Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 19 November 2024

Case Number: T 2287/22 - 3.4.02

Application Number: 12773636.1

Publication Number: 2699902

IPC: G01N21/25, G01N21/55, G01N21/95, G01N33/44, G01N25/02

Language of the proceedings: EN

Title of invention:
METHOD FOR ONLINE DETERMINATION OF CURE STATUS OF GLASS FIBER PRODUCTS

Patent Proprietor:
Owens Corning Intellectual Capital, LLC

Opponent:
ROCKWOOL INTERNATIONAL A/S

Headword:

Relevant legal provisions:
EPC 1973 Art. 100(b), 83

Keyword:
Sufficiency of disclosure - (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0

Case Number: T 2287/22 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 19 November 2024

Appellant: (Patent Proprietor)	Owens Corning Intellectual Capital, LLC One Owens Corning Parkway Toledo, OH 43659 (US)
Representative:	Haseltine Lake Kempner LLP One Portwall Square Portwall Lane Bristol BS1 6BH (GB)
Respondent: (Opponent)	ROCKWOOL INTERNATIONAL A/S Hovedgaden 584C 2640 Hedehusene (DK)
Representative:	Gill Jennings & Every LLP The Broadgate Tower 20 Primrose Street London EC2A 2ES (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 17 August 2022 revoking European patent No. 2699902 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	R. Bekkering
Members:	C. Kallinger
	C. Almberg

Summary of Facts and Submissions

I. The opposition division held that the European patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. Consequently, the patent was revoked.

II. The patent proprietor (appellant) lodged an appeal against the opposition division's decision and requested that the appealed decision be set aside and that the case be remitted to the opposition division for consideration of the remaining grounds for opposition in respect of the claims as granted (main request), or as amended according to one of auxiliary requests 1 to 3 filed with the statement of grounds of appeal dated 30 December 2022.

III. With its statement of grounds of appeal the proprietor submitted the following document:

D9 Declaration of Liang Chen, dated 20 December 2022

IV. The opponent (respondent) requested, in its reply to the appeal, that the appeal be dismissed, i.e. that the decision to revoke the patent be upheld.

V. With a further letter dated 10 August 2024 the proprietor submitted claims according to auxiliary request 4.

VI. In a communication pursuant to Article 15(1) RPBA 2020 the board informed the parties of its preliminary

opinion. The board was, inter alia, of the opinion that the invention as defined in the claims of the patent as granted as well as according to the auxiliary requests 1 to 4 did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

VII. There was no written response to the communication.

VIII. On 19 November 2024 oral proceedings took place.

IX. The parties final requests were as follows:

The proprietor requested that the appealed decision be set aside and that the case be remitted to the opposition division for consideration of the remaining grounds for opposition in respect of the claims as granted (main request), or as amended according to one of auxiliary requests 1 to 3 filed with the statement of grounds of appeal dated 30 December 2022 and auxiliary request 4 filed with the letter dated 10 August 2023.

The opponent requested that the appeal be dismissed, i.e. that the decision revoking the patent be upheld.

X. This decisions refers to the following documents:

D3 US 7,063,983
D5 WO 84/01430

XI. The independent claims of the main request read:

"1. A method of determining the cure status of a mineral fibrous product (67) on a conveyor (64) of a manufacturing line, the method comprising:

capturing an optical reflectance measurement from a sectioned face (100) of a sectioned mineral fibrous product (67) on-line, without removing the mineral fibrous product (67) from the manufacturing line;
analyzing the optical reflectance measurement from at least one region of interest of the sectioned face (100); and
assessing the degree of cure of the mineral fibrous product (67) based on the optical reflectance measurement at the region of interest."

Independent claim 11 of the main request reads:

"11. A method of determining the cure status of a mineral fibrous product (67) on a conveyor (64) of a manufacturing line, the method comprising:

capturing a color digital image from a sectioned face (100) of the fibrous product (67) using a color digital camera (118) on-line, without removing the fibrous product (67) from the manufacturing line;
analyzing at least one region of interest from the color digital image to obtain a color system variable for the region of interest; and
assessing the degree of cure of the fibrous product (67) on the basis the color system variable from the region of interest."

Reasons for the Decision

1. Main request

1.1 Sufficiency of disclosure - Article 100(b) EPC

The opposition division came to the conclusion that the invention as defined in claims 1 and 11 of the patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

The board agrees with the opposition division's conclusion and is not convinced by the proprietor's arguments for the following reasons.

1.1.1 Disclosure over the whole scope of the claims

Claim 1 defines a method for determining the degree of cure of a mineral fibrous product based on the optical reflectance measurement.

Independent claim 11 defines a method for determining the degree of cure of the fibrous product based on a color system variable obtained from a color digital image.

The patent therefore is based on the assumption that a measurable and reproducible correlation exists between the cure status of a mineral fibrous product and the result of an optical reflectance measurement or a color system variable in a digital photo captured from such a product.

However, the board is not convinced that *"the optical reflectance measurements are linked to the cure status for any given fibrous mineral product"* as alleged by the proprietor.

In this respect, the board agrees with the opposition division and the opponent that the claimed invention cannot be worked by the skilled person across the whole scope of the claims (cf. Case Law of the Boards of Appeal, 10th ed., 2022, "CLBA", II.C.7.1.2).

The use of a color digital image to determine the cure status of any given mineral fibrous product presupposes that the product must undergo a color change that is indicative of the degree of cure. However, this seems not to be the case.

In this respect the opponent referred to document D3 (column 1, lines 19 to 23) which showed that the uncured binder and the cured binder are visually indistinguishable.

The opponent also referred to document D5 (page 4, lines 3 to 10) which showed that the change of color was not a reliable indication of cure status.

The proprietor argued that the passages cited from documents D3 and D5 related to the problems associated with a visual inspection, i.e. an inspection with the naked eye. This was, however, fundamentally different from the invention as claimed which employed an optical reflectance measurement or a color digital image, both resulting in quantifiable data. Therefore, documents D3 and D5 could not raise serious doubts with respect to the sufficiency of disclosure of the invention as claimed.

The proprietor further argued that the patent explained, in the footnote of Table B, that the concept for determining B-values was the same without the pink dye but that the values would be shifted.

The board is not convinced by the proprietor's arguments for the following reasons.

Document D3, originating from the proprietor, explicitly states (see column 1, lines 19 to 23) that *"there is no visual test available to determine whether the binder has sufficiently cured"* and that *"the network maintains a white opaque appearance regardless of the level of cure."*

In addition, document D5 states (see page 4, lines 7 to 10) that *"as an indicator of cure, color has been shown objectively to be misleading in many cases, as well as subjective. Moreover, color changes do not exhibit high sensitivity except when the mat is already over-cured (burnt)"* (emphasis added by the board).

In the boards view, these statement indicate that, even in the cases where there is a change in color, it was known in the art that this is not a reliable indication of cure status. Therefore, independent of how the color of the mineral fibrous product is inspected (with the naked eye or via optical measurements), these documents raise serious doubts that a reliable and reproducible correlation exists between the degree of cure of a mineral fibrous product and its color.

The board is therefore of the opinion that the opponent has discharged its burden of proof by raising serious doubts, substantiated by verifiable facts (documents D3

and D5, cf. CLBA, II.C.9.1), that the skilled person reading the patent, using their common general knowledge, would be unable to carry out the invention over the whole scope of the claims, i.e. to assess the degree of cure of any mineral fibrous product based on the optical reflectance measurement (claim 1) or the color system variable obtained from a digital image (claim 11).

1.1.2 Reproducible embodiment

With respect to a reproducible embodiment, the proprietor argued that an example disclosed in the patent used a commercially available product (paragraph [0054]: R-20) and the measurement results of the B-value for this product (Figure 6). In addition, Table B disclosed the correlation of B-Values with the degree of cure.
This example was therefore reproducible by the skilled person and, in addition, could also be extended to further mineral fibrous products by simple recalibration of the values exemplarily listed in Table B. Even if such a re-calibration had to be performed for large number of available mineral fibrous products, there was no undue burden involved for the skilled person.

The proprietor further argued that the opponent failed to provide evidence to the contrary, i.e. evidence which showed that the claimed method was not able to determine the degree of cure of the mineral fibrous product based on the optical reflectance measurement.

The board first recalls that by the opponent's discharge of its burden of raising serious doubts, substantiated by verifiable facts, the onus has shifted

to the proprietor to rebut those doubts (CLBA, II.C. 9.1). However, the board is not convinced by the proprietor's case and agrees with the opponent and the opposition division for the following reasons.

The B-values in Table B of the opposed patent are not reproducible by the skilled person since the table does not identify the binder, the amount of binder, the type of dye, or any of the curing conditions that were used.

As this information is also missing in the example described in paragraph [0054], also this example is not reproducible by the skilled person.

Figure 6 of the patent shows a *"typical B value trace"* for *"a specific product"* (see paragraph [0054]). However, this measurement of a color system variable (B-value) over time, even if generated for the R-20 product mentioned in the corresponding description, only discloses that a mineral fibrous material (produced with unknown binder, dye and curing conditions) shows a consistent color system variable over time. This Figure is, however, no proof that the degree of cure of any mineral fibrous product can be correlated to an optical reflectance measurement (claim 1) or a color system variable obtained from a digital image (claim 11) as it fails to provide measurement data for various degrees of cure.

1.1.3 Document D9

Document D9 is a declaration from Mr. Liang Chen, an employee of the proprietor. It was filed by the proprietor as additional evidence to further demonstrate that the skilled person was able to obtain

the cure status of a mineral fibrous product without a dye.

The proprietor submitted this document in order to demonstrate the applicability of the method to mineral fibrous products without a pink dye.

Notwithstanding the question of admittance, the board notes the following with respect to the content of document D9 and its relation to the disclosure of the patent:

- Under the headline *"Obtaining the values in Table B of the Patent"* on page 1, the following table discloses an *"Illustrative example for R-19 Product"*. However, the patent does not disclose R-19 as the mineral fibrous product for which Table B gives the B-values but only refers to an *"R-20 light density, pink residential insulation"* in a different context (paragraph [0054]).
- The table on page 1 of D9 explains that the B-values are *"Product line dependent".* This suggests that there are further, non-discussed properties influencing the B-values.
- Under the headline *"Determining cure status for products not including pink dye" on page 2,* document D9 refers to *"yellow products without the pink colorant"* and explains that there is a shift of the set point of the B-value. However, this only indicates that a yellow mineral fibre product has a different B-value than a pink mineral fibre product but fails to prove how deviations in the B-value of the yellow mineral fibre product can be correlated to varying cure status.

In view of the above, the board is of the opinion that also document D9 is not suitable to dispel the serious

doubts and, thereby, establish sufficiency of disclosure of the opposed patent.

1.1.4 Conclusion

The board agrees with the opposition division and the opponent that documents D3 and D5 raise serious doubts that the claimed assessment of the degree of cure of a mineral fibrous product based on the optical reflectance measurement (claim 1) or the basis the color system variable (claim 11) is reproducible.

Furthermore, the patent does not provide a general teaching as to how an optical reflectance measurement or a color system variable can be related to the cure status of any mineral fibrous product as claimed, i.e. a mineral fibrous product using any binder and no dyes.

In addition, the patent does not provide a single reproducible embodiment.

As a result, the patent does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art and thus the ground for opposition under Article 100(b) EPC prejudices the maintenance of the patent as granted (Article 101(2) EPC).

2. Auxiliary requests 1 to 4 - Sufficiency of disclosure (Article 83 EPC)

2.1 Compared to the main request, claim 1 of auxiliary request 1 includes the limitation of granted claim 5, i.e. *"the optical reflectance measurement is a digital color image".*

2.2 Compared to auxiliary request 1, in auxiliary request 2, dependent claim 8 has been deleted.

2.3 In comparison to the main request, auxiliary request 3 is limited to the subject-matter of granted claims 11 to 19.

2.4 Auxiliary request 4 is identical to the main request, except that claim 12 has been deleted.

2.5 Therefore, the method for determining a cure status of a mineral fibrous product claimed in any of the independent claims of these auxiliary requests rest on the same assumption as discussed above for the main request.

Notwithstanding the question of admittance of some of these requests, the board is therefore, for the same reasons as set out above regarding the main request, of the opinion that the patent as amended according to the auxiliary requests 1 to 4 fails to disclose the invention as claimed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC).

Therefore, also the patent as amended has to be revoked (Article 101(3)(b) EPC).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

L. Gabor R. Bekkering

Decision electronically authenticated