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**Datasheet for the decision
of 8 December 2025**

Case Number: T 0213/24 - 3.3.05

Application Number: 17739997.9

Publication Number: 3487823

IPC: B32B17/10, G01S7/481,
G01S17/93, C03C4/10, C03C17/36,
C03C4/00

Language of the proceedings: EN

Title of invention:
GLASS FOR AUTONOMOUS CAR

Patent Proprietor:
AGC Glass Europe

Opponents:
SAINT-GOBAIN GLASS FRANCE
Pittsburgh Glass Works LLC
Pilkington Group Limited

Headword:
Glass/AGC

Relevant legal provisions:
EPC Art. 56, 83
RPBA 2020 Art. 13(2)

Keyword:

Sufficiency of disclosure - main request and first auxiliary request - (no) - auxiliary request 1.1 - (yes)

Inventive step - auxiliary request 0.1 - (no) - auxiliary request 1.1 - combination invention - (yes)

Amendment after summons - exceptional circumstances (yes)

Decisions cited:

T 1800/21

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0213/24 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 8 December 2025

Appellant: SAINT-GOBAIN GLASS FRANCE S.A.
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted on 19 December 2023 rejecting the opposition filed against European patent No. 3487823 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman R. Winkelhofer
Members: T. Burkhardt
R. Elsässer

Summary of Facts and Submissions

- I. The appeals by opponent 1 (appellant 1) and opponent 3 (appellant 2) lie from the opposition division's decision to reject the oppositions against European patent No. 3 487 823 B.
- II. Of the documents discussed at the opposition stage, the following are relevant to the present decision:
- D1 EP 15172780.7 accessible as priority document of WO 2016 202606 A1
 - D2 EP 15172779.9 accessible as priority document of WO 2016 202689 A1
 - D3 US 2011/0199674 A1
 - D4 DE 10 2008 014 089 A1
 - D5 US 2011/0027515 A1
 - D6 WO 2015/170771 A1
 - D6a machine translation of D6
 - D7 WO2014/128016 A1
 - D8 WO 2015/091106 A1
 - D11 KR 10 2015 0000095 A1
 - D11a machine translation of D11
 - D15 EP 1 462 244 A1
 - D16 DE 10 2004 017 890 A1
 - D17 "futuretrends", Belron, technical note, issue 20, December 2014
 - D18 "Thatcham Insight - Energy regeneration systems, friction stir welding new technology and repairability, AEB not all systems are the same", brochure, Thatcham
 - D25 US 8,664,132 B2

- D26 "Solarphire™ PV High-Transmissive Glass",
datasheet, PPG Industries, Inc., 2010
- D27 US 8,227,079 B2
- D29 US 2016/0003946 A1
- D30 US 2015/0192677 A1
- D39 US 2013/0059137 A1

III. On the same day as their grounds of appeal, appellant 1 submitted the following further document:

- D58 US 6,538,192 B1

IV. Independent claim 1 of the **main request** and of **auxiliary request 0.1**, broken down into features, reads as follows:

- 1.1 *"Automotive glazing comprising:*
- 1.2 *a. at least one glass sheet*
- 1.3 *having an absorption coefficient lower than 5 m^{-1} in the wavelength range from 750 to 1050 nm and having an external face and an internal face,*
- 1.4 *b. an infrared filter*
- 1.5 *wherein an infrared-based remote sensing device*
- 1.6 *in the wavelength range from 750 to 1050 nm, and preferably in the wavelength range from 750 to 950 nm,*
- 1.7 *is placed on the internal face of the glass sheet*
- 1.8 *in a zone free of the infrared filter layer."*

- V. Dependent claims 7 to 10 of the main request relate to preferred compositions of the glass sheet and include ranges of the total iron content expressed as Fe_2O_3 .

Compared with the main request, these dependent claims have been deleted in **auxiliary request 0.1**, and the remaining dependent claims have been renumbered accordingly.

- VI. Compared with claim 1 of the main request and of auxiliary request 0.1, the following feature has been inserted at the end of independent claim 1 of the **first auxiliary request** and of **auxiliary request 1.1**.

"[... infrared filter layer] "; and wherein the infrared-based remote sensing device is a LIDAR system based on scanning, rotating or solid state LiDARs and enabling of 3D mapping the surroundings around the vehicle."

Moreover, compared with the first auxiliary request, dependent claims 7 to 10 have been deleted in auxiliary request 1.1, and the remaining dependent claims have been renumbered accordingly.

- VII. Dependent claims 2 to 12 of auxiliary request 1.1 refer to preferred embodiments.

- VIII. At the appeal stage, opponent 2 (party as of right) has not filed any submissions.

- IX. The arguments put forward by the appellants during the appeal proceedings, where relevant to the present decision, can be summarised as follows.

The main request and first auxiliary request did not meet the requirements of Article 83 EPC.

Auxiliary request 0.1 did not meet the requirements of Article 56 EPC when starting from D3.

Auxiliary request 1.1 was to be disregarded. It moreover did not meet the requirements of Article 83 EPC and 56 EPC when starting from D3, D27 and D15.

- X. The arguments put forward by the respondent (patent proprietor) during the appeal proceedings, where relevant to the present decision, can be summarised as follows.

Auxiliary request 1.1 was to be considered.

All the claim requests met the requirements of the EPC.

- XI. Appellants 1 and 2 request that the decision under appeal be set aside and amended such that the patent be revoked.

The respondent requests that the appeals be dismissed, or that the patent be maintained on the basis of

- auxiliary request 0.1 filed with the reply to the appeals, or the
- first to fourth auxiliary requests filed with the reply to the appeals, or
- auxiliary requests 1.1, 2.1, 3.1 or 4.1, filed on 28 November 2025.

Reasons for the Decision

Main request

1. Article 100(b) EPC in combination with Article 83 EPC

The appellants are of the view that the invention according to dependent claims 9 and 10 did not meet the requirements of Article 83 EPC.

This is indeed the case.

These dependent claims define compositions of the glass sheet which explicitly allow for an Fe (iron) content of up to 1 wt%.

However, the patent consistently teaches that such high iron contents are not compatible with glass sheets having the claimed low absorption coefficient in the infrared range (feature 1.3). For instance, paragraphs [0033] and [0035] of the patent state that, to achieve the claimed low absorption coefficients in the infrared range, a low iron content is required, and that, moreover, even such a low iron content has to be compensated by chromium in a specific concentration range. The patent does not contain any specific examples, let alone examples showing that it is possible to arrive at the claimed absorption coefficients with a glass sheet having the relatively high iron contents defined in claims 9 and 10.

On the contrary, paragraph [0035] of the patent refers, *inter alia*, to document **D7**, which confirms this

conclusion (e.g. page 8, line 13 to page 9, line 10 of D7). Thus, the low absorption coefficients of examples 2, 3 and 4 of D7 (see the tables on pages 13 and 14) were obtained with an iron content of 0.01 wt%. Similarly, **D8** discloses (in the paragraph bridging pages 3 and 4) that a low iron content is necessary to achieve high transmission in the infrared range (the skilled person knows that low absorption tends to result in high transmission). The tables of D8 also indicate that the examples with an iron content above 1000 ppm (0.1%) have absorption coefficients that are clearly above the claimed range. The passage on page 10, point 403 of **D6a** confirms that a low iron content is necessary to achieve high IR transmission.

Consequently, the main request does not meet the requirements of Article 83 EPC.

Auxiliary request 0.1

In auxiliary request 0.1, the dependent claims explicitly mentioning relatively high iron contents of the glass sheet, namely claims 7 to 10, have been deleted.

For the reasons set out below, this claim request is to be considered, but does not meet the requirements of Article 56 EPC.

2. Admission/consideration

Appellant 2 requested that auxiliary request 0.1 not be considered.

Auxiliary request 0.1 had been filed at the opposition stage. Since the respondent had, moreover, indicated that auxiliary request 0.1 was aimed at overcoming the Article 83 EPC objection, which is also clearly apparent by the amendments carried out, there is no reason why this claim request should be disregarded.

Consequently, this request is to be considered (Article 12(4) RPBA).

3. Article 56 EPC

3.1 The invention relates to automotive glazing.

3.2 It has not been contested that document **D3**, which also relates to automotive glazing (see paragraph [0127]), is an appropriate springboard for assessing inventive step (see in particular figure 2 and paragraphs [0001], [0007] and [0084]).

3.3 The appellants are of the view that it was sufficient for the glass sheet to have the low absorption coefficient for a single wavelength within the wavelength range. Otherwise, paragraph [0024] of the patent would be superfluous.

This is not convincing.

Claim 1 does not require the glass sheet to have an absorption coefficient lower than 5 m^{-1} at a wavelength in the range from 750 nm to 1050 nm. Rather, the glass sheet must have the claimed low absorption coefficient in the wavelength range between 750 nm and 1050 nm.

Paragraph [0024] of the patent cannot prove the contrary. While, strictly speaking, this paragraph is superfluous (if the absorption coefficient is low for all wavelengths between 750 nm and 1050 nm, it is necessarily also the case for wavelengths between 750 nm and 950 nm), the narrower range simply matches the preferred range of the sensing device.

- 3.4 The appellants, moreover, argued that D3 inherently disclosed feature 1.3 (low absorption coefficient). Dependent claim 7 of auxiliary request 0.1 specified that the glass with the low absorption coefficient was an "extra-clear glass". The glasses of D3 were also extra-clear glasses and it was known that extra-clear glasses had the claimed low absorption coefficient. This was shown by documents such as **D6**, **D39** (its admission notwithstanding), **D25**, **D8**, **D26** and **D58**; the latter should be considered since it was a response to new elements in the decision.

This is not convincing either.

The threshold for implicit disclosure is high. In the patent, there is no definition of the term "extra-clear glass" used in claim 7 of auxiliary request 0.1.

D3 does not disclose that layers (A) and (C) of figure 2 are "extra-clear" glasses. Paragraph [0037] merely indicates that these layers are "colorless, clear, transparent". Paragraphs [0038] and [0039] explain that "clear" in this context means limited haziness, and "transparent" means high transmission of *visible light* (and not of *IR radiation*). Paragraph [0084] of D3 indicates that the infrared transmission of "optical window (b2)" is preferably >60%.

This is, however, not a direct and unambiguous disclosure that the glass of D3 has the claimed absorption coefficient of lower than 5 m^{-1} in the wavelength range from 750 nm to 1050 nm, which mainly corresponds to the IR range.

None of **D39** (its admission notwithstanding), **D25**, **D8**, **D26** and **D58** (the question of the admission of the latter document likewise notwithstanding) can prove that the glasses of D3 are extra-clear glasses and/or do have the required low absorption coefficients either. These documents are patent documents or brochures and therefore cannot prove common general knowledge.

- 3.5 On the other hand, there is agreement that D3 does not disclose feature 1.7 (sensing device is placed on the internal face of the glass sheet). In figure 2 of D3, there is a certain distance between the glass sheet (C) and sensing device S.
- 3.6 Consequently, features 1.3 and 1.7 are both distinguishing features.
- 3.7 According to the patent in suit, the problem to be solved is that of providing automotive glazing with a sensing device where the intensity of the IR radiation perceived by the sensor is more uniform throughout the field of view, as indicated in paragraph [0025] of the patent.
- 3.8 It is suggested that this problem is solved by means of the glazing of claim 1, which is characterised :
- in that the glass sheet has an absorption coefficient lower than 5 m^{-1} in the wavelength range from 750 nm to 1050 nm, and

- in that the sensing device is placed on the internal face of the glass sheet.

- 3.9 However, even if there were a synergistic effect related to these two distinguishing features, as the respondent argued, it would not be achieved across the entire claimed range.

As can be seen from figure 2 of D3, the field of view of sensor S (see the greyed area) is not obstructed by intermediate layer B (which has an infrared radiation-screening effect). According to paragraph [0083], "optical window (b2)" is permeable to IR radiation.

Moving sensor S in D3 towards the glazing does not change the sensor's field of view. Hence, the path length of the IR radiation through the glass sheet does not change, neither at the edges nor in the middle of the field of view. Consequently, a lower absorption coefficient of the glass sheet cannot improve the uniformity of the IR radiation intensity perceived by the sensor.

- 3.10 Thus the problem has to be reformulated in a less ambitious manner, i.e. as being that of increasing the intensity of IR radiation perceived by the sensor, as argued by appellant 1.

- 3.11 An inventive step cannot be acknowledged (Article 56 EPC).

As explained above, the location of the sensor on the internal face of the glass sheet has no technical effect and is thus arbitrary. **D4** (figure 1, paragraph [0039]), **D6** (see page 1, point 18 of D6a), **D15**

(figure 2 (16)) and **D27** (figure 3 (15)) for example disclose such a position of the sensor.

In the absence of an effect related to feature 1.7 there can also be no synergistic effect between features 1.7 and 1.3.

Regarding feature 1.3, the skilled person is aware that a decrease in the glass sheet's absorption coefficient is an obvious way to increase IR transmission (and thereby the intensity of IR radiation perceived by the sensor), and that this can be achieved by a low iron content (see for example **D8**, paragraph bridging pages 3 and 4, or **D25**, column 1, lines 50 to 61).

Auxiliary request 0.1 is thus not allowable.

First auxiliary request

4. Article 100(b) EPC in combination with Article 83 EPC

The reasoning of point 1. above relating to the main request also applies to dependent claims 9 and 10 of the first auxiliary request, which therefore also violate Article 83 EPC.

Auxiliary request 1.1

5. Admission/consideration

- 5.1 Auxiliary request 1.1 was submitted after the communication under Article 15(1) RPBA, just over a week before the oral proceedings at the appeal stage.

The appellants argued that this request should not be considered as there were no exceptional circumstances justified with cogent reasons, as required by Article 13(2) RPBA.

The objection under Article 83 EPC against the dependent claims, which allowed for an iron content of up to 1%, had already been raised in the notice of opposition.

Submitting this claim request at such a late stage violated the principles of procedural economy and fairness towards the parties.

5.2 However, for the reasons set out below, this request is to be considered.

Auxiliary request 1.1 differs from the first auxiliary request in that dependent claims 7 to 10 have been deleted, and the remaining dependent claims renumbered accordingly.

According to case law, the deletion of dependent claims amounted "in a majority of decisions" to exceptional circumstances within the meaning of Article 13(2) RPBA, and therefore such claim requests were admitted even if they could have been filed earlier (Case Law of the Boards of Appeal, 11th edn., 2025, V.A.4.5.4.j)).

Moreover, auxiliary request 1.1 combines the amendments of two claim requests that had already been submitted at the opposition stage, and which are admissible.

- The LIDAR system had already been added in claim 1 of the first auxiliary request to address inventive step objections. It is based on claim 15 as granted.

- Dependent claims 7 to 10, which explicitly allowed for a high iron content, had already been omitted in auxiliary request 0.1, to overcome an objection under Article 83 EPC.

5.3 The claims of auxiliary request 1.1 that remain after the omission of dependent claims 7 to 10 of auxiliary request 0.1 were already discussed in detail by the parties in their written submissions. There is thus no shift of the legal and factual framework, and the principles of procedural economy and procedural fairness are safeguarded (T 1800/21, catchword).

Since the amendments lead, moreover, to a request on the basis of which the patent can clearly be maintained (see below), auxiliary request 1.1 is to be considered (Article 13(2) RPBA).

6. Article 83 EPC

For the reasons set out below, auxiliary request 1.1 meets the requirements of Article 83 EPC.

6.1 The appellants argued that it was not possible to carry out the invention over the entire scope claimed, and pointed to examples 10 and 11 of **D1** to show that an increase in the Cr (chromium) content did not lower the absorption coefficient, contrary to the teaching of paragraphs [0033] and [0035] of the patent. The patent did not provide a concept fit for generalisation.

This is not convincing.

Paragraphs [0033] and [0035] of the patent explain that

low absorption coefficients in the infrared wavelength range could be obtained in spite of small amounts of iron in the glazing, provided that chromium was present in a specific range. The dependent claims explicitly specifying high iron contents of the glazing have been omitted in auxiliary request 1.1.

Paragraph [0035] of the patent refers to **D7**, which discloses several glazings with absorption coefficients in the claimed range (see the passages of D7 cited above under point 1.). Similarly, **D1** (see the passages cited above) and **D2** (see the tables), confirm that it is possible to obtain a glazing with the required absorption coefficients in the presence of a small amount of iron, and chromium in a specific concentration range.

With regard to the comparison between examples 10 and 11 of **D1**, the compositions of these two examples do not only differ in chromium concentration. Any changes to the absorption coefficients are therefore not necessarily exclusively caused by the different chromium content.

Moreover, the appellants have provided no experimental data to support their arguments.

There is thus no evidence that, using the teaching of the patent and their common general knowledge, the skilled person could not produce a glass sheet with an absorption coefficient in the claimed range.

In view of the teaching of the patent on the iron and chromium content, there is also no evidence that it was not "fit for generalisation" to arrive at a glass sheet with a low absorption coefficient.

6.2 Finally, the appellants are of the view that the skilled person was at a loss when trying to carry out the claimed mapping, in particular on the sides and the rear of a vehicle, when the sensing device was located behind the windshield.

However, as argued by the respondent, it is not required for the claimed 3D mapping that the field of view of the sensor covers 360°C. The possibility is not ruled out of the surroundings of the vehicle being mapped in several runs.

7. Article 56 EPC

7.1 **D3** as the closest prior art

7.1.1 The appellants contended that paragraph [0004] of D3 disclosed the feature newly added in auxiliary request 1.1, even if the term LIDAR was not mentioned.

This is not persuasive, since not every "senso[r] for distance measuring" is a LIDAR, let alone a LIDAR of the claimed type.

D3 is silent on the size of the field of view of the sensor (S) of figure 2, this figure being merely a schematic drawing.

While claim 1 of auxiliary request 1.1 does not specify a specific angle of the field of view of the scanning, rotating or solid state type LIDAR sensor, this angle has to be significant to fulfil the claimed function (feature) of "mapping the surroundings around the vehicle". It has not been disputed that this feature

excludes single spot LIDARs, which have a field of view with an angle close to zero.

- 7.1.2 Such an increased field of view of the sensor entails an increased length of the path (and thereby an increased absorption) of the IR radiation through the glass sheet towards the edges of the field of view.

Under these circumstances the combination of the distinguishing features - in particular of the sensor type on the one hand and of the low absorption coefficient of the glass sheet on the other hand - successfully solves the problem of providing glazing with improved uniformity of the IR radiation intensity perceived by the sensor over the angles of its field of view (see paragraph [0025] of the patent).

- 7.1.3 The appellants further argued in this context that an effect would not be achieved across the entire claimed range.

- Firstly, it was not the absorption coefficient that mattered, but absorbance, which also depended on the thickness of the glass sheet, unlike the absorption coefficient.

This is not convincing, since the effect is present for a given thickness of the glass sheet. There is no reason for the skilled person, starting from D3, also to modify the thickness of the glass sheets.

- Secondly, the wavelength used by the sensing device did not necessarily correspond to the wavelengths where the glass sheet had a low absorption coefficient.

This view is also not shared, since, according to claim 1, the wavelength of the sensing device corresponds to the wavelengths where the glass sheet has a low absorption coefficient.

- Thirdly, claim 1 did not exclude the presence of an additional glass layer with a high absorption coefficient in the infrared range. In such a case the desired effect would not be achieved.

This is not convincing either. Even if only one of the glass layers of D3, i.e. layer A or C in figure 2, was replaced by a sheet with a low absorption coefficient, and if the sensing device was placed on the glass sheet, the effect would still be achieved (although to a lower extent than if both glass sheets were replaced). Given that the sensing device S of D3 is also infrared-based and that optical window b2 is transmissive to infrared radiation (paragraph [0084]), the addition of a further layer with low infrared transmission is purely speculative.

7.1.4 There is thus no reason to doubt that the problem posed has been successfully solved.

7.1.5 The claimed solution is not obvious when starting from D3, since there is no incentive in the prior art to solve the technical problem posed in the claimed manner, in particular not in documents **D4, D5, D6, D8, D11/D11a, D15, D16, D17, D18, D25, D26, D27, D29, D30** and **D39** (its admission notwithstanding). These documents may disclose one or more of the distinguishing features, such as a LIDAR sensing device, but do not provide the incentive that this improves the uniformity of the intensity of IR radiation perceived by the sensing device.

7.2 **D15** or **D27** as the closest prior art

The appellants also drew upon D15 or D27 as alternative closest prior art documents.

D27 is also directed to automotive glazing (column 1, lines 3 to 4). While it discloses a LIDAR (column 2, lines 58 to 59), it does not, at least, disclose the low absorption coefficient of feature 1.3. This has not been disputed either.

As explained above (see point 7.1.2), feature 1.3 results in improved uniformity of the intensity of IR radiation perceived by the LIDAR sensor throughout its field of view, as indicated in paragraph [0025] of the patent.

There is no incentive in the prior art to solve the technical problem posed by reducing the absorption coefficient of the glass sheet to lower than 5 m^{-1} .

Moreover, it is teaching central to D27 that at least the first glass sheet (see figure 3 (11)) is tinted by using a considerable amount of iron as colourant (claim 1). This thus teaches away from the low iron contents required to achieve the claimed low absorption coefficients. It would also be useless to reduce the absorption coefficient of the second, non-tinted glass sheet (12), as this is not the sheet that limits the amount of IR radiation perceived by sensor 15, as argued by the respondent.

D15 is more remote than D27 since, additionally, it does not disclose a LIDAR sensor.

7.3 Consequently, the subject-matter of claim 1 of auxiliary request 1.1 involves an inventive step vis-à-vis D3, D27 and D15 (Article 56 EPC).

For the same reasons, the subject-matter of the other claims of auxiliary request 1.1 also involves an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of auxiliary request 1.1 as submitted on 28 November 2025 and the description to be adapted.

The Registrar:

The Chair:



C. Vodz

R. Winkelhofer

Decision electronically authenticated