3.14 The main request is therefore not allowable, as the zinc epoxy primer composition according to its claim 1 lacks an inventive step.

First to third auxiliary requests

4. Inventive step

- 4.1 Claim 1 of the first auxiliary request corresponds to granted claim 1. The reasoning and the conclusion reached for granted claim 1 therefore equally applies to claim 1 of the first auxiliary request.

- 4.2 Claim 1 of the second auxiliary request corresponds to granted claim 1 further limited by the type of curing agent present in the composition *"and wherein the epoxy-based binder system comprises one or more curing*

agents selected from compounds or polymers comprising at least two reactive hydrogen atoms linked to nitrogen, such curing agents being selected from aliphatic amines and polyamines, polyamido amines, polyoxy alkylene amines, aminated polyalkoxy ethers, alkylene amines, aralkyl amines, aromatic amines, Mannich bases, and including epoxy adducts and derivatives thereof". It is apparent to the Board that the formulation of claim 1 "*and including epoxy adducts and derivatives thereof*" can only mean that the mention of the use of derivatives only applies to the epoxy adducts and not to all the other members of the list of curing agents recited in claim 1.

4.3 The opponent argued (section 4.4 of the statement of grounds of appeal) that claim 1 of the second auxiliary request only differed from example 1 of D11 in the solids volume % of zinc. The two-component anti-corrosive paint of example 1 of D11 comprises aminopropyltrimethoxy silane as curing agent which is not part of the list of curing agents of operative claim 1, especially since claim 1 only refers to aliphatic amines (which do not encompass silanes) and claim 1 cannot be read as comprising derivatives of aliphatic amines. Claim 1 of the second auxiliary request therefore additionally differs from example 1 of D11 in the nature of the curing agent present in the composition.

4.4 The use of the curing agents defined in operative claim 1 has not been shown to be associated with a technical effect. As a result the problem defined for the main request in view of D11 is also valid for claim 1 of the second auxiliary request.

- 4.5 The compositions of D11 are said to contain an amine curing agent (b1) (claim 1). The curing agents are discussed on page 15, lines 13-23 of D11 and a list is disclosed that contains Diethylentriamine, Triethylentetramine, Tetraethylenpentamine, Petaethylenhexamine, Propylendiamine, Dipropylentriamine, Bis-(aminopropyl)-amine, N,N-Bis-(3-aminapropyl)ethylendiamine, N,N,2,2-Tetramethyl-1,3-propandiamine, N',N''-Trimethylethylendiamine, Neopentandiamine, 2-Methyl-1,5-Pentandiamine, 1,3-Diaminepentane, Hexamethylendiamine that are all compounds or polymers comprising at least two reactive hydrogen atoms linked to nitrogen, such curing agents being selected from aliphatic amines and polyamines as defined in operative claim 1. Since the curing agents already suggested in D11 fall under those defined in operative claim 1, the Board concludes that claim 1 of the second auxiliary request lacks an inventive step over D11.
- 4.6 Claim 1 of the third auxiliary request corresponds to claim 1 of the second auxiliary request further limited to an amount of zinc in the range of 20-30 % by solids volume of the primer composition (instead of 20-40 % by solids volume). The patent proprietor and the opponent relied on their arguments provided in view of inventive step for the main request.
- 4.7 The limitation of the range defining the amount of zinc in the composition from 20-40 % by solids volume to 20-30 % by solids volume does not change the reasoning of inventive step provided for the main request. In particular, the variation of the amount of zinc over the range of 55 to 70 wt.-% as suggested in D11 already rendered the zinc amount of 20-40 % by solids volume obvious, the same conclusion therefore applied to the

range of 20-30 % by solids volume of claim 1 of the third auxiliary request. As to the definition of the curing agent, the reasoning provided for the second auxiliary request is also applicable to claim 1 of the third auxiliary request. There is no indication in the patent in suit that the combination of the limitation of the amount of zinc with the definition of the curing agent in operative claim 1 leads to a specific effect nor does the Board find a basis for such an effect in the patent in suit. Therefore, the problem defined for the second auxiliary request starting from D11 is also valid for claim 1 of the third auxiliary request. Since the same is valid also for the definition of the curing agents, the Board concludes that claim 1 of the third auxiliary request lacks an inventive step over D11.

Fourth auxiliary request

5. The fourth auxiliary request

5.1 The wording of use claims 1, 2 and 5 of the fourth auxiliary request correspond to that of claims 9, 10 and 13 of the main request in that, due to the deletion of claim 1 in the latter, the back-references "*according to anyone of the preceding claims*" and "*according to anyone of the claims 1-8*" for defining the zinc epoxy primer composition in said claims 9, 10 and 13 of the main request have been replaced by the definition in accordance with granted claim 1, i.e. "*comprising an epoxy-based binder system and 20-40 % by solids volume of the primer composition of zinc; said primer composition having a volume solids % determined according to ISO 3233 with the modification that drying is carried out at 23 °C and 50 % relative humidity for 7 days of at least 82 %*". Claims 1-8 of the main request relating to the zinc epoxy primer composition

do not form part of the fourth auxiliary request.

- 5.2 The opponent clarified at the oral proceedings before the Board that among the previously raised objections of lack of inventive step against the fourth auxiliary request, only two objections were maintained, one objection against claim 1 starting from D11 as closest prior art combined with either document D15 or D18 and another against claims 2 and 5 starting from D16/D17 as closest prior art combined with either document D2, D3 or D11.
- 5.3 The patent proprietor specifically contested the admittance of the objection of lack of inventive step starting from D11 into the proceedings on the grounds that the objection had not been part of the first instance proceedings and that it had been raised late into the appeal proceedings.
- 5.4 It is however apparent that an objection of lack of inventive step starting from D11 as the closest prior art was in fact raised by the opponent in the first instance proceedings with their letter of 10 October 2019 (page 8, section 10.2) against claim 1 of auxiliary request 7 filed with the patent proprietor's letter of 22 November 2018. Claim 1 of auxiliary request 7 filed with letter of 22 November 2018 corresponds to that of claim 1 of the present fourth auxiliary request. The Board therefore finds that the contested objection had in fact been raised in the first instance proceedings.
- 5.5 Even if the opposition division, which maintained the patent on the grounds of a lower-ranking request (auxiliary request II), did not deal with the contested objection in their impugned decision, there is no

indication on file that the contested objection was not maintained by the opponent at any stage of the first instance proceedings. In contrast, the same objection was again laid out, albeit briefly, in the statement of grounds of appeal of the opponent (sections 87-89) against claim 8 of auxiliary request II which subject-matter essentially corresponds to that of claim 1 of the fourth auxiliary request, the only difference between these claims being the amount of zinc in the primer (20-35 % by solids volume in claim 8 of the then pending auxiliary request II and 20-40 % by solids volume in claim 1 of the present fourth auxiliary request). Hence, it is evident that the objection of inventive step against claim 8 of auxiliary request II starting from D11 must also apply against claim 1 of the present fourth auxiliary request which is broader in scope in view of the upper limit defined for the amount zinc.

5.6 The Board therefore finds that there is no reason not to take into account in appeal the objection of lack of inventive step against claim 1 of the fourth auxiliary request starting from D11 as the closest prior art (Article 12(4) RPBA 2020).

6. Inventive step starting from document D11

6.1 Claim 1 of the fourth auxiliary request concerns the use of the zinc epoxy primer composition according to claim 1 of the main request in a coating system consisting of (i) a first layer of said zinc epoxy primer composition in wet form when applied and (ii) a second layer of a top-coat composition comprising a polyurea-based binder system. The top-coat composition in claim 1 is in wet form when applied to the surface of a substrate and has a volume solids % of at least 82

%. The weighted average volume solids % of the coating system is defined to be at least 84 %.

6.2 The opponent's objection of lack of inventive step over D11 also started from its example 1. In addition to the amount of zinc in the zinc epoxy primer composition, the distinguishing feature that was identified in section 3.8 above, claim 1 of the fourth auxiliary request additionally differs from example 1 of D11 in that the primer composition is used in a coating system, as defined in point 6.1 above, which system requires (i) the presence of a polyurea top-coat applied in wet form having a volume solids % of at least 82 % and (ii) a weighted average volume solids % of the coating system of at least 84 %.

6.3 Both parties formulated the problem over D11 as the provision of an alternative coating system. In view of the absence of data showing an effect resulting from these distinguishing features over the anticorrosive coating system of example 1 of D11 the Board has no reason to come to a different conclusion.

6.4 The opponent considered that D15, which public availability at the priority date of the patent in suit was not contested anymore at the oral proceedings before the Board, rendered the claimed subject matter obvious.

6.5 D11 discloses in its table 1 coating systems with a top-coat. The coating systems of example 8 is the one that is relevant within table 1 as it contains a primer composition that is the one of example 1 of D11. The coating systems of this example also contains as a top-coat a two-component system which is a polyurethane system (example 8) that is applied on the primer

composition.

- 6.6 The opponent considered that the use of a top-coat based on polyurea in place of a top-coat based on a two-component polyurethane as in D11 was obvious in view of D15 (slides 5, 6, 8, 10 and 11).
- 6.7 The question of obviousness was whether D15 suggested that a polyurea top-coat could be used as an alternative to the polyurethane top-coat in the coating system of example 8 of D11 in which the primer composition was a zinc epoxy primer.
- 6.8 D15 discloses the use of polyaspartic coatings obtained from the reaction of aliphatic polyisocyanates with polyaspartates (slide 2) to form a coating that contained (poly)urea (slide 6). Polyaspartic coatings in the sense of D15 are therefore polyureas in the sense of the patent in suit. The opponent pointed at slides 5 and 7 of D15 which showed the solids contents and viscosities of the polyaspartate (slide 5) and polyisocyanates (slide 7) used in the preparation of the polyaspartics in D15 (slide 8). The patent proprietor, however, pointed out that D15 was silent with respect to the use of zinc (statement of grounds of appeal, section 144). The slides of D15 indeed do not suggest the application of a polyaspartic coating on a zinc comprising primer composition, i.e. in the context of coating compositions for aggressively corrosive environments. To the contrary, slide 13 of D15 rather suggests to use a "direct to metal" polyaspartic topcoat instead of a system comprising an epoxy primer and a 2 component polyurethane topcoat. No suggestion can be therefore found in D15 to apply a polyaspartic coating on the primer described with example 1 of D11, all more when a higher amount of zinc

is to be employed, as required by operative claim 1.

- 6.9 Furthermore, there is no suggestion that a top-coat based on a polyurea having a volume solids % of at least 82 % would have been considered to be applicable in D15. There is therefore no reason for the skilled person starting from D11 to replace the top-coat of polyurethane by a top-coat of polyurea with a volume solids % of at least 82 %. On that basis, the use of a zinc epoxy primer composition as defined in claim 1 of the fourth auxiliary request has not been shown to lack an inventive step in the light of the combined teaching of D11 and D15.
- 6.10 The opponent mentioned at the oral proceedings that the same argument of lack of inventive step could equally be made by considering the teaching of D18 in combination with the closest prior art D11. The only argument submitted in writing in relation to D18 (section 65 of the rejoinder) is that it took no invention to combine a known zinc epoxy primer as disclosed in D11 with the polyurea top-coat of D18.
- 6.11 D18 is a sixteen page academic paper about polyurea spray coatings. The document contains parts disclosing general information about polyurea coatings, their properties and applications. In the absence of any specific citation from the opponent in D18 that should be considered, the Board is not in the position to conclude that faced with the problem of providing an alternative coating composition a skilled person would have applied the teaching of D18 concerning the use of polyurea topcoats in the context of the coating system disclosed in example 8 of D11 such as to arrive at the use of a zinc epoxy primer composition as defined in operative claim 1. In this respect, the patent

proprietor submitted in their statement of grounds of appeal that D18 was silent with the respect to the presence of zinc, which was not contested. The argument of the opponent relying on the scant citation of D18 can therefore not succeed.

6.12 The opponent also argued that the same objection of lack of inventive step also held for the other independent claims of the fourth auxiliary request. No further detail or argumentation was however provided for the objection against these independent claims. The fourth auxiliary request contains two further independent claims besides claim 1, claims 2 and 5 both also relating to the use of a zinc epoxy primer composition.

6.12.1 Claim 2 of the fourth auxiliary request differs from claim 1 in the values of the volume solids % of the zinc epoxy primer composition of the first layer (86 % in claim 2 and 82 % in claim 1), of the volume solids % of the top-coat (78 % in claim 2 and 82 % in claim 1) and of the weighted average volume solids % of the coating system (82 % in claim 2 and 84 % in claim 1). These differences have no impact on the reasoning provided in relation to claim 1 of the fourth auxiliary request, as the assessment of inventive step does not rely on particular value of the volume solid % of each of the features. In the absence of any detailed submissions in this respect from the opponent, the Board can only arrive at the same conclusion that claim 2 has not been shown to lack an inventive step when starting from the disclosure of D11.

6.12.2 Claim 5 of the fourth auxiliary request concerns the use of a zinc epoxy primer composition in accordance with the use defined in claim 1 or alternatively claim

2 in which the use is further limited by the method of application of the base and top-coats. As for claim 2, the opponent relied on their argumentation provided for claim 1 and did not provide an argumentation that was specific to the subject matter disclosed in claim 5 of the fourth auxiliary request. Having regard to the reasoning provided in relation to claim 1 in points 6.1 to 6.11 above, the absence of submissions specific to claim 5 provided by the opponent and the fact that the subject-matter of claim 5 is narrower in scope, the Board can only conclude that the subject-matter of operative claim 5 has not been shown to lack an inventive step starting from the disclosure of D11.

7. Inventive step starting from D16/D17

7.1 The opponent also argued that D16 and D17 were relevant to claims 2 and 5 of the fourth auxiliary request since claim 2 and part of claim 5 (second option) lacked priority entitlement. The subject matter of claims 2 and 5 of the fourth auxiliary request indeed corresponds to the subject matter of granted claims 10 and 13 respectively, for which the impugned decision has established that their claim to priority of 23 May 2008 (EP 08156796) was invalid (decision of the opposition division, page 6), a conclusion that was not disputed in appeal. In particular, the system with a first layer with at least 86 % volume solids, a second layer with at least 78 % volume solids, and a weighted average volume solids % of at least 82 % defined in claim 2 and in claim 5 (second option) of the fourth auxiliary request is not disclosed in the priority document such that the effective filing date of these claims is therefore 22 May 2009, i.e. the filing date of parent application EP 09749928.9. D16, which bears the publication date "11/12/2008", is therefore a

document according to Article 54(2) EPC for claim 2 and the second option of claim 5 of the fourth auxiliary request. In accordance, the opponent raised an objection of lack of inventive step starting from D16 as the closest prior art against claim 2 and the second option of claim 5 in their statement of grounds of appeal (point 92).

7.2 D16 is a technical datasheet concerning the commercially available product Intercure® 99, a polyaspartic coating (page 1) having a volume solids % of 80 % ±1. The product is said to be applicable over approved anti-corrosive primers (page 1, third paragraph and page 2, passage "Primed Surfaces"). The last paragraphs of page 3 further disclose that a suitable primer for Intercure® 99 is the commercially available Interzinc® 52. Interzinc® 52 is disclosed in D17 as being a two-component, metallic zinc rich epoxy primer with a volume solids % of 59 %. The amount of zinc in the epoxy primer is not disclosed.

7.3 Claim 2

7.3.1 Claim 2 of the fourth auxiliary request concerns the use of a zinc epoxy primer composition comprising an epoxy-based system and **20-40 % by solids volume of the primer composition of zinc**; said primer composition having a **volume solids %** determined according to ISO 3233 with the modification that drying is carried out at 23°C and 50 % relative humidity for 7 days **of at least 82 %** in a coating system consisting of (i) the first layer of said zinc epoxy primer composition, said zinc epoxy primer composition being in wet form when applied to the surface of a substrate and having a **volume solids % of at least 86 %**; and (ii) the second layer of a top-coat composition comprising a polyurea-

based binder system, said top-coat composition being in wet form when applied to the surface of a substrate and having a **volume solids % of at least 78 %**; wherein the weighted average **volume solids % of the coating system is at least 82 %**; and wherein the volume solids is determined according to ISO 3233 with the modification that drying is carried out at 23°C and 50 % relative humidity for 7 days (emphasis added by the Board).

- 7.3.2 Claim 2 of the fourth auxiliary request differs from the disclosure of D16 in combination with D17 in (i) the amount of zinc in the epoxy primer composition (20-40 % by solids volume in claim 2), (ii) the volume solids % of the zinc epoxy primer (at least 82 %) and when applied to the surface of a substrate (at least 86 %) and (iii) the weighted average volume solids % of the coating system (at least 82 %).
- 7.3.3 As pointed out by the opponent during the oral proceedings, the experimental data comprised in the patent in suit are not suitable to establish the presence of an effect resulting from the distinguishing features of claim 2 over the disclosure of D16/D17. For claim 2 therefore, similarly to the problem formulated for claim 1, the problem successfully solved over the disclosure of D16/D17 merely resides in the provision of an alternative anticorrosive coating system.
- 7.3.4 The combination of Intercure® 99 and Interzinc® 52 considered in D16 with D17 points to a coating system having a zinc epoxy primer of unknown zinc content and having a low amount of volume solids % (59 %). There is no teaching in D16 or D17 indicating that the volume solids % of the zinc epoxy primer Interzinc® 52 could be adjusted to be in the range of at least 82 %, let alone without affecting the properties of the primer or

its compatibility with the top-coat Intercure® 99, a factor that is given particular consideration in D16 (page 2, first line of the passage "primed surface" which states that Incure 99 can be applied over approved anti-corrosive primers). There is also no suggestion in D16/D17 that the weight average volume solids % of the coating system constituted by the primer Interzinc® 52 and the top-coat Intercure® 99 in D17 and D16 could be increased up to the level defined in operative claim 2. Given the values of the volume solids % of the top-coat Intercure® 99 of D17 (80 % ±1) and that of the zinc epoxy primer Interzinc® 52 (59 %) the question of obviousness is also whether the skilled person would have known how to obtain a coating system having a higher weighted average volume solids of at least 82 % as required in claim 2 of the fourth auxiliary request.

7.3.5 The opponent argued at the oral proceedings that that difference in the volume solids % of the primer and the coating system could easily be bridged by the skilled person without however showing how that could be achieved or providing evidence for that statement. In section 95 of the statement of grounds of appeal the opponent argues that the required weight average volume solids % could be found in D2, D11 or D3.

7.3.6 D2 however does not disclose the weighted average volume solids % of the coating systems it describes, which is also acknowledged by the opponent in section 25 of their statement of grounds of appeal. D2 therefore cannot suggest the weighted average volume solids % of the coating system required by operative claim 2.

7.3.7 D11 concerns two-component anticorrosion paints (claim 1). The passage in D11 showing coating systems is in the examples, in particular example 8 comprising a primer composition of a zinc epoxy primer composition and a top-coat of a polyurethane. There is however no disclosure of the weighted average volume solids % in that passage of D11. The argumentation of the opponent in their statement of grounds of appeal (section 95) points to D11 without providing a reference to a passage relevant to the weighted average volume solids % of the coating system. A further reference to passages of D11 (pages 4 and 11) is made in section 18 of the statement of grounds of appeal but these passages do not concern the weighted average volume solids % of the coating system. D11 therefore does also not suggest a weighted average volume solids % of the coating system as defined in present claim 2.

7.3.8 D3 concerns high-solids anticorrosive coating compositions based on an epoxy resin, a curing agent and an additive (claim 1) whereby the volume solids is in the range of 72 to 100 % (claim 6). It is however apparent from that disclosure that the volume solids % in that document does not correspond to the primer composition and the top-coat as required in claim 2 of the fourth auxiliary request but only that of a coating composition that corresponds to the zinc epoxy primer in the patent in suit. The opponent cited paragraphs 1, 9, 10 and 13-18 (statement of grounds of appeal, sections 32, 38 and 42) and examples 30 and 31 (rejoinder, section 38). These passages of D3 however do not suggest the weighted average volume solids % of the coating system as define in claim 2 of the fourth auxiliary request. D3 therefore is not relevant to the question of obviousness relating to the weighted

average volume solids % of the coating system.

7.3.9 None of the evidence cited by the opponent shows that the skilled person starting from the combination Intercure® 99 and Interzinc® 52 in D16 with D17 would have obtained a coating system according to claim 2 of the fourth auxiliary request. The objection of lack of inventive step against claim 2 of the fourth auxiliary request starting from D16/D17 therefore fails.

7.4 Claim 5

7.4.1 Claim 5 of the fourth auxiliary request concerns the use of a zinc epoxy primer composition in a method for the establishment of a coated structure using a coating system consisting of the zinc epoxy primer composition and a top-coat composition, said top-coat composition comprising a polyurea-based binder system. Claim 5 contains two options regarding the volume solids % of primer, top-coat and coating system. The second option corresponds to claim 2 of the fourth auxiliary request whereby the volume solids % of the zinc epoxy primer is at least 86 %, that of the top-coat composition at least 78 % and the weighted average volume solids % of the coating system of at least 82 %.

7.4.2 The second option in claim 5 of the fourth auxiliary request corresponds to claim 2 further defining the method for the establishment of the coated structure in four steps (i)-(iv). The second option in claim 5 is therefore more limited in scope than claim 2 which has already been acknowledged to be inventive starting from D16/D17 as the closest prior art. Having regard to the reasoning provided in relation to claim 2 in point 7.3 above, the absence of submissions specific to claim 5 provided by the opponent and the fact that the subject-

matter of claim 5 is narrower in scope than claim 2, the Board can only conclude that the subject-matter of claim 5 of the fourth auxiliary request has not been shown to lack an inventive step starting from the disclosure of D16/D17.

8. Accordingly, none of the objections raised by the opponent against the claims of the fourth auxiliary request is convincing.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of claims 1 to 7 of the fourth auxiliary request, filed with the statement of grounds appeal and a description to be adapted thereto.

The Registrar:

The Chairman:



D. Hampe

F. Rousseau

Decision electronically authenticated