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**Datasheet for the decision  
of 27 June 2019**

**Case Number:** T 1821/15 - 3.3.09

**Application Number:** 09741913.9

**Publication Number:** 2274370

**IPC:** C08J9/00

**Language of the proceedings:** EN

**Title of invention:**

COMPOSITIONS OF EXPANDABLE VINYL AROMATIC POLYMERS WITH AN  
IMPROVED THERMAL INSULATION CAPACITY, PROCESS FOR THEIR  
PREPARATION AND EXPANDED ARTICLES OBTAINED THEREFROM

**Patent Proprietor:**

versalis S.p.A.

**Opponents:**

Total Research & Technology Feluy  
Synthos S.A.

**Headword:**

**Relevant legal provisions:**

EPC Art. 54(2), 83, 87(2), 87(4), 111(1)  
RPBA Art. 12(4), 13

**Keyword:**

Late-filed arguments: (admitted; no new case)

Main request: sufficiency (yes), priority (no), novelty (no)

Auxiliary requests: admitted (yes)

New first auxiliary request: sufficiency (yes), priority (yes), novelty (yes)

Remittal for further prosecution

**Decisions cited:**

G 0002/98, G 0003/14, T 0449/04, T 1772/09

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

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Case Number: T 1821/15 - 3.3.09

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.09**  
**of 27 June 2019**

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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 20 July 2015  
revoking European patent No. 2274370 pursuant to  
Article 101(3) (b) EPC.**

**Composition of the Board:**

**Chairman**            W. Sieber  
**Members:**            N. Perakis  
                              E. Kossonakou

## Summary of Facts and Submissions

- I. This decision concerns the appeal filed by the patent proprietor against the opposition division's decision revoking European patent No. 2 274 370.
- II. In their notices of opposition, the two opponents had requested revocation of the patent in its entirety on the grounds of Article 100(a) (lack of novelty and lack of inventive step), 100(b) and 100(c) EPC.

Claim 1 as granted reads as follows:

"1. Compositions of expandable vinyl aromatic polymers which comprise:

a) a polymeric matrix obtained by polymerizing a base comprising 50-100% by weight of one or more vinyl aromatic monomers and 0-50% by weight of at least one co-polymerizable monomer;

b) 1-10% by weight calculated with respect to the polymer (a), of an expandable agent englobed in the polymeric matrix;

c) 0.05-25% by weight, calculated with respect to the polymer (a), of an athermanous filler comprising coke, in particle form with an average diameter of the particles ranging from 0.5 to 100  $\mu\text{m}$  and with a surface area, measured according to ASTM D-3037/89 (BET), ranging from 5 to 50  $\text{m}^2/\text{g}$ ."

The documents filed before the opposition division included:

D2: WO 2008/141767 A2;

D5: WO 2007/045454 A1;

D15: IUPAC: "Recommended terminology for the description of carbon as a solid", Pure & Appl. Chem., vol 67, no. 3, 1995, pp 473-506;

D29: Technical report of Total Research & Technology Feluy, dated 26 January 2015;

D32: WO 2007/119102 A2.

III. The opposition division held that neither the main request nor any of the five auxiliary requests before it met the requirements of the EPC.

The main request filed with the letter dated 13 December 2013 is the sole request relevant for the purposes of the present decision. The claims of the main request correspond to the claims as granted, with the difference that dependent claims 19-21 were amended to overcome objections raised under Article 100(c) EPC.

With regard to the main request, the opposition division decided that:

- claim 1 was not entitled to the claimed priority since D2 was "the first application" of the claimed subject-matter within the meaning of Article 87(4) EPC; and
- the subject-matter of claim 1 lacked novelty in view of D2, which was published before the filing date of the subject-matter of claim 1.

IV. The patent proprietor (the appellant) appealed against the opposition division's decision and requested that this decision be set aside. The main request before the opposition division submitted with the letter of 13 December 2013 constituted the appellant's main request in appeal. With the statement setting out the grounds of appeal dated 27 November 2015 the appellant submitted five auxiliary requests and the following documents:

D40: TIMCAL TIMREX® PC 40-OC Coke (Unverified Data\*\*),  
www.Matweb.com; and

D41: Declaration of Mr R. Felisari dated  
26 November 2015 containing experimental data.

The appellant requested that the case be remitted to the opposition division for the assessment of inventive step if the main request or, alternatively, one of the first to fifth auxiliary requests was found to be novel. Furthermore, it requested that a question be referred to the Enlarged Board of Appeal for clarification of a fundamental legal issue if the board was inclined not to follow T 449/04 in its decision on priority.

V. By their respective letters dated 18 April 2016 and 28 April 2016, opponent 2 (respondent 2) and opponent 1 (respondent 1) requested that the appeal be dismissed.

VI. In a communication dated 28 May 2019, the board gave a preliminary opinion on the issues of sufficiency, priority and novelty.

VII. By letter dated 11 June 2019, respondent 2 requested that the auxiliary requests be not admitted into the

proceedings and that the case be remitted to the opposition division for further prosecution if the board came to the conclusion that one of these auxiliary requests were admitted.

VIII. By letter dated 19 June 2019, the appellant filed further arguments on the outstanding issues of priority and novelty.

IX. On 27 June 2019, oral proceedings were held before the board.

During these proceedings, respondent 1 requested that the board interpret the subject-matter of claim 1 of the main request and that the auxiliary requests not be admitted into the proceedings.

Respondent 2 requested that the appellant's latest written submissions (letter of 19 June 2019) not be considered. Furthermore, it withdrew its request to remit the case to the opposition division if one of the auxiliary requests were admitted into the proceedings.

The patent proprietor withdrew its request for referral of a question to the Enlarged Board of Appeal. It also withdrew the first and third auxiliary requests and renumbered the fourth and fifth auxiliary requests, which became the first and third auxiliary requests.

Claim 1 of the (renumbered) first auxiliary request differs from claim 1 of the main request only as regards the value range of the surface area, which according to claim 1 of the first auxiliary request reads as follows:



"with a surface area, measured according to ASTM D-3037/89 (BET), ranging from 5 to 20m<sup>2</sup>/g".

During the discussion on priority the appellant also filed Annex 1. It was a graph based on the experimental results of the technical report D29 which showed the variation of the surface area of the pulverised particles of carbon coke PC40 of example 1f of D2 when the size of these particles varied.

Lastly, respondent 2 raised objections concerning independent claim 9 (surface area not in line with claim 1) and claim 23 (clerical issue) of the first auxiliary request.

In reaction to these objections, the appellant submitted a new first auxiliary request, which differed from the (renumbered) first auxiliary request only in that claims 9 and 23 were amended to overcome respondent 2's objections.

Despite the requests of the appellant and respondent 2 made in the written proceedings to allow their respective technical experts to speak on technical matters during the oral proceedings, it was not necessary for these experts to make any submissions.

X. The relevant arguments put forward by the appellant in its written submissions and during the oral proceedings may be summarised as follows:

- The arguments submitted with the letter of 19 June 2019 were admissible since they were not new but rather summarised the appellant's position on the issues of priority and novelty in the appeal proceedings.

- The invention underlying the subject-matter of claim 1 of the main request was sufficiently disclosed. With regard to the terms "coke" and "athermanous", it was clear from the patent in suit that they were part of the skilled person's common general knowledge. With regard to the "average diameter of the particles", it was clear from the claims considered in their entirety that it related solely to the coke particles and not to any other particle type. Furthermore, the skilled person would not have encountered any problem in reproducing the claimed invention since the patent in suit disclosed how the average diameter of the coke particles was measured (paragraph [0015]) and, more importantly, since commercial coke had been used in the examples of the patent which had an average particle diameter falling within that of claim 1. The respondents, who bore the burden of proof, had not filed any technical evidence to show that they were unable to carry out the claimed invention.
  
- Contrary to the respondents' arguments, claim 1 of the main request was entitled to the claimed priority since D2 was not "the first application" of the claimed subject-matter within the meaning of Article 87(4) EPC. It was clear from claim 1 of D2 that this document related to a different invention from the invention of claim 1 (i.e. a composition of expandable vinyl aromatic polymers involving a graphite material of a specific graphitisation degree not homogeneously distributed). The specific composition of example 17 of D2 to which respondent 1 made reference included the pulverised carbon coke of example 1f, which was a comparative example

and not an example according to the invention of D2. In view of the case law of the boards of appeal of the EPO (namely T 449/04), a comparative example could not be considered for the assessment of "the same invention" in the terms of Article 87(4) EPC. Lastly, D2 did not disclose that the pulverised particles of carbon coke PC40 of example 1f with an average d50 size of 4  $\mu\text{m}$  had a surface area falling within the claimed range. Nor was such a surface area an inherent property of the pulverised particles of carbon coke PC40 of this example. The technical evidence submitted by respondent 1 (D29) essentially related to particles of a different carbon coke, namely carbon coke PC40-OC, with particles having an average d50 size of 3.6  $\mu\text{m}$ . Furthermore, the technical evidence submitted by the appellant (D41) showed that at these particle sizes the measurement of the surface area gave different values. Thus, the skilled person would not have directly and unambiguously derived from D29 that the particles of carbon coke PC40 of example 1f of D2 with an average d50 size of 4  $\mu\text{m}$  inherently had a surface area within the claimed range.

- Since claim 1 of the main request was entitled to the claimed priority, D2 was not prior art under Article 54(2) EPC. Furthermore, it was not prior art under Article 54(3) EPC because it had not entered the regional European phase.
  
- D32 was not relevant for the novelty of claim 1 of the main request because it did not disclose the surface area of the solid particles added to the expandable polystyrene composition. Contrary to respondent 1's assertions, the surface area of the

particles was not a trivial feature of the claimed invention. Furthermore, the skilled reader of D32 would not have considered the surface area of the particles disclosed in D5 because they were carbon black particles and not carbon coke particles.

- Contrary to the respondents' objection, the auxiliary requests should be admitted into the proceedings because they were submitted at the earliest possible occasion, namely with the statement setting out the grounds of appeal, in an effort to overcome the opposition division's objections. The amendments were easy to understand, were supported by the application as filed and narrowed down the scope of protection. Furthermore, they did not raise any new issues. With regard to convergency, there was no requirement that the requests should be absolutely converging. In the present situation with complicated subject-matter, there had to be some flexibility.
  
- Claim 1 of the new first auxiliary request (submitted during the oral proceedings before the board and identical to claim 1 of the (renumbered) first auxiliary request) was entitled to the claimed priority. It could no longer be argued that the carbon coke particles of example 1f of D2 with an average d50 size of 4  $\mu\text{m}$  would implicitly have a surface area falling within the narrower range of claim 1 of the new first auxiliary request. The curve drawn by respondent 1 based on the experimental results of D29, which correlated the size of the particles with their surface area and according to which particles with a size of 4  $\mu\text{m}$  would have been expected to have a surface area of less than  $20\text{m}^2/\text{g}$ , was speculative. The curve drawn

by the appellant and submitted during the oral proceedings as Annex 1 showed that particles with a size of 4  $\mu\text{m}$  had a surface area of 22  $\text{m}^2/\text{g}$ , thus greater than 20 $\text{m}^2/\text{g}$ .

- Since D2 was not the "first application", the claimed priority was valid. Thus D2, published after the priority date, was not prior art under Article 54 EPC and claim 1 of the new first auxiliary request was novel. For the reasons given for the main request, it was also novel over D32.

XI. The relevant arguments put forward by the respondents in their written submissions and during the oral proceedings may be summarised as follows:

- The appellant's arguments submitted with the letter dated 19 June 2019 should not be admitted into the proceedings because they raised new issues to which the respondents were unable to reply at such a late stage of the appeal proceedings.
- The invention underlying the subject-matter of claim 1 of the main request was not sufficiently disclosed. Firstly, there was no definition of the term "athermanous" in the application as filed. Secondly, the term "particle size" was interpreted to relate to any kind of particles present in the athermanous filler composition, each of which had a different morphology. Thus, the term "particle size" was unclear and the skilled person was unable to reproduce the claimed invention. There was no need to furnish any technical evidence since T 1772/09 concerned the insufficiency of disclosure of the specific issue at hand.

- The subject-matter of claim 1 of the main request was not entitled to the claimed priority since example 17 of D2, which disclosed a composition of expandable vinyl aromatic polymer containing the specific carbon coke particles of example 1f, was "the first application" of the claimed subject-matter within the meaning of Article 87(4) EPC. Contrary to the appellant's point of view, it was the whole content of D2 and not only the claims which should be considered to assess whether D2 was "the first application" of the claimed subject-matter. On the basis of the disclosure of D2, it was clear that example 1f and, by extension, example 17 were not comparative examples but examples of the invention of D2. Furthermore, the pulverised particles of carbon coke PC40 of example 1f with an average d50 size of 4  $\mu\text{m}$  inherently had a surface area falling within the range of claim 1 of the main request. This was shown by the technical evidence D29 submitted by respondent 1 and the curve which correlated the size of the particles with their surface area. According to this curve, particles with a size of 4  $\mu\text{m}$  clearly had a surface area of less than 50m<sup>2</sup>/g. The technical evidence D41 submitted by the appellant was not relevant since it concerned a carbon coke which was different from the coke of example 1f of D2 (carbon coke PC40-OC instead of carbon coke PC40) and had a smaller average d50 size (1.80/1.82  $\mu\text{m}$  instead of 4  $\mu\text{m}$ ).
  
- Since claim 1 of the main request was not entitled to the claimed priority of 7 May 2008, D2, with a publication date of 27 November 2008, prior to the filing date of claim 1 of the main request (1 May 2009), was prior art under Article 54(2) EPC

and the disclosure of example 17 of D2 anticipated the subject-matter of claim 1 of the main request.

- Furthermore, the subject-matter of claim 1 of the main request lacked novelty over D32. This document did not disclose the surface area of the coke particles in the expandable polystyrene compositions. However, this property was trivial and thus inherent to the coke particles as shown by D5.
- The appellant's auxiliary requests should not be admitted into the proceedings. They were late-filed, raised new issues which the respondents could not deal with during the oral proceedings and were diverging.
- For the reasons set out for the main request, the new first auxiliary request was also not allowable in terms of sufficiency and novelty. D2 was still "the first application" of the claimed subject-matter since example 1f of D2 inherently disclosed that the pulverised particles of carbon coke PC40 with an average d50 size of 4 µm had a surface area falling within the claimed range. This was shown by the curve based on the experimental results of D29, which correlated the size of the particles with their surface area and according to which particles with a size of 4 µm had a surface area of less than 20m<sup>2</sup>/g.

XII. The appellant requested that the decision of the opposition division be set aside and that the case be remitted to the opposition division for the assessment of inventive step, if the main request or one of the new first to third auxiliary requests were found to be

novel. The main request was filed with the letter of 13 December 2013, the new first auxiliary request was filed in the oral proceedings before the board and the second and third auxiliary requests were filed with the statement setting out the grounds of appeal dated 27 November 2015 as the second and fifth auxiliary requests, respectively.

XIII. The respondents requested that the appeal be dismissed.

## **Reasons for the Decision**

### **Main request**

#### **1. *Admission of the appellant's arguments filed with the letter of 19 June 2019***

1.1 During the oral proceedings before the board, respondent 2 requested that the appellant's submissions filed with the letter of 19 June 2019 not be admitted into the proceedings on the grounds that they were late-filed and raised new issues to which respondent 2 was not able to reply in view of the upcoming oral proceedings.

1.2 The board does not agree. These submissions were filed as a reply to the board's preliminary opinion and basically summarised the appellant's arguments already filed in the written proceedings on the outstanding issues of priority and novelty.

Furthermore, respondent 2 did not specify any new technical issue raised in the appellant's submissions or any new lines of argument which would have changed



the appellant's case and which would have required more time in order to prepare an appropriate defence.

1.3 Thus, the board admitted the appellant's latest written submissions into the proceedings.

## **2. Sufficiency of disclosure**

2.1 Respondent 1 raised an objection of insufficiency of disclosure based on the following feature of claim 1:

"0.05-25% by weight, calculated with respect to the polymer (a), of an athermanous filler comprising coke, in particle form with an average diameter of the particles ranging from 0.5 to 100  $\mu\text{m}$  and with a surface area, measured according to ASTM D-3037/89 (BET), ranging from 5 to 50  $\text{m}^2/\text{g}$ ".

2.1.1 Respondent 1 considered that the term "athermanous" was not sufficiently disclosed in the patent in suit, leaving the skilled person unsure as to the exact meaning of an athermanous filler comprising coke.

2.1.2 Respondent 1 also considered that the average diameter of the particles was not sufficiently disclosed since the patent did not provide any indication of the calculation method used to measure it, in particular in view of the different morphology of the coke, carbon black and graphite particles which could be included in the athermanous filler composition. Respondent 1 referred to T 1772/09 in order to justify why there was no need to provide any technical evidence in support of its objection.

2.2 Contrary to respondent 1's assertions, the board considers that the patent in suit provides the skilled

person with the necessary information to put the claimed invention into practice.

- 2.2.1 With regard to the first objection, the patent provides a definition of the term "athermanous" in paragraph [0005], where it is stated that:

*"Athermanous materials are in fact capable of interacting with the radioactive (sic) flow, reducing its transmission and thus increasing the thermal insulation of the expanded materials in which they are contained."*

The skilled reader would immediately understand that the expression "radioactive flow" is wrong and the reference should rather be to the radiative or heat flow.

Furthermore the term "athermanous" is known to a person skilled in the art as stated in the patent in suit in the part concerning the state of the art (paragraph [0005]):

*"In order to avoid this drawback, suggestions have been made to fill the polymer with athermanous materials such as graphite, carbon black or aluminium."*

Lastly, the patent in suit makes specific reference to the European patent EP 620246 (see paragraph [0006]), which provides a definition of the athermanous materials, which are materials that absorb heat and in particular infrared radiation (A publication: column 2, lines 34-37).

As regards the term "coke", the appellant filed D15, a document also cited in paragraph [0019] of the patent

in suit, which discloses the common general knowledge of the skilled person and provides definitions of the coke (see page 485 under the heading "COKE").

In summary, this objection by respondent 1 is without merit.

2.2.2 With respect to the second objection, it became clear during the oral proceedings that the objection was closely related to the question as to how the feature "an athermanous filler comprising coke, in particle form with an average diameter of the particles ranging from 0.5 to 100  $\mu\text{m}$  and with a surface area, measured according to ASTM D-3037/89 (BET), ranging from 5 to 50  $\text{m}^2/\text{g}$ " is to be understood, namely

- whether the specified average particle diameter and surface area concern only the coke in particle form present in the athermanous filler, while other athermanous fillers, which could be present due to the word "comprising", are not required to have the specified particle parameters,  
or
- whether all particles (not exclusively the coke particles) present in the athermanous filler must have the specified average particle diameter and surface area.

In the board's understanding, respondent 1's objection was raised on the basis of the second interpretation, under which it would not be possible to define an average particle diameter of athermanous fillers in flake or fibre form.

However, in the board's view the only sensible and uniform interpretation on the basis of the application

as a whole is the first one, namely that the coke particles comprised in the athermanous filler must have the specified average particle diameter and surface area.

The board does not consider that the comma after the word "coke" has any particular grammatical function since no comma is used after the word "coke" to describe the same feature in independent claims 7 and 9 (corresponding to claims 7 and 9 as filed).

Furthermore, it is conspicuous to the board that athermanous fillers other than coke are defined differently. Thus, claim 2 of the main request (corresponding to claim 2 as filed) explicitly allows for up to 5% by weight of graphite and/or carbon black. Claim 4 (corresponding to claim 4 as filed), which refers back to claim 2, requires that carbon black has an average particle diameter ranging from 10 to 1,000 nm. At least the lower limit of this range, namely 10 nm (i.e. 0.01  $\mu\text{m}$ ), would be inconsistent with the range in claim 1 (lower limit of 0.5  $\mu\text{m}$ ) if the range in claim 1 applied to all athermanous fillers, including carbon black.

Thus, in the board's view the average particle diameter in claim 1 can only relate to coke particles.

Respondent 1 did not provide any technical evidence to show that the disclosure of the patent was insufficient with respect to the measurement of the average particle diameter of coke.

It is noted that paragraph [0015] of the patent in suit discloses that:

*"The coke is available as a finely subdivided powder with a size (MT50) of the particles of powder ranging from 0.5 to 100 µm, preferably from 2 to 20 µm. The particle size (M50) is measured with a laser granulometer and is the diameter which corresponds to 50% by weight of particles having a lower diameter and 50% by weight having a higher diameter."*

Furthermore, the appellant pointed out that "coke" was a commercial product and that a commercial coke was used in the examples of the patent in suit, namely Calcined Coke 4023 having a particle diameter MT50% of about 5 µm and Needle Coke 4727 having a particle diameter MT50% of about 6 µm, with both types of coke being sold by the company Asbury Graphite Mills Inc (USA) (paragraphs [0061] and [0082]).

The respondents did not contest the particle size of the commercial products used.

Under these circumstances T 1772/09 is irrelevant because it does not concern the particle size of a commercially available compound used as a component of a claimed composition (the present case) but rather the particle size of a claimed (allegedly new) compound either in the form of a powder (claim 1) or crystals (claim 8).

In summary, this objection by respondent 1 is also without merit.

### **3. *Priority of claim 1***

- 3.1 Respondent 1 argued that claim 1 of the main request was not entitled to the priority date of 7 May 2008 deriving from the filing of the national application

IT MI20080823 because D2 was "the first application" of the subject-matter of claim 1 of the main request within the meaning of Article 87(4) EPC.

- 3.2 Respondent 1 made reference to example 17 of D2, which discloses a composition of expandable vinyl aromatic polymer made by combining 775 parts of a vinyl aromatic mixture according to example 8 with 225 parts of an additive stream containing 114.4 parts of a concentrate of graphite material (page 63, line 24 to page 64, line 25), the concentrate of graphite material being obtained according to example 1f (page 70, line 21 to page 71, line 1) and containing pulverised coke with an average d50 size (measured by laser diffraction) of 4  $\mu\text{m}$  (page 53, line 19 to page 54, line 9).

The composition of expandable vinyl aromatic polymers comprises a polymeric matrix obtained by polymerising 84.46 wt.% of styrene (page 63, line 25 to page 64, line 2). It also comprises a mixture of n-pentane and iso-pentane as the expandable agent in an amount of 6 wt.% with respect to the vinyl aromatic mixture (page 64, lines 11-13 and 17-19). The concentrate of graphite material is present in an amount of 14.8 wt.% with respect to the vinyl aromatic mixture (page 64, lines 7-8, 13 and 17-19).

This was not contested by the appellant. The parties disagreed as to whether the concentrate of graphite material disclosed in example 1f of D2 was part of the invention of D2 or whether it was a comparative example.

- 3.3 The appellant held that example 1f was not an example of the invention of D2 and consequently that it should not be taken into consideration in view of the case law

of the boards of appeal of the EPO, in particular T 449/04. According to this decision, when assessing whether an earlier application had disclosed the "same invention" within the meaning of Article 87(1) EPC as the invention claimed in the patent in suit, the "same invention" did not encompass the comparative examples of the earlier application which were clearly and definitely excluded from the scope of the invention in the earlier application (T 0449/04, Headnote).

The appellant based its argument on claim 1 of D2 which allegedly contained essential features of the invention which were absent from example 1f and related to a graphite material which was not homogeneously distributed in the composite material and which had a graphitisation degree, calculated by means of the Maire and Mering formula, of at least 0.2.

- 3.4 The board does not agree with the appellant's interpretation of the invention of D2. The board refers to G 2/98 (Headnote) according to which the requirement for claiming priority of "the same invention", referred to in Article 87(1) EPC, means that priority of a previous application in respect of a claim in a European patent application in accordance with Article 88 EPC is to be acknowledged only if **the skilled person can derive the subject-matter of the claim directly and unambiguously, using common general knowledge, from the previous application as a whole**. Thus, it is not only claim 1 of D2 which is relevant for the assessment of the "same invention" but rather the entire teaching of document D2 as read by the skilled person using their common general knowledge.

Thus, the invention of D2 concerns expandable composite materials based on vinyl aromatic polymers, to which an

agent is added to improve the thermal insulation (page 13, lines 14-21). The improvement of the thermal insulation is achieved by adding graphite material into the granulates of expandable vinyl aromatic polymers which are not homogeneously dispersed in the polymer matrix (page 15, lines 7-11). The graphite material consists of graphitic carbon but it can also contain smaller quantities of non-graphitic carbon such as carbon black (page 19, lines 9-11). Table 1 shows graphitisation degrees of various graphite materials useful for the invention of D2 (examples from 1a to 1i) and non-useful examples (page 21, lines 6-22). This means that D2 itself considers the graphite material of example 1f, which has no graphitisation degree and is thus coke, to be an example of the disclosed invention. The graphite material/coke of example 1f is obtained by pulverising coke PC40 produced by Timcal starting from crude oil in a jet mill to obtain a powder with an average d50 size (measured by laser diffraction) of 4 µm. This pulverised coke is mixed with other ingredients in a twin-screw extruder and is used as concentrate of graphite material.

There is, therefore, no doubt that example 1f is an example of the invention of D2 and thus the *ratio decidendi* of T 0449/04 does not apply.

- 3.5 The appellant's second line of reasoning was that D2 did not disclose the surface area of the coke PC40 obtained after pulverisation in a jet mill to an average d50 size of 4 µm.

Respondent 1 filed the technical report D29 which shows the influence of the pulverisation degree of coke PC40 on the surface area.



Table 3 provides the following results as regards the particle average diameter d50 in  $\mu\text{m}$  and the corresponding surface area (BET) in  $\text{m}^2/\text{g}$ :

	d50	BET
PC40	9.0	7.5
PC40 3VZ5	7.6	9.1
PC40 from cyclone	5.4	7.6
PC40 from filter	3.6	26.2

Firstly, this table confirms what the skilled person knows, i.e. that when the particle average diameter d50 decreases, the particle surface area (BET) increases. Furthermore, it shows that at a particle average diameter d50 of 4  $\mu\text{m}$ , the BET will be somewhere between 7.6 and 26.2  $\text{m}^2/\text{g}$ , i.e. within the claimed range from 5 to 50  $\text{m}^2/\text{g}$ .

The board acknowledges that the technical evidence D41, submitted by the appellant, shows that two surface area measurements of coke particles with almost the same d50 provide very different results, namely 39 and 52  $\text{m}^2/\text{g}$ , one falling within the claimed range and the other (just) above the upper limit of the claimed range. This evidence was, however, carried out with coke PC40-OC and most importantly on particles with an average diameter d50 much lower than that of example 1f of D2, namely 1.80 and 1.82, respectively. Therefore, this evidence is not conclusive and cannot invalidate the results of D29.

The board thus comes to the conclusion that the technical evidence of D29 demonstrates that the particles of coke PC40 with an average diameter d50 of 4  $\mu\text{m}$  will inevitably have a surface area within that of

the particles of claim 1 of the main request, i.e. from 5 to 50 m<sup>2</sup>/g.

- 3.6 In summary, D2 is "the first application" of the subject-matter of claim 1 of the main request within the meaning of Article 87(4) EPC, which means that claim 1 of the main request is not entitled to the priority date of 7 May 2008.

#### **4. *Novelty of claim 1***

- 4.1 D2, which was published on 27 November 2008, i.e. before the filing date of the subject-matter of claim 1 of the main request, namely 1 May 2009, is prior art under Article 54(2) EPC.

- 4.2 In light of points 3.2 to 3.4 above, the subject-matter of claim 1 of the main request lacks novelty over the disclosure of D2, in particular of example 17.

- 4.3 Since claim 1 lacks novelty, the main request is not allowable.

#### **The auxiliary requests**

#### **5. *Admission***

- 5.1 During the oral proceedings before the board the appellant withdrew the first and third auxiliary requests filed with the statement setting out the grounds of appeal and made its fourth auxiliary request, also filed with the statement setting out the grounds of appeal, its first auxiliary request. This request was then amended in order to overcome objections raised during the oral proceedings by respondent 2 (see point X above) and this amended

version became the appellant's new first auxiliary request.

Claim 1 of the new first auxiliary request is identical to claim 1 of the fourth auxiliary request filed with the statement setting out the grounds of appeal.

As the new first auxiliary request essentially resulted from a request filed at the earliest point in the appeal proceedings and the amendments were made to overcome objections raised for the first time during the oral proceedings before the board, this request was admitted into the proceedings under Article 13(1) RPBA.

- 5.2 The second auxiliary request was filed as the second auxiliary request with the statement setting out the grounds of appeal. The fifth auxiliary request was filed with the statement setting out the grounds of appeal and became the appellant's new third auxiliary request.

These requests were filed at the earliest point in the appeal proceedings and their subject-matter was narrowed down compared with that of the main request, was easy to understand and was disclosed in the application as filed. Thus, the board saw no reason why these requests should be excluded from the proceedings (Article 12(2) and (4) RPBA).

### **New first auxiliary request**

#### **6. *Sufficiency***

The subject-matter of claim 1 of the new first auxiliary request differs from the subject-matter of claim 1 of the main request only in that the surface

area requirement for the coke particles has been restricted from 5 to 50 m<sup>2</sup>/g to 5 to 20 m<sup>2</sup>/g. This amendment has no bearing on sufficiency of disclosure. Thus, the reasoning on this issue set out in point 2 above is equally valid for the new first auxiliary request.

## **7. Priority**

7.1 The respondents argued that claim 1 of the new first auxiliary request was still not entitled to the claimed priority date, because D2 was also "the first application" of the subject-matter of claim 1 of the new first auxiliary request within the meaning of Article 87(4) EPC. The respondents continued to rely on the composition of example 17, which contained the pulverised coke particles of example 1f with an average diameter d<sub>50</sub> (measured by laser diffraction) of 4 µm. They argued that these particles inherently had a surface area, measured according to ASTM D-3037, that fell within the claimed range of 5-20 m<sup>2</sup>/g.

Respondent 1 referred to its technical report D29, which investigated the effect of grinding coke on the particle size distribution and on the specific surface area BET, and to the graph included in its letter dated 28 April 2016 (page 5). This graph was based on the experimental results of table 3 of D29, which illustrated the variation of the particle surface area when the particle average diameter d<sub>50</sub> varied. Respondent 1 asserted that the coke particles with an average diameter of 4 µm had an estimated surface area of less than 20 m<sup>2</sup>/g and thus lay within the claimed subject-matter.

7.2 However, an enlarged copy of this graph, filed by the appellant as Annex 1 during the oral proceedings before the board, shows that particles with an average diameter  $d_{50}$  size of  $4\ \mu\text{m}$  have an estimated surface area of just above  $20\ \text{m}^2/\text{g}$  and thus lay outside the claimed subject-matter. The appellant estimated that the value was about  $22\ \text{m}^2/\text{g}$ .

7.3 In view of this ambiguity associated with the relevant value in the graph, the board can only conclude that it is not directly and unambiguously derivable from values in table 3 of D29 and the related graph that the pulverised coke particles with an average diameter  $d_{50}$  of  $4\ \mu\text{m}$  - as disclosed in D2 - inherently has a surface area which falls within the surface area of the coke particles of claim 1.

Consequently, D2 does not disclose the subject-matter of claim 1 of the new first auxiliary request and thus it is not "the first application" of the subject-matter of claim 1 of this request within the meaning of Article 87(4) EPC.

7.4 The patent in suit claims the priority date of 7 May 2008 from the national filing of IT MI200808823 (P1). The respondents did not challenge this priority right for the subject-matter of claim 1 of the new first auxiliary request. The board has no reason to challenge it either. On the contrary, the board referred to its communication of 28 May 2019 (point 8.1) in which it replied to respondent 2's objection that claim 1 and page 5, last paragraph, of the priority document (P1) did not disclose the units of the average diameter of the coke particles by stating that the priority document, considered in its entirety, directly and unambiguously disclosed that the coke

particles had an average diameter of 0.5 to 100  $\mu\text{m}$  (claims 3, 7, 9, 14 and 22).

7.5 In summary, the subject-matter of claim 1 of the new first auxiliary request is entitled to the claimed priority date.

**8. *Novelty of independent claim 1***

8.1 Since claim 1 of the new first auxiliary request is entitled to the priority date of 7 May 2008, D2, with a publication date of 27 November 2008, is not prior art under Article 54(2) EPC. Furthermore, it is not prior art under Article 54(3) EPC because it did not enter the regional European phase.

8.2 Respondent 1 raised a further novelty objection on the basis of D32. This document discloses compositions of expandable vinyl aromatic polymers which are prepared by a mixture of ethylenically unsaturated monomers containing at least 25 wt.% of one or more styrenic monomers and from 0.01 to 10 wt.% of a particulate solid, the weight percentages based on the weight of the mixture (abstract; page 4, lines 7-16; claim 1). The particulate solid is selected from a list of materials including coke (page 12, line 22 to page 13, line 2; claim 4). The particulate solid has a particle size of from 0.001 to 5  $\mu\text{m}$  (page 13, lines 7-12; claim 5). However, as acknowledged by respondent 1, D32 does not disclose the surface area of the particulate solid.

8.3 Respondent 1 argued that the feature of the surface area of the particulate solid was either trivial and inherent to the coke particles of D32 or implicit in view of D5. Respondent 1 concluded that the skilled person seeking to reproduce the compositions of D32

would have used coke particles with a surface area falling within the claimed range.

8.3.1 However, respondent 1 did not provide any evidence to support its assertions of triviality and inherence.

8.3.2 D5 concerns expandable granulates having compositions based on vinyl-aromatic polymers and **carbon black**, which is different from coke (abstract; page 8, lines 15-18; claim 1). Thus, contrary to respondent 1's assertions the skilled person would not have derived from D5 any information regarding the surface area of the coke particles of D32.

8.4 Thus, the subject-matter of claim 1 of the new first auxiliary request is novel over the cited prior art.

9. ***The other independent claims of the new first auxiliary request***

The subject-matter of independent claims **6** (expanded articles), **7** (expanded extruded sheets of vinyl aromatic polymers), **9** (a process for preparing the compositions of expandable vinyl aromatic polymers, in beads or granules, according to claims 1 to 5), **14** (a process for preparing in continuous manner the compositions of expandable vinyl aromatic polymers, in beads or granules, according to claims 1 to 5), and **22** (a process for the production of expanded extruded sheets of vinyl aromatic polymers according to claims 7 or 8) involves an athermanous filler comprising coke in particle form with an average diameter of the particles ranging from 0.5 to 100  $\mu\text{m}$  and with a surface area ranging from 5 to 20  $\text{m}^2/\text{g}$ .

The inventions underlying the subject-matter of these claims are considered to fulfil the requirements of Article 83 EPC and the subject-matter of these claims is considered to be novel for the reasons set out above for the subject-matter of claim 1 of the new first auxiliary request.

**10. Remittal**

The decision under appeal dealt only with the issues of added subject-matter and novelty. Furthermore, all the parties requested the remittal of the case to the opposition division for further prosecution. Thus, the board exercises its discretion under Article 111(1) EPC and remits the case to the opposition division for further prosecution.



## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division for further prosecution on the basis of claims 1 to 25 of the new first auxiliary request filed in the oral proceedings before the board on 27 June 2019.

The Registrar:

The Chairman:



M. Canueto Carbajo

W. Sieber

Decision electronically authenticated