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**Datasheet for the decision  
of 01 October 2010**

**Case Number:** T 0560/06 - 3.3.05

**Application Number:** 97420038.8

**Publication Number:** 0795311

**IPC:** A61K 6/02

**Language of the proceedings:** EN

**Title of invention:**

Two phase dental porcelain composition

**Patentee:**

JENERIC/PENTRON Incorporated

**Opponent:**

Vita Zahnfabrik H. Rauter GmbH & Co.

**Headword:**

Dental porcelain/JENERIC

**Relevant legal provisions:**

EPC Art. 52(1), 54(1)(2), 56

**Relevant legal provisions (EPC 1973):**

EPC R. 55(c)

**Keyword:**

"Admissibility of the opposition (yes)"

"Novelty (yes)"

"Inventive step (yes)"

**Decisions cited:**

G 0001/92

**Catchword:**

-



Case Number: T 0560/06 - 3.3.05

**D E C I S I O N**  
**of the Technical Board of Appeal 3.3.05**  
**of 01 October 2010**

**Appellant:** Vita Zahnfabrik H. Rauter GmbH & Co.  
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**Representative:** von Kreisler Selting Werner  
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**Respondent:** JENERIC/PENTRON Incorporated  
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**Representative:** UEXKÜLL & STOLBERG  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 13 March 2006  
revoking European patent No. 0795311 pursuant  
to Article 102(1) EPC 1973.

**Composition of the Board:**

**Chairman:** G. Raths  
**Members:** B. Czech  
S. Hoffmann

### Summary of Facts and Submissions

- I. The appeal is from the decision of the opposition division to reject the opposition against European patent No. 0 795 311.
  
- II. The patent was granted with twelve claims, claims 1 and 2 reading as follows:

*"1. A two-phase porcelain composition comprising a leucite crystallite phase dispersed in a feldspathic glass matrix, a maturing temperature of from about 750 °C to about 1050 °C and a coefficient of thermal expansion of from about  $12 \times 10^{-6}$  cm/cm/°C to about  $17.5 \times 10^{-6}$  cm/cm/°C (room temperature to 450 °C), said porcelain composition comprising:*

<i>Component</i>	<i>Amount (wt.%)</i>
<i>SiO<sub>2</sub></i>	<i>57-66</i>
<i>Al<sub>2</sub>O<sub>3</sub></i>	<i>7-15</i>
<i>K<sub>2</sub>O</i>	<i>7-15</i>
<i>Na<sub>2</sub>O</i>	<i>7-12</i>
<i>Li<sub>2</sub>O</i>	<i>0.5-3</i>
<i>CaO</i>	<i>0-3</i>
<i>MgO</i>	<i>0-7</i>
<i>F</i>	<i>0-4</i>
<i>CeO<sub>2</sub></i>	<i>0-1</i>

*wherein the leucite crystallites possess diameters not exceeding about 10 microns and represent from about 5 to about 65 weight percent of the two-phase porcelain composition."*

*"2. The two-phase porcelain composition of Claim 1 further comprising at least one component selected from the group consisting of opacifying agent, pigment and fluorescing agent."*

III. Opponent 01 had raised objections under Article 100(a) EPC (lack of novelty and inventive step). Opponent 02, who later withdrew its opposition, had additionally raised an objection under Article 100(b) EPC (insufficiency of disclosure).

IV. The prior art relied upon in the opposition proceedings includes the following documents:

D1: DE 1 441 336 B

D14: US 4 604 366 A

D15: "IPR Empress", Ivoclar Vivadent Report No. 6,  
September 1990

Opponent 01 had also invoked prior uses by virtue of sales of materials referred to under the trade name "Omega 900". The allegation of prior use was supported by a bundle of documents labelled D3 to D13 including the following:

D8: Invoices of VITA Zahnfabrik dated January/February 1996 addressed to various recipients, and

D12: Three analytical reports dated 23.05.1995,  
21.10.98 and 22.07.98.

V. In the contested decision the opposition division found that none of the invoked grounds for opposition under Article 100(a) and (b) EPC prejudiced the maintenance of the patent as granted.

More particularly, the opposition division held that the skilled person was able to reproduce the invention without undue burden in the light of the information given in the contested patent, in particular in paragraphs [0019] to [0024].

The alleged public prior use had not been sufficiently substantiated and as such had not been made available to the public, and accordingly did not form part of the state of the art.

The claimed subject-matter was novel and inventive in view of the cited prior art. More specifically, neither document D1 nor D14 unambiguously disclosed a material having a composition as claimed and comprising leucite crystallites with "the claimed specific particles size diameter in a specific range". D14 represented the closest prior art. The selection of a leucite crystallite size of less than 10 micrometers in the finished porcelain composition was not obvious in view of D14 or any of the other documents cited.

VI. In its statement of grounds of appeal, the appellant (opponent 01) argued that the subject-matter of claim 1 lacked an inventive step over the teaching of document D14. In this connection it also referred to document D15. The appellant also maintained that the subject-matter of the patent in suit lacked an inventive step in view of the public prior use constituted by the

sales of material commercialised as "Omega 900" before the priority date of the patent in suit. In this connection, it filed the further documents

D22: Delivery note No.210780 dated 19.01.96,

D23: Accounting document of Vita Zahnfabrik dated 18.07.06, and

D24: Declaration by Mr. Hauser dated 19.07.2006,

and offered oral testimony from a witness, Mr Hauser, concerning the correctness of assertions made in connection with the invoices D8 and the delivery note D22.

VII. In its reply, the respondent (proprietor of the patent) questioned the admissibility of the opposition of the appellant (opponent 01). The respondent concurred with the conclusion reached by the opposition division concerning the alleged prior use of "Omega 900" products. Moreover, it argued that even assuming all the allegations of the appellant in relation to the availability to the public of said products were correct, it would not have been obvious for the skilled person to modify said products in a manner leading to the claimed products. The claimed invention was also inventive in view of D14, even if combined with D15.

VIII. The parties were summoned to oral proceedings.

IX. In response to the summons, the appellant filed a further written submission rebutting the respondent's objection regarding the alleged inadmissibility of the

opposition. It raised novelty objections based on each of documents D1 and D14. Moreover, it emphasised that the "Omega 900" materials had been available to and analysable by the public before the priority date of the patent in suit.

- X. By letter dated 10 September 2010, the appellant informed the board that it would not attend and would not be represented at the oral proceedings.
- XI. Oral proceedings were held on 1 October 2010 in the absence of the appellant.

In response to concerns expressed by the board regarding some of the claims of the patent as granted, the respondent filed a new main request replacing the one previously on file and consisting only of claims 1 and 2 of the patent as granted (see point II above).

- XII. As far as they are pertinent to the assessment of the respondent's amended main request submitted during the oral proceedings, the arguments of the parties may be summarised as follows.

The **appellant** held that the reasoned statement filed with its notice of opposition also addressed the feature "5 to 95%" by referring inter alia to claim 2 of D1. The opposition was thus admissible.

The appellant stated that its entire reasoning as presented before the opposition division was to be incorporated by reference into the appeal proceedings.

Having regard to the reasons given in the contested decision, the appellant argued that the opposition division had not drawn the correct conclusion from the fact that the expression "*diameters not exceeding about 10 microns*" was unclear. The appellant held that due to its lack of clarity, said features could not establish novelty over the disclosures of documents D1 and D14.

The appellant invoked lack of inventive step over document D14, arguing that Table 1 of D14 disclosed a material comprising the components recited in claim 1 of the patent in suit in the prescribed amounts. Said material solved the technical problem underlying the patent in suit, namely the provision of a leucite-containing material suitable for preparing dental ceramics of a predetermined coefficient of thermal expansion coefficient ("CTE" hereinafter). As regards the leucite crystal size, D14 not only disclosed the range of 2 to 50  $\mu\text{m}$ , as mentioned in the contested decision: in example 2 of D14 a leucite crystal size in the range of from 5 to 10  $\mu\text{m}$  was disclosed. D14 thus provided a hint to the skilled person to choose crystal sizes towards the lower end of the range. Moreover, the skilled person knew, as was illustrated by e.g. document D15, that a finer dispersion of small leucite crystals in the glass phase would result in a reduced formation of cracks compared with the case in which wherein larger leucite crystals were used. The allegedly surprising improvement in physiological compatibility merely represented a "bonus effect" based on the smoother and more homogeneous surface of the dental ceramic and could not render the claimed material inventive.



The appellant maintained that "Omega 900" products were made available to the public and were thus analysable before the priority date of the patent in suit. It held that the evidence submitted proved the public prior use of "Omega 900" compositions before the priority date of the patent in suit. Sales of the said compositions to members of the public, including final customers such as dental laboratories, were established in particular by the invoices D8, delivery note D22, accounting document D23 and the statement D24. The commercialised "Omega 900" compositions were thus publicly available for the analysis of their composition using standard methods, as shown by, inter alia, document D12, and the skilled person was thus in a position to arrive at the claimed subject-matter without an inventive step being involved.

The **respondent** held that the opposition of the appellant was not admissible, since it did not deal with one important feature of claim 1, i.e. the relative amount of leucite crystals comprised in the composition.

Document D1 did not even mention the formation of leucite, let alone the size or amount of any leucite crystallites potentially formed under the processing conditions described, and was thus not novelty-destroying. Document D14 did not disclose a porcelain material having both the composition and the properties required by claim 1 of the patent in suit.

Starting from document D14 as the closest prior art and aiming to provide compositions having the required coefficient of thermal expansion and maturing

temperature while providing a particularly smooth surface after firing, there was no obvious reason for selecting the chemical composition and the relative amount and size of the leucite crystallites as suggested by the patent in suit. According to document D14 the leucite crystallites could have a size of up to 50  $\mu\text{m}$ , and no particular precautions were taken to keep their diameters  $\leq 10 \mu\text{m}$ . Document D15 did not suggest the use of crystallites with such diameters, let alone in amounts of 5 to 65 weight percent, in order to solve the technical problem underlying the invention.

Regarding the alleged prior use of "Omega 900", the respondent held that it was not sufficiently substantiated. Questions remained unanswered concerning the date on which the alleged prior use occurred and the circumstances relating to the use. Moreover, it had not been proven that compositions which were identical or similar to the claimed products had been made available to the public before the priority date. In any case, it would not have been obvious for a skilled person to modify the composition of the allegedly used product, the leucite content or the size of the leucite crystallites as suggested by the patent in suit.

XIII. The appellant requested in writing (in its statement of grounds of appeal) that the decision under appeal be set aside and the European patent be revoked.

The respondent requested that the contested decision be set aside and that the patent be maintained on the basis of claims 1 and 2 according to the main request filed at the oral proceedings.

## Reasons for the Decision

### *Admissibility of the opposition*

1. As pointed out by the respondent, the statement of grounds for opposition of opponent 01 (appellant) does not contain any explicit argumentation with regard to the feature of claim 1 concerning the amount of leucite crystallites having diameters not exceeding about 10 micrometers, i.e. the feature "*from about 5 to about 65 weight percent*".
2. However, in said statement of grounds, opponent 01 raised objections regarding the novelty and inventiveness of the claimed subject-matter in view of document D1. The submissions include a detailed analysis of the disclosure of document D1 and address the issue of the relative proportions of the two phases comprised in the composition according to D1 (1:1 to 9:1 according to claim 2 of D1), as well as the issue of the leucite crystallites' size. In the board's judgment, it can easily be understood from this analysis that the opponent considered, without expressly saying so, that the feature in question (point 1 above) was implicitly disclosed in document D1.
3. The board thus concludes that the opposition of opponent 01, filed with the EPO on 8 August 2001, is admissible since it complies with the requirements of the then valid Rule 55(c) EPC 1973.

*Admissibility of the new main request*

4. Claims 1 and 2 making up the new main request filed at the oral proceedings are identical to claims 1 and 2 of the patent as granted. Claims 3 to 12 of the patent as granted were deleted by the respondent in response to reservations expressed by the board in the course of the oral proceedings.
5. While absent at the oral proceedings before the board, the appellant had the opportunity in the appeal procedure to bring forward objections and arguments against the claims of the patent which are upheld according to the present main request, and it did so in its written submissions. The board thus takes the view that accepting the new amended main request at the oral proceedings entails no unfair surprise for the appellant.
6. Considering all the above circumstances, the board decides to admit the respondent's new main request despite its late filing, pursuant to Article 13(1) and (3) RPBA.
7. Moreover, the board sees no reason for delaying the proceedings any further. In accordance with Article 15(3) RPBA, the board takes its decision on the basis of the present main request despite the absence of the appellant at the oral proceedings.

*Amendments*

8. The claims according to the respondent's main request differ from the claims as granted only in that claims 3

to 13 were deleted. Such an amendment cannot give rise to objections under Articles 123(2), 123(3) or 84 EPC. The amendment is, therefore, allowable.

*Sufficiency of disclosure*

9. The board is satisfied that the claimed invention is disclosed in a manner sufficiently clear and complete to be carried out by a person skilled in the art (Article 83 EPC).
10. Since the appellant did not challenge the positive finding of the opposition division (see point V above) having regard to sufficiency of disclosure, detailed reasoning need not be given in this respect.

*Novelty*

11. The appellant acknowledged that lack of clarity of a granted claim does not constitute a ground for opposition pursuant to Article 100 EPC. However, it argued that the features of claim 1 reading "*wherein the leucite crystallites possess diameters not exceeding about 10 microns*" were so unclear that, in accordance with the established jurisprudence of the boards of appeal, they could not at all be relied upon to distinguish the claimed subject-matter from the disclosure of the prior art, i.e. of documents D1 and D14, respectively. The appellant did not, however, cite any specific decision handed down by the boards of appeal in a case comparable to the present one which could have corroborated its view in this respect.

12. The board accepts that the terms "*about*" and "*diameter*" (of leucite crystallites) lack precision in the sense that the ambit of the claim is blurred at its border (upper limit for leucite particle size). However, in the board's judgment, the features quoted under point 11 above are far from being so unclear as to become entirely meaningless for the person skilled in the art. The appellant merely alleged, but failed to demonstrate convincingly, that this blurring was so important as to make it impossible for the skilled person to distinguish the claimed compositions from the ones disclosed in either D1 or D14. The following analysis of D1 and D14 shows that such a distinction can be made.

13. Document D1

13.1 The appellant did not show that one of the specific dental porcelain compositions disclosed in D1 together with the respective methods for their preparation, and comprising all the components recited in present claim 1 in the relative amounts required by present claim 1, implicitly contained only leucite crystallites that would be considered by a skilled person to have "*diameters not exceeding about 10 microns*" (i.e.  $\mu\text{m}$ ), let alone in a relative amount of 5 to 65 weight percent (to be compared to the proportion of 1:1 to 9:1, i.e. 50% to 90%, disclosed in claim 2 of D1).

13.2 In the absence of further evidence and arguments to this effect, the board sees no reason for calling into question the finding in the contested decision (point 4 of the reasons) of the opposition division, according to which there was no direct and unambiguous disclosure

in D1 of a composition falling within the ambit of present claim 1.

14. Document D14

14.1 D14 (see abstract; claims 1 and 8; column 1, lines 5 to 31; column 6, line 65 to column 7, line 27) discloses dental porcelain raw materials obtained by mixing higher and lower melting glass materials with glass ceramic materials containing differing, controlled amounts of leucite crystals in a glassy phase matrix. The components are mixed in order to adjust inter alia the firing temperature of the porcelain material in the range from about **700** to **1315°C** (column 2, last paragraph) and the CTE of the final porcelain in the range of from **8** to **20**, preferably from **10** to **19** x 10<sup>-6</sup> in/in/°C **at 500°C** (see column 1, lines 30 to 31; column 6, lines 4 to 7). The glass ceramic (frit) materials are obtained by heating a potash feldspar with a potassium source such that a feldspathic glassy matrix phase is formed which contains dispersed leucite crystals in the micron size range, preferably having a size of from **2 to 50 microns**, cooling and finally pulverising the material. The amount of leucite particles dispersed in the glassy phase depends on the amount of potassium dopant added (see column 4, lines 15 to 32, and column 7, lines 10 to 27).

14.2 In the general description part there is thus no direct and unambiguous disclosure of a porcelain composition meeting all the conditions imposed by claim 1 of the patent in suit in terms of composition, maturing temperature, CTE, leucite crystallite size and amount. For the sake of completeness, it is noted that the two

suitable glass compositions described in table 1 do not, as alleged by the appellant, describe a composition having an analysis as required by present claim 1: the higher melting glass contains too much sodium, and the lower melting glass contains too little potassium.

14.3 Document D14 also comprises two examples describing specific dental porcelain compositions. Based on the indications comprised in examples 1 and 2 regarding the chemical compositions and relative amounts of the matrix glass frits A and B (see table 4) and the compositions and relative amounts of the glass-ceramic frits prepared from the feldspars (see table 2) doped with 4% and 9% potassium nitrate, respectively, the overall chemical compositions according to the two examples can be computed to fall within the ranges according to claim 1 of the patent in suit. At the oral proceedings, this was not disputed by the respondent.

14.3.1 The two exemplified compositions have a fusion point of 954°C and 955°C, respectively, i.e. within the maturing temperature range of claim 1 of the patent in suit.

14.3.2 Moreover, the glass-ceramic components admixed to form the dental raw material compositions are the same in both examples and "contained leucite in a 5 to 10 micron particle size range dispersed in the residual glassy phase" (column 9, lines 9 to 11). Purely for the sake of argument, the board assumes in favour of the appellant that this statement is to be understood to mean that the glassy phase will contain no significant amount of leucite particles larger than 10 µm.



14.3.3 However, as will be seen from the following, the two examples of D14 do not disclose all the features of claim 1.

14.3.4 The examples do not contain meaningful indications concerning the CTE values attributable to the disclosed compositions. For the skilled person, the value of 1.2 in example 1 obviously must be wrong, but the correct value is not necessarily 12 and the measuring temperature range is not indicated (D14 mentions CTE values at 400, 500 and 600°C in table 3). Example 2 only contains relative indications as to the CTE coefficient. It has not been convincingly established whether or not one or both of said values lie within the range of instant claim 1.

14.3.5 Moreover, for the board, the exact relative amount of leucite contained in the glass-ceramic materials referred to in table 2 and used in preparing the compositions according to the specific examples 1 and 2 cannot be directly and unambiguously derived from D14, not even from the statement in column 4, lines 15 to 28, of document D14, which was referred to in the opposition proceedings, considering the vague language of said statement (see "might contain" in lines 23 to 25).

14.4 In summary, neither the general description nor the two specific examples of document D14 provide a direct and unambiguous disclosure of a composition showing all the features of present claim 1 in combination.

15. The board is also convinced, and therefore confirms the view of the opposition division, that none of the other

cited prior art documents is novelty-destroying either. Since the appellant did not raise a novelty objection on the basis of one of these documents, detailed reasoning need not be given in this respect.

16. The subject-matter of independent claim 1 and, consequently, of dependent claim 2, thus meets the novelty requirement of Article 52(1) in conjunction with Article 54(1) and (2) EPC.

*Inventive step*

17. The patent in suit (see paragraph [0001]) relates to a two-phase dental porcelain composition of low maturing temperature and high thermal expansion, useful in the preparation and repair of dental restorations such as porcelain-fused-to-metal restorations, all-ceramic restorations, inlays, onlays and veneers.
18. The parties shared the view of the opposition division that document D14 can be regarded as a suitable starting point for the assessment of inventive step. The board can accept this view considering that document D14 also relates to providing two-phase dental porcelain compositions having a controlled coefficient of thermal expansion.
19. The technical problem underlying the patent in suit in the light of D14 consists in the provision of porcelain compositions suitable for use as dental porcelain which provide a particularly smooth, non-abrasive surface when applied to high expansion alloys and ceramics. This problem is also addressed in section [0009] of the patent in suit.

20. As a solution to said technical problem, the patent in suit proposes the two-phase porcelain composition according to claim 1 of the main request (see point II above), which is characterised by *a maturing temperature of from about 750 °C to about 1050 °C and a coefficient of thermal expansion of from about  $12 \times 10^{-6}$  cm/cm/°C to about  $17.5 \times 10^{-6}$  cm/cm/°C (room temperature to 450 °C),* by the following specific composition

<i>Component</i>	<i>Amount (wt.%)</i>
<i>SiO<sub>2</sub></i>	<i>57-66</i>
<i>Al<sub>2</sub>O<sub>3</sub></i>	<i>7-15</i>
<i>K<sub>2</sub>O</i>	<i>7-15</i>
<i>Na<sub>2</sub>O</i>	<i>7-12</i>
<i>Li<sub>2</sub>O</i>	<i>0.5-3</i>
<i>CaO</i>	<i>0-3</i>
<i>MgO</i>	<i>0-7</i>
<i>F</i>	<i>0-4</i>
<i>CeO<sub>2</sub></i>	<i>0-1</i>

and by the requirement that *the leucite crystallites possess diameters not exceeding about 10 microns and represent from about 5 to about 65 weight percent of the two-phase porcelain composition.*

21. Success of the proposed solution to the technical problem

21.1 It has to be noted that according to the patent in suit special measures (see section [0023] of the description) are taken to provide a mixture having the chemical composition according to claim 1 but comprising no

leucite crystals with diameters of more than about 10  $\mu\text{m}$ .

21.2 As emphasised in the patent in suit (see sections [0012] and [0018] of the description), ascertaining that the size of the leucite crystallites contained in a material having a specific chemical composition according to claim 1 does not exceed about 10  $\mu\text{m}$  ensures that the porcelain is fired to nearly 100% of theoretical density, thus forming an impervious surface which is particularly smooth and which will thus not wear away local dentition or cause discomfort in the oral cavity in the way conventional porcelains do. This was not disputed by the appellant.

21.3 In the absence of evidence to the contrary, the board considers the explanations provided by the patent in suit to be plausible and concludes that the stated technical problem is indeed solved by the claimed solution.

22. Hence, it remains to be decided whether the claimed solution to the stated technical problem is obvious in view of the cited prior art.

23. Firstly, it has to be noted that the teaching of D14 encompasses the provision of porcelain compositions with firing temperatures of up to 1315°C and/or with CTE values of less than 12 and more than 17.5 (see point 14.1 above). Moreover, according to the general teaching of document D14, the leucite crystallites dispersed in the glass-ceramic materials used may have a size in the "micron size range, for example, on [sic] the order of 2 to 50 microns" (see column 4, lines 50

to 52). However, the issue of the smoothness of the dental porcelain after firing is not addressed and there is no indication of a preference for crystallite sizes close to the lower end of said range.

23.1 According to document D14, the leucite crystals comprised in the glass-ceramic component of the compositions may generally have a size of from 2 to 50  $\mu\text{m}$  (column 7, lines 15 to 19). D14 contains no suggestions to take particular precautions in order to keep the maximum size of the dispersed leucite crystallites at a level of about 10  $\mu\text{m}$ . It is acknowledged that the glass-ceramic frits used according to examples 1 and 2 "contained leucite in the 5 to 10 micron particle size range" (column 9, lines 22 to 24). In the absence of any indication whatsoever concerning possible advantages of such relatively low crystallite sizes, the specific information ("5 to 10 microns") contained in the examples does not motivate the skilled person to take measures to ascertain that the leucite particles contained in the glass-ceramic frits have a diameter of at most 10  $\mu\text{m}$  in any case (in terms of composition, firing temperature and CTE), let alone in order to solve the technical problem stated above by providing a composition which additionally meets the other criteria specified in claim 1 of the patent in suit.

23.2 The claimed solution is thus not obvious in view of document D14 taken by itself.

24. In its statement of grounds of appeal, the appellant also asserted that the skilled person knew that "a finer dispersion of small crystals in the glass phase

leads to a reduced formation of cracks as compared to the use of larger leucite crystals" (translation by the board). Document D15 was cited as an illustrative example of this knowledge.

- 24.1 The board notes that document D15 is a publication describing the development of commercial glass-ceramic materials for use in dental restoration systems. Considering the nature of this publication, the board does not accept that its contents can be considered to belong to common general knowledge.
- 24.2 The materials described in D15 are obtained by fusing a basic glass composition (which may be a mixture of two base glass compositions), quenching the melt, milling and re-melting the material, followed by a controlled tempering process transforming the material into a glass ceramic. It has to be noted that the materials used contain no lithium and may contain less sodium and more aluminium (see Figure 12 of D15) than the material according to claim 1 of the patent in suit.
- 24.3 It is acknowledged that D15 discloses glass-ceramics comprising leucite "microcrystals" in the "micrometer range" or "of a few micrometers" (translation by the board) dispersed within a glass matrix: see page 3, central column, third paragraph; page 10, left-hand column, penultimate paragraph; page 11, left-hand column, second paragraph and the leucite crystals in Figures 20 to 21.
- 24.4 However, the appellant did not indicate specific passages of D15 to support its allegation that the finer the crystals were, within the range of from 2 to

50 µm taught by D14, the more the crack formation would be reduced. Nor did the board find passages in D15 suggesting that in the context of a different chemical composition (see point 24.2 above), keeping the leucite crystal size  $\leq$  about 10 µm and the leucite amount in the range between 5 to 65 weight percent would lead to a particularly smooth surface of the dental porcelain after firing.

24.5 The claimed solution was thus not even obvious when considering both documents D14 and D15 together. Hence there can be no question of a "bonus effect".

25. The alleged prior uses of "Omega 900"

25.1 In order to substantiate the nature of what had actually been made available to the public by means of the sales evidenced by the various commercial supporting documents D8, D22 and D23, the appellant relied inter alia on document D12. The documents labelled D12 include two reports ("Analysenbericht") showing the results of analyses performed on samples numbered "199", "199.1", "278" and "278.1". The reports bear hand-written indications according to which the four samples are in fact four different compositions of the "Omega 900" or "Om 900" type, labelled respectively "Gr. Misch", "D. Misch", "neue Schultermasse" and "neue Window".

25.1.1 It can safely be assumed that the report dated 21.10.1998 (concerning samples "278" and "278.1") must relate to analyses performed a relatively long time after the priority date of the patent in suit. Moreover, the indications "neue Schultermasse" (sample "278") and

"neue Window" (sample "278.1") could be understood to relate to modified products possibly only developed a short time before the analysis, i.e. after the relevant priority date. The report dated 21.10.98 is thus not suitable as proof of the composition of any "Omega 900" products sold before the priority date.

25.1.2 Moreover, as recognised by the appellant in its statement of grounds for opposition, none of the four samples mentioned in D12 has a composition falling within the ranges according to claim 1 of the patent in suit. In particular, all of the four analysed samples differ from the claimed composition in terms of  $\text{Na}_2\text{O}$  and  $\text{Li}_2\text{O}$  contents, which are considerably lower than required by present claim 1, as well as in terms of their  $\text{Al}_2\text{O}_3$  contents, which are higher than the maximum value required by present claim 1. Moreover, sample "199" also has an  $\text{SiO}_2$  content which is considerably lower than the minimum content prescribed by present claim 1.

25.2 Therefore, even assuming in the appellant's favour, but purely for the sake of argument,

- i) that products having the specific compositions reported in D12 were indeed made available to the public by virtue of sales without any confidentiality agreement before the priority date of the patent in suit, and
- ii) that the sold products could have been analysed (composition and micro-morphology) and reproduced by the person skilled in the art (see the conclusions in opinion G 1/92 (OJ 1993, 277) of the Enlarged Board of Appeal),



so that the products and their relevant properties could be regarded as forming part of the prior art to be considered, the skilled person would not be induced by these specific prior art products (having compositions according to D12) to modify the compositions disclosed in D14 such as to obtain a composition falling within the ambit of claim 1 of the patent in suit. The reasons are as follows.

- 25.3 Selecting the components in amounts corresponding to the analyses given in D12 would lead to products not falling within the claimed ranges, at least with respect to sodium, lithium and aluminium oxides.
- 25.4 Moreover, the appellant did not express any view on the argument of the respondent that none of the documents relating to the "Omega 900" products described the amount of leucite crystals possibly contained therein. The appellant thus did not show that leucite crystals were contained in "Omega 900" products commercialised before the priority date in an amount of between 5 and 65 weight percent. Consequently, based on the evidence on file, said alleged prior use of "Omega 900" products does not suggest incorporating leucite in an amount within the range of 5 to 65 weight percent into a composition according to D14.
26. According to a second line of argument presented in the appellant's statement of grounds for opposition, the claimed compositions did not involve an inventive step in view of the alleged prior use of "Omega 900" products.

26.1 More particularly, the appellant argued as follows (in its statement of grounds for opposition):

Since the "Omega 900" products had a CTE of about  $13.3 \times 10^{-6}$  between 25 and 450°C, contained finely dispersed leucite crystals of about 3 µm in diameter and provided a homogeneous and dense surface after firing, varying the relative amounts of the different oxide components was something within the reach of the skilled person, who knew the effects of such variations on the fusion point and firing temperature, the opacity and the CTE of the material. It also submitted, though without providing evidence, that the skilled person would aim for compositions with relatively low firing temperatures in order to avoid the undesirable growth of the leucite particles upon firing.

26.2 However, the appellant did not set out convincingly - why the skilled person unaware of the present invention would depart from the allegedly commercially available, and hence optimised, products by modifying the relative amounts of three of the essential oxide components, and still expect a high smoothness of the fired material and crystal diameters not greater than about 10 µm in combination with a CTE and maturing temperature in the range according to claim 1, and - what would induce him to control the amount of leucite crystals in the range of from 5 to 65 wt.-%.

26.3 Therefore, even assuming that "Omega 900" products with a composition according to the reports of D12 (1995) were made available to the public before the priority date, the appellant did not, in the board's judgment, discharge its burden of proving that providing the

claimed composition was obvious in view of said allegedly used products.

26.4 The board is also satisfied that the other prior art documents cited in the opposition proceedings contain no additional information which could render the claimed subject-matter obvious.

27. The subject-matter of claim 1 and 2 thus involves an inventive step (Article 52(1) EPC in conjunction with Article 56 EPC).

**Order**

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

1. The decision under appeal is set aside.
  
2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of claims 1 and 2 according to the main request filed at the oral proceedings and a description to be adapted.

The Registrar

The Chairman

C. Rodriguez Rodriguez

G. Rath