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**Datasheet for the decision  
of 11 November 2014**

**Case Number:** T 0672/12 - 3.2.03

**Application Number:** 99106353.8

**Publication Number:** 0931886

**IPC:** E04B1/78, E04C2/16

**Language of the proceedings:** EN

**Title of invention:**

A mineral fiber-insulated plate

**Patent Proprietor:**

Rockwool International A/S

**Opponent:**

Knauf Insulation Technology sprl

**Headword:**

**Relevant legal provisions:**

EPC Art. 100(a), 54, 56

**Keyword:**

Novelty - (yes)  
Inventive step - (no)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern  
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Case Number: T 0672/12 - 3.2.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.03**  
**of 11 November 2014**

**Appellant:** Knauf Insulation Technology sprl  
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**Representative:** Farmer, Guy Dominic  
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**Respondent:** Rockwool International A/S  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
24 January 2012 concerning maintenance of the  
European Patent No. 0931886 in amended form.**

**Composition of the Board:**

**Chairman** G. Ashley  
**Members:** V. Bouyssy  
M. Blasi

## **Summary of Facts and Submissions**

- I. European patent No. 0 931 886 (in the following: "the patent") relates to a mineral fiber-insulating plate having a central body and a compacted surface layer, wherein the fiber orientation in the surface layer is different than that present in the central body.
- II. The patent as a whole was opposed on the grounds of Article 100(c) EPC, Article 100(b) EPC and Article 100(a) EPC for lack of novelty and inventive step. The Opposition Division held that the patent could be maintained in amended form on the basis of the set of amended claims submitted before it as the main request (Article 101(3)(a) EPC).
- III. This interlocutory decision has been appealed by the opponent (here appellant).
- IV. With the summons to oral proceedings, the Board sent a communication pursuant to Articles 15(1) and 17(2) of the Rules of Procedure of the Boards of Appeal (RPBA) indicating to the parties its preliminary, non-binding opinion of the case.
- V. Oral proceedings before the Board were held on 11 November 2014 without the participation of the duly summoned patent proprietor (here respondent). Reference is made here to the minutes of the oral proceedings.
- VI. Requests

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

The respondent requested that the appeal be dismissed and the patent be maintained as amended in opposition.

VII. Claims

Independent claim 1 as amended in opposition is directed to the following subject-matter (compared to claim 1 as granted, added features are indicated in bold, deleted features in strike-through):

"1. A mineral fiber-insulating plate (10, 10', 10'') defining a ~~plane~~ **longitudinal direction** and comprising:  
a central body (12) containing mineral fibers,  
a surface layer (14, 16) containing mineral fibers,  
said central body (12) and said surface layer (14, 16) being adjoined in facial contact with one another,  
said mineral fibers of said central body (12) being arranged generally perpendicularly to said ~~plane~~ **longitudinal direction** and said surface layer,  
said surface layer (14, 16) being of a higher compactness as compared to said central body (12),  
CHARACTERIZED in that  
said mineral fibers of said surface layer (14, 16) are arranged generally in a direction parallel with said ~~plane~~ **longitudinal direction**,  
said mineral fibers of said central body (12) and said mineral fibers of said surface layer (14, 16) being bonded together to form an integral mineral fibre-insulating plate solely through cured bonding agents cured in a single curing process and initially present in uncured, non-woven mineral fiber webs from which said central body (12) and said surface layer (14, 16) are produced."

VIII. In the statement of grounds of appeal and the reply to it, the parties have referred *inter alia* to the following prior art documents which were filed in the opposition proceedings and have been cited in the decision under appeal:

D2: US4950355A

D6: GB1403322A

D7: CA1057183A

of these D2 is cited in the patent specification (paragraph [0003]).

IX. The relevant arguments of the parties in the written proceedings and, as far as present, in the oral proceedings can be summarised as follows:

a) Interpretation of claim 1

Claim 1 specifies that the plate defines "a longitudinal direction" and that the mineral fibers of the surface layer are arranged generally in a direction parallel with this "longitudinal direction".

The appellant contends that, in the contested patent, the term "longitudinal direction" is defined only for the mineral fiber-insulating web, whereby its "longitudinal direction" corresponds to its direction of travel (e.g. Figures 1 to 10 and paragraphs [0016], [0021], [0022]). Thus, claim 1 requires that the mineral fibers of the surface layer are arranged generally in a direction parallel with the direction of travel of the web from which the plate has been formed.

The respondent submits that claim 1 is directed to a rectangular plate *per se*, which has been cut from the

web in the production line: after the plate is removed from the production line, its "longitudinal direction" implicitly corresponds to the plate length, which may either be the same as the longitudinal direction, i.e. the direction of travel of the web or perpendicular to it.

b) Novelty with respect to D2

The appellant submits that the subject-matter of claim 1 is anticipated by a laminated plate manufactured in the production line shown in Figure 10 of D2. In particular, the mineral fibers of the highly compressed surface layer 51 must inevitably be aligned essentially parallel to the direction of travel of the web. Further, D2 discloses that in Figure 10 the webs 50 and 51 can remain uncured before being fed into the curing oven 5 if guide means are provided to prevent the fan-folded web 43 from losing its compression, so that the re-united webs 50 and 51 are implicitly cured in a single curing process.

The respondent refers to the decision of the Opposition Division that D2 fails to disclose the two features in the characterising portion of claim 1.

c) Inventive step with respect to D2

The appellant contends that, starting from D2, claim 1 lacks an inventive step in view of common general knowledge.

The respondent agrees with the reasoning given in the decision of the Opposition Division, concluding that claim 1 is inventive against a combination of D2 with either D6 or D7.

## Reasons for the Decision

1. Interpretation of claim 1
  - 1.1 Before turning to the questions of novelty and inventive step, it is necessary to establish how the mineral fibers are arranged in the surface layer as defined in claim 1.
  - 1.2 Claim 1 is directed to a mineral fiber-insulating plate *per se*, which has been cured in a single curing process. Claim 1 specifies that the plate defines a "longitudinal direction". The adjective "longitudinal" normally relates to the length of a body. Hence, a skilled reader of claim 1 would immediately understand that the "longitudinal direction" of the plate corresponds to its length, i.e. it is parallel to the plate length. It then follows from claim 1 read in isolation that the mineral fibers of the surface layer are orientated substantially parallel to the plate length.
  - 1.3 This construction accords with the teaching of the specification. In the production line shown in Figures 1 to 10, after the single curing step in curing oven sections 92 and 94 takes place, the integral bonded mineral fiber-insulating web is cut into rectangular plates 10'' by means of a knife 96 (paragraph [0049] and Figure 10). It is clear that the illustrated plate 10'' is cut so short that its length is perpendicular to the direction of travel of the web and that the fibers of its top layer 14 are arranged parallel to the plate length. Figure 12 shows a plate 10 produced in accordance with the process shown in Figures 1 to 10 (page 3, lines 28 to 29 and

paragraphs [0052], [0053], [0057] and [0058]). When reading the description of Figure 12, it is immediately apparent that this plate corresponds to the short plate 10'' shown in Figure 10, so that its length is also perpendicular to the direction of travel of the web and the fibers of its top layer 14 are arranged parallel to the plate length.

2. Novelty with respect to D2

2.1 D2 discloses, in relation to Figure 10, a process for manufacturing a laminated cured mineral fiber-insulating web, from which building insulation plates are cut. The web comprises: a central body 50 containing mineral fibers arranged generally perpendicularly to the longitudinal direction of the web; a surface layer 51 containing mineral fibers; the central body 50 and the surface layer 51 being adjoined in facial contact with one another; and the surface layer 51 being of a higher compactness as compared to the central body 50 (column 7, lines 39 to 43 and column 12, lines 30 to 44). In particular, it is preferred that the surface layer 51 is compressed down to approximately 1/3 to 1/5 of its original thickness which increases the density three to five times original (column 2, lines 53 to 58).

2.2 The parties dispute whether the mineral fiber-insulating plate thus obtained comprises the following two features in the characterising portion of claim 1:

- that "said mineral fibers of said surface layer ... are arranged generally in a direction parallel with said longitudinal direction", and
- that "said mineral fibers of said central body ... and said mineral fibers of said surface layer ... being bonded together to form an integral mineral



fibre-insulating plate solely through cured bonding agents cured in a single curing process and initially present in uncured, non-woven mineral fiber webs from which said central body ... and said surface layer ... are produced."

### 2.3 Arrangement of the fibers of the surface layer

2.3.1 With reference to the manufacturing process shown in Figure 10, D2 teaches that, after severing the fan-folded web 43 into two secondary webs 50 and 51, web 51 is "treated just as the mineral fiber web 8 of FIG. 1, namely, it is fed through compression rolls 9, 10, the binder applicator means 13, etc. and then reunited with the remaining secondary mineral fiber web 50 (or others formed therefrom) as these mineral fiber webs are introduced between the compacting rollers and fed in and through the curing oven 5" (column 12, lines 27 to 44). At the same time, it is taught that compression rollers 9 and 10 apply such an intense compression to the secondary web "that the mineral fibers tend to align in the direction of travel" (column 2, lines 40 to 42), and that this aligning effect results in that "the mineral fibers are aligned essentially horizontally or parallel to the direction of travel or the major area of the overall multi-ply laminated mineral fiber web" (column 10, lines 37 to 43 and Figures 1 and 4). From these passages it follows directly that, when producing a mineral fiber-insulating plate according to the process of Figure 10 of D2, the mineral fibers of the highly compressed web 51 are arranged essentially parallel to the direction of travel of the web.

2.3.2 In the decision under appeal, the Opposition Division argued that such an arrangement of the fibers in the

compressed web 51 cannot be derived from D2 because it would contradict the teaching of column 12, lines 55 to 60 that the fibers of web 51 are normal to its major plane. However, when reading this teaching in context, in particular in the light of Figure 10, it is clear that the reference to web 51 therein is erroneous. Indeed, in Figure 10, the fan-folds 45 of the web 43 are formed on the conveyor 44 by swinging the compressed primary web 39 composed of vertically orientated mineral fibers about an axis transverse to the web 39 and the conveyor 44, and thus the surface layers of the web 43 are inevitably composed of mineral fibers which are orientated mainly parallel to the direction of travel of the web. Since the web 51 is a "relatively thin" web obtained by severing the surface layer of the fan-folded web 43 (column 12, lines 31 to 34 and Figure 10), it is implicit that the mineral fibers of the uncompressed thin web 51 are arranged mainly along the direction of travel of the web. The subsequent intense compression of the web 51 between rollers 9 and 10 then inevitably results in that the fibers of the highly compressed web 51 are even more aligned in the direction of travel of the web, so that they are certainly "essentially parallel" to it.

- 2.3.3 For the following reason, however, this does not imply that the mineral fibers of the surface layer are arranged parallel with the plate length:
  
- 2.3.4 D2 is silent as to how the laminated web manufactured by the process of Figure 10 is eventually cut into building insulation plates. However, it is implicit for a skilled reader that the web is cut transversally into lengths corresponding to the desired dimensions of the plates, depending on their intended use. Thus, the web of D2 may be cut either into short plates, as shown in

Figure 10 of the contested patent, or into long plates and, accordingly, the actual length of the cut plate may either be perpendicular to the direction of travel of the web (short cut length) or be parallel to it (long cut length). Hence, the mineral fibers of the surface layer of the plate may either be parallel to the plate length (short cut length) or be perpendicular to it (long cut length).

2.3.5 The Board thus concludes that it cannot be directly and unambiguously derived from D2 that the manufacturing process disclosed therein inevitably results in a plate in which the mineral fibers of the surface layer are arranged parallel to the plate length, as required in claim 1.

#### 2.4 Single curing process

2.4.1 With reference to the manufacturing process shown in Figure 1, D2 teaches that the compressed secondary web 8 is prevented from expanding under the inherent resilience of its mineral fibers by providing guide means on both sides of the web 8 between compression rollers 9 and 10 and curing oven 5 or, alternatively, by partially curing the mineral fiber web 8 with heating means 15, which is provided downstream of the last set of compression rollers 9 and 10 (column 8, lines 60 to column 9, lines 15). This specific teaching corresponds to the general teaching from column 2, line 64 to column 3, line 8.

2.4.2 With respect to the alternative manufacturing process of Figure 10, D2 discloses that the fan-folded web 43 is partially cured before it is severed into the secondary webs 50 and 51 (column 12, lines 27 to 30).

This specific teaching corresponds to the general teaching at column 5, lines 36 to 42.

- 2.4.3 In addition, D2 teaches that even though means 48 are provided in Figure 10 for depositing binder as the fan-folds 45 are produced to prevent them from expanding, "any of the means heretofore described relative to FIG. 1 can be utilized" (column 12, lines 10 to 26).
- 2.4.4 A skilled reader of this passage would thus understand that, in the process shown in Figure 10, any of the afore mentioned alternative means described in relation to Figure 1 can be used to prevent the web 43 and its fan-folds 45 from expanding. Hence, in Figure 10, the web 43 and its fan-folds 45 can be prevented from expanding by providing guide means on both sides of the web 43, instead of partially curing it. In such a case, the secondary webs 50 and 51 remain uncured before being fed into and through the curing oven 5. There the reunited webs 50 and 51 are bonded together by curing the binder previously deposited by means 48 in a single curing process. This anticipates the last feature of claim 1.
- 2.4.5 Irrespective of this, the last feature of claim 1 attempts to define the claimed plate by referring to the method by which it is cured. Contrary to the Opposition Division, the Board is not convinced that curing in a single step instead of successive steps would inevitably lead to a discernible difference in the finished plate, such as the binder concentration or the degree of cross-linking in the layers of the plate; these properties are a function of the curing parameters, and these are not defined in claim 1.

2.5 In conclusion, the subject-matter of claim 1 differs from a mineral fiber-insulating plate as obtained by a manufacturing process disclosed in relation to Figure 10 only in that the mineral fibers of the surface layer are arranged substantially parallel to the plate length.

2.6 Hence, the subject-matter of claim 1 is novel over D2 in the sense of Articles 52(1) and 54 EPC.

3. Inventive step with respect to D2

3.1 There is no dispute that the disclosure of D2 is an appropriate starting point for the assessment of inventive step.

3.2 As set out in section 2.5 above, the subject-matter of claim 1 is distinguished from D2 only in that the mineral fibers of the surface layer are arranged substantially parallel to the plate length. As set out in sections 2.3.2 to 2.3.4 above, D2 discloses that, at the end of the manufacturing process of Figure 10, the mineral fibers of the surface layer 51 are arranged parallel with the travel direction of the web. However, it fails to disclose that the web is cut into relatively short plates, such that the plate length is perpendicular to the direction of travel of the web.

3.3 The Board cannot recognise any specific technical effect provided with a short cut length. In fact, it was common general knowledge of a skilled person before the priority date of the patent that, depending on the intended use of the plates, the web of D2 would be cut into short or long plates. Thus, cutting this web into short lengths is an obvious step for the skilled person to take. By so doing, he would inevitably arrive at a

plate with a length perpendicular to the travel direction of the web, so that the mineral fibers of the surface layer would be arranged substantially parallel to the plate length, as required by the distinguishing feature of claim 1.

3.4 The Board therefore concurs with the appellant that, when starting from D2, the subject-matter of claim 1 lacks an inventive step in the sense of Articles 52(1) and 56 EPC.

4. In conclusion, the ground for opposition under Article 100(a) EPC, namely that of lack of inventive step, prejudices the maintenance of the patent as amended before the Opposition Division.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



C. Spira

G. Ashley

Decision electronically authenticated