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**Datasheet for the decision  
of 10 August 2024**

**Case Number:** T 2313/22 - 3.3.05

**Application Number:** 15812269.7

**Publication Number:** 3159323

**IPC:** C04B35/48, A61C13/083,  
C04B35/488, C04B35/64,  
A61C13/08

**Language of the proceedings:** EN

**Title of invention:**

COLORED TRANSLUCENT ZIRCONIA SINTERED BODY AND POWDER, AND USE THEREOF

**Patent Proprietor:**

Tosoh Corporation

**Opponents:**

Solvantum Intellectual Properties Company  
3M Healthcare Germany GmbH  
Treibacher Industrie AG

**Headword:**

Zirconia sintered body/TOSOH

**Relevant legal provisions:**

EPC Art. 54, 56, 83, 87, 123(2)  
RPBA 2020 Art. 12(2)

**Keyword:**

Sufficiency of disclosure - (yes)  
Inventive step - main request, auxiliary requests 1 to 7 and 9  
- (no) - auxiliary request 10 - (yes)  
Amendments - auxiliary request 8 - allowable (no) - auxiliary  
request 10 - allowable (yes)  
Priority - (no)  
primary object of appeal proceedings to review decision -  
appeal case directed to arguments on which decision was based  
- auxiliary request 10 - (yes)

**Decisions cited:**

G 0003/14, T 2831/18, T 0386/17, T 0665/90, T 0092/20

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 2313/22 - 3.3.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.05**  
**of 10 August 2024**

**Appellant:** Tosoh Corporation  
(Patent Proprietor) 4560 Kaisei-cho  
Shunan-shi  
Yamaguchi 746-8501 (JP)

**Representative:** TBK  
Bavariaring 4-6  
80336 München (DE)

**Respondents 1:** Solventum Intellectual Properties Company  
(Opponents 1) 3M Healthcare Germany GmbH  
2510 Conway Ave E / Carl-Schurz-Str. 1  
Maplewood Minnesota 55144 (US) / 41453 Neuss (DE)

**Representative:** Brem, Roland  
Solventum Germany GmbH  
Legal Affairs  
Espe Platz  
82229 Seefeld (DE)

**Respondent 2:** Treibacher Industrie AG  
(Opponent 2) Auer von Welsbach-Strasse 1  
9330 Treibach-Althofen (AT)

**Representative:** Schwarz & Partner Patentanwälte GmbH  
Patentanwälte  
Wipplingerstraße 30  
1010 Wien (AT)

**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 18 July 2022  
revoking European patent No. 3159323 pursuant to  
Article 101(3) (b) EPC.**

**Composition of the Board:**

**Chairman**            E. Bendl  
**Members:**            T. Burkhardt  
                          O. Loizou

## Summary of Facts and Submissions

- I. The patent proprietor's (appellant's) appeal lies from the opposition division's decision to revoke European patent No. 3 159 323 B1.
- II. Of the documents discussed at the opposition stage, the following are relevant to the present decision:

Exhibit A	Table with colorant concentrations re-submitted by opponents 1 with the reply to the grounds of appeal
D2	EP 2 263 988 A1
D3	JP 2008-222450 A
D3a	English translation of D3
D5	EP 2 939 993 A1
D5a	WO 2014/104236 A1
D20a	"Laborversuch zur Nachstellung von Beispiel 1 aus Patentschrift EP 2 263 988 B1 - Teil 1: Hydrolyse von $ZrOCl_2$ durch Kochen unter Rückfluss", experimental report by opponent 2
D20b	"Laborversuch zur Nachstellung von Working Example 1-16 aus Patentschrift EP 3 159 323 B1 - Teil 2: Yttrium-Dotierung und Trocknung von $Zr(OH)_4$ -Sol Suspension aus Hydrolyseschritt 2", experimental report by opponent 2
D20c	"Laborversuch zur Nachstellung von Working Example 12 aus Patentschrift EP 3 159 323 B1 - Teil 3: Weiterverarbeitung bis zum Sinterkörper", experimental report by opponent 2
D21	JP2014-128263

- D21a English translation of D21
- D25 H. Fujizaki et al., "'Zpex® Smile' Which Increases the Coloration Grade and Translucence of 'Zpex®' Dental Zirconia", Tosoh Research & Technology Review vol. 58, 2014
- D25a English translation of D25

- III. The opposition division held, *inter alia*, that:
- the main request and auxiliary requests 1 to 8 did not meet the requirements of Article 83 EPC in view of the tests carried out by the opponents
  - auxiliary requests 9 and 10 did not meet the requirements of Article 56 EPC in view of D5 in combination with D3
- IV. In appeal proceedings, the appellant maintained *inter alia* the main request (claims as granted) and auxiliary requests 1 to 10 forming the basis of the decision under appeal.
- V. Independent claims 1, 7 and 11 of the main request read as follows:

"1. A colored translucent zirconia sintered body comprising zirconia containing greater than 4.0 mol% and not greater than 6.5 mol% of yttria, less than 0.25 mol% of erbia, greater than 0 ppm and less than 2,000 ppm of iron oxide in terms of Fe<sub>2</sub>O<sub>3</sub>, less than 0.01 wt.% of cobalt oxide in terms of CoO, and less than 0.1 wt.% of alumina, provided that the zirconia contains at least either greater than 0 mol% of erbia or greater than 0 wt.% of cobalt oxide in terms of CoO; the zirconia sintered body having a relative density of not less than 99.90%, a total light transmittance of not less than 25% and less than 40% for light having a

wavelength of 600 nm at a sample thickness of 1.0 mm, and a strength of not less than 500 MPa."

"7. A production method for the colored translucent zirconia sintered body according to any one of claims 1 to 6 comprising:

a molding step of obtaining a green body by molding a zirconia powder composition containing greater than 4.0 mol% and not greater than 6.5 mol% of yttria, less than 0.25 mol% of erbia, less than 0.1 wt.% of an aluminum compound in terms of  $\text{Al}_2\text{O}_3$ , greater than 0 ppm and less than 2,000 ppm of iron compound in terms of  $\text{Fe}_2\text{O}_3$ , and less than 0.01 wt. % of cobalt compound in terms of  $\text{CoO}$ , provided that the zirconia powder composition contains at least either greater than 0 mol% of erbia or greater than 0 wt.% of cobalt oxide in terms of  $\text{CoO}$ ; and a sintering step of sintering the green body under normal pressure at 1,400 to 1,600°C."

"11. A zirconia powder composition comprising greater than 4.0 mol% and not greater than 6.5 mol% of yttria, less than 0.25 mol% of erbia, greater than 0 ppm and less than 2,000 ppm of iron compound in terms of  $\text{Fe}_2\text{O}_3$ , less than 0.01 wt. % of cobalt compound in terms of  $\text{CoO}$ , and less than 0.1 wt.% of alumina, provided that the zirconia powder composition comprises at least either greater than 0 mol% of erbia or greater than 0 wt.% of cobalt oxide in terms of  $\text{CoO}$ ; the zirconia powder composition having a BET specific surface area of from 7 to 13  $\text{m}^2/\text{g}$ ."

VI. Auxiliary requests 1 to 6 and 9 comprise an independent claim directed to a zirconia powder composition identical to that of claim 11 of the main request.

VII. Compared with claim 11 of the main request, the yttria concentration range in independent product claim 8 of auxiliary request 7 has been further limited to "~~greater~~not less than ~~4.64.0~~ mol% and not greater than 6.5 mol%" (differences with respect to claim 11 of the main request underlined or struck through, emphasis added by the board).

VIII. Independent claim 1 of auxiliary request 8 reads as follows (differences with respect to claim 1 of the main request underlined or struck through, emphasis added by the board):

"1. A colored translucent zirconia sintered body comprising zirconia containing greater than 4.0 mol% and not greater than 6.5 mol% of yttria, not less than 0.03 mol% and less than 0.25 mol% of erbia, greater than 0 ppm and less than 2,000 ppm of iron oxide in terms of  $\text{Fe}_2\text{O}_3$ , less than 0.01 wt.% of cobalt oxide in terms of CoO, and less than 0.1 wt.% of alumina ~~, provided that the zirconia contains at least either greater than 0 mol% of erbia or greater than 0 wt.% of cobalt oxide in terms of CoO;~~ the zirconia sintered body having a relative density of not less than 99.90%, a total light transmittance of not less than 25% and less than 40% for light having a wavelength of 600 nm at a sample thickness of 1.0 mm, and a strength of not less than 500 MPa."

IX. Independent claim 1 of auxiliary request 10 reads as follows (differences with respect to claim 11 of the main request underlined or struck through, emphasis added by the board):

"~~11~~1. A zirconia powder composition comprising greater than 4.0 mol% and not greater than 6.5 mol% of yttria,



less than 0.25 mol% of erbia, greater than 0 ppm and less than 2,000 ppm of iron compound in terms of  $\text{Fe}_2\text{O}_3$ , less than 0.01 wt.% of cobalt compound in terms of  $\text{CoO}$ , and less than 0.1 wt.% of alumina, provided that the zirconia powder composition comprises at least either greater than 0 mol% of erbia or greater than 0 wt.% of cobalt oxide in terms of  $\text{CoO}$ ; the zirconia powder composition having a BET specific surface area of from ~~7-10~~ to ~~13-12~~  $\text{m}^2/\text{g}$ ."

Dependent claims 2 and 3 relate to specific embodiments.

- X. Since the parties withdrew their requests for oral proceedings, these were cancelled.
- XI. The arguments put forward by the appellant during the appeal, where relevant to the present decision, can be summarised as follows.

All the requests met the requirements of the EPC.

- XII. The arguments made by opponents 1 (respondents 1) and opponent 2 (respondent 2) during the appeal, where relevant to the present decision, can be summarised as follows.

The main request and auxiliary requests 1 to 7 and 9 did not meet the requirements of Article 56 EPC.

Auxiliary request 8 did not meet the requirements of Article 123(2) EPC.

Auxiliary request 10 was not to be considered, and did not meet the requirements of Article 123(2) EPC or Article 56 EPC.

XIII. The patent proprietor (appellant) requested that the oppositions be rejected. Alternatively, they requested that the patent be maintained in amended form on the basis of:

- auxiliary requests 1 to 19 re-submitted with the statement setting out the grounds of appeal
- new auxiliary requests 20 and 21 submitted with the statement setting out the grounds of appeal.

Joint opponents 1 (joint respondents 1) and opponent 2 (respondent 2) requested that the appeal be dismissed.

## **Reasons for the Decision**

### *Main request*

The main request corresponds to the claims as granted.

#### 1. Sufficiency of disclosure

For the following reasons, the opposition division's conclusion that the main request does not meet the requirements of Article 83 EPC is incorrect.

##### 1.1 Reworking of Working Example 12 of the patent in suit by the respondents

The opposition division concluded that the respondents' attempt to rework Working Example 12 of the patent in suit proved that the invention was not sufficiently disclosed.

The patent in suit describes which process steps are necessary to produce:

- the different zirconia powders (paragraphs [0156] to [0168])
- the sintered body (paragraphs [0169] to [0170])

The patent in suit also contains several examples (see for example tables 2 to 4).

However, several gaps in the teaching of the patent in suit had to be filled by the respondents when trying to repeat Working Example 12, in particular:

- the absence of details about the hydrolysis step to be used (paragraph [0156] of the patent in suit). Consequently, the respondents chose to follow the instructions of paragraph [0064] of D2 in this regard. This was considered a reasonable approach, especially since a family member of D2 is cited in paragraph [0003] of the patent in suit (see D20a)
- the absence of details about the calcination step to be used. The respondents chose the temperature and the duration of paragraph [0156] of the patent in suit and a heating rate of 5K/min (page 1 of D20c)
- the absence of details (device, temperatures etc.) about the spray drying step to be used (paragraph [0159] of the patent in suit). In the respondents' view, spray drying required a certain scale

In spite of these efforts, the BET specific areas of the powders produced (see the table on page 8 of D20c) were, although mostly still in the lower range of claim 11, significantly smaller than those obtained in working example 12 of the patent in suit (table 1 of the patent in suit).

Moreover, the relative density and light transmittance of the sintered body produced from these powders (page 8 of D20c) were below the ranges of claim 1.

However, the patent in suit indicates that a BET specific surface area of the powder composition:

- which is below the range of claim 11 results in problems with pulverisation
- which is above the range of claim 1 is likely to cause a low density (paragraph [0117])

It is known that the BET specific surface areas of these types of powder depend to a large extent on calcination conditions. While not contesting this in general, the appellant subsequently stated that specifically the *heating rate* of the calcination step is of only minor influence.

Given the importance of calcination to specific surface area and, in turn, density, it does not make sense for the respondents to have used the *entire* charge ZrO<sub>2</sub>-IP-01/20-01-T01 - i.e. the first and only portion of the hydrolysis product with the high conversion required by paragraph [0064] of **D2** - to carry out calcination with a single set of operating conditions, i.e. 1160°C for 2h after heating at a rate of 5K/min (page 1 of D20c), yielding low BET specific surface areas.

Instead, the respondents should have carried out several small scale tests to determine the calcination conditions for obtaining BET specific surface areas closer to those of table 1 of the patent in suit and not only at the lower limit of the claimed range.

Under these circumstances, a single counter-experiment is not sufficient to establish serious doubts (see also T 665/90, reasons 3).

## 1.2 Relative densities

The respondents also objected to the feasibility of determining the relative density of claim 1, which involved knowledge of the theoretical density. Different crystal phases were present. The impact of erbia was not considered in the equations of the patent in suit, in particular in cases where further components (such as  $\text{HfO}_2$ ) are present. No theoretical density was indicated for erbia and the values given in further documents were different.

However, the board concurs with the opposition division's preliminary view before the oral proceedings, according to which paragraphs [0024] to [0034], [0126] to [0131] and [0172] to [0177] of the patent in suit provide sufficient information and examples for determining relative density even if different crystal phases, erbia and/or further elements are present. In this regard, the respondents succeeded in determining relative density in document D20c although hafnia was, in the respondents' view, "typically always present together with zirconia".

The presence of several errors in paragraph [0174] of the patent in suit does not change this finding as these errors can be easily identified and corrected.

Cases T 2831/18 and T 92/20 do not apply to the case at hand. Firstly, in both cases, due to the withdrawal of the appeal, no final decision was issued. Moreover,

contrary to the present case, the equations in these cases were only based on an yttria concentration of 3%.

The respondents' objections are moreover not supported by evidence and several aspects instead concern clarity issues, which cannot be discussed under the current circumstances (G 3/14).

### 1.3 Light transmittance

Paragraphs [0149] to [0151] and [0153] provide information on how light transmittance of the sintered body is measured. Measurement results are shown for several examples (table 2).

In document D20c (page 8), the respondents succeeded in determining light transmittance.

There is no evidence to prove that this parameter can only be determined with undue burden or that any differences between measurement methods are such that they do not only affect the edges of the claim.

### 1.4 Colorant content

In the respondents' view, none of the working examples of the patent in suit could be reproduced since there was no hint which powders should be used and in which amounts. Exhibit A showed that the sum of the individual colorant concentrations did not match the values in the column "Total colorant content" in table 2 of the patent in suit.

While it has not been contested that there is a mismatch between the contents of the individual colorants and the total amount, this does not call into

question sufficiency of disclosure. There is, for example, no evidence that, using the individual colorant concentrations of table 2, sintered bodies with the indicated other properties (e.g. density, light transmittance, luminosity) are not obtained.

2. Priority

The appellant indicates several passages of the priority document **D21** (see English translation **D21a**) that allegedly disclose, in combination, the feature "the zirconia powder composition comprises at least either greater than 0 mol% of erbia or greater than 0 wt.% of cobalt oxide in terms of CoO" of claim 1 of the patent in suit.

In this regard, the appellant cites paragraphs [0031], [0033], [0036] and [0037] of the priority document. In addition, the appellant points to paragraphs [0038], [0039] and [0072] as well as to Working Examples 1 to 4, 6, 7, 9 and 12 of the priority document as supposed pointers.

Paragraphs [0031], [0033], [0036], [0037], [0038] and [0039] of the priority document explain which elements can be present in the sintered body and in which concentrations. Paragraph [0072] as well as working examples 1 to 4, 6, 7, 9 and 12 disclose specific compositions.

However, a skilled person cannot derive said feature of claim 1 of the patent in suit from these passages in a direct and unambiguous manner. In this regard, it has not been contested that the priority document does not contain expressions such as "at least" or "either" in

this context. Paragraph [0031] of the priority document merely indicates that *examples* of the colorants *include* erbia and oxides of iron and of cobalt.

It is also unclear why the skilled person should selectively read certain paragraphs in combination (e.g. paragraphs [0031] and [0036]) without considering others (e.g. paragraph [0039] with regard to alumina). It is thus unclear, for instance, why erbia was optional while iron was mandatory, although both paragraphs [0032] and [0036] disclose maximum upper limits and do not mention optionality (in contrast to cobalt oxide in paragraph [0037]). Similarly, it is unclear why alumina is only optional since paragraph [0039] does not indicate this.

The fact that in no working example are both erbia and cobalt oxide missing is not sufficient in this regard, since these working examples disclose further features not inserted into claim 1 (e.g. a specific alumina content).

Therefore, said feature of claim 1 of the patent in suit is an arbitrary selection from said passages of the priority document, and the priority of the patent in suit is not valid (Article 87 EPC).

### 3. Novelty

#### 3.1 Document **D5/D5a**

D5 is a family member of WO 2014/104236 A1 (referred to as D5a below), which is in Japanese and was published on 3 July 2014, i.e. before the filing date of the patent in suit (22 June 2015).



Since the priority of the patent in suit is not valid (see point 2.), D5a is prior art under Article 54(2) EPC.

It has not been contested that the contents of D5 and D5a are identical. Consequently, reference is made below to the passages of D5.

The following concentration ranges of claim 1 of D5 and claim 1 of the patent in suit overlap:

- between 0.02 mol% and <0.25 mol% of erbia
- between 20 ppm and <2000 ppm iron oxide
- 0% cobalt oxide
- between 0.0051 mol% and <0.1 mol% alumina

Besides these multiple overlaps, claim 1 of the patent in suit requires an yttria concentration greater than 4.0 mol% and not greater than 6.5 mol% whereas claim 1 of D5 requires an yttria content between 2 mol% and 4 mol%. This is a further distinguishing feature. T 386/17 does not apply to the case at hand in this regard, since in that case the prior art disclosed a specific value and not a range.

With regard to the specific examples, at least the yttria concentrations of the specific examples of D5 (see table 1) are too low, as already concluded by the opposition division.

Consequently, D5a does not anticipate the subject-matter of the independent claims of the patent in suit (Article 54(1) and (2) EPC).

3.2 Document **D25/D25a**

The respondents have not explained why the opposition division was wrong when concluding - with regard to auxiliary request 9 - that D25/D25a did not disclose:

- the combination of iron oxide and either erbia or cobalt oxides
- a relative density

in the respective ranges of the independent claims of the patent in suit.

As this feature is also present in the independent claims of the claims as granted, D25/D25a does not anticipate their subject-matter either (Article 54(1) and (2) EPC).

4. Inventive step

The decision under appeal concluded that the subject-matter of claim 1 of auxiliary request 9, which is identical to that of claim 11 of the main request, lacks inventive step in view of D5/D5a.

For the reasons set out below, the board shares this view and considers that the subject-matter of claim 11 of the main request lacks inventive step.

4.1 The invention relates to a zirconia powder composition.

4.2 In the first instance proceedings, there was agreement that **D5/D5a**, more specifically examples 7 or 8 thereof, was the closest prior art.

According to table 1 of D5, examples 7 and 8 contain:

- 0.08 mol% erbia

- 0.05 wt% Al<sub>2</sub>O<sub>3</sub>
- 200 ppm and 450 ppm Fe<sub>2</sub>O<sub>3</sub> respectively

On the other hand, the yttria content of examples 7 and 8 is 2.92 mol% and thus below the range of claim 11 of the patent in suit.

The powder composition of examples 7 and 8 of D5 is obtained by mixing powders with a BET specific surface area of 13 m<sup>2</sup>/g, 13 m<sup>2</sup>/g and 12 m<sup>2</sup>/g respectively (paragraphs [0119], [0122] and [0125]). Thus, the specific surface area of the mixture has to be in the range of claim 11.

Since D5 also deals with a zirconia powder composition for producing a zirconia sintered body and since it has numerous features in common with claim 11 of the patent in suit, it is a reasonable starting point for assessing inventive step.

- 4.3 According to the patent in suit, the problem to be solved is to provide a zirconia powder composition which makes it possible to obtain a front tooth denture having aesthetics (such as translucency/light transmittance and colour tone) equivalent to that of a natural front teeth, and strength (paragraph [0015]).

Thus, the patent in suit already explicitly considers the problem not to be limited to the provision of specific translucency. In addition, paragraph [0068] of the patent in suit links both translucency and luminosity to aesthetics. There is thus no amendment of the appellant's case in this regard, and this formulation of the (at present still subjective) technical problem can be accepted.

The board also notes that not all the aspects of the problem (e.g. suitability for front teeth or luminosity) have to be explicitly indicated in claim 11 as long as they are a consequence of the claimed subject-matter.

4.4 It is proposed that this problem be solved by the zirconia powder composition of claim 11 being characterised at least by an yttria concentration between greater than 4.0 mol% and not greater than 6.5 mol%.

4.5 However, the problem has not been solved successfully over the entire claimed range, as proven by documents D20a to D20c.

It has not been contested that the composition of the mixture of zirconia powders used in documents D20a to D20c corresponds to that of Working Example 12 of the patent in suit and falls within the claimed concentration ranges.

In view of the amounts and respective BET specific surface area of the individual powders used in D20c, the BET specific surface area of the resulting powder composition has to fall within the range of claim 11.

However, the table on page 8 of D20c shows that the density and light transmittance are clearly below and the luminosity  $L^*$  is clearly above the ranges corresponding to the aesthetics of front teeth indicated in the patent in suit.

The light transmittance determined in examples 7 and 8 of D5 seems to be within the range of claim 1 of the patent in suit, even if account is taken of the

different method of measurement used. In D5, the D65 method is used (see paragraphs [0017] or [0021]), and not a light with a 600 nm wavelength. However, table 2 of the patent in suit itself shows that the D65-translucency is only slightly higher than the translucency measured by means of a light with a 600 nm wavelength. Hence, the luminosities of examples 7 and 8 of D5 should still lie within the range of claim 1. This has not been disputed. On the other hand, the light transmittance determined in D20c is significantly lower than the claimed range.

4.6 Consequently, the problem has not been solved over the entire range. Rather, the suitability for front teeth seems to be even lower than that of D5.

4.7 According to established case law, however, such a disadvantageous modification of the closest prior art cannot confer inventive step (Case Law of the boards of appeal, 10<sup>th</sup> edn., 2022, I.D.9.21.1)

The subject-matter of claim 11 of the main request therefore lacks inventive step (Article 56 EPC).

#### *Auxiliary requests 1 to 7 and 9*

#### 5. Inventive step

Admittance of auxiliary requests 1 to 7 and 9 notwithstanding, said requests do not meet the requirements of Article 56 EPC.

Auxiliary requests 1 to 6 and 9 comprise an identical independent claim directed to a zirconia powder

composition. These requests fail for the same reason as the main request (Article 56 EPC).

With regard to auxiliary request 7, the following is noted. Since the yttria concentration of Working Example 12 of the patent in suit is within the claimed range of claim 8 of auxiliary request 7 (see table 2 of the patent in suit) and since it has not been contested that tests D20a to D20c are a faithful reproduction, at least composition-wise, of Working Example 12 of the patent in suit, the inventive step objection against the main request also applies to auxiliary request 7 (Article 56 EPC).

#### *Auxiliary request 8*

#### 6. Amendments

Admittance of auxiliary request 8 notwithstanding, said request does not meet the requirements of Article 123(2) EPC.

Independent claim 1 of auxiliary request 8 requires *in combination*:

- the *mandatory* presence of erbia (in an amount not less than 0.03 mol%) and iron compound (greater than 0 ppm and less than 2000 ppm)
- the *optional* presence of cobalt compound and of alumina

Contrary to the appellant's assertion, there is no basis in the application as originally filed for these requirements in combination.

In line with independent claim 1 of auxiliary request 8, paragraph [0051] indicates that "[t]he sintered body of the present invention contains iron oxide" and that the content of iron oxide ... is greater than 0 ppm by weight in terms of  $\text{Fe}_2\text{O}_3$ ". In other words, the iron compound is mandatory.

Also in line with independent claim 1, paragraph [0053] indicates that cobalt oxide is optional ("The sintered body of the present invention may contain cobalt oxide. When the sintered body contains cobalt oxide, the content thereof is ...").

However, while according to independent claim 1 erbia is mandatory and alumina optional, paragraphs [0049] and [0057] deal with these compounds in the same manner. They may not be present but preferably are present.

- Thus, paragraph [0049] states that "[t]he sintered body of the present invention contains erbia" and that "[t]he content of erbia is preferably not less than 0 mol% (0 wt%) [sic], more preferably greater than 0 mol%, and even more preferably not less than 0.03 mol% (0.087 wt.%)".
- Similarly, paragraph [0057] indicates that "[t]he sintered body of the present invention contains alumina" and that "the alumina content ... may be not less than 0 wt.% [sic] and is more preferably not less than 0.03 wt.%."

In addition, the examples of the patent in suit (table 2) instead suggest the mandatory presence of alumina and the only optional presence of erbia. In fact, all the examples do contain alumina whereas Working Example 12 does not contain erbia (but cobalt oxide).

Consequently, the mandatory presence of erbia in combination with the optional presence of alumina in independent claim 1 goes beyond the disclosure of the application as originally filed (Article 123(2) EPC).

#### *Auxiliary request 10*

#### 7. Admissibility

Auxiliary request 10 is considered in the decision under appeal (see points II.2.1 and II.2.4). Under these circumstances, there is no discretion to disregard it at the appeal stage as requested by respondents 1 (Article 12(2) RPBA 2020; Case Law of the Boards of Appeal, 10th edn., 2022, V.A.3.4.4).

#### 8. Amendments

For the reasons set out below, auxiliary request 10 meets the requirements of Article 123(2) EPC.

Compared with claim 11 as originally filed, claim 1 of auxiliary request contains the requirements that:

- the iron oxide content is "greater than 0 ppm", and
- the zirconia contains "at least either greater than 0 mol% of erbia or greater than 0 wt. % of cobalt oxide in terms of CoO"

Claim 1 is based on claim 11 as originally filed in combination with paragraphs [0049], [0051] and [0053] of the application as originally filed (i.e. paragraphs [0045], [0047] and [0049] of the A1 publication.



Paragraph [0051] specifically explains the advantage of combining iron oxide in the sintered body with "at least either of cobalt and erbium".

Contrary to the respondents' view, paragraphs [0049], [0051] and [0053] as originally filed belong to the general section describing the sintered body, not to individual embodiments.

The respondents indicate that, while paragraphs [0049], [0051] and [0053] of the application as originally filed specify the respective concentrations in the "sintered body of the present invention", claim 1 specifies the contents in the "zirconia".

However, the board agrees with the opposition division that these passages of the application as filed use the terms "zirconia" and "sintered body of the present invention" synonymously.

Moreover, the range of the BET specific surface area has been limited to 10 to 12 m<sup>2</sup>/g (see paragraph [0122] of the application as originally filed).

Auxiliary request 10 thus meets the requirements of Article 123(2) EPC.

9. Inventive step

9.1 Examples 7 and 8 of **D5/D5a** are still considered the closest prior art.

As explained above (see point 4.), inventive step could not be acknowledged for several higher ranking requests since tests D20a to D20c carried out by the respondents

showed that the desired effects were not achieved over the entire claimed range.

However, this argument does not apply to auxiliary request 10 as the range of the BET specific surface area has been limited in claim 1 of auxiliary request 10, thus excluding the powders of D20c having too low a BET specific surface area (see the table on page 8).

Hence, there is no longer any evidence on file that the problem mentioned in the patent in suit (see also point 4.3 above) has not been successfully solved.

To the contrary, table 2 of the patent in suit indicates that powder compositions according to claim 1 of auxiliary request 10 enable the production of sintered zirconia bodies having the desired densities, light transmittances and luminosities, and are thus suitable for front teeth applications. By contrast, the luminosity of examples 7 and 8 of D5 is too high (table 1).

Since the available prior art does not suggest solving the technical problem addressed by reducing the yttria content and since there is even teaching away from lower yttria concentrations in D5 (paragraph [0022]), inventive step is to be acknowledged (Article 56 EPC).

9.2 The respondents acknowledge that the teaching of **D6** is similar to that of D5/D5a. The conclusion is consequently the same (Article 56 EPC).

9.3 For the same reasons, the subject-matter of dependent claims 2 and 3 also involves an inventive step (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 opposition division with the order to maintain the patent in amended form on the basis of auxiliary request 10 submitted with the grounds of appeal and a description to be adapted.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated