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**Datasheet for the decision
of 24 June 2015**

Case Number: T 0119/12 - 3.3.05

Application Number: 02718909.1

Publication Number: 1362015

IPC: C03C17/36

Language of the proceedings: EN

Title of invention:

LOW-E MATCHABLE COATED ARTICLES AND METHODS OF MAKING SAME

Patent Proprietor:

GUARDIAN INDUSTRIES CORP.

Opponent:

SAINT-GOBAIN GLASS FRANCE

Headword:

Coated article/GUARDIAN

Relevant legal provisions:

EPC Art. 100(a), 100(b), 54(1), 54(2), 56, 100(c), 123(2), 83
RPBA Art. 13(1), 13(3)

Keyword:

Grounds for opposition - added subject-matter (no) -
insufficiency of disclosure (no)
Inventive step - main request (no)
Late-filed auxiliary requests - admitted (yes)
Amendments - auxiliary request 0a - allowable (no) -
auxiliary request 0a' - allowable (yes)
Novelty - auxiliary request 0a' (yes)
Inventive step - auxiliary request 0a' (yes)
Request to continue the proceedings in writing - rejected

Decisions cited:

T 0942/06, T 0182/89, T 0119/82, T 0014/83

Catchword:



**Beschwerdekammern
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Case Number: T 0119/12 - 3.3.05

**D E C I S I O N
of Technical Board of Appeal 3.3.05
of 24 June 2015**

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 23 November
2011 rejecting the opposition filed against
European patent No. 1362015 pursuant to Article
101(2) EPC.**

Composition of the Board:

Chairman G. Raths
Members: A. Haderlein
P. Guntz

Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the decision of the opposition division rejecting the opposition against patent No. 1 362 015. The patent in suit concerns low-E matchable coated articles and methods of making the same.
- II. The opposition division held that the grounds for opposition mentioned in Article 100(c), 100(b) and 100(a) in conjunction with Articles 52(1), 54 and 56 EPC did not prejudice the maintenance of the patent as granted, having regard to the following documents in particular:
- D1: US 5 376 455 A
D4: US 4 800 933 A
D5: US 6 014 872 A
D6: EP 0 771 766 A1
- III. With the statement setting out the grounds for appeal, the appellant filed the following documents:
- D8: EP 0 456 487 A2
D9: Technical Report dated 29 December 2008
D10: Technical Report dated 21 July 2006
D12: Declaration by Mr. Jribi.
- IV. In reply to the statement of the grounds of appeal, the respondent (patentee) filed nine auxiliary requests.
- V. The board issued a communication containing its preliminary, non-binding opinion.

- VI. In reply to the board's communication, the respondent filed further auxiliary requests 0a to 9a.
- VII. At the oral proceedings that took place before the board on 24 June 2015, the appellant filed further auxiliary requests including auxiliary request 0a'.
- VIII. The wording of the claims relevant for the present decision is as follows.

Claim 1 of the main request - patent as granted:

"1. A coated article comprising a layer system supported by a glass substrate (1), said layer system comprising from said glass substrate outwardly:

- a. a first dielectric layer (3) including silicon nitride having a thickness of 300-380 Å;
- b. a first Ni or NiCr inclusive layer (5) having a thickness of 20-150 Å;
- c. an infrared (IR) reflecting layer comprising silver (7) having a thickness of 40-120 Å;
- d. a second Ni or NiCr inclusive layer (9);
- e. and a second dielectric layer including silicon nitride (11) having a thickness of 400-500 Å, characterized in that
- f. the coated glass substrate has a ΔE^* value (glass side) no greater than 2.5 after or due to heat treatment; and
- g. said second Ni or NiCr inclusive layer (9) has a thickness of 20-150 Å."

Claim 1 of auxiliary request 0a (amendments with respect to the main request being underlined):

"1. A coated article comprising a layer system supported by a glass substrate (1), said layer system

comprising from said glass substrate outwardly:

- a. a first dielectric layer (3) including silicon nitride having a thickness of 300-380 Å;
- b. a first Ni or NiCr inclusive layer (5) having a thickness of 20-150 Å;
- c. an infrared (IR) reflecting layer comprising silver (7) having a thickness of 40-120 Å;
- d. a second Ni or NiCr inclusive layer (9);
- e. and a second dielectric layer including silicon nitride (11) having a thickness of 400-500 Å, characterized in that
- f. the coated glass substrate has a ΔE^* value (glass side) no greater than 2.5 after or due to heat treatment; and
- g. said second Ni or NiCr inclusive layer (9) has a thickness of 20-150 Å,

wherein heat treatment means heating the coated article to a temperature above 550°C and for a sufficient period of time to enable thermal tempering, bending, or heat strengthening of the coated article."

Independent claims 1, 13 and 16 of auxiliary request 0a' (zero a prime) (amendments with respect to the main request being underlined):

"1. A coated article comprising a layer system supported by a glass substrate (1), said layer system comprising from said glass substrate outwardly:

- a. a first dielectric layer (3) including silicon nitride having a thickness of 300-380 Å;
- b. a first Ni or NiCr inclusive layer (5) having a thickness of 20-150 Å;
- c. an infrared (IR) reflecting layer comprising silver (7) having a thickness of 40-120 Å;
- d. a second Ni or NiCr inclusive layer (9);
- e. and a second dielectric layer including silicon

nitride (11) having a thickness of 400-500 Å,
characterized in that
f. the coated glass substrate has a ΔE^* value (glass side) no greater than 2.5 after or due to heat treatment; and
g. said second Ni or NiCr inclusive layer (9) has a thickness of 20-150 Å,
wherein heat treatment means heating the coated article to a temperature above 593°C and for a sufficient period of time to enable thermal tempering of the coated article."

"13. A method of making a coated article, comprising the steps of depositing on a glass substrate (1), from said glass substrate outwardly:
a. a first dielectric layer (3) including silicon nitride having a thickness of 300-380 Å;
b. a first Ni or NiCr inclusive layer (5) having a thickness of 20-150 Å;
c. an infrared (IR) reflecting layer comprising silver (7) having a thickness of 40-120 Å;
d. a second Ni or NiCr inclusive layer (9);
e. and a second dielectric layer including silicon nitride (11) having a thickness of 400-500 Å,
f. wherein prior to heat treatment the glass substrate with the layer system thereon has a sheet resistance R_s no greater than 20 ohms/square,
characterized in that
g. the coated glass substrate has a ΔE^* value (glass side) no greater than 2.5 after or due to heat treatment; and
h. said second Ni or NiCr inclusive layer (9) has a thickness of 20-150 Å,
wherein heat treatment means heating the coated article to a temperature above 593°C and for a sufficient period of time to enable thermal tempering of the coated

article."

"16. An insulating glass (IG) window unit comprising first (1,21) and second (23) glass substrates sealed together proximate their respective peripheral edges so as to form an insulating space (30) therebetween, a layer system supported by one of said glass substrates to form a monolithic unit proximate said insulating space, said layer system of the monolithic unit comprising from said glass substrate outwardly:

- a. a first dielectric layer (3) including silicon nitride having a thickness of 300-380 Å;
- b. a first Ni or NiCr inclusive layer (5) having a thickness of 20-150 Å;
- c. an infrared (IR) reflecting layer comprising silver (7) having a thickness of 40-120 Å;
- d. a second Ni or NiCr inclusive layer (9);
- e. and a second dielectric layer including silicon nitride (11) having a thickness of 400-500 Å, characterized in that
- f. the monolithic unit has a ΔE^* value (exterior or outside) no greater than 2.5 after or due to heat treatment; and
- g. said second Ni or NiCr inclusive layer (9) has a thickness of 20-150 Å,

wherein heat treatment means heating the coated article to a temperature above 593°C and for a sufficient period of time to enable thermal tempering of the coated article."

Claims 2 to 12, 14, 15 and 17 to 19 represent particular embodiments of the subject-matter of claims 1, 13 and 16, respectively, on which they depend.

IX. The appellant argued essentially as follows:

Main request - Article 100(c) EPC

The expression "comprising silver" in claim 1 led to subject-matter that extended beyond the content of the application as filed. Claim 1 as granted was based on originally filed claims 2 and 14. Claims 1 and 14 as filed referred to "silver layer" and not to a layer "comprising silver". The description as originally filed failed to give a basis for this amendment. In particular, the passage from page 6, line 20, to page 7, line 8, was not linked with any of the claims originally filed and specifically related to a layer system having a thickness of 1 to 12 mm. It therefore related to a different invention from the one claimed in the claims of the patent. The feature "a ΔE^* value (glass side) no greater than 2.5" was disclosed only in combination with an IR reflective layer made of silver. Thus, the feature "comprising silver" led to added-subject matter in the sense of Article 100(c) EPC.

The expression "a ΔE^* value (glass side)" led to added-subject matter. This feature was ambiguous as it contained an expression between brackets. Also, claim 32 as originally filed required that the ΔE^* value of the insulating glass (IG) unit was within a certain range, whereas in the corresponding claim 16 of the granted patent it was the ΔE^* value of the monolithic unit that was referred to. Thus, for this reason too the subject-matter of the claims as granted was not contained in the application as filed.

Main request - sufficiency of disclosure

It was not clear whether examples 1 to 4 were according

to one or more of the claims of the patent as granted. In particular, features (b) and (g), i.e. the thicknesses of the first and second Ni or NiCr inclusive layers, were not indicated in the examples. There was no basis for the opposition division's conclusion that it was not reasonable to surmise that the thicknesses defined in the claims would not be respected when the procedure as set out in the examples was carried out. The claims encompassed embodiments wherein the first and second Ni or NiCr inclusive layers were of a thickness such that a sufficiently transparent window as claimed in claims 16 and 19 could not be obtained as evidenced by D12. According to D12 it was not possible to reproduce the examples given in the patent in suit because the thicknesses of the layers thereof were not indicated. Also, it was difficult to obtain the equipment used in the examples, leading to an additional burden for the skilled person trying to carry out the invention. But even when using this equipment, the skilled person was aware that various parameters needed to be adjusted. The patent was however silent about these parameters. In case T 942/06, the competent board had held that the patent lacked sufficient disclosure. This case was similar to the present one.

Main request - novelty

D1 was novelty-destroying for the subject-matter of claim 1. D1 disclosed a range of at least 7 Å for the second Ni or NiCr inclusive layer and thus covered the range of 20 to 150 Å of claim 1. Although not explicitly stated in D1, the effective upper limit of the range of at least 7 Å was 150 Å. Thus, the claimed range of 20 to 150 Å was not narrow in comparison with the range known from D1, nor was its lower limit

sufficiently far removed from the lower limit known from D1. Moreover, the skilled person, when studying the general disclosure and the example of D1, would seriously contemplate thicknesses of 20 Å and more.

D4 to D6 disclosed all the features of claim 1. In particular, the passage in column 11, lines 39 *et seqq.*, of D4 and corresponding passage in column 11, lines 49 *et seqq.*, of D5 disclosed ranges for the first and second Ni or NiCr inclusive layers which completely encompassed the respective ranges of claim 1. A similar reasoning applied in view of the table on page 8 of D6.

The passages on page 3, lines 5 *et seqq.* and lines 36 *et seqq.*, of D8 also anticipated the subject-matter of claim 1.

Main request - inventive step

D1 represented the closest prior art. The subject-matter of claim 1 differed from the disclosure of D1 in the thickness of the second Ni or NiCr inclusive layer. The feature relating to the ΔE^* value constituted a result to be achieved. The respondent had failed to show that this result was achieved over the whole scope claimed. Therefore, this feature did not constitute a difference over D1 and was to be disregarded when assessing inventive step. It was obvious to thicken the Ni or NiCr inclusive layers in order to decrease the variation in colour, i.e. in order to achieve a better matchability. Moreover, the passage in column 13, lines 59 to 65, of D1 constituted a hint for the skilled person to thicken the second Ni or NiCr inclusive layer. The skilled person was not dissuaded by the above passage from thickening the second Ni or NiCr inclusive layer, since claim 1 of the patent in suit

did not exclude coated articles having a rather low transmissivity. There was also a hint to increase the second Ni or NiCr inclusive layer in the passage in column 8, lines 1 *et seq.*, of D1. Concerning the problem to be solved suggested in the patent in suit, i.e. improved matchability, this problem was already solved in D1. In D1, the variation in colour was already very low, as evidenced by table 5 of D1. Furthermore, D9 showed that a small variation in colour was also obtainable by the Ni or NiCr inclusive layers having thicknesses below those claimed and below those disclosed in D1. D10 showed that there was no link between matchability and the thickness of the Ni or NiCr inclusive layers because it was possible to obtain ΔE^* values not above 2.5 with thicknesses below the respective ranges of claim 1. In view of a reformulated problem, i.e. the provision of an alternative coated article, the subject-matter of claim 1 was obvious, since the skilled person could have thickened the second Ni or NiCr inclusive layer. Faced with the problem of providing an alternative, the skilled person would have increased the thickness of the second Ni or NiCr layer also in view of D4 or D8.

Auxiliary request 0a - Article 123(2) EPC

Apart from being late-filed, the amendment to the independent claims was not disclosed in the application documents as filed and led to non-compliance with Article 123(2) EPC.

Auxiliary request 0a' - admissibility

There was no reason to file this request late, i.e. only at the oral proceedings. Moreover, the amendment carried out did not overcome the objection of lack of

inventive step. Therefore, this request should not be admitted into the proceedings.

Auxiliary request 0a' - inventive step

There was a lack of inventive step for the same reasons as for the main request. The amendment carried out did not constitute any restriction as it encompassed temperatures which were common in the art when subjecting a glass substrate to tempering. For instance, D1 disclosed a temperature of 665°C for the heat treatment. The temperatures used for the tests of D10 were about 600°C.

The appellant's request to continue the proceedings in writing and to set a time limit for making further submissions

In view of the board's preliminary opinion, announced at the oral proceedings, that auxiliary request 0a' was allowable, the appellant became aware that the board considered the amendment relating to the temperature of the heat treatment to be decisive for the board's opinion. This had not been apparent to the appellant in the proceedings before the point in time where, at the oral proceedings, the chairman informed the parties of the board's preliminary opinion, i.e. that auxiliary request 0a' was allowable. It was necessary for the appellant to carry out further experiments.

X. The respondent argued essentially as follows:

Main request - Article 100(c) EPC

The expression "comprising silver" was fully supported in the originally filed documents. In particular,

page 6, lines 20 *et seqq.*, disclosed the feature "IR reflecting silver (Ag) inclusive layer" which, in the section following the above passage, was referred to simply as "IR reflecting Ag layer 7". The passage on page 9 including Table 1 explicitly referred to Figure 1. The above passage on page 6 also referred to Figure 1. Hence, the feature "comprising silver" did not lead to added subject-matter.

The objection relating to the ΔE^* value was unfounded.

Main request - sufficiency of disclosure

The burden of proof for lack of sufficiency of disclosure was with the appellant in accordance with T 182/89. The appellant had not discharged this burden. There were no reasons to assume that the examples in the patent in suit were not according to the independent claims. Concerning the newly raised objection with respect to claims 16 and 19, the term "window" did not exclude coating systems having a rather low transmissivity. Even if the skilled person had no access to the equipment mentioned in the patent, he was able to appropriately configure a different sputter coater. There was ample information in paragraphs 0028 and 0038 to 0040 to carry out the invention.

Main request - novelty

None of the documents D1, D4 to D5 and D8 disclosed the subject-matter of any of the independent claims. In particular, the feature relating to the ΔE^* value was a distinctive feature and was not only a feature which was implicitly resulting from the other parameters set in the claimed ranges.

Main request - inventive step

D1 disclosed neither feature (f) nor feature (g). The term "heat treatment" in the sense of the present invention did not mean a marginal heating of the coated article. In the patent in suit in paragraph 0041 a temperature of about 685°C was used, which could substantially alter the colour characteristics of the coated article. The term "heat treatment" was defined in paragraph 0064 of the patent in suit, i.e. it implied a sufficiently high temperature close to but still slightly below the softening temperature of the glass. Tempering, bending or heat strengthening carried out at any given temperature during any given time on the coated article known from D1 would always result in a ΔE^* value above 2.5. As was clear from the passage in column 3, lines 19 *et seqq.*, of D1, the term "heat-treatable" defined therein did not imply that the colour characteristics were not altered. The passage in column 5, lines 53 *et seqq.*, needed to be seen in the context of this definition. The passage from column 5, penultimate line, to column 6, line 54 *et seqq.*, related to prior-art coating systems discussed in D1. From these passages it could not be concluded that the colour characteristics of the layer system of D1 would not substantially be altered when subjecting it to rather low temperatures. The problem to be solved was to improve color matchability and to improve durability. This problem was indeed solved. Thus, the findings of T 119/82 did not apply. Without having recognised the unexpected advantage, the person skilled in the art would, when starting from D1, not thicken the upper Ni or NiCr inclusive layer, since this would lead to increased processing time and consumption of sputtering material. Thus, the skilled person would not have arrived at the claimed solution in an obvious way.

Auxiliary request 0a - Article 123(2) EPC

The basis for the amendment in auxiliary request 0a could be found on page 34, lines 25 to 30, of the application as filed.

Auxiliary request 0a' - admissibility

This request was filed at the oral proceedings in reaction to the board's preliminary opinion that auxiliary request 0a did not comply with Article 123(2) EPC. Request 0a had been filed in order to react to the preliminary opinion that the board had expressed in its communication pursuant to Article 15(1) RPBA. In this communication the board was of the opinion that the feature relating to the ΔE^* value appeared to be implicitly disclosed in D1. For these reasons, auxiliary request 0a' should be admitted into the proceedings.

Auxiliary request 0a' - inventive step

The feature relating to the ΔE^* value was not disclosed in D1. Consequently, the subject-matter of claim 1 differed from the disclosure of D1 in two features, i.e. features (f) and (g) of claim 1. These were not hinted at by the prior art. The subject-matter of independent claims 1, 13 and 16 therefore involved an inventive step.

The appellant's request to continue the proceedings in writing and to set a time limit for making further submissions

The appellant was of the opinion that auxiliary request 0a' did not meet the requirements of inventive step for

the same reasons as for the main request. Thus, according to the respondent, there was no reason to continue the proceedings in writing.

XI. Requests

The appellant requested that the decision be set aside and that the patent be revoked. It also requested that the proceedings be continued in writing and that a time limit be set for making further submissions.

The respondent requested that the appeal be rejected and, in the alternative, that the patent be maintained in amended form based on one of auxiliary requests 0a or 0a' or on one of the further auxiliary requests submitted during the written and oral proceedings.

Reasons for the Decision

1. Main request - patent as granted - Article 100(c) EPC
- 1.1 The feature "comprising silver"
 - 1.1.1 According to the appellant, the presence of the feature "comprising silver" in independent claims 1, 13 and 16 resulted in subject-matter not disclosed in the application documents as originally filed.
 - 1.1.2 The board notes that the originally filed claims, in particular claim 14 as filed, referred to "silver layer" rather than to a "layer comprising silver". But it notes that in the passage of the description relating to Figure 1, i.e. page 6, line 20, to page 8, line 21, the expressions "IR reflecting silver (Ag) inclusive layer 7" and "IR reflecting Ag layer 7" are used interchangeably. The expression "silver inclusive

layer 7" is thus clearly to be considered synonymous with "layer 7 comprising silver". In the passage on page 9, lines 8 *et seqq.* including Table 1, which discloses the ranges now claimed in the independent claims, reference is made to Figure 1. In Table 1, layer 7 is designated as "Ag (layer 7)". These passages therefore provide a clear basis for the replacement of the expression "silver layer" by the expression "layer comprising silver".

- 1.1.3 The fact that the passage on page 6, line 20, to page 7, line 8, was not linked with any of the claims originally filed, as submitted by the appellant, supports the view taken by the board that this passage is to be considered part of the general disclosure of the application as filed and, therefore, can be combined with the other features present in the independent claims.

The board also does not agree with the appellant that the embodiment depicted in Figure 1 necessarily required a thickness of 1 to 12 mm, since these thicknesses are said to be optional (cf. "(e.g. (sic), clear...)" in lines 21 *et seqq.* of page 6).

The board is also not convinced that the feature "a ΔE^* value (glass side) no greater than 2.5" was only disclosed in combination with an IR reflective layer made of silver, the latter expression implying a layer consisting of silver. Indeed, in a further passage relating to the general disclosure of the patent application as filed, i.e. Table 3 on page 14, the " ΔE^* value (glass side)" is preferably no greater than 2.5.

- 1.1.4 Thus, the board concludes that the feature "comprising silver" does not result in the subject-matter of the

patent extending beyond the content of the application as filed.

1.2 The feature " ΔE^* value (glass side)"

1.2.1 According to the appellant the application as filed related to the " ΔE^* value" when viewed from the glass side. The claims as granted contained the expression "glass side" in brackets. Since expressions in brackets were optional, the granted claims extended to coated articles wherein the requirement of the " ΔE^* value" did not need to be complied with when viewed from the glass side.

1.2.2 The board notes that even assuming that the expression " ΔE^* value (glass side)" included an ambiguity, this ambiguity was already present in the application documents as filed (see for instance page 4, line 14; page 5, line 10) and in particular in the claims as filed (see independent claims 1, 17, 23 and 27).

1.2.3 It is true, as submitted by the appellant, that claim 32 as originally filed required that the ΔE^* value of the insulating glass (IG) unit was within a certain range whereas in the corresponding claim 16 of the granted patent it is the ΔE^* value of the monolithic unit which is referred to. The application as filed however directly and unambiguously discloses IG units including a monolithic unit showing the corresponding ΔE^* value. For instance, as stated on page 5, last paragraph, of the application as filed, the monolithic unit of Figure 1, which relates to a general disclosure of the invention as stated above, can be used in an IG unit. Also, Table 8 compares examples 1 to 4 once in a monolithic state and then incorporated in an IG unit, implying that the

monolithic units of the invention can generally be used in an IG unit.

- 1.2.4 Thus, the board concludes that the feature relating to the ΔE^* value does not result in the subject-matter of the patent extending beyond the content of the application as filed.
- 1.3 In view of the above and considering that the appellant did not raise any other objections under the provisions of Article 100(c) EPC, the board concludes that the subject-matter of the claims of the patent as granted does not extend beyond the content of the application as filed.
2. Main request - sufficiency of disclosure
 - 2.1 It is generally the opponent, i.e. the appellant in the present case, that bears the burden of proof of an alleged lack of sufficiency of disclosure (see in particular T 182/89, Reasons 2, third paragraph).
 - 2.2 According to the appellant, it was not clear whether examples 1 to 4 were according to one or more of the claims of the patent as granted. In particular, features (b) and (g), i.e. the thicknesses of the first and second Ni or NiCr inclusive layers, were not indicated in the examples.

The board is not convinced by this argument. According to the established jurisprudence, when assessing compliance with the requirement of sufficiency of disclosure the whole information content of the patent in suit must be taken into account and not only a part of it such as the examples (cf. T 14/83, Reasons 3). It is therefore not sufficient to argue that the examples

given in the patent in suit do not indicate the thicknesses of the respective layers. The board notes in this respect that these thicknesses are not only indicated in the independent claims, but are also stated in Table 1 on page 4 of the patent.

- 2.3 According to the appellant, it was difficult to obtain the equipment used in the examples, leading to an additional burden for the skilled person trying to carry out the invention. But even when using this equipment, the skilled person was aware that various parameters needed to be adjusted. The patent was however silent about these parameters.

In this respect the board notes that there is nothing in the patent in suit that would indicate that the specific sputter coaters mentioned in paragraphs 0039 and 0040 were essential for the invention to be carried out and that the coated articles could only be obtained using these specific ones. Also, other sputter coaters were and are available to the skilled person (cf. D1, column 12, lines 39 et seq.). Hence, the question whether it is difficult to have access to the specific sputter coaters mentioned in the patent in suit is irrelevant for assessing sufficiency of disclosure. Likewise, although the parameters to be adjusted may be considered numerous, in view of the cited prior art it is clear that the skilled person, at the effective date of the patent in suit, was able to produce coated articles having the respective thicknesses as indicated in the independent claims. The skilled person was also able to analyse the articles for their respective ΔE^* values. As even indicated on page 5, third paragraph from the bottom, of declaration D12, in order to verify if he actually had arrived at the claimed invention, all the skilled person needed to do was to effectively

deposit a layer system having the indicated thickness and measure the colour in reflection before and after heat treatment.

- 2.4 The appellant's argument that the claims encompassed embodiments that were not sufficiently transparent for a window as claimed in claims 16 to 19 to be obtained is also not convincing. The transmissivity not being indicated, these claims also encompass embodiments having a rather low transmissivity.
- 2.5 Turning now to D12, the board finds this declaration to be insufficient as evidence that there was non-compliance with the requirement of sufficiency of disclosure. In items 1 to 4, the author of the declaration essentially states that the examples could not be reproduced because of the alleged lack of information on the thicknesses of the respective layers. For the board, this argument is not convincing for the reasons set out *supra* at 2.2. In item 5, first paragraph, of D12, the author himself states that the invention could be carried out by referring to Table 1 of the patent (see page 3, penultimate paragraph). Finally, as mentioned *supra* at 2.3, according to D12 in order to determine the ΔE^* value, the skilled person had to effectively deposit a layer system having the indicated thickness and measure the colour in reflection before and after heat treatment. That the skilled person was able to carry out such heat treatment and these measurements was not contested by the appellant.
- 2.6 In support of its objection as to lack of sufficiency of disclosure, the appellant referred to decision T 942/06, decided by this board in a different composition. The case underlying that decision is

however substantially different from the case at hand, and therefore it cannot be concluded from that decision that the patent in suit does not comply with the requirement of sufficiency of disclosure. Independent claim 1 of the case underlying T 942/06 contained no fewer than four parameters, and independent claim 18 even contained five parameters. According to the then competent board, at least some of these parameters were in mutual conflict, and since the description did not contain sufficient guidance, there was a lack of sufficiency of disclosure (T 942/06, Reasons 3.2.3).

In the case at hand, however, only one parameter is contained in independent claim 1, i.e. the feature relating to the ΔE^* value. Thus, difficulty over mutual conflict between parameters does not arise in independent claim 1 of the patent in suit. This reasoning applies *mutatis mutandis* to the other independent claims.

2.7 For the above reasons, the board concludes that the appellant did not discharge its burden of proof. The requirements of sufficiency of disclosure (Article 100(b) EPC) are therefore met.

3. Main request - novelty

Since the main request does not comply with the requirements of inventive step (see at 4. *infra*), there is no need to address the appellant's objection with respect to the requirement of novelty.

4. Main request - inventive step

4.1 Invention

The invention is directed to a coated article comprising a layer system supported by a glass substrate (claim 1), a method of making a coated article (claim 13) and an insulating glass window unit (claim 16).

4.2 Closest prior art

4.2.1 The board agrees with the parties that D1 is to be considered the closest prior art. More specifically, the board considers the embodiment disclosed in column 18, lines 11 to 16, to constitute the closest prior art since it discloses a layer system in which the second NiCr layer is "about 15 Å" thick, i.e. a value coming closest to the required minimum value of 20 Å in claim 1.

4.2.2 It has not been disputed that the features of the preamble, i.e. features (a) through (e), are disclosed in D1 in combination (*loc. cit.*).

The board also agrees with the respondent in that feature (g), i.e. the second Ni or NiCr layer having a thickness of 20-150 Å, is not disclosed in D1.

With respect to feature (f), i.e. the feature relating to the ΔE^* value, the board comes to the conclusion that it cannot be considered a distinguishing feature with respect to D1 for the purposes of assessing inventive step for the following reasons.

- (a) According to feature (f), "the coated glass substrate has a ΔE^* value (glass side) no greater than 2.5 after or due to heat treatment". The board construes this as referring to a coated article that, if subjected to heat treatment, would show a ΔE^* value on its glass side, calculated as stated in paragraph 0034 of the patent in suit and using values measured before and after heat treatment (see in particular page 6, lines 22 to 24, of the patent in suit).

The board notes that the term "heat treatment" is not defined in claim 1. In particular, this term is not restricted to the heat treatment described in paragraph 0041 of the patent in suit. The board however acknowledges that in the context of the patent in suit the skilled person would understand by this expression that the article can be heated to a temperature sufficient to enable thermal tempering, bending or heat strengthening (cf. paragraph 0064 of the patent). But this feature is not restricted to a treatment at a specific temperature and in particular not to a heat treatment at the temperatures mentioned in paragraph 0064 of the patent (cf. "This definition includes, for example (sic)..." in paragraph 0064).

- (b) The respondent did not contest that bending, tempering or heat strengthening of a glass article such as the one disclosed in D1 could be carried out at temperatures well below 593°C.

According to D1, column 5, lines 53 *et seqq.*, prior-art coated articles need to be heat treated at temperatures below 593°C in order to "achieve

heat-treatability without adversely affecting the coating". This passage thus confirms that bending, tempering and heat strengthening is indeed possible at temperatures below 593°C.

- (c) According to the respondent, independently of the temperature applied or the duration of the treatment, subjecting the article of D1 to heat treatment would always lead to a significant change in the colour characteristics, thus leading to a ΔE^* value (glass side) above 2.5.

The board is not convinced by this argument. While it is true that the expression "heat treatable" is given a special meaning in D1 (see column 3, lines 19 to 28), this meaning does not exclude that the colour characteristics remain unchanged (cf. "does not necessarily (sic) include such a restriction") with a sufficiently moderate heat treatment, i.e. at temperatures below 593°C. These temperatures are substantially lower than those used in D1 (i.e. 665°C, see column 18, lines 17 and 18), where they result in a change in colour characteristics (see in particular Table 5, column 21, line 47, to column 22, line 6, and column 23, line 68, to column 24, line 21). When subjecting the article of D1 to temperatures below 593°C (i.e. more than 70°C below the 665°C used in D1 and eventually using a substantially shorter treatment duration (i.e. less than 16 minutes, see column 18, line 18), the effect of heat treatment on the colour characteristics of the treated article will be substantially reduced, eventually resulting in a ΔE^* value (glass side) equal to or lower than 2.5. The board therefore does not find a basis in D1 for the respondent's contention that subjecting

the article of D1 to heat treatment at any given temperature would always lead to a significant change in the colour characteristics, thus always leading to a ΔE^* value (glass side) above 2.5.

4.2.3 For these reasons, the board arrives at the conclusion that the subject-matter of claim 1 differs from the coated article disclosed in D1 only in feature (g).

4.3 Problem

According to the patent in suit (paragraphs 0010, 0011 and 0014) and according to the respondent, the problem to be solved was to improve matchability, i.e. to keep the colour characteristics as viewed by the naked eye both before and after heat treatment as constant as possible (see also paragraphs 0030 to 0032 of the patent in suit). The patent in suit also states that the problem consisted in improved IR reflectance and improved solar control characteristics (paragraphs 0012 and 0013). Also according to the respondent, the problem solved was increased durability.

4.4 Proposed solution

As a solution to this problem, the patent proposes a coated article characterised in that the second Ni or NiCr inclusive layer has a thickness of 20-150 Å.

4.5 Success of the solution

As to the success of the solution, the board is not convinced that the problem has indeed been solved. In particular, according to the patent in suit improved matchability is not achieved for all monolithic

embodiments, but is achieved only in a dual or multi-glass substrate structure such as an IG unit (see paragraph 0032). The board also notes that the patent in suit does not contain any comparative examples, let alone a comparative example representative for D1. Concerning the problem of improved IR reflectance and improved solar control characteristics, the respondent did not rely on this problem. Concerning the problem of improved durability, there is no data available that would support that this problem has been successfully solved. Nor is it plausible that this problem is actually solved, since claim 1 encompasses embodiments in which the overall thickness of the layer system is smaller compared to the embodiment disclosed in column 18, lines 11 *et seqq.*, of D1.

4.6 The problem is therefore reformulated and consists in the provision of an alternative coated article.

4.7 Obviousness

It remains to be decided whether the claimed alternative coated article can be derived from the state of the art in an obvious manner or not.

4.7.1 It is true that D1 teaches that thickening the lower and the upper Ni or NiCr layer, while resulting in a heat-treatable article, will result in too low a visible transmission for matching the optics of a specific glass referred to in D1 (column 13, lines 60 to 65, of D1).

4.7.2 According to established case law (see in particular T 119/82, Reasons 16), disadvantageous modifications do not involve an inventive step if the skilled person could clearly predict these disadvantages, if his

assessment was correct and if these predictable disadvantages were not compensated for by any unexpected advantages.

4.7.3 In the case at hand, such an unexpected technical advantage has not been invoked by the respondent, nor is there any indication that the coated article according to claim 1 would not have a low visible transmission. Thus, the skilled person could clearly predict that, when using a thickness of the second Ni or NiCr inclusive layer of more than 15 Å, e.g. a thickness of 20 or 25 Å, visible transmission would be lower than the glass referred to in column 13, line 65, of D1.

4.7.4 For the above reasons, the board concludes that it was obvious to arrive at the subject-matter of claim 1 in view of D1 alone. Hence, the subject-matter of claim 1 does not meet the requirements of Article 56 EPC.

5. Auxiliary requests 0a and 0a' - admissibility

5.1 Auxiliary request 0a was filed by the respondent under cover of its letter dated 26 May 2015, and auxiliary request 0a' (zero a prime) was filed at the oral proceedings before the board. As these requests were filed after the parties had been summoned to oral proceedings, their admission was within the discretion of the board (Article 13(1), (3) RPBA).

5.2 Auxiliary request 0a was filed in response to the board's communication raising doubts as to whether the feature relating to the ΔE^* value could be considered a distinguishing feature when assessing inventive step. This issue had not been raised before in the proceedings. Auxiliary request 0a' was filed in

response to the board's preliminary opinion, announced at the oral proceedings, that the amendments carried out in auxiliary request 0a did not meet the requirements of Article 123(2) EPC.

- 5.3 According to the appellant, the amendments did not overcome the inventive step objection. The subject-matter of the independent claims of both auxiliary requests 0a and 0a' would still not meet the requirements of Article 56 EPC for the same reasons as for the main request.

Thus, these requests did not raise issues which the appellant could not reasonably have been expected to deal with without adjournment of the oral proceedings.

- 5.4 The amendments also constituted a legitimate reaction to the board's written communication and to the preliminary opinion given at the oral proceedings.
- 5.5 For the above reasons, the board admitted auxiliary requests 0a and 0a' (zero a prime) into the proceedings pursuant to Article 13(1), (3) RPBA.
6. Auxiliary request 0a - Article 123(2) EPC
- 6.1 According to the respondent, the amendments made to the independent claims were based on page 34, last paragraph, of the application as filed.
- 6.2 This passage discloses the temperature of 550°C only in combination with tempering. In the preceding sentence bending and heat strengthening are also mentioned, but this sentence is silent about the temperature. Hence, the feature "to a temperature above 550°C and for a sufficient period of time to enable thermal tempering,

bending, or heat strengthening" is not directly and unambiguously disclosed in the application as filed. The amendments therefore do not meet the requirements set forth in Article 123(2) EPC.

7. Auxiliary request 0a' - sufficiency of disclosure and allowability of the amendments
 - 7.1 The requirements of sufficiency of disclosure are met for the same reasons as set out *supra* at 2. (Articles 83 and 100(b) EPC).
 - 7.2 The amendments made are directly and unambiguously derivable from page 34, last paragraph, of the application as filed disclosing that heat treating means heating the coated article to a temperature of at least 1100°F, i.e. 593°C, for a sufficient period of time to enable tempering of the coated article. The requirements of Article 123(2) EPC are therefore met. As the amendments do not extend the scope of protection, Article 123(3) EPC is also complied with.
8. Auxiliary request 0a' - novelty
 - 8.1 While D1 discloses (see claim 1 of D1) a lower limit for the thickness of the Ni or NiCr inclusive layer of at least 7 Å, D1 neither explicitly nor implicitly discloses an upper limit for this layer. There is no support in D1 for the appellant's contention that the effective upper limit for this thickness was 150 Å. Thus, the feature of 20 to 150 Å in claim 1 does not constitute a selection from a broader range having defined limits. Apart from the general disclosure of at least 7 Å, D1 discloses a thickness of at most 15 Å (see column 18, line 15, and column 10, line 30). There is no indication in D1, as contended by the appellant,

that the skilled person would seriously contemplate thicknesses within the range of 20 to 150 Å. The board thus concludes that D1 does not disclose that the second Ni or NiCr inclusive layer has a thickness of 20-150 Å.

8.2 D1 also does not disclose that the coated glass substrate has a ΔE^* value (glass side) no greater than 2.5 after or due to heat treatment, wherein heat treatment means heating the coated article to a temperature above 593°C and for a sufficient period of time to enable thermal tempering of the coated article.

8.2.1 In fact, the considerations set out *supra* at 4.2.2 do not apply to auxiliary request 0a' since the requirement concerning the ΔE^* value must now be complied with for temperatures above 593°C.

8.2.2 According to the appellant, there was no substantial change in the colour characteristics for the coated article of D1 which was evidenced by the values in Table 5 of D1.

The board notes, as also agreed by the parties, that the values given in Table 5 of D1 are expressed in the Hunter system, which is different from the CIE LAB Scale system on which the ΔE^* value in claim 1 is based. These systems are not directly comparable. From the values given in Table 5 of D1 it can therefore not be deduced that the ΔE^* value of the article of D1 is equal or below 2.5. The board thus concludes that the feature relating to the ΔE^* value is also not disclosed in D1.

8.3 None of documents D4 to D6 and D8 disclose that the coated glass substrate has a ΔE^* value (glass side) no

greater than 2.5 after or due to heat treatment, wherein heat treatment means heating the coated article to a temperature above 593°C and for a sufficient period of time to enable thermal tempering of the coated article.

The subject-matter of the independent claims is novel over D4 to D6 and D8 for this reason alone.

8.4 The board therefore concludes that the subject-matter of the independent claims is novel (Article 54(1), (2) EPC).

9. Auxiliary request 0a' - inventive step

9.1 For the subject of the invention, the closest prior art and the problem to be solved, see 4.1 to 4.4 *supra*.

9.2 As to the solution to that problem, according to claim 1 of auxiliary request 0a', it is proposed to solve it by means of a coated article characterised in that the second Ni or NiCr inclusive layer has a thickness of 20-150 and that the coated glass substrate has a ΔE^* value (glass side) no greater than 2.5 after or due to heat treatment, wherein heat treatment means heating the coated article to a temperature above 593°C and for a sufficient period of time to enable thermal tempering of the coated article.

In this context the board does not share the appellant's opinion that, as the latter feature constituted a result to be achieved, it should be disregarded when assessing inventive step. In the board's opinion this feature is a mandatory feature of claim 1 and therefore cannot be disregarded when

assessing inventive step.

- 9.3 As to the success of the solution, the board notes that all embodiments covered by the independent claims now require that the ΔE^* value (glass side) is no greater than 2.5 after or due to thermal tempering at a temperature above 593°C.

According to the appellant this requirement is met in the closest prior art D1. For this purpose it referred to documents D9 and D10.

In the board's opinion, neither D9 nor D10 can put into question that the success of the solution occurs over the whole scope claimed. The board notes in this respect that D9 and D10 are of little probative value since large parts appear to have been purposefully deleted. Apart from that, the product tested in D9 (see page 2, "Sungard HP Neutral Plus 50") differs from the product in column 18, lines 11 to 16, of D1, i.e. the closest prior art, at least in a substantially thicker silver layer and a substantial increase in the thickness of the second Ni or NiCr inclusive layer. Also, the silver layer of D9 is substantially thicker than the respective upper limit of claim 1 of D1. With respect to D10, the board notes that the examples given on its page 3 all have a second dielectric layer which is substantially thicker than the one of the embodiment shown in column 18, lines 11 to 16, of D1. While the three products shown in D10 are covered by the features (a) to (e) of claim 1 of D1, they do not relate to a specific embodiment disclosed in D1. Nor does D10 support the conclusion that all embodiments covered by claim 1 of D1 satisfy the requirement relating to the ΔE^* value in claim 1 of auxiliary request 0a'.

Thus, the problem of improved matchability, i.e. keeping the colour characteristics as viewed by the naked eye both before and after heat treatment as constant as possible, is successfully solved.

- 9.4 As to obviousness, the board notes that the general teaching of D1 is to devise a coated article which has colour characteristics which are different from a certain prior-art article before heat treatment at 665°C but which match those of the prior-art article after heat treatment (see in particular Table 5, column 21, line 47, to column 22, line 6, and column 23, line 68, to column 24, line 21). This teaching therefore entails that a change in the colour characteristics during heat treatment at 665°C is actually required to finally arrive at a product having the desired colour characteristics. Moreover, the aim of D1 being to match the properties of the article of the prior art cited therein, D1 teaches that thickening the second Ni or NiCr inclusive layer would lead to too low a transmittance, such that the resulting article would not have the same transmittance as that prior-art article (see column 13, lines 59 to 65). The board thus concludes that, in view of the problem to be solved, the skilled person would neither have modified the article of D1 such that the ΔE^* value for tempering at more than 593°C was 2.5 or less, nor would he have increased the thickness of the second Ni or NiCr layer from 15 to at least 20 Å. For the same reasons, the passage in column 8, lines 1 *et seqq.* of D1 referred to by the respondent would not have motivated the skilled person to do so. He would therefore not have arrived in an obvious way at the subject-matter of claim 1 in view of D1 alone or in view of D1 when combined with the teachings of either D4 or D8.

9.5 Therefore, the subject-matter of claim 1 meets the requirements of Article 56 EPC. Likewise, the subject-matter of independent claims 13 and 16 involves an inventive step.

The subject-matter of claims 2 to 12, 14, 15 and 17 to 19 depend on claims 1, 13 and 16, from which they derive their patentability.

10. The appellant's request to continue the proceedings in writing

10.1 The appellant contends that it only became aware of the importance of the amendment relating to the temperature of the heat treatment for the board's opinion when the chairman announced the board's preliminary opinion that auxiliary request 0a' was allowable. According to the appellant, continuation of the proceedings in writing would have allowed the submission of further experimental evidence which was necessary in view of the board's preliminary opinion.

10.2 For the board this is not sufficient a reason to justify the continuation of the proceedings in writing and the setting of a time limit for making further submissions including for instance experimental data. In fact, in the communication pursuant to Article 15(1) RPBA (see item 4.1.2 of the communication) the board drew the attention of the parties to the question of whether feature (f), i.e. the feature relating to heat treatment, could be considered a distinguishing feature when assessing inventive step, in particular in view of the fact that the temperature of heat treatment was not specified in the claims. For an objective reader reading the communication, it is immediately clear that the answer to the above question could prove decisive

for the outcome of the proceedings. Moreover, the appellant had already filed documents D9 and D10 which, as submitted by the appellant, related to data obtained using heat treatment at about 600°C, i.e. a temperature within the range addressed in the amendments in auxiliary request 0a'. These documents were also addressed at the oral proceedings.

10.3 In this context, the board also wishes to point out that during discussion of the admissibility of auxiliary request 0a', the appellant did not contend that it was not prepared to deal with this request. Rather it argued that the reasons for lack of inventive step, in its view, had not changed.

10.4 For the above reasons, the board rejects the appellant's request to continue the proceedings in writing.

Order

For these reasons it is decided that:

1. The request to continue the proceedings in writing is rejected.
2. The decision under appeal is set aside.
3. The case is remitted to the opposition division with the order to maintain the patent in amended form on the basis of auxiliary request 0a' (zero a prime), submitted during oral proceedings before the board, and a description to be adapted.

The Registrar:

The Chairman:



C. Vodz

G. Rath

Decision electronically authenticated