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**Datasheet for the decision  
of 10 July 2013**

**Case Number:** T 2327/09 - 3.3.05  
**Application Number:** 03763527.3  
**Publication Number:** 1521730  
**IPC:** C04B 35/447, C04B 41/83,  
C04B 35/66, A61L 27/12,  
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**Language of the proceedings:** EN

**Title of invention:**

Method of manufacture of porous inorganic structures and  
infiltration with organic polymers

**Applicants:**

Pilliar, Robert M.  
Hong, Jenshong  
Santerre, Paul J.

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 84

**Keyword:**

"Clarity (all requests): no"

**Decisions cited:**

-

**Catchword:**

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Case Number: T 2327/09 - 3.3.05

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.05**  
**of 10 July 2013**

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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted 17 July 2009  
refusing European patent application  
No. 03763527.3 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman:** G. Rath  
**Members:** G. Glod  
C. Vallet

## Summary of Facts and Submissions

- I. The present appeal lies from the decision of the examining division to refuse European patent application EP 03 763 527.3.
- II. The examining division considered that the feature "*holding at said temperature*" referring to a temperature between 570 and 600°C was not unambiguously derivable from the original application. Therefore, the subject-matter of claim 1 of the main request and of the first to third auxiliary requests was found not to meet the requirements of Article 123(2) EPC.
- III. The applicant's (hereafter: the appellant) notice of appeal and the grounds of appeal were received by letters dated 18 September 2009 and 27 November 2009 respectively.
- IV. On 28 February 2013, the appellant was summoned to oral proceedings scheduled for 17 July 2013.
- V. The provisional non-binding opinion of the board in accordance with Article 15(1) RPBA was sent on 22 April 2013.
- VI. With the letter of 12 June 2013 the appellant informed the board that it would not attend the oral proceedings scheduled for 17 July 2013.

VII. The appellant's arguments submitted in writing can be summarised as follows:

Claim 1 of the main request was a combination of originally filed claims 5, 6 and 7. The feature "holding at said temperature" was unambiguously derivable from the application as filed and claim 1 of the main request was not novel with respect to the content of the original application. The following passages of the original application were of particular relevance: page 16, lines 10 to 21; page 8, lines 7 to 12; page 22, lines 5 to 10 and page 10, lines 15 to 25. According to studies and experiments disclosed on page 24, line 20 to page 25, line 15 of the original application, the range of 570°C to 600°C was reached. The holding time for the temperature was not limited to one hour and could be varied as illustrated on page 19, lines 6 to 7; page 25, lines 16 to 17 and page 15, lines 17 to 20 of the original application.

The application defined a new two-stage sintering process wherein the aim of the first step was to allow an initial, rapid sinter-neck development. The result of the studies and experiments was discussed in connection with the determination of sinter-neck formation related to calcium polyphosphate in order to establish a useful range of temperatures for a rapid sinter-neck formation to occur. Also, it was established that the temperature and hold-time period could vary depending on the parameters (e.g. relative humidity or kind of sintering powder used) or final product properties to be achieved (e.g. tensile strength). In addition, at least one example was provided of the parameters (temperature - time) that

could be used in such a new two-stage sintering process.

The feature of the fourth auxiliary request according to which the packed amorphous calcium polyphosphate powder is subjected to a sequential two-stage sintering procedure was supported in several places in the description such as page 16, lines 10 to 21 and page 10, lines 15 to 25.

VIII. Requests:

The appellant requested the decision under appeal to be set aside and the patent to be granted based on the main request or first to third auxiliary requests, claim 1 of these requests having been submitted during the examination phase with the letter dated 5 June 2009 or based on the fourth auxiliary request, claim 1 of this request having been submitted with the grounds of appeal on 27 November 2009. Claims 2 to 29 of these requests are identical to claims 2 to 29 of the main request submitted during the examination phase with the letter of 14 May 2009 and received on 15 May 2009.

IX. Claim 1 of the **main request** reads as follows:

*"1. A method for forming calcium polyphosphate into three dimensional structures, comprising the steps of:*  
*a) forming an amorphous calcium polyphosphate powder material having particles in a pre-selected particle size range;*  
*b) packing the formed amorphous calcium polyphosphate powder material to produce a packed amorphous calcium polyphosphate powder;*

*c) pre-sintering the packed amorphous calcium polyphosphate powder by heating said powder to a temperature between 570 and 600°C and holding at said temperature for an appropriate period of time to produce a pre-sintered amorphous calcium polyphosphate body; and*

*d) heating the pre-sintered amorphous calcium polyphosphate body to a final sintering temperature above a crystallization temperature of said calcium polyphosphate powder material and below a melting temperature of said calcium polyphosphate powder material to form a three dimensional porous crystalline calcium polyphosphate structure."*

Claim 1 of the **first auxiliary request** differs from claim 1 of the main request in that in step c) the word "thereafter" has been added at the end.

Claim 1 of the **second auxiliary request** differs from claim 1 of the main request in that step c) reads as follows:

*"c) pre-sintering the packed amorphous calcium polyphosphate powder by heating said powder to a temperature between 570 and 600°C and holding at said temperature for generally one hour to produce a pre-sintered amorphous calcium polyphosphate body; and"*

Claim 1 of the **third auxiliary request** differs from claim 1 of the main request in that step c) reads as follows:

*"c) pre-sintering the packed amorphous calcium polyphosphate powder by heating said powder to*

*generally 500°C at a rate of generally 10°C per minute, and heated to a temperature between 570 and 600°C at a rate of 5°C per minute and holding at said temperature for generally one hour to produce a pre-sintered amorphous calcium polyphosphate body; and"*

X. Claim 1 of the **fourth auxiliary request** reads as follows:

*"1. A method for forming calcium polyphosphate into three dimensional structures, comprising the steps of:*

- a) forming an amorphous calcium polyphosphate powder material having particles in a pre-selected particle size range;*
- b) packing the formed amorphous calcium polyphosphate powder material to produce a packed amorphous calcium polyphosphate powder;*
- c) subjecting the packed amorphous calcium polyphosphate powder to a sequential two stages sintering procedure comprising:*
  - i) pre-sintering the packed amorphous calcium polyphosphate powder by heating said powder to a temperature between 570 and 600°C for an appropriate period of time to produce a pre-sintered amorphous calcium polyphosphate body; and*
  - ii) heating the pre-sintered amorphous calcium polyphosphate body to a final sintering temperature above a crystallization temperature of said calcium polyphosphate powder material and below a melting temperature of said calcium polyphosphate powder material to form a three dimensional porous crystalline calcium polyphosphate structure."*

## Reasons for the Decision

### Article 84 EPC

1. Main request
  - 1.1 Process step c) of claim 1 is defined by a result to be achieved in view of the feature "*for an appropriate period of time to produce a pre-sintered calcium polyphosphate body*".
  - 1.2 Such a definition is acceptable if the skilled person can easily determine what an appropriate period of time is and verify whether the result (pre-sintered calcium polyphosphate body) is obtained or not to know whether he is working within or outside the scope of the claim.
  - 1.3 As to the definition of "*pre-sintered*", in the present case, the board is of the opinion that the skilled person does not know when a body can be qualified as pre-sintered and how it can be distinguished from a sintered body or a non-sintered body. There is also no generally recognised test available in the art that would allow the skilled person to establish whether a body is pre-sintered or not. Therefore the claim per se is not clearly defined.

There is also no indication in the description showing that it is within the skilled person's knowledge to determine whether a body is pre-sintered or not. It seems that a body is considered as pre-sintered if it displays an effective viscosity to develop significant sinter necks (see for example original claim 1; page 8, lines 1-3; page 16, lines 12-14 and page 24, lines



21-24). However, the description does not contain any indication either as to how the development of significant sinter necks can be verified.

It should also be noted that the appellant, in reaction to the communication sent pursuant to Article 15(1) RPBA (see point 7.5), did not provide any evidence that the skilled person would know how to establish whether a pre-sintered amorphous calcium polyphosphate body was obtained or not.

The description indicates that in some cases the sinter neck growth is not accurate, resulting in under-sintered or over-sintered structures (see page 25, line 16 to page 26, line 4). The skilled person thus learns that pre-sintered amorphous calcium polyphosphate body has a specific meaning, but he does not know how to determine whether a body qualifies as pre-sintered or not. Consequently, he does not know when he is working within the scope of the claim.

1.4 Therefore, claim 1 of the main request does not fulfil the requirements of Article 84 EPC and said request must fail.

2. First auxiliary request

The amendment made to claim 1 does not have an impact on the features objected to in the main request. Therefore the objections under Article 84 EPC raised for the main request remain valid and the subject-matter of claim 1 of the first auxiliary request does not fulfil the requirements of said article. The first auxiliary request also fails.

3. Second auxiliary request
  - 3.1 In step c) of claim 1 the expression "*holding at said temperature for an appropriate period of time*" has been replaced by "*holding at said temperature for generally one hour*".
  - 3.2 The expression "*generally*" is understood as meaning "in most instances; usually, on most occasions". This implies that in some cases the holding at a temperature between 570°C and 600°C is not one hour.
  - 3.3 The skilled person understands that usually holding the temperature at a temperature between 570°C and 600°C for one hour will provide a pre-sintered amorphous calcium polyphosphate body, but on some occasions the temperature has not to be held for one hour at a temperature between 570°C and 600°C to produce the desired pre-sintered amorphous calcium polyphosphate body. However, since the definition of "pre-sintered" is not clear, it is not known to the skilled person when the holding for one hour does not apply, so he does not know whether he is working within the scope of the claim.
  - 3.4 If possible, the skilled person could check whether the holding of the temperature for one hour has allowed him to produce a pre-sintered amorphous calcium polyphosphate body. If not he could adapt the holding time accordingly. As explained above (see Article 84 for the main request) the skilled person is at a loss when trying to establish whether a pre-sintered amorphous calcium polyphosphate body is obtained, since

he does not know when such a body can be considered as pre-sintered. Consequently, the skilled person is not able to check whether the term "generally" applies or whether there is the exceptional situation that the powder has to be held at a temperature between 570°C and 600°C for a time other than one hour.

The scope of claim 1 of the second auxiliary request is therefore not clearly defined and does not fulfil the requirements of Article 84 EPC. Said request must fail.

4. Third auxiliary request

The third auxiliary request still contains the feature "*holding at said temperature for generally one hour*". The amendments made in the third auxiliary request do not help to clarify said feature, so the arguments put forward for the second auxiliary request also apply here.

Claim 1 of the third auxiliary request does not fulfil the requirements of Article 84 EPC and said request must fail.

5. Fourth auxiliary request

Claim 1 of the fourth auxiliary request contains the feature "*heating said powder to a temperature between 570 and 600°C for an appropriate time to produce a pre-sintered amorphous calcium polyphosphate body*".

The only difference with respect to claim 1 of the main request is that the expression "*holding at said temperature*" has been deleted. However, this deletion

does not influence the arguments put forward for the main request under Article 84 EPC, since the appropriate time period still needs to be determined by checking whether a pre-sintered amorphous calcium polyphosphate body is produced, which the skilled person does not know how to do (see point 1 above).

Consequently the subject-matter of the fourth auxiliary request does not fulfil the requirements of Article 84 and said request must fail.

6. None of the requests is allowable.

## **Order**

### **For these reasons it is decided that:**

The appeal is dismissed.

The Registrar

The Chairman

K. Boelicke

G. Raths