Internal distribution code:

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

Datasheet for the decision of 14 December 2016

Case Number: T 0346/13 - 3.2.07

Application Number: 03708616.2

Publication Number: 1500482

IPC: B28B11/02, B01D39/20, B01D39/14

Language of the proceedings: EN

Title of invention:
METHOD OF MANUFACTURING HONEYCOMB STRUCTURAL BODY

Patent Proprietor:
NGK Insulators, Ltd.

Opponent:
Young Thought Limited

Headword:

Relevant legal provisions:
EPC R. 103(1)(a)
EPC Art. 83, 54(1), 56, 100(b)

Keyword:
Substantial procedural violation - (no)
Reimbursement of appeal fee - (no)
Sufficiency of disclosure - (yes)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:
T 0575/05, T 0815/07

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern
Boards of Appeal
Chambres de recours

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0346/13 - 3.2.07

D E C I S I O N
of Technical Board of Appeal 3.2.07
of 14 December 2016

Appellant: (Opponent)	Young Thought Limited Narrow Quay House Narrow Quay Bristol BS1 4AQ (GB)
Representative:	Basra, Sandeep Haseltine Lake LLP Bürkleinstrasse 10 80538 München (DE)
Respondent: (Patent Proprietor)	NGK Insulators, Ltd. 2-56 Suda-cho, Mizuho-ku Nagoya-City, Aichi Pref. 467-8530 (JP)
Representative:	Naylor, Matthew John Mewburn Ellis LLP City Tower 40 Basinghall Street London EC2V 5DE (GB)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 11 December 2012 concerning maintenance of the European Patent No. 1500482 in amended form.**

Composition of the Board:

Chairman	G. Patton
Members:	K. Poalas
	C. Brandt

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the interlocutory decision maintaining European patent No. 1 500 482 in amended form.

II. Opposition had been filed against the patent as a whole based on Article 100(a) EPC (lack of novelty and lack of inventive step), Article 100(b) EPC (insufficient disclosure) and Article 100(c) EPC (unallowable amendments).

III. The opposition division found that the amended description page 2 filed during the oral proceedings and the rest of the patent as granted met the requirements of the EPC.

IV. Oral proceedings took place before the board on 14 December 2016.

(a) The appellant requested that the decision under appeal be set aside and that the patent be revoked in its entirety, and further that the appeal fee be reimbursed.

(b) The respondent (patent proprietor) requested that the appeal be dismissed and that the patent be maintained as upheld by the opposition division (main request), or that the case be remitted to the opposition division if any finding of lack of novelty or inventive step were made against claim 1 of the patent as granted (auxiliary request 1), or that the patent be maintained in amended form on the basis of one of the sets of claims filed as auxiliary requests 1 to 5 with the reply to the statement of grounds of appeal, now renumbered with letter dated 23 November 2016 as auxiliary requests

2 to 6.

V. The following documents are referred to in the present decision:

D1 US-A-2002/0020944;
D2 US 4 559 193;
D3 Test Method JIS Z0237:2000;
D4 US 4 557 773;
D5 Product Information Sheet - Scotch® No. 810 Magic® Tape;
D6 3M Technical Data Sheet - Scotch® transparent polyester tape No. 9390;
D7 3M Technical Data Sheet - Scotch® transparent polyester tape No. 9391;
D8 Technical Data Sheet - Scotch® Transparent Film Tape 600;
D9 Technical Data Sheet - Scotch® Transparent Film Tape 681;
D10 Technical Data Sheet - Scotch® Transparent Film Tape 6811;
D11 Technical Data Sheet - Scotch® Transparent Film Tape 605;
D17 Email exchange between the appellant's attorney and an employee of 3M United Kingdom plc;
D20 "Development and Manufacture of Pressure-Sensitive Products", I. Benedek, 1999 (pub. Marcel Dekker), pages 263 to 298;
D21 "Peel Adhesion as a Function of Peel Angle, Peel Rate, and Peel Temperature", Allen T Tsaur and Tom Tsaur, c. 2010,obtained from http://www.pstc.org/files/public/TsaurAllen.pdf;
D24 Product catalogue for Masking Tapes from Grainger, obtained from the website http://www.grainger.com/Grainger/masking-tapes/tapes/

adhesives-sealants-and-tape/ecatalocj/N-85c.

VI. Independent claim 1 of the main request reads as follows:

"A method for producing a honeycomb structure including a step of plugging up a plurality of cells (3) at either of end faces (41, 43) of a honeycomb formed body (1) having two end faces and a plurality of cells passing from one end face to another end face, whereby the step of plugging up the cells includes a first substep of adhering a film (9) to either of the end faces, a second substep of boring holes through the film at specified positions (91) corresponding to the cells to be plugged up by a high-density energy beam and a third substep of packing a plugging material (15) in the cells to be plugged up, and the film used at the first substep comprises a substrate layer and an adhesive layer, characterized in that the film has an adhesive force of 3 - 15 N/25 mm".

In view of the outcome of the present decision, the text of the claims of the auxiliary requests are not of relevance for the present case.

VII. The arguments of the appellant may be summarised as follows:

Substantial procedural violation

It is incumbent on the opposition division to respect the right of the opponent to be heard before reversing its provisional opinion on inventive step and concluding that the skilled man would not combine the teachings of D1 and D4 due to the different thicknesses of the two particular films mentioned in said

documents. There is nothing in the conduct of the opposition division to suggest that it was giving any credence to the submissions in paragraph 5.14 of the proprietor's letter of 8 October 2012, and no objective reason why the opponent should give that paragraph any more weight than the remainder of the above-mentioned proprietor's letter.

The failure to hear the opponent on this point at the oral proceedings amounts to a substantial procedural violation in the circumstances of the resultant reversal of the opinion on inventive step.

As a result, the appeal fee has to be reimbursed under Rule 103(1)(a) EPC.

Sufficiency of disclosure, Articles 100(b) and 83 EPC

In the present case the parameters of "adhesive force" in claim 1 and "thickness" in claims 3 to 5 are not such as to produce such consistent values that the skilled person will know when attempting to carry out the invention whether what he produces will solve the problem or not. These parameters cannot be implemented without undue burden.

The sole information in the patent in suit concerning the measuring of the adhesive force of the film is to be found in paragraph 14, said last referring to D3. The different test methods disclosed in D3 would produce substantially different values, thereby denying the skilled person access to the alleged contribution to the art.

The plot of page 8 of D21 documents the arbitrariness and unpredictability of the actual resultant

measurement with respect to whether it is inside or outside the range 3 – 15 N/25 mm depending on whether the test peel angle is 90° or 180°.

The "thickness" parameter of the film or its component layers, which is the sole additional characterising feature of claims 3 to 5, is subject to a number of possible test methods. Neither the claims nor the description give any suggestion as to which one or ones of the possible test methods are envisaged. The known different test methods would produce substantially different values, again denying the skilled person access to the alleged contribution to the art.

Claim 1 according to the main request – novelty, Article 54(1) EPC

Although an adhesive force of 3 to 15 N/25 mm is not explicitly disclosed in any of D1, D2 or D4, said feature is implicitly disclosed in said documents, since said documents disclose an adhesive bond strength between the film and the ceramic body that is high enough to seal properly to the honeycomb formed body but low enough not to break the honeycomb formed body when removed by peeling or firing, see D1, paragraphs 35 to 39; D2, column 4, line 64, and column 5, line 13; D4, column 3, lines 49 to 53.

In addition, D4 explicitly teaches a specific embodiment using laser boring of a thin transparent polyester film. Furthermore, D5 and D17 provide evidence that the film to be used in the method known from D4 would have an adhesive force of 7 N/25 mm.

Claim 1 according to the main request – inventive step, Article 56 EPC

Starting from D4

The method of claim 1 differs from the one known from D4 in that the film has an adhesive force of 3 – 15 N/ 25 mm.

The effect of said differentiating feature is that sure plugging of the cells can be achieved without any damage to the honeycomb cells when the film is removed.

The problem to be solved can be seen in the provision of a sure plugging of the cells (no slippage of the film) while avoiding damage while peeling or decomposing/burning the film.

Since the selection of an adhesive force of 3-15 N/25 mm was well within the normal capacity of the skilled person at the priority date, as evidenced by documents D5 to D11 and D24, it must be concluded that the subject-matter defined in claim 1 of the patent does not involve an inventive step.

On the other hand, Table 1 of the patent in suit shows the data of different experiments carried out on a single honeycomb formed body using different adhesive films. According to the plot on page 8 of D21 there is a broad variation for the adhesive force values measured under 90° or 180° peel angle conditions. This means that a measurement of the adhesive force of Comparative Example 1 of Table 1 under different peel angle conditions may result in an adhesive force value falling within the claimed range of 3 – 15 N/25 mm. This means that the claimed adhesive force range does not solve the above-mentioned problem of avoiding damage while peeling the film. Moreover, a balance of

positive effects in all film removal circumstances, i.e. also by burning the film, is shown in Table 1 of the patent in suit only for Example 1, i.e. the above-mentioned problem is not solved across the whole scope of claim 1. For this reason alone the subject-matter of claim 1 lacks inventive step. This also means that the claimed range does not provide the alleged improvement over the prior art and that the problem to be solved is to be seen in the provision of an alternative method for fabricating plugged honeycomb structures.

In such a case the problem to be solved can be seen in the provision of an alternative method. There are many tapes available on the market having an adhesive force falling within the claimed range, see D5, D6, D7, D10 and D11, and the skilled person would try to apply one of these when searching for an alternative method. This would result in an arbitrary choice of a known tape which the skilled person can be expected to make without the exercise of an inventive activity.

Starting from D1 or D2

The above-mentioned arguments with regard to inventive step starting from D4 as closest prior-art document are also valid when starting from D1 or D2 as closest prior-art document.

VIII. The arguments of the respondent may be summarised as follows:

Sufficiency of disclosure, Articles 100(b) and 83 EPC

The appellant provides no evidence that, in real working conditions, the skilled person has difficulty finding films of the types mentioned. The results of

the different tests of D3 might vary for certain films; however, this is rather different from evidence showing the skilled person in this technical field having any real difficulty in measuring the adhesive force or being unable to perform said measuring methods without undue burden.

There is no evidence that D21 is a publicly available document, and the information disclosed therein has therefore to be disregarded.

Many of the documents filed by the appellant (see D5 to D11, D20 and D24) quote values for adhesive force without specifying any test method. The reality is that the skilled person does not need to be told in detail the method used for measurement of the adhesive force; and the skilled person, while recognising that different such methods exist, has the ability to understand what is meant when an adhesive force is quoted without reference to a specific measuring method.

Therefore there is no evidence of a real-world problem for the skilled person in working the present invention.

No evidence is provided by the appellant that films vary in "thickness" with the measuring method used to the extent that a statement of the exact method is vital. On the contrary, in the present technical field the method of measuring thickness is routinely not stated.

Therefore, the skilled person in the present technical field has no difficulty in finding suitable films for the present invention, and no problem in putting the

invention into practice.

Claim 1 according to the main request – novelty, Article 54(1) EPC

No adhesive force value is mentioned in D1, D2 or D4. Only with hindsight can it be identified as a property for investigation or discussion. The skilled person at the priority date had numerous possible choices outside the claimed range, and it was thus not inevitable that it would choose one within the claimed range.

Accordingly, there is no direct and unambiguous disclosure of something falling within the scope of the claims.

There is no evidence that the effects provided by a film having an adhesive force within the claimed range are achieved in the prior-art documents D1, D2 or D4. The appellant's argument in this respect is based on an overly broad and speculative interpretation of the disclosure of said documents.

The appellant argues that the tape, whose data sheet is D5, is the tape referred to in D4, with D17 providing evidence that the tape of D5 was publicly available before the priority date of the patent in suit. This is not the case, since the tape of D5 is not the tape referred to in column 8, lines 12 to 14, of D4 because it has a different thickness and is made of a different material.

The subject-matter of claim 1 is therefore novel.

Claim 1 according to the main request – inventive step, Article 56 EPC

Starting from D4

The method of claim 1 differs from the one known from D4 in that the film has an adhesive force of 3 – 15 N/ 25 mm.

The effect of said characterising feature of claim 1 over the method known from D4 is that sure plugging of the cells (no slippage of the film) can be achieved without any damage to the honeycomb cells when the film is removed (patent in suit, paragraphs 6 and 7).

The problem to be solved can be seen in the provision of a sure plugging of the cells while avoiding damage while peeling or decomposing/burning the film.

The appellant refers to documents D5 to D11 and D24 and argues that the selection of the claimed adhesive force range was well within the normal capacity of the skilled person at the priority date and therefore that inventive step is lacking.

The appellant failed to provide any evidence as to why the skilled person seeking to solve the above-mentioned problem **would** choose a film having an adhesive force of 3 to 15 N/25 mm.

The appellant’s argument that no improvement is shown in Table 1 is not correct. Table 1 provides evidence that a film having adhesive force values lying within the claimed range solves the above-mentioned problem of providing a method with inhibited breakage of the honeycomb when the film is removed via peeling or decomposing/burning.

As Table 1 provides evidence for the improvement achieved, the appellant's argument that the present invention provides only an alternative, i.e. the present invention is to be seen as an arbitrary choice, must fail.

Starting from D1 or D2

The above-mentioned arguments with regard to inventive step starting from D4 as closest prior-art document are also valid when starting from D1 or D2 as closest prior art document.

Reasons for the Decision

1. *Substantial procedural violation*

1.1 An opposition division's provisional opinion expressed in the communication annexed to the summons to oral proceedings is obviously an opinion which can be changed after the opposition division was confronted with further arguments put forward by the parties in writing or orally after the issuing of the communication. Not allowing the opposition division to change its provisional opinion in the light of further arguments submitted by the parties would make both the submissions of the parties put forward in writing after the issuing of the communication and the subsequent oral proceedings meaningless.

1.2 The third paragraph on page 8 of the impugned decision discloses one of the reasons given by the opposition division for considering that the subject-matter of claim 1 of the patent as granted involves inventive step (see also page 8, penultimate paragraph, and page 9, first paragraph). For the sake of argument the board follows the appellant's submission that the reasoning

expressed in the third paragraph of page 8 of the impugned decision, namely that due to the different thickness of the two particular films mentioned in D1 and D4 the teachings of said documents are not combinable with each other, was the decisive argument in assessing inventive step.

1.3 The fact is that the argument concerning the non-combinability of the teachings of D1 and D4 had been put forward under paragraph 5.14 in the respondent's submissions dated 8 October 2012, said submissions being filed within the time limit according to Rule 116 EPC. This was also acknowledged by the appellant in its statement with the grounds of appeal.

1.4 Accordingly, the appellant had one month until the oral proceedings for presenting counter-arguments in writing on said topic. It further had the opportunity to present counter-arguments on this topic orally during the oral proceedings.

1.5 The board notes in this respect that the opposition division decides each case on the basis of all arguments presented by the parties both in writing and orally and is not obliged to invite a party to present a complete line of counter-arguments against a specific line of argument of the other party. The degree of completeness of a party's line of argument or counter-argument lies within the entirely free disposition and responsibility of each party.

1.6 In the present case the appellant refrained from putting forward counter-arguments on the above-mentioned respondent's inventive step argument in writing or orally, and it was not prevented from doing

so by the opposition division.

1.7 Therefore the board cannot recognise any procedural violation by the opposition division in terms of the requirements of Article 113 EPC.

1.8 Since the board considers that no substantial procedural violation has occurred, reimbursement of the appeal fee is refused in accordance with Rule 103(1)(a) EPC.

2. *Sufficiency of disclosure, Articles 100(b) and 83 EPC*

2.1 As far as the "adhesive force" feature is concerned, the board follows the respondent's argument that the skilled person would understand that the "adhesive force" feature used in the patent in suit corresponds to the "adhesive strength" feature used in D3.

2.2 Furthermore, the board considers that the adhesive force of an adhesive film is a common parameter for which standard measurement methods are undisputedly known. Some of those are listed in D3, said last being referred to in paragraph 14 of the patent in suit.

2.3 The skilled person would thus obviously have no problem in choosing one of the measurement methods disclosed in D3, measuring the adhesive force for a specific adhesive film and then defining whether the measured value falls within the adhesive force range claimed in claim 1.

2.4 In the board's view the appellant provides no evidence that in real working conditions the skilled person has difficulty finding films having an adhesive force falling within the claimed range. The results of the

different tests of D3 might vary for certain films; however, this is rather different from evidence showing the skilled person in this technical field having any real difficulty in measuring the adhesive force or being unable to perform said measuring methods without undue burden.

2.5 The appellant's argument in this respect is that the adhesive force value is uncertain because the different measurement methods lead to different results. According to the board, however, using an allegedly indefinite term in claim 1 in the present case is not a problem under Article 83 EPC, but rather under Article 84 EPC.

2.6 Furthermore, many of the documents cited by the appellant quote values for adhesive force without any reference to any specific testing method or standard. For example D5, D8, D9, D10 and D11 all specify "adhesion to steel". D6 and D7 specify "JIS method" and "against polyester", and the reference to the D3 standard seems to be considered enough information for the reader to identify the test method used. D20 and D24 do not specify any method or standard.

2.7 As far as the "thickness" feature is concerned, the board again follows the respondent's argument that no evidence is provided that films vary in "thickness" with the method used to the extent that a statement of the exact method is vital, since in the present technical field the method of measuring thickness is routinely not stated (meaning that it is sufficiently well understood to be excluded), and that the skilled person can read values of thickness from data sheets to identify suitable films without the need for any

reference to the measuring method.

2.8 The board further considers that T 575/05 (not published in OJ EPO), referred to by the appellant, is not relevant for the present case since it concerns a patent requiring measurement of the thickness of a very soft body, made from highly compressible materials. The present invention does not relate to such special materials, but to adhesive films which are in principle well-known products.

2.9 Also, T 815/07 (not published in OJ EPO), referred to by the appellant, concerning a patent claiming a product, where Test Method A of a method described therein does not give sufficiently reliable results for defining said product, is not relevant to the present case, said last referring to standard testing methods according to D3.

2.10 For the above-mentioned reasons the board considers the insufficient disclosure objection raised by the appellant to be unfounded and concludes that the patent in suit discloses the present invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

3. *Claim 1 of the main request – novelty, Article 54(1) EPC*

3.1 It is undisputed that none of documents D1, D2 or D4 mentions any specific adhesive force value, let alone an adhesive force value within the claimed range of 3 – 15 N/25 mm.

3.2 The board does not agree with the appellant’s argument that documents D1, D2 and D4 must necessarily have used

a film having an adhesive force within the claimed range because the effects described in paragraph 7 of the patent in suit, namely avoiding slippage of the film during packing of a plugging material and inhibiting breakage of the honeycomb formed body at the time of removing the film, are achieved in said documents, for the following reasons.

3.3 The appellant presented no evidence that these effects are indeed achieved in said documents. The board does not accept the validity of the appellant's reasoning that the fact that D1, D2 and D4 do not mention any partition wall damage when the covering is removed and that the figures of these documents show "clean-ended honeycomb bodies" is evidence that in the methods according to said documents no such damage occurs. The board in this respect follows the respondent's argument that it is logically false to say that if a document does not mention disadvantage X, then disadvantage X does not exist. Perhaps the problem occurred in the cited documents but the authors chose not to mention it. Perhaps it was not noticed. Perhaps it was not considered a problem and so was ignored. Patent documents frequently do not report the disadvantages of the technologies described. Further, the figures of D1, D2 and D4, being schematic, are not helpful for discerning the condition of the partition wall ends.

3.4 With regard to the documents filed by the appellant during the present opposition/appeal proceedings disclosing concrete adhesive force values referred to by the appellant, namely documents D5 to D11, D17, D21 and D24, the board notes that none of these documents has a publication date, let alone a publication date before the priority date of the patent in suit. Accordingly, the board cannot accept these documents as

evidence that a specific film disclosed in one of said documents having a corresponding adhesive force mentioned therein was available to the public before the priority date of the patent in suit and that such an adhesive tape was inevitably used in a method known from one of documents D1, D2 or D4, as argued by the appellant.

3.5 The appellant argues that the tape, whose data sheet is D5, is the tape referred to in D4, with D17 providing evidence that the tape of D5 was publicly available before the priority date of the patent in suit. The board in this respect follows the respondent's argument that the tape of D5 is not the tape referred to in column 8, lines 12 to 14, of D4, because it has a different thickness and is made of a different material.

3.6 Furthermore, even accepting that before the priority date of the patent in suit some adhesive tapes having an adhesive force lying within the range claimed in claim 1 were publicly available, it is uncontested that before the priority date of the patent in suit some publicly available adhesive tapes had adhesive forces outside the claimed range. Accordingly, at the priority date of the patent in suit it was not inevitable that a tape with adhesive force within the claimed range had been used in a method known from one of documents D1, D2 or D4.

3.7 For the above reasons the method of claim 1 is novel over the methods known from D1, D2 and D4.

4. *Claim 1 according to the main request – inventive step, Article 56 EPC*

4.1 *Starting from D4*

4.1.1 The method according to claim 1 differs from the one known from D4 in that the film has an adhesive force of 3 – 15 N/25 mm.

4.1.2 The technical effect of said differentiating feature is that sure plugging of the cells can be achieved (no slippage of the film) without any damage to the honeycomb cells when the film is removed (see paragraph 6 of the patent in suit).

4.1.3 The problem to be solved is therefore to be seen in the provision of a sure plugging of the cells while avoiding damage while peeling or decomposing/burning the film.

4.1.4 The appellant argues that the selection of the claimed adhesive force range was, due to the adhesive force values disclosed in documents D5 to D11, D17, D21 and D24, well within the normal capacity of the skilled person at the priority date and that therefore inventive step is lacking.

4.1.5 The appellant failed to provide any evidence as to why the skilled person seeking to solve the above-mentioned problem would choose a film having an adhesive force of 3 to 15 N/25 mm.

4.1.6 As stated under point 3.4 above, documents D5 to D11, D17, D21 and D24, said documents being referred to by the appellant, are not considered by the board to represent state of the art publicly available before the priority date of the patent in suit. But even if for the sake of argument they were to be considered to have been publicly available before the priority date

of the patent, there is nothing in them that would prompt the person skilled in the art starting from the method known from D4 and seeking to solve the above-mentioned problem to use a film having an adhesive force of 3 to 15 N/25 mm.

4.1.7 As far as Table 1 of the patent in suit is concerned, the board notes that on the one hand it is obvious that the same measurement method is used for defining the adhesive force of Examples 1, 2, 3 and of Comparative Example 1 and that on the other hand there is no significant variation in the adhesive force values measured by the different measurement methods. D21, not being a publicly available document, cannot support the appellant's allegation that the different measurement methods depending on the peel angle would provide an adhesive force for Comparative Example 1 falling within the claimed range.

4.1.8 Not only that, but the board notes that the last four rows of Table 1 show advantageous effects for Examples 1, 2 and 3 over Comparative Example 1. According to these rows, no breakage occurs in Examples 1, 2 and 3 when the film is peeled off and, in addition, no breakage occurs in Example 1 even when the film is removed by firing.

4.1.9 Therefore, the board considers that Table 1 is evidence that a film having adhesive force values lying within the claimed range solves the above-mentioned problem of providing a method with inhibited breakage of the honeycomb when the film is removed via peeling **or** decomposing/burning.

4.1.10 Due to the board's finding under points 4.1.7 and 4.1.8 above, there can be no merit in the appellant's

argument that, since Table 1 of the patent in suit cannot provide evidence of any improvement over the prior art, the problem to be solved is to be seen in the provision of an alternative method for fabricating plugged honeycomb structures by arbitrarily choosing an adhesive film provided with an adequate adhesive force.

4.2 *Starting from D1 or D2*

4.2.1 The above-mentioned arguments with regard to inventive step starting from D4 as closest prior-art document are also valid when starting from D1 or D2 as closest prior-art document.

4.3 For the above reasons the subject-matter of claim 1 involves an inventive step.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

2. The request for reimbursement of the appeal fee is refused.

The Registrar: The Chairman:

G. Nachtigall G. Patton

Decision electronically authenticated