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**Datasheet for the decision
of 26 March 2026**

Case Number: T 0908/24 - 3.2.03

Application Number: 11847810.6

Publication Number: 2649219

IPC: C23C22/34, C23C22/73, C23C22/78

Language of the proceedings: EN

Title of invention:
METAL PRETREATMENT COMPOSITION CONTAINING ZIRCONIUM, COPPER,
AND METAL CHELATING AGENTS AND RELATED COATINGS ON METAL
SUBSTRATES

Patent Proprietor:
Henkel AG & Co. KGaA

Opponent:
PPG Industries, Inc.

Relevant legal provisions:
RPBA 2020 Art. 13(2)
EPC Art. 123(2), 52(1), 56

Keyword:

Amendment after summons - exceptional circumstances (yes)
Amendments - extension beyond the content of the application
as filed (no)
Inventive step - (yes) - unexpected improvement shown

Decisions cited:

T 0172/17, T 0540/24



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Case Number: T 0908/24 - 3.2.03

D E C I S I O N
of Technical Board of Appeal 3.2.03
of 26 March 2026

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted/
electronically transmitted on 6 May 2024
concerning maintenance of the European Patent
No. 2649219 in amended fo rm.**

Composition of the Board:

Chairman F. Bostedt
Members: B. Miller
M. Olapinski

Summary of Facts and Submissions

- I. European patent EP 2 649 219 B1 ("the patent") relates to metal pretreatment compositions containing zirconium that can be applied to metal substrates to enhance paint adhesion.
- II. An opposition against the patent was filed on the grounds of Article 100(c) and (a) EPC together with Articles 54 and 56 EPC.

In the interlocutory decision, the opposition division found that the contested patent met the requirements of the EPC on the basis of the claims of the third auxiliary request filed in electronic form on 18 January 2024.

- III. The opponent ("appellant") appealed the interlocutory decision.
- IV. Cited evidence

The following documents already cited during the opposition proceedings are of particular importance to the present decision:

D2: US 7,749,368 B2
D4: WO 01/83850 A1
D5: US 2004/0163736 A1
D6: US 5,584,946
D7: US 6,558,480 B1
D10: US 2007/0272900 A1
D11: WO 2007/065645 A1

D12: WO 2011/090691 A2
D13: US 2009/0032144 A1
D14: WO 2009/115504 A1
D15: US 2008/0254315 A1

V. With the summons to oral proceedings, the Board sent a communication pursuant to Article 15(1) RPBA indicating to the parties its preliminary, non-binding, opinion on the case.

VI. With a letter dated 20 October 2025 the respondent filed auxiliary request 4.

VII. Oral proceedings were held on 26 March 2026.

During the oral proceedings, the appellant requested that auxiliary request 4 not be admitted. The patent proprietor ("respondent") countered this by requesting that the appellant's request for non-admittance of auxiliary request 4 not be admitted.

At the end of the oral proceedings the following requests were maintained by the parties.

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

The respondent requested that the patent be maintained on the basis of auxiliary request 4 filed with the letter dated 20 October 2025.

VIII. Wording of the sole claim of **auxiliary request 4** including feature numbering as per the contested decision:

- F1.1 "A zirconium-based metal pretreatment
- coating composition comprising
- F1.2 water and
- F1.3 50 to 300 ppm of dissolved Zr,
- F1.4 20 to 50 ppm of dissolved Cu,
- F1.5 0 to 100 ppm of SiO₂,
- F1.6 150 to 2000 ppm of total Fluoride,
- F1.7 10 to 100 ppm of free Fluoride,
- F1.8 25 to 1500 ppm of a copper chelating agent
- F1.8.1 comprising tartaric acid and/or salts
- thereof."

IX. The appellant's arguments in relation to auxiliary request 4 can be summarised as follows.

(a) Admittance

Auxiliary request 4 was filed after the notification of the Board's communication pursuant to Article 15(1) RPBA. There were no exceptional circumstances that justified the admittance of the late-filed request, as it could and should have been filed earlier.

The appellant's request for non-admittance of auxiliary request 4, which was submitted during the oral proceedings before the Board, was filed in time, as there was no time limit applicable for a request for non-admittance in reaction to claim requests filed after the notification of the Board's communication.

(b) Amendments

Claim 3 and paragraph [0011] of the application did not provide a basis for the amendments in claim 1 because

they disclosed the amounts of copper in relation to "added" dissolved copper.

The application as filed did not directly and unambiguously disclose the combination of features in accordance with claim 1. To arrive at the claimed subject-matter, it was necessary to generalise the specific examples or to perform multiple selections from the general specification. Starting from the combination of claims 1 to 3 and 7 as originally filed, the application as filed provided no pointer to select 20 ppm as the lower limit of the copper content, and did not disclose this amount in combination with only 25 ppm as the lower limit of the copper chelating agent. In fact, in view of the examples, a skilled person would not have considered this combination to be disclosed in the application.

(c) Inventive step starting from D13

The subject-matter of claim 1 differed from the disclosure of Example 1 of D13 in that the composition comprised 25 to 1500 ppm of a copper chelating agent comprising tartaric acid and/or salts thereof. The patent did not include a comparative example based on Example 1 of D13. In particular, Example 2 of the patent did not provide an adequate comparison with D13, since its composition did not contain nitrate ions in line with the disclosure of D13.

Moreover, the patent failed to disclose the composition of the pretreatment composition according to Example 3, i.e. the components used and their respective quantities. Hence Examples 2 and 3 of the patent could not demonstrate an effect in comparison with the composition of Example 1 of D13.

Further doubts concerning the credibility of the effects claimed by the patent arose from the fact that Example 1 of the patent already demonstrated that excellent paint adhesion could be achieved without adding tartaric acid. Rather, a comparison of Examples 1 and 2 of the patent suggested that paint adhesion depended on other features as well, such as the pH or the amount/ratio of the active components. Furthermore, it was doubtful that the effect could be obtained over the whole scope of protection because claim 1 covered the possibility of using tartaric acid or its salts in an amount far lower than required to complex all the copper ions.

Starting from D13, the objective technical problem to be solved could therefore only be regarded as being to provide an alternative.

Arbitrarily modifying the composition of Example 1 of D13 came within the customary practice of the skilled person.

Moreover, documents D4, D7, D8, D10 and D15 provided an incentive for the skilled person to add tartaric acid or its salts to the compositions in the examples of D13 for different reasons. This argument also applied when the objective technical problem was formulated differently, since these documents already disclosed the beneficial use of tartaric acid and its salts in conversion coatings, such as for increasing the corrosion resistance. It was further obvious to add tartrate to the compositions of D13 because both nitrates and carboxylic acids were known chemical conversion reaction accelerators.

Therefore, the subject-matter of claim 1 was obvious starting from D13.

(d) Inventive step starting from D6

Gluconate was a known copper chelating agent. The presence of a chelating agent was not part of the distinguishing features.

The subject-matter of claim 1 differed from the pretreatment composition disclosed in Example 8 of Table 1 of D6 in that the copper chelating agent comprised tartaric acid and/or salts thereof and the composition comprised 20 to 50 ppm of dissolved copper.

These distinguishing features were independent of each other. Hence an independent partial problem could be identified for each distinguishing feature.

A skilled person would add copper to the pretreatment compositions of D6 in the amounts as defined in claim 1 in an obvious manner, because copper was a conventional ingredient used in these amounts, as evidenced by D2, D5, D11 and D14.

It was also obvious to replace the gluconate in Example 8 of D6 with tartrate, as both are polyhydroxycarboxylic acids and known chelating agents, as evidenced by D4, D7, D8, D10 and D15.

The subject-matter of claim 1 was thus obvious starting from D6.

X. The respondent's corresponding arguments in relation to auxiliary request 4 can be summarised as follows.

(a) Admittance

The appellant's request for non-admittance of the newly filed auxiliary request 4 was filed late and should not be admitted into the proceedings.

The sole remaining claim 1 of auxiliary request 4 corresponded to claim 1 of auxiliary request 3 on which the contested decision was based.

Auxiliary request 4, in which claim 2 of auxiliary request 3 had been deleted, did not alter the factual or legal framework of the proceedings. It did not require the matter at issue to be re-evaluated. It did not run counter to the principle of procedural economy and did not jeopardise the legitimate interests of either of the parties. In fact, deleting claim 2 from auxiliary request 3 merely reduced the complexity of the proceedings by eliminating one of the matters in dispute.

Therefore there were exceptional circumstances for admitting auxiliary request 4.

(b) Amendments

Claim 1 related to a pretreatment composition. The definition of the product was independent of how and when the various dissolved ions were incorporated into the composition. Therefore, in the context of the pretreatment composition according to claim 1, it was irrelevant whether the dissolved copper was added separately, in combination with other ingredients, or by elution of the treated metal.

Claim 1 was based on claims 1 to 4 and 7 as originally filed, corresponding to the disclosure in paragraphs [0011], [0012] and [0014] of the application as published. The amendments were thus not based on multiple selections or an unallowable generalisation of examples. In fact, only a single selection of the lower limit of copper from paragraph [0038] was sufficient to arrive at the subject-matter of claim 1. No pointer was required to amend a single end value of one component of a composition.

(c) Inventive step starting from D13

The subject-matter of claim 1 differed from the disclosure of Example 1 of D13 in that the composition comprised 25 to 1500 ppm of a copper chelating agent comprising tartaric acid and/or salts thereof. Examples 2 to 4 of the patent demonstrated that adding tartrate improved the paint adhesion of the treated metal sheets without compromising the corrosion resistance. An exact comparative example according to Example 1 of D13 was not required to render the alleged effect of better paint adhesion credible. It was immediately apparent to the skilled person that the compositions used for Examples 3 and 4 corresponded to those of Example 2.

The objective technical problem could be formulated as being how to provide a pretreatment composition that achieved a coating having improved paint adhesion without compromising corrosion resistance.

When faced with this objective technical problem, the skilled person would find no suggestion in D13 or the other cited documents D4, D7, D8, D10 and D15 to solve

it by using a copper complexing agent comprising tartaric acid.

(d) Inventive step starting from D6

The subject-matter of claim 1 differed from the pretreatment composition disclosed in Example 8 of Table 1 of D6 in that it comprised 20 to 50 ppm of dissolved copper (feature F1.4), and a copper chelating agent comprised tartaric acid and/or salts thereof (feature F1.8.1).

The use of tartrate was linked to the presence of dissolved copper in the pretreatment composition in order to control and reduce its amount, see paragraphs [0030] and [0031] of the patent.

Therefore there was a chemical interaction between copper and the copper chelating agent.

D6 did not specify why gluconate was present in Example 8. In particular, D6 did not disclose that it was present for its possible function as a chelating agent. As the composition in Example 8 of D6 did not contain copper, the skilled person had no reason to focus on ingredients in that composition that could form complexes with copper. In particular, there was no reason to replace gluconate with tartrate simply because they are both polyhydroxycarboxylic acids.

Reasons for the Decision

1. Auxiliary request 4 - admittance
 - 1.1 As auxiliary request 4 was filed after the notification of the communication of the Board under Article 15(1) RPBA, its admittance is governed by Article 13(2) RPBA. According to this provision, any amendment to a party's appeal case shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.
 - 1.2 Any part of a party's appeal case which is not directed to the requests, facts, objections, arguments and evidence contained in the statement of grounds of appeal or the reply constitutes an amendment to a party's appeal case within the meaning of Article 13(1) and (2) RPBA.

It follows that the filing of a new claim request, even if one or more claims of a previous claim request have been deleted in this new request, constitutes an amendment of the appeal case within the meaning of Article 13(1) and (2) RPBA.
 - 1.3 When exercising its discretion under Article 13(2) RPBA, the Board may also rely on the criteria as set out in Article 13(1) RPBA (see T 172/17, Reasons 5.4).
 - 1.4 In the case at hand, the Board had indicated in point 6.2 of its communication pursuant to Article

15(1) RPBA that the amendments to claim 2 of auxiliary request 3 resulted in an unallowable generalisation of claim 8 as originally filed.

1.5 In reaction thereto, the respondent filed auxiliary request 4. The sole remaining claim 1 of auxiliary request 4 corresponds to claim 1 of auxiliary request 3 on which the contested decision was based.

1.6 The amendment to auxiliary request 4 (deletion of independent claim 2 with respect to auxiliary request 3) directly addresses the objection of unallowable generalisation, which the Board had considered to be valid, and the reason why it overcomes that objection is immediately apparent. The amendment is also strictly limited to overcoming this objection. It does not shift the discussion because the remaining subject-matter of claim 1 was already fully addressed and discussed, and it thus does not give rise to any new objections. Furthermore, the amendment does not impose any additional burden on the other party. Overall, although the respondent only amended its appeal case in response to the Board's preliminary opinion, it did so in a manner that clearly served procedural economy.

This distinguishes the present case from T 540/24, which the appellant had cited to support its argument.

1.7 The Board considered the above circumstances to be exceptional under Article 13(2) RPBA. It therefore decided to admit auxiliary request 4 into the appeal proceedings.

In view of this conclusion, a discussion of the respondent's request that the appellant's request for

non-admittance of auxiliary request 4 not be admitted into the proceedings is not necessary.

2. Auxiliary request 4 - Article 123(2) EPC

2.1 Claim 1 in accordance with auxiliary request 4 is based on claims 1, 3, 4 and 7 as originally filed in combination with paragraph [0038] of the application as filed (references below relate to the published application WO 2012/078788 A2, "the application"), as can be seen in the table below.

feature	text (features added to claim 1 as filed in bold)	basis in the application as filed
F1.1	"A zirconium-based metal pretreatment coating composition comprising	claim 1
F1.2	water and	claim 1
F1.3	50 to 300 ppm of dissolved Zr,	claim 3
F1.4	20 to 50 ppm of added dissolved Cu,	claim 3: (0 to 50 ppm) [0038]: (20 ppm to)
F1.5	0 to 100 ppm of SiO₂,	claim 3
F1.6	150 to 2000 ppm of total Fluoride,	claim 3
F1.7	10 to 100 ppm of free Fluoride,	claim 3
F1.8	25 to 1500 ppm of a copper chelating agent	claim 4

F1.8.1 **comprising tartaric acid** claim 7
and/or salts thereof."

2.1.1 The appellant argued that the disclosure of claim 3 of the application did not provide a basis for feature F1.4, because the amounts of copper disclosed therein related to "added" dissolved copper.

This argument is not convincing.

Claim 1 relates to a pretreatment composition. The definition of the product is independent of how and when the various dissolved ions were incorporated into the composition.

Therefore, in the context of the pretreatment composition according to claim 1 of auxiliary request 4, it is irrelevant whether the dissolved copper is "added" separately, in combination with other ingredients, or by elution of the treated metal.

2.1.2 The further arguments presented by the appellant regarding potential multiple selections and unallowable generalisations of examples are not convincing either. In view of the basis for the amendments summarised above, it is unnecessary to consult the examples or perform multiple selections.

Starting from the embodiment of the combination of features according to dependent claims 1, 3, 4 and 7, only a single selection of the lower copper limit as disclosed in paragraph [0038] of the application is sufficient to arrive at the subject-matter of claim 1.

According to established case law, in the case of a disclosure of both a general and a preferred range, a combination of the preferred disclosed narrower range and one of the part-ranges lying within the disclosed overall range on either side of the narrower range is directly and unambiguously derivable from the original disclosure of the patent in suit and thus supported by it, see Case Law of the Boards of Appeal, 11th edition, 2025, "Case Law", Chapter II.E.1.5.1 a).

Correspondingly, when considering a single selection from the disclosure of the application it is irrelevant whether the application contains a "pointer" towards the amended range or whether there is a reason or motivation to modify the originally disclosed range.

Contrary to the appellant's further argument, the lower limit of the range for the amount of tartaric acid in claim 1 does not present a technical obstacle for the skilled person to amending the lower limit of the range for the amount of copper either. This is because, even when using tartaric acid and its salts in quantities lower than the amount required to complex all of the copper, a certain quantity of copper is still complexed. Therefore the amount of available copper in the claimed treatment solution is reduced in line with the disclosure of the application (see paragraphs [0010] and [0015]).

3. Auxiliary request 4 - Article 56 EPC, starting from D13
- 3.1 D13 relates to a pretreatment conversion composition for improving corrosion resistance and paint adhesion, see paragraphs [0002] to [0004] of D13.

3.2 Example 1 of D13 discloses a zirconium-based metal pretreatment coating composition comprising water, 173 ppm of zirconium, 217 ppm of complexed fluoride (10.5 g of a 45 wt.-% hexafluorozirconic acid solution equals 394 ppm of H_2ZrF_6 containing 173 ppm of Zr and 217 ppm of complexed fluoride), 22 ppm of free fluoride and 20 ppm of dissolved copper (17.57 g of a 5 wt.-% solution of copper nitrate hemipentahydrate with a molecular weight of 232.6 g/mol equals 73 ppm of said compound in the composition and results in 20 ppm of dissolved copper).

It is uncontested that the subject-matter of claim 1 of auxiliary request 4 differs from the disclosure of Example 1 of D13 in that the composition comprises 25 to 1500 ppm of a copper chelating agent comprising tartaric acid and/or salts thereof (features F1.8 and F1.8.1).

3.3 Example 2 demonstrates that the claimed effect (better paint adhesion) is linked to the presence of tartrate, since the compared pretreatment compositions presented in Table 3 differ from each other only by the presence of tartrate. Thus the board is convinced that Example 2 of the patent demonstrates that using a copper chelating agent comprising tartrate improves the paint adhesion to the treated metal parts, see Table 3, last column, of the patent.

Furthermore, Example 3 of the patent demonstrates that adding tartrate does not negatively impact the corrosion resistance obtained by the zirconium-based pretreatment coating (in contrast to adding triethanolamine (TEA) as a chelating agent, as illustrated by Example 4).

- 3.4 The appellant argued that these effects were not rendered credible, in particular not over the whole scope.
- 3.4.1 In a first line of argument, the appellant argued that the patent did not include a comparative example according to Example 1 of D13. The amounts of the components used in Example 2 of the patent differed from those used in Example 1 of D13. Furthermore, the composition of Example 2 of the patent did not contain certain ions, such as nitrate, that were present in the composition of Example 1 of D13. Therefore, in the appellant's view, Example 2 of the patent did not provide an adequate comparison with the closest prior art.

This argument is not convincing.

When assessing inventive step, the credibility of the alleged technical effect is to be considered. One way to demonstrate an effect is to provide experimental evidence. However, it is not necessary for a patent to contain examples that correspond exactly to those in any document that could be used as a starting point for assessing inventive step. Moreover, it is not even necessary to provide experimental evidence at all if the claimed effect is immediately apparent or rendered credible for a skilled person in other ways. For an effect to be considered credible, it is sufficient to demonstrate that it is based on the distinguishing feature. This is the case here, because Example 2 of the patent compares the paint adhesion of baked samples which have been treated with compositions which only differed by the presence of tartrate, see first column of Table 3 of the patent.

The fact that the composition of Example 1 of D13 contains the components in slightly different amounts from those in Example 2 of the patent does not call into question the results demonstrated in the patent. Likewise, the fact that alternative counter-ions or further active ingredients are present, without proof or concrete arguments to the contrary, does not invalidate the findings demonstrated in the patent. The appellant's general arguments, however, do not give rise to serious doubts regarding the effects demonstrated in Example 2 of the patent.

- 3.4.2 The appellant further argued that the patent did not disclose the composition of the pretreatment bath according to Example 3, i.e. the components used and their respective quantities. This meant that the results shown in Example 3 were meaningless and should not be taken into account.

The Board does not agree.

Example 3 of the patent compares compositions comprising tartrate with compositions which are otherwise identical apart from containing not tartrate but an alternative copper chelating agent. The results of Example 3 of the patent credibly show that using tartrate as a complexing agent does not negatively affect corrosion resistance.

In order to demonstrate this effect, it does not matter whether the composition used in Example 3 is the same as that in Example 2 and falls within the scope of claim 1 of auxiliary request 4 because there is no reason to doubt, and it has not been established by the appellant that, the demonstrated effect (no negative

impact on corrosion resistance) is not obtained under the conditions defined in claim 1.

3.4.3 The appellant also submitted that Example 1 of the patent (see Table 2) already demonstrated that very good corrosion resistance and paint adhesion could be obtained using a pretreatment composition that did not contain a copper chelating agent comprising tartaric acid and/or salts thereof. The pretreatment compositions in Examples 1 and 2 of the patent differed in terms of pH, as well as the amounts and ratios of active ingredients. The differences in paint adhesion observed between the comparative examples 2-1 and 2-2 (see Table 3) and samples 1 to 4 and 6 of Example 1 (see Table 2) could also result from these differences, for example in pH (Example 1: pH 4.2, Example 2: pH 4.0).

Moreover, it was not credible that tartaric acid and/or salts thereof would contribute to further improved paint adhesion when added to the pretreatment compositions of Example 1 (samples 1 to 4 and 6) which already achieved 100% paint adhesion.

These arguments are not convincing, either.

Example 1 of the patent is intended to demonstrate the effect of the baking temperature on the adhesion of the electrodeposited coating, see paragraph [0042]. As Example 1 aims to demonstrate a different effect from that demonstrated by Example 2, a comparison of Examples 1 and 2 is not required and the difference in compositions between the two examples is irrelevant.

Even if the appellant's arguments that the use of certain pretreatment compositions, such as samples 1 to

4 and 6 of Example 1 of the patent, resulted in coated steel sheets already showing good paint adhesion were accepted, this does not create doubts that adding tartrate can improve paint adhesion even further. Example 2 demonstrates that the claimed effect (better paint adhesion) is clearly linked to the presence of tartrate, since the compared pretreatment compositions presented in Table 3 differ from each other only by the presence of tartrate. This effect may be less pronounced for compositions that already achieve very good paint adhesion in a different manner. However, the fact that good paint adhesion can be achieved in different ways does not call into doubt that the effect demonstrated in Example 2, an improvement in paint adhesion, is achieved at all and over the whole breadth of the claim.

- 3.4.4 The appellant also argued that the claimed effect (better paint adhesion) was not achieved over the whole scope of protection because claim 1 encompassed embodiments where the amount of copper chelating agent was below the amount required for complexing all the copper in the composition (for example 20 ppm Cu and only 25 ppm tartrate).

This argument is not convincing either.

The patent is based on the finding that controlling and reducing the amount of readily available copper in the pretreatment composition improves paint adhesion (see paragraphs [0007], [0009], [0031], [0032] and [0050]).

Hence the copper chelating agent added to the composition will react with the available copper.

Even if the copper chelating agent is present in an amount below the minimum amount required to complex all the copper in solution, it still complexes some of the copper in the corresponding amount. Due to the dynamic binding, the presence of chelating agent influences binding rate and deposition rate of all the copper ions. Accordingly, a small amount of a copper chelating agent does not have the same effect as a reduced amount of copper ions without chelating agent. The presence of tartaric acid and/or salts thereof contributes to controlling and reducing the amount of copper deposition in the coating and thus contributes to an improvement in paint adhesion, as shown in Example 2 in the patent. This effect may be less pronounced if a relatively small amount of chelating agent is used, but it can nevertheless still be obtained.

- 3.5 In view of the above considerations, the Board concludes that the effects demonstrated in examples of the patent are credible over the whole breadth of the claim.
- 3.6 Starting from D13, the objective technical problem can therefore be formulated as being how to provide a metal pretreatment coating composition which achieves a coating providing improved paint adhesion without compromising corrosion resistance.
- 3.7 When faced with this objective technical problem, the skilled person will find no suggestion in D13 or the additionally cited prior-art documents D4, D7, D8, D10 and D15 to solve it by using a copper complexing agent comprising tartaric acid and/or salts thereof.
- 3.7.1 In fact, D13 proposes the use of a complexing agent, such as tartaric acid, to stabilise copper in solution,

thereby preventing precipitation of impurities (see paragraphs [0023] and [0025] of D13). D13 also proposes the addition of a water-soluble copper compound, for example in the form of copper tartrate ("copper tartarate", see paragraph [0022]). Furthermore, D13 proposes adding tartaric acid as a reaction accelerator (see paragraph [0041] of D13), an effect confirmed by the disclosure in D5 (see paragraph [0035]) and D2 (see column 6, lines 37 to 43).

However, these possible reasons for adding tartaric acid disclosed in D13 do not provide motivation for a skilled person seeking to solve the objective technical problem of improving the paint adhesion of the coating without compromising corrosion resistance.

More importantly, the skilled person would not consider the teachings in paragraphs [0023] and [0041] in combination with the examples of D13.

In these examples, copper is deliberately added as an active in the form of a salt (copper nitrate). Therefore paragraph [0023] of D13, which relates to impurities, would not provide an incentive for the skilled person to add tartrate to the compositions in the examples of D13 as the copper in these compositions is not an impurity.

The same applies in relation to the possible presence of a reaction accelerator in the examples of D13. The examples already contain nitrate, which is considered a reaction accelerator according to paragraph [0041] of D13. Consequently, the teaching in paragraph [0041] of D13 would not provide an incentive to add further tartrate to the compositions of the examples of D13 either.

Moreover, as the composition in the examples is prepared specifically from a solution of copper nitrate, the list of possible metal salts in paragraph [0022] does not encourage the skilled person to use a different salt, all the more so as there is no indication in D13 that adding copper in the form of copper tartrate may contribute to solving the objective technical problem.

Hence a skilled person starting from Example 1 of D13 would not have arrived at the claimed subject-matter in an obvious manner.

- 3.7.2 The further cited documents D4, D7, D8, D10 and D15 do not provide the necessary motivation or incentive to add tartaric acid and/or salts thereof to solve the objective technical problem either, as they propose using tartaric acid or its salts for different purposes.

D4 and D7 reveal that adding tartaric acid or a salt thereof provides additional benefits, at least when preparing the composition with hard domestic and industrial water supplies, see D4 (page 12, line 33 to page 13, line 17, in particular page 13, line 10) and D7 (column 8, line 65 to column 9, line 25, in particular column 9, line 16). Tartaric acid is thus added as a complexing agent for calcium and magnesium and not to solve the objective technical problem of the present invention.

Paragraph [0027] of D8 states that tartaric acid can improve the stability of pretreatment compositions and can further promote the cross-linkability (insolubility) of a coating formed on the surface of a

metal material. While the patent also suggests improved stability of the pretreatment bath (see paragraph [0050], last sentence), this is not the effect on which the objective technical problem is based. Furthermore, the improved insolubility of the coating does not correspond to improved adhesion of paint to the coating as in the objective technical problem either. Hence the effects disclosed in D8 do not relate to the objective technical problem and do not suggest that the paint adhesion could be improved by adding tartaric acid and/or its salts.

Paragraph [0059] of D10 explains that tartaric acid can be added as a chelating agent to chelate the metal ions dissolved out by the etching reaction of the solution when the load of the metal material to be treated is high for the treatment liquid. Hence this effect is unrelated to the application of a coating as in the present invention.

D15 (see paragraph [0028]) relates to a different type of pretreatment composition (not zirconium-based but vanadium-based) and merely discloses that the addition of tartaric acid to pretreatment compositions comprising vanadium cations and vanadyl cations is believed to secondarily impart corrosion resistance to metallic components.

Therefore the information provided in these documents would not provide an incentive for the skilled person to solve the objective technical problem by adding tartaric acid and/or its salts to the compositions in the examples of D13.

3.8 In summary, the Board concludes that the subject-matter of claim 1 of auxiliary request 4 is not obvious starting from D13.

4. Auxiliary request 4 - Article 56 EPC, starting from D6

4.1 According to the title and lines 6 to 8 of column 1 of D6, D6 relates to a chromium-free conversion coating treatment of aluminium to protect it against corrosion, i.e. the same general technical field as in the patent, bearing in mind that claim 1 is not limited to coatings for a particular metal.

The zirconium-based metal pretreatment coating composition according to Example 8 of D6 comprises 600 mg/l ZrF_6^{3-} (equivalent to 264 ppm of dissolved Zr and 330 ppm of complexed fluoride), 70 ppm HF (free fluoride), 300 ppm of gluconate, and water.

4.2 D6 does not list copper as a constituent of the conversion coating composition. The Board considers that any copper residues present in the water used to prepare the composition would be significantly less than the amount specified in claim 1. Therefore the composition of D6 does not contain copper in that amount.

4.3 It is thus undisputed that the subject-matter of claim 1 differs from the pretreatment composition disclosed in Example 8 of Table 1 of D6 in that

- the copper chelating agent comprises tartaric acid and/or salts thereof (feature F1.8.1) and
- the composition comprises 20 to 50 ppm of dissolved copper (feature F1.4).

4.4 The appellant argued that these distinguishing features were independent of each other, and that an independent partial problem could be identified for each distinguishing feature. Feature F1.8.1 was specifically about tartaric acid and/or salts thereof, rather than the presence of a copper chelating agent (because gluconate present in the solution of D6 already represented a copper chelating agent). There was thus no link between the presence of this component and copper, apart from its copper chelating activity (which was, however, not part of the distinguishing features). Accordingly, the two distinguishing features could be considered separately.

4.5 This argument is not convincing.

4.5.1 Gluconate is indeed a copper chelating agent, regardless of whether the composition in D6 contains copper. Therefore feature F1.8 does not represent a distinguishing feature.

However, since the pretreatment compositions in Examples 1, 2 and 8 of D6 do not contain copper, and the function of gluconate in these compositions is not specified (it is only stated to be a "potential" component, see column 5, lines 38 to 41), its specific function as a copper chelating agent in the context of claim 1 cannot be disregarded when determining whether the distinguishing features are functionally linked, or whether they are unrelated or independent of each other and thus solve independent problems.

4.5.2 Moreover, according to the patent, tartaric acid and/or salts thereof are used to control and reduce the amount of copper deposition in the coating, thereby contributing to improved paint adhesion, see

paragraphs [0030] and [0031]. Therefore tartaric acid and/or salts thereof as a copper chelating agent according to feature F1.8.1 is/are functionally linked to the presence of dissolved copper in the pretreatment composition (feature F1.4).

- 4.5.3 It follows that the two distinguishing features and their ingredients are not unrelated or independent of each other, and they cannot be considered separately for inventive step, i.e. whether they involve an inventive step cannot be established based on whether each feature is separately obvious in the light of the prior art, see Case Law, Chapter I.D.9.3.2.

Accordingly, the question is not whether the skilled person would have solved two distinct problems, namely

- by adding copper to the composition of D6 to improve corrosion resistance and adhesion properties, as submitted by the appellant by reference to D2 (column 4, lines 28 to 38), D5 (paragraph [0014]), D11 (page 25, table 5) and D14 (page 20, last paragraph), and
- by exchanging gluconate for tartrate as a mere alternative.

Instead, the question is whether the skilled person would have been motivated to add both copper and tartaric acid and/or salts thereof together in order to solve an objective technical problem which is formulated by taking both distinguishing features into account.

- 4.6 Examples 2 to 4 demonstrate that using tartrate as a chelating agent in a copper-containing pretreatment composition improves paint adhesion to the treated metal parts (see Example 2) without adversely affecting

the corrosion properties (compare Examples 3 and 4). According to paragraph [0034] of the patent, the Cu/Zr ratio should be as low as 0.3 to 0.1. While the pretreatment compositions according to Example 2 of the patent do not achieve a ratio that low (see Table 3), the pretreatment compositions comprising tartrate nevertheless achieve a coating with improved paint adhesion compared with compositions which are otherwise identical apart from containing no tartrate, see also the discussion above in points 3.3 and 3.4.

4.7 In view of these experimental results and in line with the appellant's arguments regarding the motivation to add copper (based on D2 (column 4, lines 28 to 38), D5 (paragraph [0014]), D11 (page 25, table 5) and D14 (page 20, last paragraph)) and the general problem underlying the patent (see paragraphs [0007] and [0008]), the objective technical problem starting from D6 may be formulated as being how to provide a conversion coating composition providing a coating with improved corrosion resistance and paint adhesion.

4.8 Confronted with this objective technical problem, the skilled person has no reason to add copper to the composition of Example 8 of D6 together with tartaric acid and/or salts thereof.

The skilled person could have added copper for the reasons submitted by the appellant (see point 4.5.3 above) and could also have added tartaric acid and/or salts thereof. However, there is no reason why the skilled person not only "could" but "would" have made both modifications to the composition of Example 8 of D6 in the absence of any motivation to that effect. This is because neither D6 nor the other cited documents disclose

- the potential problems with paint adhesion that arise from the presence of copper in the pretreatment composition (see comparative examples in Table 3 of the patent) and
- the possible solution to improve the paint adhesion of coatings obtained from a copper-containing pretreatment composition (namely, to control and, if necessary, reduce the amount of copper by using a complexing agent comprising tartaric acids and/or salts thereof) while not compromising the corrosion resistance (see examples 2 and 3 of the patent).

Nor is there any reason to add copper to the composition of Example 8 of D6 and in addition to replace gluconate with tartrate as argued by the appellant simply because gluconate and tartrate are both polyhydroxycarboxylic acid salts and are also known to function as chelating agents, see D4 (page 13, lines 9-10), D7 (column 9, lines 14-16), D10 (paragraph [0059]) and D15 (paragraph [0028]).

This is because D6 does not disclose the function of gluconate in the exemplified compositions (gluconate is only stated to be a "potential" component, see column 5, lines 38 to 41 of D6). In particular, the skilled person would not understand the function of gluconate in this specific composition to be one of a copper chelating agent, since none of the compositions of D6 contain copper. Hence, when starting from Example 8 of D6, the skilled person has no reason to consider known alternative polyhydroxycarboxylic acid salts in order to solve the objective technical problem.

4.9 As set out above in point 3.7.2, the further cited documents D4, D7, D8, D10 and D15 do not provide the necessary motivation or incentive to both add copper to

the composition of Example 8 of D6 and replace gluconate with tartrate either. This is because they propose using tartaric acid and/or salts thereof for purposes other than those disclosed in the patent.

4.10 In view of the above, the Board concludes that the subject-matter of claim 1 is not obvious when starting from D6 either.

5. In summary, the ground for opposition under Article 100(a) EPC in combination with Article 56 EPC does not prejudice maintenance of the patent in amended form on the basis of auxiliary request 4.

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 with the following claims and a description to be adapted thereto:

Claims:

No. 1 in accordance with auxiliary request 4 filed with the letter of 20 October 2025.

The Registrar:

The Chairman:



D. Grundner

F. Bostedt

Decision electronically authenticated