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**Datasheet for the decision  
of 10 June 2016**

**Case Number:** T 0244/12 - 3.2.07

**Application Number:** 06445040.6

**Publication Number:** 1734155

**IPC:** C23C30/00, C23C16/30,  
C23C16/36, C23C16/40, B23B27/14

**Language of the proceedings:** EN

**Title of invention:**  
Coated cutting tool insert

**Patent Proprietor:**  
Sandvik Intellectual Property AB

**Opponent:**  
Kennametal Shared Services GmbH

**Headword:**

**Relevant legal provisions:**  
EPC Art. 56, 83, 99(1), 108  
EPC R. 41(2)(c), 42(1)(e), 76(2)(a), 76(2)(c), 77(2), 152(8)

**Keyword:**

Admissibility of opposition - (yes)  
Admissibility of appeal - (yes)  
Sufficiency of disclosure - (yes)  
Inventive step - (yes)

**Decisions cited:**

G 0001/12, T 0025/85, T 0590/94, T 0870/92, T 1269/11,  
T 0478/99, T 0413/02, T 0670/95, T 0019/97, T 1137/97,  
T 0445/08, T 1151/02

**Catchword:**



**Beschwerdekammern**  
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Case Number: T 0244/12 - 3.2.07

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.07**  
**of 10 June 2016**

**Appellant:** Kennametal Shared Services GmbH  
(Opponent) Wehlauer Strasse 73  
90766 Fürth (DE)

**Representative:** Prinz & Partner mbB  
Patent- und Rechtsanwälte  
Rundfunkplatz 2  
80335 München (DE)

**Respondent:** Sandvik Intellectual Property AB  
(Patent Proprietor) 811 81 Sandviken (SE)

**Representative:** WSL Patentanwälte Partnerschaft mbB  
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**Decision under appeal:** **Decision of the Opposition Division of the European Patent Office posted on 22 December 2011 rejecting the opposition filed against European patent No. 1734155 pursuant to Article 101(2) EPC.**

**Composition of the Board:**

**Chairman** H. Meinders  
**Members:** G. Patton  
E. Kossonakou

## **Summary of Facts and Submissions**

- I. The appellant (opponent) lodged an appeal against the decision of the Opposition Division to reject the opposition against the European patent No. 1 734 155.

The opposition was filed against the patent as a whole and was based on Article 100(a) EPC (lack of novelty and lack of inventive step) and Article 100(b) EPC (insufficiency of the disclosure).

The Opposition Division held that these grounds did not prejudice the maintenance of the patent as granted.

- II. The Board provided the parties with its preliminary non-binding opinion annexed to the summons for oral proceedings that the opposition and the appeal could be regarded as admissible and that the appeal could be dismissed.

- III. Oral proceedings took place on 10 June 2016 during which the followings aspects, *inter alia*, were discussed:

- admissibility of the opposition and of the appeal;
- sufficiency of disclosure;
- admission of documents D19 and D20 into the proceedings; and
- inventive step of the claimed subject-matter.

The present decision was announced at the end of the oral proceedings.

- IV. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

V. The respondent (patent proprietor) requested that the appeal be rejected as inadmissible, otherwise that it be dismissed or, subsidiarily, if the decision under appeal were to be set aside, that the patent be maintained on the basis of the claims of auxiliary request 1, filed with the submissions of 21 August 2012.

VI. Claim 1 of the main request (patent as granted) reads as follows:

"A coated cutting tool insert of cemented comprising a body of generally polygonal or round shape having at least one rake face and at least one clearance face **characterised in** said insert having a composition of 6.4-8.6 wt-% Co, 4-8.5 wt-% cubic carbides, balance WC, a CW-ratio in the range 0.78-0.92 and having a surface zone of a thickness of 10-35  $\mu\text{m}$  depleted from the cubic carbides TiC, TaC and/or NbC, said insert being at least partly coated with a 10-25  $\mu\text{m}$  thick coating including at least one layer of  $\text{TiC}_x\text{N}_y$ , where  $x \geq 0$ ,  $y \geq 0$  and  $x+y=1$ , and an  $\alpha\text{-Al}_2\text{O}_3$ -layer being the outer layer at least on the rake face and that on said at least one rake face

- the  $\text{TiC}_x\text{N}_y$ -layer has a thickness of 5-15  $\mu\text{m}$  and a tensile stress level of 50-390 MPa and
- the  $\alpha\text{-Al}_2\text{O}_3$ -layer with a thickness of 3-12  $\mu\text{m}$  is the outermost layer with an XRD-diffraction intensity ratio  $I(012)/I(024) \geq 1.3$  and with a mean Ra value  $\text{MRa} \leq 0.12 \mu\text{m}$ , at least in the chip contact zone on the rake face, as measured on ten randomly selected areas  $10 \times 10 \mu\text{m}^2$  by AFM-technique and on said clearance face
- the  $\text{TiC}_x\text{N}_y$ -layer has a tensile stress in the range 500-700 MPa and that and
- the  $\alpha\text{-Al}_2\text{O}_3$ -layer has an XRD-diffraction intensity ratio  $I(012)/I(024) < 1.5$

or on said at least one rake face and said at least one clearance side

- the  $\text{TiC}_x\text{N}_y$ -layer has a thickness of 5-15  $\mu\text{m}$  and a tensile stress level of 50-390 MPa and  
- the  $\alpha\text{-Al}_2\text{O}_3$ -layer with a thickness of 3-12  $\mu\text{m}$ , has an XRD-diffraction intensity ratio  $I(012)/I(024) \geq 1.3$  and on the rake face is the outermost layer with a mean Ra value  $\text{MRa} \leq 0.12 \mu\text{m}$ , at least in the chip contact zone on the rake face, as measured on ten randomly selected areas  $10 \times 10 \mu\text{m}^2$  by AFM-technique and on that said clearance face the top layer consists of a coloured heat resistant paint or a coloured PVD-layer."

In view of the present decision the wording of claim 1 of the auxiliary request is not relevant.

VII. The following documents of the opposition proceedings are of relevance for the present decision:

D2: US-A-5 861 210

D4: EP-B1-0 603 144

D6: Jan Glühman, "Experimentelle Untersuchungen zur Erhöhung der Leistungsfähigkeit beschichteter Hartmetallwerkzeuge", Diplomarbeit, 2004, pages 54-57

D8: US-A-5 863 640

D10: W. Maritzen et al., "Lattice Parameters and Saturation Magnetization of Co-W-C Alloys", Powder Metallurgy International, vol. 17, no. 2, 1985, pages 68-71

The following documents were cited by the appellant for the first time in appeal (see letters dated 14 December 2012, 10 May 2016 and 23 May 2016):

- D11: EP-B-1 867 755
- D12: EP-A-1 867 756
- D13: EP-A-1 918 423
- D14: DE-A-197 52 644
- D15: J.G. Cabañas-Moreno et al., "On the Solubility of Phases in Cemented Carbides, Latin American Journal of Metallurgy and Materials, Vol. 8, no. 1-2, 1988, pages 48-51
- D16: A. Nishiyama et al., "The Purity of the Cobalt Phase in Cemented Carbide Hard Alloys", presented at the meetings of the Japan Institute of Metals, October 1958, Nagoya, Japan and April 1959, Tokyo, Japan, Trans. JIM, Volume 3, 1962, pages 185-190
- D17: B. Roebuck, "Magnetic Moment (Saturation) Measurements on Hardmetals", Int. J. of Refractory Metals & Hard Materials, Vol. 14, 1996, pages 419-424
- D18: D. Balzar, "X-Ray Diffraction Line Broadening: Modeling and Applications to High-Tc Superconductors", Journal of Research of the National Institute of Standards and Technology, Vol. 98, no 3, May-June 1993, pages 321-353
- D19: Report drafted and filed by the respondent in an infringement proceedings before a US court with respect to patents US-A-5 487 625 and US-A-5 654 035 (both of the family of D4), 27 pages
- D20: Email dated 20 May 2016 from Mr M. Beblo to Mr L. Meeman and Mr. C. Wimblish regarding stress measurements in TiCN layer performed on appellant's cutting inserts KCK05, 2 pages

VIII. The appellant argued essentially as follows:

*Admissibility of the opposition*

The legal entity which filed the opposition was the only company with this name in Germany and, hence, could easily be identified. The official designation of the opponent was therefore correct.

The address to be indicated in the notice of opposition is relevant merely for a rapid notification per postal services. There is no requirement in the EPC that it should be the address mentioned in the register of commerce.

A request to correct the address to correspond to that in the register of commerce was filed pursuant to Rules 76(2) (a) and 77(2) EPC.

No further evidence regarding the original opponent had to be filed before the expiration of the opposition period since the identity of the opponent had not changed and had also not been questioned within this period.

The opposition should therefore be regarded as admissible.

*Admissibility of the appeal*

Since the opposition was admissible the reasons presented for its inadmissibility do not hold against admissibility of the appeal.

The decision was correctly issued with the name of the original opponent "Kennametal Technologies GmbH". By



the same token, the appeal was correctly lodged in its name and on its behalf.

The change of name of the original opponent into that of the new legal entity "Kennametal Shared Services GmbH", the universal successor of the original opponent, could only be registered with the EPO once the necessary evidence was filed. This was done when filing the appeal which was clearly to be continued under the name of the new legal entity.

A statement regarding the power of the authorized representative during the opposition proceedings was filed.

The appeal should therefore be regarded as admissible.

*Sufficiency of the disclosure*

The contested patent does not describe how to produce an insert comprising the claimed CW-ratio. No embodiment according to the invention is provided in this respect in the patent.

No indication is provided either as to which extent the claimed CW-ratio contributes in solving the problem of improving toughness.

It is common knowledge, as shown in D15-D17, that the addition of cubic carbides into the composition of cutting tools inserts highly complicates the control of the CW-ratio. In view of this complexity, the skilled person would not know how to modify a given composition of the cemented carbide cutting insert in order to obtain the claimed CW-ratio.

The skilled person would not know either in which unit the measured saturation magnetization  $M_s$  should be expressed when computing the CW-ratio.

As a result of the above, the skilled person would not know how to obtain the claimed CW-ratio.

The same reasons apply with respect to the claimed thickness of the claimed surface zone depleted from cubic carbides of the substrate.

The contested patent further lacks technical information for the skilled person to obtain the claimed XRD-diffraction intensity ratio  $I(012)/I(024)$  above 1.3, and to measure it.

No relation between the XRD-diffraction intensity ratio in the  $\alpha$ - $Al_2O_3$ -layer and the tensile stress in the  $TiC_xN_y$ -layer could be derived from the contested patent. Claim 1 covers two alternatives which are contradictory to each other.

XRD measurements are subject to instrumental artefacts. Since the method to correct these instrumental artefacts is not specified in the contested patent, the skilled person would not know which one to apply.

The coloured heat resistant paint and coloured PVD-layer of the second claimed alternative are completely undefined.

The skilled person is not provided in the contested patent with all the necessary wet-blasting-treatment-related technical information. In particular the selection of the alumina/water ratio is missing.

Consequently, for each of the above reasons the skilled person would not be able to perform the invention.

*Admissibility of late-filed documents D19 and D20*

Documents D19 and D20 were filed as a reaction to the preliminary opinion of the Board given in the annex to the summons to oral proceedings. Both documents were to be regarded *prima facie* relevant for assessing inventive step of the claimed subject-matter when combining the teachings of documents D2 and D8.

Hence, documents D19 and D20 should be admitted into the proceedings.

*Inventive step*

Starting from D8 as closest prior art, the distinguishing features on the rake face shared by the two alternatives of claim 1 are as follows:

ii) the  $\text{TiC}_x\text{N}_y$ -layer has a tensile stress level of 50-390 MPa; and

iii) the  $\alpha\text{-Al}_2\text{O}_3$ -layer has an XRD-diffraction intensity ratio  $I(012)/I(024) \geq 1.3$ ; and

iv) a mean Ra value  $\text{MRa} \leq 0.12 \mu\text{m}$ , at least in the chip contact zone on the rake face, as measured on ten randomly selected areas  $10 \times 10 \mu\text{m}^2$  by AFM-technique.

In view of the synergetic technical effect associated with these distinguishing features, the problem to be solved can be seen as to increase the life time of the cutting tool cemented insert of D8.

The distinguishing features would be derivable, either explicitly or implicitly, from either the disclosure of D8 itself or from that of D2 and/or D4, as the latter documents are referred to in D8 for post-treating the coating inserts. Wet blasting would inevitably lead to cutting inserts having the distinguishing features, as shown for instance by D6.

Further, the skilled person would know that the lower the surface roughness, the better the properties of the cemented insert. Consequently, he would apply wet blasting so as to decrease the surface roughness. By doing so he would arrive at the claimed range and also obtain by the same token the claimed tensile stress levels in the coating layers.

Finally, a comparison between the examples of the contested patent allows to derive that D2 discloses all the parameters applied in the contested patent, including implicitly the wet blasting time. When applying this teaching of D2 to the cutting insert of D8, the skilled person would arrive at the claimed invention in an obvious manner.

In view of the above no inventive step should be recognized for the subject-matter of claim 1.

IX. The respondent argued essentially as follows:

*Admissibility of the opposition*

The probability that in the notice of opposition the opponent's address is correct and the opponent's name is wrong is as high as the opponent's address being wrong and the opponent's name being correct. Since there were two equally possible readings of the notice

of opposition, the opponent was not clearly and unmistakably identifiable within the opposition period. The opposition should then be considered as inadmissible.

Filing evidence for establishing the identity of the opponent after expiration of the opposition period is not an allowable means of redress.

*Admissibility of the appeal*

Since the opposition is inadmissible, the appeal should also be found inadmissible.

The merger of "Kennametal Technologies GmbH", allegedly the original opponent, with "Kennametal Shared Services GmbH" occurred before the filing of the appeal. However, the appeal was filed in the name of the former (no longer existing) company, which had no right to act before the EPO in filing an appeal. This should be regarded as inadmissible.

The representative was also no longer entitled to legally act for the former company and to file an appeal. Proof of the representative's power to act at the relevant times of the opposition and appeal proceedings should be provided.

*Sufficiency of the disclosure*

The CW-ratio is an accepted parameter in the technical field of cutting tool cemented inserts, which the skilled person knows how to measure via the saturation magnetization Ms.

It is common general knowledge that an increase in the content of W with respect to that of C leads to a decrease in the CW-ratio, and vice versa. The relative content of W and C represents the main parameter influencing the CW-ratio and is obtained by adjusting the ratio of WC and W powders. Hence, the skilled person would know how to achieve the desired CW-ratio without undue burden. The effect of the C content on the CW-ratio is also illustrated in D16.

Examples according to the invention are given in the contested patent and the arguments relating to the effect(s) of the CW-ratio are not relevant to the issue of sufficiency of the disclosure.

The skilled person would also know which unit to use for the saturation magnetization  $M_s$  in computing the CW-ratio.

How to obtain and measure the claimed thickness of a surface zone depleted from cubic carbides belongs to the skilled person's common general knowledge, as also shown in document D8.

The skilled person knows also how to obtain the claimed XRD-diffraction intensity ratio  $I(012)/I(024)$  by applying wet blasting to induce internal stresses, in particular in view of the disclosed embodiments according to the invention (Table 1, samples C-H). XRD being a well known and established method, the skilled person knows how to perform the measurements. There is no contradiction between the two claimed alternatives and the contested patent describes how to obtain both of them.

The apparatus used for the XRD-diffraction peak intensity measurements is explicitly mentioned. Hence there is no doubt that the skilled person would know how to perform, interpret and correct the measurements, so as to take into account instrumental artefacts.

The appellant's arguments regarding the coloured layer relate more to the broadness of the claim than to disclosure issues. The contested patent provides enough information on how to produce the coloured layer.

In view of the above, the skilled person would be able to perform the claimed invention.

*Admissibility of late-filed documents D19 and D20*

No new facts or arguments were provided in the annex to the summons for oral proceedings which could justify the late filing of documents D19 and D20. Further, the documents do not appear *prima facie* relevant for assessing inventive step in view of the combination of the teachings of D8 and D2 since they are totally silent on the wet blasting conditions.

Hence, documents D19 and D20 should not be admitted into the proceedings.

*Inventive step*

D8 can be regarded as the closest prior art and features ii), iii) and iv) mentioned above are the distinguishing features on the rake face shared by the two claimed alternatives of claim 1. In view of their synergetic technical effect, the problem to be solved is to increase the life time of the cutting tool cemented insert of D8.

The distinguishing features are not derivable, neither explicitly nor implicitly, from the disclosure of D8, D2 and/or D4. In particular, the wet blasting time is not disclosed, neither in D2, nor in D4, which are referred to in D8 for post-treating the surface of the cutting inserts. Further, wet blasting would not inevitably lead to said features ii), iii) and iv) of the claimed cutting insert.

It does not belong to the skilled person's common general knowledge that the lower the mean surface roughness, the longer the life time of cutting tool cemented inserts. There is no clear reason for which the skilled person would decrease the mean surface roughness down to the claimed limit of 0.12  $\mu\text{m}$  or below.

The wet blasting treatment applied in D2 aims only at removing the outer TiN layer and leaving the  $\text{Al}_2\text{O}_3$  layer as untouched as possible, contrary to the very aim of the contested patent to impact the  $\text{Al}_2\text{O}_3$  layer so as to reduce the tensile stresses in the coating layers. The gentle wet blasting of D2 is in line with the post-treatment of the cutting insert mentioned in D8. As a consequence, the skilled person applying the teaching of D2 to the cutting tools of D8 would not arrive at the distinguishing features ii), iii) and iv).

In view of the above an inventive step should be recognized for the subject-matter of claim 1.



## **Reasons for the Decision**

### 1. *Admissibility of the opposition*

- 1.1 The respondent considers that the opposition was inadmissible because at the time of its filing the legal entity named as opponent, "Kennametal Technologies GmbH", did not "exist" at the address indicated in the notice of opposition (Münchener Str. 125-127, 45145 Essen). The only company existing at this address was "Kennametal Widia Produktions GmbH & Co. KG". Hence, the probability that the opponent's address would be correct in the notice of opposition and the opponent's name wrong was as high as the opponent's address being wrong and the opponent's name being correct. This is all the more true since "Kennametal Widia Produktions GmbH & Co. KG" was active in the same technical field as that of the contested patent and had already filed oppositions before the EPO. Since there were two equally possible readings of the notice of opposition, the opponent was not clearly and unmistakably identifiable within the opposition period. In support of its arguments, the respondent filed extracts from the registers of commerce ("Handelsregister") of Essen (HRA 7912) and Fürth (HRB 10171 and HRB 10172). "Kennametal Technologies GmbH" appears only in the latter.

Further, the respondent considers that the filing of evidence (extract of the register of commerce) for proving the identity of the opponent after the expiration of the opposition period, i.e. with the notice of appeal in the present case, cannot be allowed, as stated in T 25/85, OJ EPO 1986, 81, Reasons 7 and 10.

In case of an error in the identification of the opponent, the opponent cannot rely on a prior EPO communication under Rule 77(2) EPC (T 590/94, not published in OJ EPO, Reasons 1.2; T 25/85, *supra*, Reasons 13).

In view of the above, the opponent could not be clearly and unmistakably identifiable within the opposition period pursuant to Article 99(1) EPC so that the opposition should be considered as inadmissible.

1.2 The Board cannot share this view for the following reasons:

1.2.1 For admissibility of the opposition it is indeed necessary that the opponent be readily identifiable. If the identity of the opponent is not established before expiry of the opposition period, the opposition is inadmissible and the defect cannot be remedied (T 25/85, *supra*, Reasons 6 and 7; T 590/94, *supra*, Reasons 1.2). However, failure to use the exact official designation of a legal entity does not necessarily entail inadmissibility, if the incorrect designation nevertheless suffices to establish the party's identity (T 870/92 of 8 August 1997, not published in OJ EPO, Reasons 1.2).

Rule 77(2) EPC states that when the Opposition Division notes that the notice of opposition does not comply with provisions other than those referred to in paragraph 1 (Article 99, paragraph 1 or Rule 76, paragraph 2(c) EPC), it shall communicate this to the opponent and invite him to remedy the deficiencies noted within a set period. This wording covers the data required under Rule 76(2) (a) EPC, namely the particulars of the opponent (corresponding to those

foreseen in Rule 41(2)(c) EPC for the applicant in the request for grant). These particulars are the name, **address**, nationality and the state of residence (natural person) or principal place of business (legal entity).

As put forward by the appellant, Rule 41(2)(c) EPC states that "*addresses shall be indicated in accordance with applicable customary requirements for prompt postal delivery and shall comprise all the relevant administrative units, including the house number, if any*". It follows quite clearly that the address is relevant merely for a rapid notification per postal services and not for identification purposes. There is indeed no requirement in the EPC that the address to be indicated in the notice of opposition be that of the register of commerce, as implied by the respondent's arguments. As put forward during the oral proceedings, no letters were returned as undeliverable so that all official communications could clearly reach the appellant. Hence, the address indicated in the notice of opposition ensured its function of a prompt postal delivery service pursuant to Rule 41(2)(c) EPC. More is not necessary.

- 1.2.2 The extract of the register of commerce HRB 10171, also supplied by the appellant with its notice of appeal, shows reliably the existence of the legal entity identified as the opponent. As also admitted by the respondent, there is no reason for the Board to believe that there existed two companies under the same name in Germany. The legal person which filed the opposition was the **only company in Germany with this name** and, hence, could easily be identified via the register of commerce of Fürth (HRB 10172). The official designation of the legal entity is therefore correct.

Incorrect with respect to the register of commerce, as discussed above and admitted by the appellant, was then the address, corresponding to another company of the same group (see HRA 7912). Such an error is, however, rectifiable under the applicable provisions. As the appellant has requested the relevant correction with its letter dated 13 August 2012, the European Patent Register was rectified to indicate the correct address, which appears in the corresponding extract of the register of commerce: Wehlauer Str. 73, 90766 Fürth.

Contrary to the respondent's view, there was no need to supply such evidence (extract of the register of commerce) before the expiration of the opposition period since the identity of the opponent had not changed.

- 1.2.3 In the decision T 1269/11, not published in OJ EPO, Reasons 3.1 and 5, cited by the respondent with its letter dated 10 November 2014, the opposition was filed in the name of a company ("Rockinger GmbH") which did no longer exist at the time of filing the opposition. Further, several legal entities of the same group ("Jost-Werke GmbH" renamed "Jost-World GmbH"), allegedly the opponent, existed simultaneously at the very same address given in the notice of opposition. In those circumstances it was impossible to identify which of the legal entities could have been the true intended opponent. This situation does not correspond to the present case as the company "Kennametal Technologies GmbH" existed at the time of filing the opposition, namely from at least 13 May 2005 (see HR 10172). Hence, T 1269/11, *supra*, does not apply.

1.3 In view of the above, the opposition is admissible (Article 99(1) EPC).

2. *Admissibility of the appeal*

2.1 The respondent contests the admissibility of the appeal for the following reasons:

Since the opposition is inadmissible, the appeal should also be found inadmissible. In particular, the appeal was filed in the name and on behalf of "Kennametal Technologies GmbH" which was a different entity than the legal entity "Kennametal Widia Produktions GmbH & Co. KG" which was at the indicated address.

In case it would be accepted that "Kennametal Shared Services GmbH" had taken over the position of the opponent, the appeal was not filed in its name as it should have been since its merger with "Kennametal Technologies GmbH" had occurred before said filing (see appellant's letter dated 6 September 2011). The appeal was filed in the name and on behalf of "Kennametal Technologies GmbH", which no longer existed at the time of filing the appeal. As a non-existing company - already no longer existing at the time of the oral proceedings before the opposition division - it had no right to act before the EPO.

Since the company no longer existed, the representative was no longer entitled to legally act and to file an appeal in its name since any former authorization (if existing) would have lost its validity at the time the company ceased to exist.

In fact, even at the time of filing the opposition no power of attorney was filed, nor a reference to a

general authorization mentioned. Since there are doubts concerning the authorization to act, the EPO should request the appellant to provide an authorisation. A representative should (always) be in possession of such written authorization(s), whether for the filing of an opposition or for the filing of an appeal.

2.2 The Board cannot share the respondent's view for the following reasons as also discussed during the oral proceedings and put forward in the annex to the summons for oral proceedings:

2.2.1 Since the opposition is admissible for the reasons given under point 1 above, the argument that the appeal is inadmissible because of the inadmissibility of the opposition cannot hold. As also pointed out in the discussion of the admissibility of the opposition, "Kennametal Technologies GmbH" is regarded as the original opponent.

The merger of the original opponent with "Kennametal Shared Services GmbH" and the resulting universal succession in the opponent status by this latter company had already been announced, as put forward by the respondent, in the opponent's letter dated 6 September 2011. The extract of the register of commerce ("Handelsregister"), referred to in these submissions as proof of the purported merger, was however not annexed to the letter. The opposition division did not follow up the matter and the impugned decision refers to the originally named company, Kennametal Technologies GmbH, as the opponent. Both the minutes of the oral proceedings and the decision contain no mention of a related discussion.

2.2.2 The EPC does not contain any explicit provision regarding the formal requirements for the transfer of opponent status, in particular in case of a merger, i.e. of universal succession. Nevertheless, the Boards of Appeal have consistently held that certain formal requirements have to be fulfilled for the opponent status to be transferred: a new opponent acquires party status as opponent and as party to the opposition appeal proceedings only **upon filing** with the EPO of **documentary evidence** of the legal succession (see e.g. T 870/92 of 8 August 1997, *supra*, Reasons 2; T 478/99, not published in OJ EPO, Reasons 1.2; cf. Case Law of the Boards of Appeal, 7th Edition 2013, IV.C.2.2.1).

During the opposition proceedings, despite the announcement, no evidence of the merger was filed. The issue appears not to have been addressed as the minutes of the oral proceedings and, more importantly, the decision are silent in this respect. The opposition proceedings were concluded with the originally mentioned opponent. In the absence of supporting evidence that there has been a change of status regarding the opponent, it is to be considered correct that the decision was issued with the name of the original opponent (T 413/02, not published in OJ EPO, Reasons 3; T 670/95, not published in OJ EPO, Reasons 2; cf. Case Law of the Boards of Appeal, 7th Edition 2013, VII.C.5.1.2).

From these considerations it follows that the appeal was correctly lodged in the name and on behalf of the original opponent, as until then no evidence of the purported merger had been provided to the EPO (T 19/97, not published in OJ EPO, Reasons 1 to 5; T 1137/97, not published in OJ EPO, Reasons 1 to 7; T 413/02, *supra*, Reasons 1 to 3).

The change of name of the original opponent into that of the new entity "Kennametal Shared Services GmbH", the universal successor, was done when filing the appeal.

The EPO had no reason to request a power of attorney from the professional representative during the opposition proceedings pursuant to Article 1 of the Decision of the President of the European Patent Office dated 12 July 2007 on the filing of authorisations (Special edition 3 to OJ EPO 2007, L.1). The same applies as from the merger with "Kennametal Shared Services GmbH", since no termination of his authorisation was filed pursuant to Rule 152(8) EPC, as correctly put forward by the appellant. Consequently, the appellant need not retroactively file any authorisation. It is nevertheless noted that a statement from "Kennametal Shared Services GmbH" to this effect was filed during the oral proceedings before the Board (see annex of the minutes).

In T 445/08 of 30 January 2012 (OJ EPO 2012, 588, Reasons 2.1, underlying G 1/12, OJ EPO 2014, A114, Facts and Submissions II and III), cited by the respondent in its letter dated 19 February 2013, the patent was revoked in first instance proceedings and the appeal was filed by a company "ZENON ENVIRONMENTAL INC." which was the former patent proprietor but no longer the registered patent proprietor ("Zenon Technology Partnership"). Both the distinct legal entities existed at the time of filing the appeal. Since this is not the case here, T 445/08, *supra*, does not apply, contrary to the respondent's view.

2.3 In view of the above, the appeal is admissible (Article 108 EPC).



3. *Sufficiency of the disclosure (Article 100(b) EPC)*

3.1 CW-ratio (see impugned decision, point 2.2.1)

3.1.1 The appellant considers that the contested patent does not describe how to produce an insert comprising the claimed CW-ratio. There would not be any embodiment according to the invention showing how to do this. The requirements of Article 83 EPC and Rule 42(1)(e) EPC would hence not be fulfilled.

This would apply even though the selection of the CW-ratio in a range of 0.80-0.90 to achieve a compromise between toughness and hardness would appear to be known in the art.

In addition, there would be no indication to which extent the claimed CW-ratio would contribute in solving the problem set in the contested patent, paragraph [0015], of improving toughness. The comparative examples would concern the layers, not the substrate, so that the effect(s) of the CW-ratio could not be determined. Documents D11, D12 and D13 would indicate that the CW-ratio would be irrelevant.

3.1.2 The Board cannot share the appellant's view for the following reasons, as given by the respondent:

The CW-ratio is an accepted parameter in the technical field of cutting tool cemented inserts (see also T 1151/02, not published in OJ EPO) and the skilled person knows which are the main parameters influencing its value: the Co binder composition, and more particularly the C and W contents. He will then know, how to obtain the desired value by adjusting the ratio

of WC and W powders (see contested patent, paragraph [0012]).

Further, there is no doubt that the skilled person knows how to measure the CW-ratio by specific magnetic saturation polarisation (see T 1151/02, *supra*).

Therefore, the requirements of Article 83 EPC are fulfilled in this respect.

- 3.1.3 In addition, examples according to the invention are given in the contested patent (see Example 1, Table 1, samples C to H). Therefore the requirement of at least one way to execute the invention and of appropriate examples is also fulfilled (Rule 42(1)(e) EPC).

The appellant's arguments relating to the **effect(s)** of the CW-ratio concern more the issue of inventive step than sufficiency of the disclosure for the skilled person to perform the invention.

The documents D11, D12 and D13 were published after the filing date of the contested patent. Even their priority date(s) fall after said filing date. Hence, they are not prior art according to Articles 54(2) or (3) EPC. Therefore, they are not relevant for assessing the sufficiency of disclosure of the patent in suit, which is to be determined on the basis of the skilled person's knowledge **at the date of filing**, supplemented by the information in the patent.

- 3.1.4 At the oral proceedings, as also in its late written submission dated 10 May 2016, the appellant has further argued that it would be common knowledge that the addition of cubic carbides into cutting tools cemented inserts composition, in accordance with claim 1, would

complicate the control of the saturation magnetization and, hence, of the CW-ratio.

Referring for instance to D15 (page 50, left-hand column, first complete paragraph; paragraph linking pages 50 and 51; figure 5) the appellant puts forward that dissolution of WC and Co takes place in TaC and TiC. Hence, the presence of the latter carbides influences the amount of Co in the binder and the amount of W dissolved in Co, finally altering the CW-ratio.

D16 further discloses, in particular when comparing specimens 7, 9 and 10 in table 5 which have nearly identical compositions, wild variations in saturation magnetization (see column "Co% calculated from  $4\pi\sigma$ ") as a result of the presence of TaC, TiC and NbC. Estimated Co (from measured saturation magnetization) and nominal Co content also differ highly by up to 31 or 33%.

D17 (page 422, left-hand column) discloses that other elements can influence the measured saturation magnetization in hard metals. Corrective values are even proposed in table 5 to take this influence into account for a proper estimation of the structure of the hard metals, i.e. for a non-destructive evaluation method of the composition of the binder phase.

As a consequence, in view of this complexity, the skilled person would not know how to modify a given composition of a cemented carbide cutting insert in order to make the CW-ratio fall within the claimed range. Merely adjusting the ratio of WC and W powders would not be enough. This difficulty would further be illustrated by the comparative tests provided by the appellant with a composition of the cemented carbide

cutting inserts falling within the claimed composition but having CW-ratios outside the claimed range (see appellant's letter dated 10 May 2016, comparative tests, pages 5 and 6).

Since there are no indications given in the contested patent on how to obtain the claimed CW-ratio, the skilled person would not be able to perform the invention.

In addition to the above, the skilled person would not know in which unit the measured saturation magnetization  $M_s$  should be considered in the equation given in paragraph [0012] of the contested patent since:

- in T 1151/02 the unit used is kA/m;
- in D10 and D17:  $Tm^3/kg$  (Gauss.cm<sup>3</sup>/g); and
- in the contested patent:  $hAm^2/kg$ .

Since these units appear to be contradictory to each other the skilled person would not be able to perform the invention for this reason either.

3.1.5 The Board cannot share this view for the following reasons given by the respondent, also at the oral proceedings:

As already mentioned under point 3.1.2 above, it belongs to the skilled person's common general knowledge that when increasing the content of W with respect to that of C the CW-ratio decreases, and vice versa. This relative content of W and C is the main parameter influencing the CW-ratio, even though as indeed shown by documents D15-D17 the cubic carbides have also some influence. Hence, once the amount of cubic carbides is fixed, the skilled person will know in which direction and to which amount to modify the

relative W and C contents in order to achieve the desired CW-ratio, without undue burden.

Contrary to the appellant's view, the values given in table 5 of D16 of the measured saturation magnetization are not random. They illustrate in fact a dependency of the variation of the measured saturation magnetization on the total content of carbon in the composition of the cutting inserts. This appears when comparing the values of the column "Total carbon" with those in "Co % calculated from  $4\pi\sigma$ ", particularly for specimens 8, 6, 7, 10 and 5 (in this order) since they exhibit identical compositions. Specimen 9 cannot be considered in this comparison in view of its higher free carbon content.

Finally, the unit used for the measured saturation magnetization  $M_s$  in the equation given in paragraph [0012] of the contested patent for computing the value of the CW-ratio does not play a role. The CW-ratio has no unit and the skilled person knows that the constant "0.0161" is for pure Co. Consequently, the skilled person will know which unit to use for  $M_s$  in this equation to equate this constant. In this respect the Board notes as well that the appellant itself was able to perform such measurements of the saturation magnetization and computations of the CW-ratio as shown by its comparative tests supplied with its letter of 10 May 2016, page 5.

- 3.2 Thickness of a surface zone depleted from cubic carbides
  - 3.2.1 For the appellant the same reasons as those given under point 3.1.1 above for the CW-ratio would apply with respect to the thickness of the surface zone depleted

from cubic carbides of the substrate (see statement setting out the grounds of appeal, point 2.2 and letter of 14 December 2012, point IV).

3.2.2 The Board shares however the respondent's opinion that the skilled person knows how to obtain and measure the claimed thickness of a surface zone depleted from cubic carbides. This parameter is indeed known to the skilled person, as also admitted by the appellant in its statement setting out the grounds of appeal, point 2.2. Further, document D8, which is regarded as the closest prior art for the claimed subject-matter (see below, point 6), refers to a known process for achieving the very same claimed thickness of a surface zone depleted from cubic carbides (see column 2, lines 13-17).

3.2.3 The appellant did not bring forward during the oral proceedings any further arguments to those submitted in writing and discussed above on this topic of the thickness of a surface zone depleted from cubic carbides.

3.3 XRD-diffraction intensity ratio  $I(012)/I(024)$  in the  $\alpha$ - $\text{Al}_2\text{O}_3$ -layer (impugned decision, point 2.2.2)

3.3.1 The appellant considers that the contested patent is lacking technical information for the skilled person to obtain the claimed XRD-diffraction intensity ratio  $I(012)/I(024)$  above 1.3, and to measure it. The measurement would be subject to such a high inaccuracy, as shown for instance by D14, figures 8 or 9, that it could not be reliably reproduced.

Further, no relation between the XRD-diffraction intensity ratio in the  $\alpha$ - $\text{Al}_2\text{O}_3$ -layer and the tensile

stress in the  $\text{TiC}_x\text{N}_y$ -layer could be derived from the contested patent.

The two alternatives of claim 1 would appear to be contradictory to each other. According to the first claimed alternative (alternative A) high tensile stress in the  $\text{TiC}_x\text{N}_y$ -layer (500-700 MPa) together with a high XRD-diffraction intensity ratio in the  $\alpha\text{-Al}_2\text{O}_3$ -layer (< 1.5) would enable achieving the desired properties, while according to the second claimed alternative (alternative B) lower tensile stress (50-390 MPa) in the  $\text{TiC}_x\text{N}_y$ -layer for both the rake and the clearance faces, together with a coloured PVD-layer, would suffice.

In view of this, the skilled person would not be able to perform the invention.

3.3.2 The Board cannot share the appellant's view for the following reasons, as given by the respondent:

The usual  $\sin^2\psi$  measurement method used in the contested patent for measuring the stresses in the  $\text{TiC}_x\text{N}_y$ -layer is not adapted for the  $\alpha\text{-Al}_2\text{O}_3$ -layer. Instead the XRD-diffraction intensity ratio  $I(012)/I(024)$  has been selected as a useful alternative method (contested patent, paragraphs [0024] to [0026]).

The changes in the (012) and (024) peak height intensities are induced by the distortion of the lattice due to internal stresses resulting from wet blasting, as also admitted by the appellant (see statement setting out the grounds of appeal, page 3, first complete paragraph). Since the respective changes are not proportional to each other, the ratio varies in relation to the internal stresses. This can also be

clearly derived from Table 1 of the contested patent: the internal stress in the  $\text{TiC}_x\text{N}_y$ -layer decreases while the XRD-diffraction intensity ratio  $I(012)/I(024)$  in the  $\alpha\text{-Al}_2\text{O}_3$ -layer increases, in relation with the wet blasting step parameters.

The skilled person will therefore know how to realise the claimed ratio by applying wet blasting to induce internal stresses, in particular in view of the disclosed embodiments according to the invention (Table 1, samples C-H).

XRD is a well known and established method for which references are available (see contested patent, paragraph [26], JCPDS Nos 43-1484). The skilled person will therefore also know how to measure the claimed XRD-diffraction intensity ratio. Inaccuracy is inherent to any measurements, to be taken into account by the skilled person. This does not hinder the skilled person to perform the invention.

There is no contradiction between the two claimed alternatives A and B. An insert according to alternative A comprises different stress levels in (at least) the  $\text{TiC}_x\text{N}_y$ -layer and the  $\alpha\text{-Al}_2\text{O}_3$ -layer (the latter represented by the XRD-diffraction intensity ratio  $I(012)/I(024)$ ) on the rake face in comparison with those on the clearance face. This can be achieved by wet blasting the rake face only, as illustrated by example 2 of the contested patent (paragraphs [0030]-[0034]).

Alternative B, for which the stress levels in the  $\text{TiC}_x\text{N}_y$ -layer and the  $\alpha\text{-Al}_2\text{O}_3$ -layer are the same on the rake face and on the clearance face, can be produced by



wet blasting both faces, as disclosed in paragraph [0037], lines 33-35, of the contested patent.

The skilled person will therefore be able to produce both claimed alternatives A and B.

3.3.3 At the oral proceedings as also in its late written submission dated 10 May 2016, the appellant has further argued that broadening of the XRD-diffraction peaks occurs as a result of, *inter alia*, instrumental artefacts (see for instance D18, figure 1). Hence, these instrumental artefacts would need to be extracted from the measurements in order to obtain the real values of the XRD-diffraction peak intensities. This would not be the same as, for instance, merely taking into account and extracting the background. This would be all the more true since the peaks for (012) and (014) would show different intensities and, hence, would be affected differently by the instrumental artefacts and also since the claimed ratio  $I(012)/I(014)$  would be low, i.e. a small artefact and an inadequate corrective method would have a high impact on deciding whether the ratio falls below or above the claimed limit(s). Since the corrective method of the instrumental artefacts is not specified in the contested patent, the skilled person would not know which one among the many available to use. Since each corrective method would lead to different results, he would not be able to perform the invention.

3.3.4 The Board cannot share this view for the following reasons given by the respondent at the oral proceedings:

As already mentioned under point 3.3.2 above, the measurements of XRD-diffraction peak intensities were

well known and established in the present technical field before the filing date of the contested patent. The apparatus used, "Bragg-Brentano diffractometer, Siemens D5000", is explicitly mentioned in the contested patent, paragraph [32] so that there is no doubt that the skilled person knows how to perform, interpret and correct the measurements. Finally, since the measurements are made for all peaks in one procedure with the very same apparatus and settings, the possible artefacts to be corrected will apply in a similar manner to the two ((012) and (014)) peak intensities.

### 3.4 Coloured layer

3.4.1 The appellant argues that the coloured heat resistant paint of claimed alternative B is undefined. Similarly, both the composition and the thickness of the coloured PVD-layer of said alternative B are also unspecified. High thicknesses, for instance, would possibly impart adverse properties to the insert. In view of this, the skilled person would not be able to perform the invention.

3.4.2 The Board cannot share the appellant's view for the following reasons:

The appellant's arguments relate more to the broadness of the claim, i.e. more to clarity issues which are not a ground for opposition, than to disclosure issues. Further, the contested patent, paragraph [0027], lines 28-30, provides the skilled reader with information on how to produce the coloured layer.

3.4.3 The appellant did not bring forward during the oral proceedings any further arguments to those submitted in

writing and discussed above on this topic of coloured layer.

3.5 Technical information for wet blasting

Contrary to the appellant's view put forward in its letter dated 14 December 2012, page 6, antepenultimate paragraph (see also statement of grounds, page 6, first paragraph), the skilled person is provided in the contested patent with all the necessary wet-blasting-treatment-related technical information, including the blasting angle, to perform the invention (contested patent, paragraph [0027]). The skilled person will know how to select the content ratio alumina/water by applying either the usual practice or the detailed blasting instructions of the equipment manufacturer (see impugned decision, point 2.2.1).

This Board's view was provided to the parties with the annex to the summons to oral proceedings. It has not been contested by the appellant, neither in its later written submissions nor during the oral proceedings before the Board.

3.6 In view of the above, the objections raised under the ground for opposition pursuant to Article 100(b) EPC do not prejudice the maintenance of the patent as granted.

4. *Admission of D19 and D20 into the proceedings*

4.1 The appellant filed documents D19 and D20 with its letters dated 10 May 2016 and 23 May 2016 respectively, i.e. after filing its grounds of appeal and after oral proceedings were arranged.

Hence, their admission into the proceedings is subject to the Board's discretion pursuant to Articles 13(1) and 13(3) RPBA.

4.2 The appellant argues that documents D19 and D20 were filed as a reaction to the preliminary opinion of the Board given in the annex to the summons to oral proceedings that, in the absence of comparative tests, it could not be admitted that the tensile stresses in the Al<sub>2</sub>O<sub>3</sub> and TiCN layers (features ii) and iii)) and the surface roughness of the claimed product (feature iv)) would be implicitly disclosed in D8, i.e. inevitably obtained when applying wet blasting as in D2 and/or D4 to the coated cemented carbide cutting tool insert of D8 (point 9.7). Hence, both D19 and D20 were to be regarded *prima facie* relevant for assessing inventive step when combining the teaching of documents D2 and D8. The effect of wet blasting on the tensile stresses in the Al<sub>2</sub>O<sub>3</sub> and TiCN layers such as on the final surface roughness when removing the TiN layer appears clearly from D19 and D20.

4.3 The Board cannot, however, follow this view for the following reasons given by the respondent during the oral proceedings:

No new facts or arguments with respect to those already in the file were provided in the annex to the summons to oral proceedings which could justify the late filing of D19 and D20. A negative preliminary opinion of the Board cannot in itself be a sufficient reason for filing new documents. In addition, the documents D19 and D20 cannot be seen as *prima facie* relevant for assessing, as argued by the appellant, that wet blasting would inevitably lead to the claimed tensile stresses and surface roughness (features ii), iii) and

iv)) since the documents D19 and D20 are totally silent on the wet blasting conditions applied for the production of the specimen KCK05 on which the measurements were performed.

4.4 As a consequence, in view of their filing without any sound reason at such a late stage in the proceedings and of their lack of *prima facie* relevance, documents D19 and D20 are not admitted into the proceedings pursuant to Article 13(1) RPBA.

5. *Novelty (Article 100(a) EPC)*

The appellant has not raised any lack of novelty objection against the subject-matter of claim 1. The Board concurs with this view since none of the cited prior art discloses all the features of claim 1 in combination.

6. *Inventive step (Article 100(a) EPC)*

The appellant has raised an inventive step objection against the subject-matter of claim 1 starting from D8 as closest prior art in view of the teachings of D2, D4 and/or D6.

6.1 The Board shares the view of both parties that D8 could be regarded as the closest prior art. As a matter of fact, like the contested patent, D8 lies in the technical field of cutting tool cemented inserts and aims at improving the cutting performance, in particular in steel (contested patent, paragraphs [0001] and [0011]; D8, column 1, lines 6-8 and 38-46).

6.2 D8 (column 1, line 60 to column 2, line 38) discloses a coated cutting tool cemented insert ("coated cutting

tool", "cemented carbide insert") comprising a body of generally polygonal or round shape having at least one rake face and at least one clearance face (inherent in cutting tool inserts), said insert having:

- a composition of 5-8 wt.% Co, 1.5-7.5 wt.% cubic carbides of the metals Ti, Ta and/or Nb and balance WC,
- a CW-ratio in the range 0.76-0.93, preferably 0.80-0.90, and
- a surface zone of a thickness of about 15-35  $\mu\text{m}$  depleted from the cubic carbides.

The insert of D8 is at least partly coated with a coating comprising four layers:

- a first innermost  $\text{TiC}_x\text{N}_y\text{O}_z$ -layer with a thickness of 0.1-2  $\mu\text{m}$ ,
- a second  $\text{TiC}_x\text{N}_y\text{O}_z$ -layer with a thickness of 2-15  $\mu\text{m}$ ,
- a third  $\text{TiC}_x\text{N}_y\text{O}_z$ -layer with a thickness of 0.1-2  $\mu\text{m}$ , and
- a fourth  $\alpha\text{-Al}_2\text{O}_3$ -layer with a thickness of 2-10  $\mu\text{m}$ , so that the coating exhibits a cumulative thickness of 4.2-29  $\mu\text{m}$ , and includes:
  - at least one layer of  $\text{TiC}_x\text{N}_y$ , where  $x \geq 0$ ,  $y \geq 0$  and  $x + y = 1$  (first innermost layer and second layer; see Example 1, sample A, for which  $z=0$ ), and
  - an  $\alpha\text{-Al}_2\text{O}_3$ -layer being the outer layer (fourth layer) at least on the rake face.

The top layer of the insert of D8 (column 2, lines 38-41) can also consist of a decorative layer of a material such as TiN, i.e. a coloured layer as mentioned in the contested patent, paragraph [0027], line 29.

Example 1, sample A, of D8 (column 3, lines 38-54) comprises a coated cutting tool cemented insert having:

- a composition of 7.5 wt.% Co, 5.7 wt.% cubic carbides (1.8 wt.% TiC, 0.5 wt.% TiN, 3.0 wt.% TaC, 0.4 wt.% NbC) and balance WC,
- a CW-ratio of 0.88, and
- a surface zone of a thickness of about 25  $\mu\text{m}$  depleted from the cubic carbides.

It is at least partly coated with a 12.5  $\mu\text{m}$  thick coating comprising four layers:

- a first innermost TiCN-layer with a thickness of 0.5  $\mu\text{m}$ ,
- a second TiCN-layer with a thickness of 7  $\mu\text{m}$ ,
- a third  $\text{TiC}_{0.6}\text{N}_{0.2}\text{O}_{0.2}$ -layer with a thickness of 1  $\mu\text{m}$  and a fourth  $\alpha\text{-Al}_2\text{O}_3$ -layer with a thickness of 4  $\mu\text{m}$ , so that the coating includes:
  - at least one layer of TiCN, i.e. one layer of  $\text{TiC}_x\text{N}_y\text{O}_z$ - for which  $z=0$ ,  $x\geq 0$ ,  $y\geq 0$  and  $x+y=1$  in accordance with the general disclosure of D8 discussed above, and
  - an  $\alpha\text{-Al}_2\text{O}_3$ -layer as the outer layer (fourth layer) at least on the rake face (see also samples B and D; column 3, lines 55-67 and column 5, lines 8-14).

With respect to the second alternative B of claim 1, sample A of Example 1 of D8 comprises on said at least one rake face and said at least one clearance side that:

- the TiCN-layer has a thickness of 8.5  $\mu\text{m}$ , i.e. falling within the claimed range of 5-15  $\mu\text{m}$  and
- the  $\alpha\text{-Al}_2\text{O}_3$ -layer has a thickness of 4  $\mu\text{m}$ , i.e. falling within the claimed range of 3-12  $\mu\text{m}$ .

This also falls within the corresponding features for the said at least one rake face of the first alternative A of claim 1.

6.3 As a result, D8 does **not** disclose the following features ii) to vi) listed by the respondent in its letter dated 21 August 2012, point 36, pages 10-11 (see also impugned decision, points 2.3.8 and 2.4.1):

6.3.1 of claimed alternative A:

- on said at least one rake face

ii) the  $\text{TiC}_x\text{N}_y$ -layer has a tensile stress level of 50-390 MPa;

iii) the outermost  $\alpha\text{-Al}_2\text{O}_3$ -layer has an XRD-diffraction intensity ratio  $I(012)/I(024) \geq 1.3$ ; and

iv) a mean Ra value  $\text{MRa} \leq 0.12 \mu\text{m}$ , at least in the chip contact zone on the rake face, as measured on ten randomly selected areas  $10 \times 10 \mu\text{m}^2$  by AFM-technique;

- and on said clearance face

v) the  $\text{TiC}_x\text{N}_y$ -layer has a tensile stress in the range 500-700 MPa; and

vi) the  $\alpha\text{-Al}_2\text{O}_3$ -layer has an XRD-diffraction intensity ratio  $I(012)/I(024) < 1.5$ ;

6.3.2 of claimed alternative B:

on said at least one rake face and said at least one clearance side

ii) the  $\text{TiC}_x\text{N}_y$ -layer has a tensile stress level of 50-390 MPa; and



iii) the  $\alpha$ -Al<sub>2</sub>O<sub>3</sub>-layer has an XRD-diffraction intensity ratio  $I(012)/I(024) \geq 1.3$ ; and

iv) on the rake face the outermost layer is with a mean Ra value  $MRa \leq 0.12 \mu\text{m}$ , at least in the chip contact zone on the rake face, as measured on ten randomly selected areas  $10 \times 10 \mu\text{m}^2$  by AFM-technique.

6.3.3 The Board notes that feature i) mentioned by the respondent (letter of 21 August 2012, page 10) is not a distinguishing feature of claim 1 vis-à-vis D8. It merely reflects the disclosure of D8 discussed above.

The Board further emphasizes that in the case of alternative B no upper limit for the surface roughness of the clearance face is specified, so that the mean Ra value can be above  $0.12 \mu\text{m}$  for said clearance face. Therefore, contrary to the appellant's view (see letter dated 14 December 2012, page 5), the rake and clearance faces comprise differences. A further difference also concerns the top layer of the clearance face consisting of a coloured heat resistant paint or a coloured PVD-layer.

6.3.4 The Board also notes that, contrary to the respondent's view, the top layer of the clearance face consisting of a coloured heat resistant paint or a coloured PVD-layer (feature vii) of the respondent) is known from D8 (column 2, lines 38-41; "decorative layer of a material such as TiN"). D8 does not explicitly disclose PVD as depositing method of said coloured layer. However, it does not appear clearly what structural features the claimed PVD-depositing method would impart onto such a layer that would enable to distinguish it from a layer deposited by any other usual depositing method, such as CVD.

6.4 Technical effect(s)

The synergetic technical effect of the above distinguishing features ii), iii) and iv), shared by the two claimed alternatives A and B on the rake face, can be seen in the improvement of the median time to fracture of the insert (see contested patent, Table 1, variants C to H according to the invention; paragraphs [0011], [0015] and [0036]).

6.5 Problem to be solved

The problem to be solved can then be to increase the life time of the cutting tool cemented insert of D8.

At the oral proceedings, the appellant explicitly agreed with the above analysis of the closest prior art D8 and with the resulting distinguishing features ii), iii) and iv) of the claimed subject-matter and associated synergetic technical effect and problem to be solved.

6.6 Explicit disclosure of the distinguishing features in the available prior art

6.6.1 Closest prior art D8 discloses a maximum surface roughness  $R_{\max}$  lower than or equal to  $0.4 \mu\text{m}$  (column 2, line 37-38 and column 3, line 21). It hence appears to be true, as argued by the appellant, that the mean surface roughness MRa would inevitably be lower than  $0.4 \mu\text{m}$ . This, however, cannot amount to an explicit disclosure of the claimed mean surface roughness MRa of lower than or equal to  $0.12 \mu\text{m}$ .

6.6.2 As put forward by the appellant, wet blasting is performed in D8 using an alumina-water slurry of

400-150 mesh alumina powder (column 4, lines 21-22). It is referred in D8 to the processes disclosed in D4 and D2 for post-treating the coating inserts (column 3, lines 18-30).

D4, which is cited in example 1 of D8 (cf. samples A and B, column 3, lines 51 and 65), discloses a surface roughness  $R_a$  of less than  $0.3 \mu\text{m}$ ,  $0.2 \mu\text{m}$  for example 1 (page 4, line 11; claim 2). This could then match with the maximum surface roughness  $R_{\text{max}}$  of lower than or equal to  $0.4 \mu\text{m}$  disclosed in D8. However, contrary to the appellant's view and as argued by the respondent, the Board cannot see any disclosure in D4 regarding the fact that the surface roughness would stand for the maximum  $R_{\text{max}}$ . In fact the skilled reader would rather interpret the values given in D4 as the usual surface roughness, i.e. the mean surface roughness, which would then lie above the claimed limit. Consequently, the claimed mean surface roughness is not explicitly disclosed in D4.

This applies all the more to D2 which is totally silent on the final surface roughness of the post-treated coated cemented insert.

- 6.6.3 As put forward by the respondent, the tensile stress levels in the  $\text{TiC}_x\text{N}_y$ -layer and in the  $\alpha\text{-Al}_2\text{O}_3$ -layer, the latter represented by the XRD-diffraction intensity ratio  $I(012)/I(024)$ , are not explicitly disclosed in D8, D2 or D4. These documents are indeed silent on the tensile stress levels of said layers, including the XRD-diffraction intensity ratio  $I(012)/I(024)$ .
- 6.7 Implicit disclosure of the distinguishing features in the available prior art

- 6.7.1 The Board cannot share the appellant's view that, since D8 discloses a "maximal surface roughness  $R_{\max}$ "  $\leq 0.4$   $\mu\text{m}$  (column 2, lines 35-38; column 3, lines 21-22), the "mean surface roughness MRa" will be much lower and, hence, implicitly fall close or even below the claimed limit of 0.12  $\mu\text{m}$ . As a matter of fact, this amounts to a mere allegation not based on evidence.
- 6.7.2 In D4, the coated tool inserts are wet blasted with 150 mesh  $\text{Al}_2\text{O}_3$  powder in order to smoothen the coating surface (page 4, lines 20-21; page 4, line 57; page 5, lines 42-43; page 6, lines 17-18). This would indeed correspond to the method applied in the contested patent, paragraph [0027], lines 25-27. However, D4 is silent on wet blasting parameters, such as the blasting pressure and time, which are essential for achieving the claimed mean surface roughness as appearing from Table 1 of the contested patent. Hence, the claimed surface roughness is not implicitly disclosed in D4.
- 6.7.3 As argued by the appellant, D2, column 4, lines 55-59, discloses a pressure of 2 bar for wet blasting, like in Table 1, samples C and D, of the contested patent. However, the wet blasting time, which plays a role in achieving the final surface roughness as shown in Table 1 of the contested patent (compare samples C and D with sample B), is not given in D2, which is further totally silent on the final surface roughness of the post-treated coated insert. Consequently, the claimed surface roughness is not implicitly disclosed in D2.
- 6.7.4 As a result, since wet blasting is performed in D8 according to the methods of D4 and/or D2 (see point 9.6.2 above), the claimed surface roughness is not implicitly disclosed in D8 either.

- 6.7.5 The above reasons given for the surface roughness also apply for the tensile stress levels of the layers. Even if D8, D2 and D4 indeed apply wet blasting, the claimed tensile stress levels will not be inevitably obtained.
- 6.7.6 The appellant refers in particular to D6, figure 48, in order to support its argument that wet blasting would inevitably lead to the claimed tensile stress levels. Figure 47 of D6, however, apparently obtained with the same wet blasting parameters of figure 48 (the information about the applied parameters is missing), discloses **compressive** stresses in a  $\text{TiC}_x\text{N}_y$ -layer with a top layer of  $\alpha\text{-Al}_2\text{O}_3$ , i.e. like the contested patent, while figure 48 concerns a top layer of  $\kappa\text{-Al}_2\text{O}_3$ . Figure 47, which could be seen as more appropriate than figure 48, shows values falling outside the claimed range of the stress level. Therefore, as argued by the respondent, D6 does not disclose that the claimed tensile stress levels would **inevitably** be obtained by wet blasting. Nor does D6 teach that such tensile stress levels would be appropriate in view of solving the above technical problem. As a consequence, it cannot be derived from D6 that the claimed stress levels would be implicitly disclosed in documents D8, D4 or D2 where wet blasting is performed.
- 6.7.7 The Board cannot share the appellant's view either that, since a preferred orientation in the outermost  $\alpha\text{-Al}_2\text{O}_3$ -layer in D8 is (012), i.e. higher than the texture coefficient for (024), the claimed XRD-diffraction intensity ratio  $I(012)/I(024)$  would be higher than 1 and, "most probably" above or close to the claimed limit (column 2, lines 59-61; column 3, lines 50-54; see also D4, page 2, line 28; D2, column 3, lines 64-67). As a matter of fact, this amounts to a mere allegation not based on evidence.

6.8 It follows from the preceding observations that none of the available prior art documents discloses the above distinguishing features ii), iii) and iv) of the claimed alternatives A and B, neither explicitly nor implicitly.

6.9 Further, there does not exist any reason why the skilled person, using his common general knowledge, would first come up with the claimed distinguishing features and then implement them in the cemented insert of D8 in view of solving the above technical problem.

6.10 Therefore, an inventive step has to be acknowledged for the subject-matter of claim 1.

6.11 The appellant has also argued that the aim of wet blasting is to smoothen the surface, i.e. to reduce the surface roughness, as explicitly disclosed for instance in D4, page 4, lines 20-21; page 4, line 57; page 5, lines 42-43; page 6, lines 17-18. This would unambiguously teach the skilled person that the lower the surface roughness, the better the properties of the cemented insert. He would then perform wet blasting so as to decrease the surface roughness as much as possible, thus reaching the claimed mean surface roughness without any inventive skill, possibly after a few routine tests. By doing so, he would also inevitably obtain the claimed tensile stress level in the  $TiC_xN_y$ -layer and the claimed XRD-diffraction intensity ratio  $I(012)/I(024)$  in the  $\alpha-Al_2O_3$ -layer.

The Board cannot share this view, since there is no clear reason why the skilled person would decrease the mean surface roughness down to the claimed limit of  $0.12 \mu m$  or below. As discussed above, none of the available prior art documents discloses, either

explicitly or implicitly, such mean surface roughness values. It does not belong to the skilled person's common general knowledge either that the lower the mean surface roughness, the longer the life time of cutting tool cemented inserts.

6.12 The above reasoning and conclusion on inventive step of the subject-matter of claim 1 were provided to the parties as the preliminary opinion of the Board with the annex to the summons to oral proceedings. It has not been further argued by the appellant with its later written submissions or during the oral proceedings. The appellant has instead brought forward a new line of argumentation as given hereafter.

6.13 In view of sample B falling outside the claimed invention and sample C being according to the claimed invention (see Table 1 of the contested patent), the invention would consist merely in an increase of the wet blasting time by only 5 seconds. As stated in paragraph [30] and Table 1 of the contested patent, sample B would be performed according to the blasting process of D2 to remove the 0.5  $\mu\text{m}$  thick TiN layer of the coated inserts (contested patent, paragraph [27], line 30; example 1, paragraph [28], in particular line 46).

In example 1 of D2, column 4, lines 36-42, the very same conditions as in the contested patent would be applied for removing a 2.8  $\mu\text{m}$  thick TiN layer, i.e. thicker than that of sample B of the contested patent (see Variant 1D, column 4, line 55-56 and column 5, line 3-5). This would lead to D2 implicitly disclosing a longer wet blasting time than that of sample B of the contested patent, all other wet blasting parameters of the process of D2 being in accordance with those of the

embodiments according to the invention of the contested patent. By applying this implicit disclosure to the surface treatment of the cemented carbide cutting inserts of D8, as anyway mentioned in D8 itself, column 3, lines 23-30, the skilled person would immediately arrive at inserts with the properties as claimed, i.e. with features ii), iii) and iv).

6.14 The Board cannot, however, share this view for the following reasons put forward by the respondent during the oral proceedings:

The wet blasting treatment applied in D2 is explicitly mentioned as being "gentle", meaning that it only removes the outer TiN layer and leaves the Al<sub>2</sub>O<sub>3</sub> layer **as untouched as possible** (see column 4, lines 22-29). This is also illustrated by the examples of D2 corresponding, apart from the blasting time, to the parameters of the contested patent (cf. variant 1D, column 4, lines 55-56 and column 5, lines 3-4). As a consequence, the wet blasting parameters applied in D2 are unambiguously set to avoid a modification in the tensile stresses or the surface roughness of the Al<sub>2</sub>O<sub>3</sub> layer, contrary to the very aim of wet blasting in the contested patent (cf. paragraph [14], "high impulse"). D2 is in line with the very same aim of D8, column 3, lines 23-31, where "**gentle** wet blasting" is also mentioned when referring to the process of D2. Consequently, when applying the teaching of D2 to the process of D8, the skilled person will not think, after the removal of the TiN layer, of impacting and modifying the outer Al<sub>2</sub>O<sub>3</sub> layer of the coated cutting tool inserts in such a manner as to reach the claimed tensile stresses in the Al<sub>2</sub>O<sub>3</sub> and TiCN layers (features ii) and iii)) and the mean surface roughness (feature iv)).



Consequently, the appellant's arguments regarding the combination of the teachings of D2 and D8 by taking into account an implicit disclosure in D2 in view of the contested patent itself (Table 1, sample B versus sample C) are not convincing.

7. In view of the above there is no need to discuss the respondent's auxiliary request.

## Order

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

The appeal is dismissed

The Registrar:

The Chairman:



B. Atienza Vivancos

H. Meinders

Decision electronically authenticated