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Datasheet for the decision of 24 February 2022

Case Number: T 2341/17 - 3.2.05

Application Number: 04781940.4

Publication Number: 1663622

IPC: B29C67/00, C08L53/00

Language of the proceedings: EN

Title of invention:
Laser sintering processes using thermoplastic compositions

Patent Proprietor:
3D Systems, Inc.

Opponent:
ARKEMA France

Relevant legal provisions:
EPC Art. 83, 112(1)(a) sentence 1

Keyword:
Sufficiency of disclosure - after amendment - main request (no) - auxiliary requests (no)
Referral to the Enlarged Board of Appeal (no)

Decisions cited:
G 0001/12, T 0019/90, T 1772/09, T 0045/10, T 2451/13, T 1372/16, T 0709/17, T 0122/18

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Case Number: T 2341/17 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 24 February 2022

Appellant: (Opponent)	ARKEMA France 420 Rue d'Estienne d'Orves 92700 Colombes (FR)
Representative:	Bandpay & Greuter 30, rue Notre-Dame des Victoires 75002 Paris (FR)
Respondent: (Patent Proprietor)	3D Systems, Inc. 333 Three D Systems Circle Rock Hill, SC 29730 (US)
Representative:	dompatent von Kreisler Selting Werner - Partnerschaft von Patent- und Rechtsanwälten mbB Deichmannhaus am Dom Bahnhofsvorplatz 1 50667 Köln (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 19 July 2017 concerning maintenance of the European Patent No. 1663622 in amended form.**

Composition of the Board:

Chairman	P. Lanz
Members:	M. Holz
	A. Bacchin

Summary of Facts and Submissions

I. The opponent appealed the interlocutory decision of the opposition division finding that, account being taken of the amendments made by the patent proprietor during the opposition proceedings, European patent No. 1 663 622 (the "patent") as amended according to the main request and the invention to which it related met the requirements of the European Patent Convention (EPC).

II. A summons to oral proceedings before the board was issued on 25 May 2021.

III. In a communication pursuant to Article 15(1) of the Rules of Procedure of the Boards of Appeal of the European Patent Office as applicable from 1 January 2020 (RPBA 2020, see OJ EPO 2021, A35) issued on 20 January 2022, the board expressed its preliminary opinion on the case.

IV. Oral proceedings before the board were held on 24 February 2022 by videoconference.

V. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request) or, as an auxiliary measure, that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of any of the claim sets according to auxiliary requests I and II filed by letter dated

13 March 2017 and received on 18 April 2017 and auxiliary request III filed on 20 April 2020.

The respondent further requested not to admit documents D13 to D15, filed with the statement of grounds of appeal, into the proceedings. They further requested not to admit the objection under Article 83 EPC, to the extent that it referred to the parameter d90 and the melting point, as well as not to admit the objection under Article 52(1) in conjunction with Article 54(1) and (2) EPC as it had not been raised with the statement of grounds of appeal. They also requested to refer the following questions of law concerning the interpretation of Article 83 EPC to the Enlarged Board of Appeal under Article 112(1)(a) EPC:

> "*1. Is disclosing the method for determining an essential parameter of the invention necessary for meeting the requirements of Art. 83 EPC?*
>
> *2. Should the lack of mentioning a method for the determination of such a parameter, in particular in cases where more than one method is available, automatically lead to a refusal under Art. 83 EPC?*
>
> *3. If the answer to question 2 is no, what are the criteria for meeting the requirements of Art. 83 EPC under these circumstances?*"

VI. In the decision under appeal, *inter alia*, the following documents were cited:

D3: EP 0 968 080 B1
D4: US 5,342,919

With the statement of grounds of appeal, the appellant submitted the following documents:

D13: "Rapport d'essai Distribution de la taille des Particules - Testbericht Teilchengrößenverteilung"
D14: Synoptic of the market for particle size analysers
D15: Figure "Korngrößenverteilung"

On 4 February 2022, the respondent submitted the following documents:

D16: Affidavit by Mr Schmidlin
D17: ALM, "Laser sintering material specifications, PA 850 - Nylon 11"
D18: Rilsan by Arkema, "Thermoplastic powders for powder bed fusion - Polyamide 11", Copyright 2018
D19: BASF, Technical Data Sheet, "Ultrasint® PA11", Version No.: 1.4, Revised 08/2020
D20: Horiba Scientific, "A guidebook to particle size analysis", Copyright 2010

VII. Claim 1 of the request found allowable by the opposition division (main request) reads (the feature references used by the board are indicated in square brackets):

"1. **[1.1]** A method of manufacturing an article comprising **[1.2]** laser sintering a thermoplastic composition comprising a particulate thermoplastic block copolymer **[1.3]** having a melting point of 180°C to 210°C **[1.4]** wherein the thermoplastic composition comprises at least 90%, by weight of the thermoplastic copolymer and **[1.5]** wherein the block copolymer has a d90 of 90 to 100 µm."

The request found allowable by the opposition division further contained an independent claim 9.

Claim 1 of auxiliary request I differs from claim 1 of the main request by the additional definition that the block copolymer has a heat of fusion of 15 to 35 J/g.

The claims of auxiliary request II differ from those of auxiliary request I in that claim 9 has been deleted.

The claims of auxiliary request III differ from those of the main request in that claim 9 has been deleted and in that, in claim 1, it has been further defined that the block copolymer has a median particle size of 40 to 60 µm and a particle size range of 1 to 150 µm.

VIII. The parties' arguments relevant for this decision can be summarised as follows.

(a) Admittance of objection under Article 83 EPC regarding the parameter d90

(i) Respondent

The opponent raised the objection under Article 83 EPC regarding the parameter d90 for the first time during the oral proceedings before the opposition division. Neither in the notice of opposition nor in response to the preliminary opinion of the opposition division had the opponent raised any objection concerning the sufficiency of disclosure regarding the parameter d90, even though this parameter had been present in dependent claim 4 of the patent as granted. Point 2.3.2 of the Reasons for the decision under appeal reflected that the opponent had not substantiated the ground for opposition under Article 100(b) EPC with respect to the

parameter d90 until the oral proceedings before the opposition division. Moreover, for the first time in the appeal proceedings, the appellant made reference to different devices and methods for measuring the parameter d90. For reasons of equity, this objection should not be admitted as the respondent would not be able to suitably amend the claims in application of the principle of the prohibition of *reformatio in peius*. These new arguments should not be admitted into the appeal proceedings.

(ii) Appellant

There was no legal basis for not taking into account the objection under Article 83 EPC regarding the parameter d90 since it was part of the decision under appeal. The objection under Article 83 EPC regarding the parameter d90 had been raised in the oral proceedings before the opposition division in reaction to claim amendments filed by the patent proprietor. Neither the patent proprietor in the oral proceedings before the opposition division, nor the respondent in the appeal proceedings prior to the oral proceedings before the board had filed a request not to admit this objection. The respondent's request submitted during the oral proceedings before the board was thus late filed and should not be admitted. A deviation from the principle of the prohibition of *reformatio in peius* was possible under the conditions set by G 1/99. Thus, if the proprietor found something to be unfair, they could have filed new requests. The arguments provided by the appellant in the appeal proceedings were within the framework of the objection regarding the parameter d90 raised in the oral proceedings before the opposition division.

(b) Admittance of documents D16 to D20 into the appeal proceedings

(i) Respondent

Documents D16 to D20 reflected the common general knowledge of the skilled person in the technical field of polymer particles in the micrometre range. These documents showed that while different methods were available for measuring the parameter d90, the skilled person would have understood that the parameter d90 was commonly stated on a volume basis and that it was further commonly determined by laser diffraction.

Documents D17, D18 and D19 related to polymer powders. In these documents, particle size distribution parameters of the powders were stated on a volume basis. This demonstrated that it was a common understanding in the art that particle size distribution parameters were expressed on a volume basis. As the dates indicated in documents D17 to D20 covered a time span of more than a decade, these documents showed that throughout that time, volume distribution had always been used as a basis for stating particle size distribution parameters. No reason was apparent why this should have been any different at the priority date of the patent.

Documents D16 to D20 further supported the arguments that had been previously submitted in the appeal proceedings. The relevant facts had previously been presented.

(ii) Appellant

Documents D16 to D20 should not be admitted into the appeal proceedings. These documents had been filed on 4 February 2022 and thus less than three weeks before the oral proceedings before the board. No exceptional circumstances pursuant to Article 13(2) RPBA 2020 were apparent or had been presented by the respondent. The board's preliminary opinion did not contain any new elements. Nevertheless, less than three weeks before the oral proceedings, the respondent for the first time took the view that the parameter d90 in the patent was to be understood on a volume basis and was to be measured using laser diffraction.

Moreover, none of the documents D17 to D20 belonged to the state of the art. No date was stated in document D17. In the right-hand margin of page 2 of document D18, a copyright date of 2018 was mentioned. In document D19, the date "08/2020" was indicated. At the bottom of the last page of document D20, a copyright date of 2010 was stated. Consequently, documents D17 to D20 did not prove the common general knowledge at the priority date of the patent, i.e. 8 September 2003.

(c) Merits of the objection under Article 83 EPC regarding the parameter d90

(i) Appellant

Article 83 EPC was violated by all claim requests on file in that the patent did not disclose how the parameter d90 cited in feature 1.5 of claim 1 was

defined. This feature was critical for the claimed invention since it was the only feature that was allegedly not disclosed in closest prior-art document D3 (see point 2.4.1.2 of the Reasons for the decision under appeal).

Although the term d90 was explained in paragraph [0034] (see page 4, lines 25 and 26) of the patent, it was not disclosed whether d90 referred to a number-, volume-, surface-area- or weight-based distribution parameter. Neither was this evident from paragraphs [0044] and [0052] of the patent. Document D4 showed the number-based particle size distribution (see Figure 3 and column 14, lines 1 to 3 and 61 to 66) and the volume-based particle size distribution (see Figure 4, column 14, lines 4 to 6 and column 15, lines 30 to 34) of the same powder. There, the parameter d90 for the number-based distribution was about 15 µm, while the volume-based d90 was about 200 µm. These parameter values thus differed by more than a factor of ten. Claim 1 defined a value range for d90 of 90 to 100 µm, i.e. having a width of only 10 µm (or about 10% with reference to the range average), which was much smaller than the difference between the values of the number-based parameter d90 and the volume-based parameter d90 in Figures 3 and 4 of document D4.

The respondent's allegation that the skilled person would have considered sieving unsuitable for the powder size ranges indicated in the patent was furthermore only based on the reference to ASTM E11-95 (see the last paragraph on page 1 of document D16). However, other mesh sizes were possible and would further have been considered by the skilled person for particle sizes in the range stated in feature 1.5.

Document D20 did furthermore not provide any support for the respondent's allegation that the most commonly used method for assessing the particle size distribution was laser diffraction. In contrast, document D20 described other methods of measuring particle size distributions (see page 6 and following). Therefore, even if it was assumed that laser diffraction was the most commonly used method, there were still other methods, such as image analysis. According to the first paragraph on page 7 of document D20, the primary results from image analysis were based on number distributions. Moreover, according to the second sentence of the first paragraph of the section "Laser Diffraction" on page 6 of document D20, laser diffraction results could also be displayed on a surface-area or number basis. This was also in line with the content of document D4, where the number distribution shown in Figure 3 was obtained by laser diffraction (see document D4, column 15, lines 5 to 8).

It would also not be sufficient to establish that expressing the parameter d90 on a volume basis had been commonly known to the skilled person since this would not have implied that the skilled person employed such a definition in the context of the patent. In contrast, as could be seen from document D20, other definitions of the parameter d90 were possible and would not have been excluded by the skilled person.

Moreover, decisions T 45/10 and T 1772/09 were relevant for the case at hand.

(ii) Respondent

Methods of measuring d90 were well known in the art. A skilled person could thus have carried out such an

analysis without undue burden. The definition of the term d90 presented in the patent (see paragraph [0034]) was in line with the skilled person's common understanding. The patent provided a detailed teaching of how the current invention was to be carried out, including a list of suitable materials which could be commercially purchased. Screening a given powder to a certain particle size distribution was considered to be within the daily routine of the person skilled in the art, in which the particular method was of little importance. The person skilled in the art would thus have chosen an appropriate method depending on the initial particle size of the powder.

Particle size distribution of powders for laser sintering application could be measured using different techniques, these being mostly divided into two categories: separation methods (for example, sieve analysis) and counting methods (for example, laser diffraction)(see document D16). Separation methods were, however, not suitable for determining the value of the parameter d90 for a powder having a particle distribution in the range of ≤ 100 µm since the resolution was too low when using sieve mesh sizes in the range from 5 µm to 20 µm in accordance with ASTM E11-95. While it was mentioned in paragraph [0044] of the patent that the composition was sieved to provide a desired particle size and particle size distribution, this referred to the manufacturing of the powder and not to the determining of the particle size distribution.

While the parameter d90 could be expressed by weight or volume ratio, volume corresponded to the ratio of the weight to the material density. Consequently, for a non-composite material such as the block copolymer in

feature 1.5, determining the weight ratio was equivalent to determining the volume ratio.

Laser diffraction was furthermore the most widely used method in powder characterisation for powder bed fusion (PBF) applications and was commonly displayed in the technical data sheets of different PBF powder manufacturers (see documents D17, D18 and D19). Moreover, the most common result from laser diffraction was a volume distribution (see document D20, page 4, section "Median" and page 6, section "Laser Diffraction"). Document D20 further showed that measurement results could always be converted into volume distribution parameters.

Figures 3 and 4 of document D4 showed the graphical representation of the same powder measured either on a volume (Figure 4) or a number (Figure 3) basis. The graphs were dramatically different. This was not surprising in view of the differences between the two measurement methods. The standard method, however, was to show the results by volume ratio. In some applications, it might be of interest to look at a broader picture and consider the measurement on a number basis. However, in PBF applications, measurements on a number basis provided additional data but did not replace the volume measurement, especially for the determination of the parameter d90.

Whether the person skilled in the art would have been able to determine the d90 of the block copolymer furthermore appeared to be an issue under Article 84 EPC rather than Article 83 EPC. Case law showed that a lack of the determination of a measurement method did not inevitably lead to insufficiency of disclosure.

In decision T 709/17, the claims referred to an average particle size D90, and the board in that appeal case concluded that the person skilled in the art was able to carry out the invention even though ambiguity remained concerning a parameter.

Appeal case T 1372/16 related to an emulsion of oil in water which had restrictions on the droplet size distribution, the latter being indicated in the patent to be determined using a Coulter® LS particle size analyser. The manual for the LS series of analysers was assessed during the appeal. It was decided that the patent, together with the common general knowledge, provided sufficient information for verifying whether an emulsion was according to the claims of the patent.

Decision T 122/18 concerned a coating composition defined by a maximum grain size. No measurement method was indicated, and it was submitted that the different known sieving or laser diffractometry methods provided different results. However, it was found that it had not been demonstrated that the results of such methods would vary to an extent that not only the clarity but also the sufficiency of disclosure of the invention was affected.

Returning to the patent in suit, the skilled person would have selected the most accurate instrument to determine d90 in the targeted range. They would thus have selected a counting method over a separation method. Laser diffraction or optical microscopy analyses would have been considered the best choice, but laser diffraction was the most commonly used instrument for this specific application and could be considered the standard. Moreover, unless explicitly stated otherwise, the parameter d90 was expressed on a

volume basis as this was the standard both in the literature and material data sheets (see also document D16, page 3).

While the patent itself thus did not disclose a method for measuring the parameter d90, such a method was available to the skilled person from their common general knowledge.

(d) Request for referral to the Enlarged Board of Appeal

(i) Respondent

The request for referral to the Enlarged Board of Appeal (see point V. above) originated from the board's preliminary opinion which - contrary to the opposition division - accepted the appellant's objection under Article 83 EPC and considered that the invention was not sufficiently disclosed in the patent to the extent that different definitions of the parameter d90 were possible thus leading to different particle size distributions. As a request for referral may be raised at any time, it was not late filed. The specific questions proposed for referral to the Enlarged Board of Appeal were of general interest. The question of whether a lack of disclosure of a measuring method for a parameter was relevant under Article 84 EPC or Article 83 EPC arose frequently. Previous case law, including decisions T 122/18 and T 709/17, indicated that the mere lack of identification of a measuring method was only relevant under Article 84 EPC but not under Article 83 EPC. Moreover, there was no substantive guideline as to when a lack of a measuring method was relevant under Article 83 EPC. Referring the

proposed questions to the Enlarged Board of Appeal could thus lead to harmonisation.

In the case at hand, it could be assumed that if a measurement method for the parameter d90 had been specified in the patent, a definition of that parameter would have implicitly been present. Therefore, the alleged lack of definition of the parameter d90 was due to the lack of indication of a measuring method for the parameter. Therefore, the above-cited case law was relevant for the case at hand.

(ii) Appellant

The request for referral to the Enlarged Board of Appeal was late filed as it was presented for the first time during the oral proceedings before the board. Unlike the case law cited by the respondent, the issue at hand was not about different methods of measuring but about the lack of definition of the parameter d90. A discussion about measurement methods would rather involve, for example, the issue of whether laser diffraction was to be used, how the sample was to be prepared, if the measurement was to be carried out on a dry or wet sample, etc. The case at issue was thus different from those underlying the cited case law.

Case T 122/18 was about the maximum grain size such that, unlike for the parameter d90, the question of whether this referred to a volume or number basis did not occur. Moreover, in accordance with point 2.2 of the Reasons of decision T 122/18, a deviation of more than 5% could not call sufficiency of the disclosure into question. However, as demonstrated by Figures 3 and 4 of document D4, in the case at hand, the deviation was by more than a factor of ten. In the

patent underlying T 709/17, it was furthermore explicitly defined that the parameter d90 referred to 90% of the particles by volume. Such a definition, however, was missing from the patent in suit.

(e) Further objections raised by the appellant

The appellant raised further objections, *inter alia*, under Article 83 EPC (regarding the melting point cited in feature 1.3) and Article 54 EPC. The respondent requested that the objection under Article 54 EPC and the objection under Article 83 EPC regarding the melting point not be admitted into the appeal proceedings.

Reasons for the Decision

1. Main request: Objection under Article 83 EPC regarding the parameter d90

1.1 Admittance of the objection under Article 83 EPC regarding the parameter d90 into the appeal proceedings

The respondent requested that the objection under Article 83 EPC regarding the parameter d90 raised by the appellant in appeal not be admitted into the proceedings.

The relevant question is whether the board has discretion to hold inadmissible the contested objection in accordance with Article 12(4) RPBA 2007 (applicable in this case pursuant to Article 25(2) RPBA 2020). Under this provision, the board has the power to hold inadmissible facts, evidence or requests if these could have been presented or were not admitted in the first-

instance proceedings. The board makes the following observations.

It is undisputed between the parties that an objection under Article 83 EPC regarding the parameter d90 had been raised by the opponent in the oral proceedings before the opposition division (see also point 3.3 of the minutes of the oral proceedings).

Moreover, according to points 2.3.2 and 2.3.3 of the Reasons:

> "2.3.2 ... *Regarding, the measurement methods for the melting point and the d90 of the block copolymer, the opponent has not provided any substantial evidence that the different methods of measurement existing for either of the parameters might lead to results which differ to such an extent that there are serious doubts that the person skilled in the art could not determine if a known composition falls within the scope of the claims.*
>
> 2.3.3 *Therefore the opposition division is of the opinion that the requirements of* Article 83 EPC are fulfilled."

It is apparent from this passage that, in the decision under appeal, the opposition division considered the objection under Article 83 EPC regarding the parameter d90 on its merits and thus came to the conclusion that the requirements of Article 83 EPC were fulfilled. The opposition division did not hold this objection inadmissible. Nowhere in the decision (see especially points 2.3.1 and 2.3.2) was the question of admissibility of this objection discussed. The wording

used by the opposition division in the above cited point 2.3.2 of the decision that "...the opponent has not provided substantial evidence..." clearly pertains to the allowability of the objection of lack of sufficiency rather than to its admissibility. This wording indeed refers to the established principle that a successful objection of lack of sufficiency of disclosure presupposes that there are serious doubts, substantiated by verifiable facts (see T 19/90, point 3.3 of the Reasons). The objection under Article 83 EPC regarding the parameter d90 thus forms part of the decision under appeal.

The appellant's submissions during the appeal proceedings include arguments that have apparently not been set out in such details in the opposition proceedings. These include, *inter alia*, the argument that there was a lack of definition of the parameter d90 as the skilled person did not know whether the parameter d90 referred to 90% of the particles by volume, by number, by weight or by surface area. However, the board is satisfied that these arguments are within the framework of the objection under Article 83 EPC regarding the parameter d90 raised by the opponent in the opposition proceedings and constitutes a legitimate development of that objection. The issue of the definition of the parameter d90 (i.e. in terms of volume, mass, number or surface area) has a bearing on whether different methods of measurement for the thus defined parameter d90 are known to the skilled person that could lead to substantially different results. As indicated above, it is common ground between the parties that the latter issue was raised by the opponent in the opposition proceedings and that it was also specifically addressed in the decision under appeal.

With regard to the equity reasons invoked by the respondent, the board observes that such reasons could be taken into account if it comes to deciding on allowability of amendments to a claim, as an exception to the principle of prohibition of *reformatio in peius* (see the conditions established by decision G 1/99). Since, however, the respondent did not file amended claims without the parameter d90, potentially causing an issue of *reformatio in peius*, there was no need to decide whether an exception to the prohibition of *reformatio in peius* was justified. Under these conditions, equity reasons were of no relevance for deciding on admittance of the appellant's arguments under Article 83 EPC.

Consequently, there is no legal basis in the EPC for disregarding a matter which has been decided upon, and the board has no discretion under Article 12(4) RPBA 2007 not to admit this objection. The objection under Article 83 EPC regarding the parameter d90 is thus part of the appeal proceedings (Article 12(1)(a) RPBA 2020).

1.2 Admittance of documents D16 to D20 into the appeal proceedings

With a submission of 4 February 2022, the respondent filed documents D16 to D20 to support its view on the skilled person's common general knowledge. According to the respondent, documents D16 to D20 demonstrated that it was most common to express the parameter d90 on a volume basis and to use laser diffraction for measuring the particle size distribution.

The appellant requested not to admit these documents in application of Article 13(2) RPBA 2020 as they were

filed only three weeks before the date of the oral proceedings, and none of the documents appeared to belong to the state of the art.

Under this provision, the admittance of documents representing an amendment to a party's appeal case filed after notification of a summons to oral proceedings is subject to the discretion of the board on account of whether exceptional circumstances for the late filing are present.

In this case, the board is satisfied that the filing of these documents, though at a late stage in the appeal proceedings, does not imply an amendment of the respondent's appeal case but constitutes a further corroboration of the existing arguments on the common understanding in the art for expressing particle size distribution parameters.

However, it is doubtful whether documents D17 to D20 belong to the state of the art for the patent, which has a priority date of 8 September 2003. In the right-hand margin of page 2 of document D18, a copyright date of 2018 is mentioned; in document D19, the date "08/2020" is indicated; and at the bottom of the final page of document D20, a copyright date of 2020 is stated. No publication date seems to be indicated in document D17. Irrespective of the fact that a copyright date as such is of little value as evidence of public availability on that date (see T 2451/13, point 3.2.1 of the Reasons), no evidence has been filed that these documents were available to the public before the priority date of the patent. As a consequence, it has to be established whether these documents, although possibly post-published, are suitable, in view of their

nature and content, for proving the common general knowledge at the priority date of the patent.

Documents D17, D18 and D19 state technical properties of specific commercial products, namely "PA 850", "Rilsan® Invent Natural and Rilsan® Invent Black" and "Ultrasint® PA11", respectively. These documents indicate parameter definitions that the manufacturers of these products chose to describe technical properties of their products. However, these documents are not suitable for demonstrating the skilled person's common general knowledge at the priority date. They are not suitable for showing that the skilled person would have implicitly applied one of the measurement methods or definitions indicated in these documents for the parameter d90 in the patent and not any other measurement method or definition.

In documents D16 and D20, in contrast, definitions and measurement methods for particle size distributions are discussed in general terms. These documents reflect the skilled person's basic understanding of the parameter d90 and the corresponding measurement methods that existed before the priority date of the patent. They also confirm that there are significant differences between particle size distribution parameters obtained on a volume versus a number basis (see, for example, page 6 of document D16 and pages 8 and 9 of document D20). This aspect was addressed in point 4.3. of the appellant's letter of 21 March 2019, referring, *inter alia*, to Figures 3 and 4 of prior-art document D4. These figures show that the number distribution and the volume distribution of the same Nylon 11 powder are substantially different. Documents D16 and D20 support the view that this observation is not limited to the Nylon 11 powder

described in document D4 and thus complete the picture already presented in the appeal proceedings.

In view of the above, the affidavit of Mr Schmidlin (document D16) and Annex D (document D20) were admitted into the proceedings as evidence for the skilled person's common general knowledge at the priority date of the patent. In contrast, Annexes A, B, C (documents D17, D18, D19) were not admitted because they are not suitable proof of the common general knowledge at the relevant date of the patent.

1.3 Merits of the objection under Article 83 EPC

The parties' submissions allow identifying two aspects of the objection under Article 83 EPC raised by the appellant regarding the parameter d90: (i) the definition of the parameter d90 and (ii) whether there was a suitable method for measuring this parameter. The following discussion is based on the first of these aspects.

According to the appellant, it was not disclosed whether the parameter d90 (see feature 1.5) referred to a number-, volume- or weight-based distribution parameter. Hence, the issue at hand does not merely reside in the existence of different measurement methods and instruments possibly providing different measurement results because of, for example, different levels of measurement accuracy. The question is instead whether the parameter d90 is unambiguously defined.

It is undisputed between the parties that the parameter d90 can generally be defined, for example, on a volume, weight or number basis.

Moreover, significantly different results are obtained when determining the value of the parameter d90 for the same powder depending on which of these definitions is applied. The application of these different definitions gives rise to, for example, the different particle size distributions shown in document D4 where Figure 3 shows a number distribution of a powder and Figure 4 shows the volume distribution of the same powder. As can be readily derived from these figures, very different values of d90 are obtained depending on whether a d90 for a number distribution or a d90 for a volume distribution is determined. While Figures 3 and 4 of document D4 were obtained for a Nylon 11 powder (see column 14, lines 1 to 6), there is no reason to assume that the observation that a number distribution and a volume distribution (and their respective d90 values) deviate from each other is restricted to Nylon 11. This observation instead applies to other particle compositions as well, as is confirmed by document D16 (see page 6) and document D20 (see page 8). Consequently, the board is satisfied that deviations between the number and volume distributions exist also for block copolymers falling under the definition of claim 1 of the main request.

It is further undisputed between the parties that the patent itself does not expressly indicate whether the parameter d90 is to be understood on the basis of volume, weight, number, etc. In contrast, paragraph [0034] of the patent merely sets out:

> *"The term 'd90 of 90 to 100 µm' is defined as 90% of the particles being smaller than 90 to 100 µm, and 10% of the particles being greater than 90 to 100 µm."*

While there is thus no explicit indication in the patent, the respondent is of the opinion that the skilled person would have understood that the parameter d90 in the context of the patent was volume based and that it was to be measured by laser diffraction.

This allegation, however, is not convincing and is furthermore not supported by the evidence provided by the respondent.

Document D20 expressly mentions that the particle size distribution can be calculated based on, for example, a number or volume distribution (see, for example, page 8). There is no indication in document D20 that would allow the conclusion that the skilled person, in the context of the patent, would only have considered the possibility that the parameter d90 was based on a volume distribution.

Document D20 also does not describe volume distribution to be the only standard for stating particle size distribution parameters. Quite to the contrary, according to the last sentence of the first paragraph on page 8 of document D20:

> *"The particle size distribution can be calculated based on several models: most often as a number or volume/mass distribution."*

It is further noted that, according to the affidavit by Mr Schmidlin:

> *"At the light of the above argumentation, it can be concluded that a person skilled in the art would:*
> *...*

2. Understand that, unless explicitly stated otherwise, the D90 value is expressed as a %Volume basis as this is the standard both in literature and on materials datasheets." (see page 3 of document D16)

It seems from document D16 (see the top of page 3) that this conclusion is mainly based on the observation that document D20 (see page 4, section "Median", lines 5 to 9 and page 6, section "Laser Diffraction") describes that laser diffraction results are typically or most commonly reported based on a volume distribution. In other words, the above statement in document D16 assumes that the skilled person would have (only) considered laser diffraction as the method for assessing the value of the parameter d90 in the context of the patent. This assumption, however, is not persuasive for the following reasons.

Document D20 expressly states various measurement methods, such as laser diffraction, dynamic light scattering, acoustic attenuation and image analysis (see, for example, page 6, first sentence in the section "Technique Dependence"). All these measurement methods are available to the skilled person. Moreover, there is no indication in document D20 that would allow the conclusion that the (only) standard method for measuring the parameter d90 was laser diffraction or that the skilled person being confronted with the parameter d90 in the patent implicitly understood this parameter to be measured by laser diffraction and nothing else.

Thus, it cannot be concluded, also in view of document D20, that the skilled person would (only) have

considered laser diffraction as the method of measuring the parameter d90 cited in the patent.

Incidentally, document D20 explains that measurement results provided, for example, on a volume or number basis, may, to some extent, be calculated one from the other (see the second paragraph of the section "Laser Diffraction" on page 6 and section "Transforming Results" on page 9). This observation confirms that the question of definition of the parameter d90 is to some extent separate from the question of choosing a specific measurement method.

Moreover, the mere knowledge of methods for transforming the results for the parameter d90 obtained based on one definition to those based on a different definition would not have allowed the skilled person to see how the parameter d90 in the context of the patent was defined. While the skilled person may have been able to convert, to some extent, the value of the parameter d90 obtained on a number basis to a value of the parameter d90 on a volume basis (and *vice versa*), this ability would not have allowed the skilled person to derive to what parameter definition the requirement of feature 1.5 referred, for example, if it was the parameter d90 on a number or a volume basis that was required to be between 90 and 100 µm.

Additionally, if the value of the parameter d90 for a given powder is in the range of 90 to 100 µm according to one of the definitions of d90 outlined above (for example, on a number basis), it can generally not be concluded that the value of the parameter d90 of the same powder according to a different definition (for example, on a volume basis) is in the same range. In contrast, document D4 (see Figures 3 and 4)

demonstrates that d90 of the same powder obtained by using the different definitions of the parameter d90 can deviate by far more than 10 µm, i.e. the range defined in feature 1.5.

Feature 1.5 is furthermore of particular relevance for the definition of the invention. This is not merely stressed by the presence of this feature in independent claim 1 and by the wording of paragraph [0034] of the patent (*"In accordance with an important feature of the present invention, ..."*). In numerous instances, the patent defines the technical problem in terms of an alleged advantage achieved over US Patent No. 6,110,411 (see, for example, paragraphs [0012], [0045], [0063] and [0064]). The cited US patent belongs to the same patent family as document D3. According to the respondent (see the last two sentences on page 5 of its reply dated 11 April 2018):

> *"As pointed out by the Opposition Division, the only distinguishing feature between the present invention and the disclosure of D3 is the d90 value. It therefore appears to [*sic*] reasonable to deduce that the observed improvements are due to the distinguishing feature, which is thus to be associated with a technical effect."*

As thus acknowledged by the respondent, feature 1.5 is of particular relevance for bringing about the desired technical effect. However, in view of the different definitions for the parameter d90 known in the art and considering the lack of indication in this regard in the patent, the skilled person would not have known which definition to apply.

In fact, the patent as a whole does not disclose a single way of how the invention is to be carried out. While, in the context of "Example 1", a value of d90 of 94 microns is mentioned (see paragraph [0052]), the description of "Example 1" does not indicate how the parameter d90 is defined, i.e. which of the various possible definitions indicated above to apply. In the context of "Example 1", the skilled person can therefore only rely on the general explanation in paragraph [0034] which, however, also fails to give a sufficiently clear and complete definition of this essential parameter for the reasons indicated above.

1.4 Case law

Decisions T 45/10 (see points 4.3 to 4.3.5 of the Reasons) and T 1772/09 (see points 5 to 5.9 of the Reasons), both cited by the appellant, bear some resemblance to the current case in that they address whether a lack of definition of a particle size parameter cited in a claim (average particle size and mean particle size, respectively) can give rise to a violation of Article 83 EPC.

Moreover, in case T 709/17, cited by the respondent, claim 1 of the main request referred to voriconazole characterised, *inter alia*, by an average particle diameter D90 of less than 150 micrometres. Appellant 1 in that appeal case argued that the average particle diameter D90 in claim 1 did not necessarily imply a limitation to "by volume" such that claim 1 was broader and thus covered diameter values not based on a distribution by volume. Since the patent in suit did not teach how to measure these diameter values, it was argued that there was a problem of sufficiency of

disclosure. However, in point 1.2 of the Reasons, the deciding board set out:

> "*The patent in suit (paragraph [0070]) defines the notation Dx as being synonymous to D(v, 0.X), i.e. as representing diameter values derived from volume distributions. In line with this definition, the diameter values Dx are measured in the patent in suit via laser diffraction (paragraphs [0062] and [0067] to [0069]), i.e. a method that gives values based on a volume-weighted distribution. This method is well-established in the art. The skilled person reading the patent as a whole thus knows how to determine the average particle diameter D90.*"

In other words, the patent in decision T 709/17 explicitly defined d90 as referring to the volume distribution. The case at hand, however, is different since there is no indication in the patent that would have led the skilled person to assume that the term d90 referred to the volume distribution.

In decision T 1372/16, the definition of the size of droplets in an emulsion was discussed. According to point 3.3 of the Reasons:

> "*The span is a measure of the width of the droplet size distribution. It is defined in claims 1 and 9 of the patent in suit with reference to the droplet diameters D10, D50 and D90.*
>
> *According to paragraphs [0017] and [0018] of the patent in suit, the droplet diameters, and thus the span, can be determined using a Coulter® LS particle size analyser. ...*"

Hence, in appeal case T 1372/16, the patent made an explicit reference to a series of instruments to be used for analysing the particle size. Such a reference, however, is missing from the patent in suit.

In appeal case T 122/18, the appellant argued that the invention could not be implemented without undue burden since no measurement method had been specified for the parameter "maximum grain size" in claim 1 (see, for example, point 2.2 of the Reasons). However, the current board notes that the "maximum grain size" discussed in decision T 122/18 is not subject to the above issue of whether this applied to (merely) a certain percentage (such as 90%) of the particles by volume, by mass, by number, etc. The indication of a maximum grain size instead requires that all grains have a size below or equal to that value. Therefore, the problem that the skilled person faces in view of the term d90 is not present for the parameter "maximum grain size".

Further case law was cited by the respondent to support its view that a lack of the determination of a measurement method did not inevitably lead to an insufficiency of disclosure. However, the board notes that the issue at hand is not whether the failure of indicating a measurement method for a parameter in a patent inevitably or automatically results in a violation of Article 83 EPC. In contrast, in the current case, the skilled person, taking into account their common general knowledge, was not able to derive what definition of the parameter d90 was to be applied in the context of the patent.

1.5 Conclusions regarding the objection under Article 83 EPC

Consequently, even when taking into account their common general knowledge, the skilled person lacked a definition of the parameter d90 in the patent. The invention as defined in claim 1 of the main request therefore does not meet the requirements of Article 83 EPC in view of the lack of definition of the parameter d90.

2. Auxiliary requests I to III: Objection under Article 83 EPC

The parameter d90 is present in the claims of auxiliary requests I to III too. Therefore, auxiliary requests I to III are not allowable for the same reasons set out above with reference to the main request.

3. Request for referral to the Enlarged Board of Appeal

Pursuant to Article 112(1)(a) EPC, a board must refer a question to the Enlarged Board of Appeal if it considers that a decision is required to ensure the uniform application of the law or if a point of law of fundamental importance arises.

The appellant requested for the first time during the oral proceedings before the board to refer to the Enlarged Board of Appeal the questions indicated in point V. above. They argued that the question of whether a lack of disclosure of a measuring method for a parameter was relevant under Article 84 EPC or Article 83 EPC was one of fundamental importance and of

general interest since it arose frequently. In addition, specific guidelines were absent as to when a lack of measuring method was relevant under Article 83 EPC.

A point of law of fundamental importance is present if the question is relevant for a substantial number of similar cases and is therefore of great interest not only to the parties to the appeal proceedings in question (see G 1/12 in OJ EPO 2014, A114, point 11 of the Reasons). The board does not dispute that the question of whether the absence of a measuring method for a parameter results in a violation of Article 83 or Article 84 EPC may be relevant to a number of cases beyond the current one. Nevertheless, even in such a case, the criteria to be considered by the board is whether such a fundamental point of law is relevant for the appeal in question or whether a decision may be reached regardless of the answer to the referred question. Turning to the facts of the case, the issue at stake is whether the skilled person, on account of the common general knowledge, is able to derive the definition of the parameter d90 to be applied in the context of the patent. Since, as indicated above, the question of definition of the parameter d90 is essentially separate from the question of choosing a specific measurement method, a clarification of whether disclosing a measurement method for a parameter in the patent is a necessary condition for meeting the requirements of Article 83 EPC is not relevant for deciding the underlying appeal.

The board has also considered whether a referral in this case would be needed because of a lack of uniform application of the law. A referral can be necessary to ensure the uniform application of the law if the case

law of the boards provides divergent interpretations of the EPC. However, in this case, the case law cited by the respondent is, in the board's view, not suitable for proving that there is a divergence in the application of the law, nor that the board's approach diverges from established case law. The case law cited by the respondent and considered above (see point 1.4) pertains to cases in which the patent made explicit reference to the kind of particle size definition to be applied (for instance, T 709/17 and T 1372/16) or simply did not specifically address the issue of the particular parameter d90. The facts in the current case are, however, different as the patent, independently of the lack of disclosure of the measuring method to be used, does not unambiguously indicate the physical parameter to be measured since "d90" can have different meanings in the common art.

For these reasons, the board does not see a divergence in the law cited by the respondent and, even if there were one, it would merely have a theoretical significance for the underlying case.

Since none of the conditions set by Article 112(1)(a) EPC were fulfilled, the request for referral to the Enlarged Board of Appeal was refused.

4. Conclusions

Since the requirements of Article 83 EPC are not met for the main request and auxiliary requests I to III, the patent must be revoked.

In this situation, decisions regarding the respondent's requests not to admit into the appeal proceedings

documents D13 to D15, the objection under Article 83 EPC to the extent that it referred to the melting point and the objection under Article 54 EPC were not necessary.

Order

For these reasons it is decided that:

1. The request for referral to the Enlarged Board of Appeal is refused.

2. The decision under appeal is set aside.

3. The patent is revoked.

The Registrar: The Chairman:

N. Schneider P. Lanz

Decision electronically authenticated