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**Datasheet for the decision  
of 24 March 2021**

**Case Number:** T 1095/18 - 3.3.03

**Application Number:** 05808420.3

**Publication Number:** 1812485

**IPC:** C08F297/08, C08L23/06,  
C08L23/08

**Language of the proceedings:** EN

**Title of invention:**

POLYETHYLENE MOLDING COMPOSITION FOR COATING STEEL PIPES

**Patent Proprietor:**

Basell Polyolefine GmbH

**Opponents:**

Borealis Technology OY  
THE DOW CHEMICAL COMPANY

**Relevant legal provisions:**

EPC Art. 54, 111(1)

**Keyword:**

Novelty - main request (no) - auxiliary request (yes)  
Remittal to the department of first instance - (yes)

**Decisions cited:**

T 0198/84, T 0279/89, T 0666/89, T 0245/91, T 0653/93,  
T 0131/03, T 0673/12, T 1571/15



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Case Number: T 1095/18 - 3.3.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.03**  
**of 24 March 2021**

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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 1 March 2018  
revoking European patent No. 1812485 pursuant to  
Article 101(3)(b) EPC.**

**Composition of the Board:**

**Chairman**            O. Dury  
**Members:**            D. Marquis  
                              C. Brandt

## **Summary of Facts and Submissions**

- I. The appeal was filed by the patent proprietor against the decision of the opposition division to revoke the patent EP 1 812 485 B1.
- II. Claim 1 as granted read as follows:
- "1. A polyethylene molding composition which has a multimodal molar mass distribution and has a density at a temperature of 23°C in the range from 0.94 to 0.95 g/cm<sup>3</sup> and an MFI<sub>190/5</sub> in the range from 1.2 to 2.1 dg/min and comprises from 45 to 55% by weight of a low molecular weight ethylene homopolymer A, from 30 to 40% by weight of a high molecular weight copolymer B of ethylene and another olefin having from 4 to 8 carbon atoms and from 10 to 20% by weight of an ultra high molecular weight ethylene copolymer C, where all percentages are based on the total weight of the molding composition".
- III. European patent EP 1 812 485 was opposed on the grounds that its subject matter lacked novelty and inventive step (Article 100(a) EPC) and was not sufficiently disclosed (Article 100(b) EPC).
- IV. The decision under appeal was based on the main request filed on 24<sup>th</sup> November 2017, on a first auxiliary request that corresponded to the third auxiliary request filed on 24<sup>th</sup> November 2017, on a second and third auxiliary requests that corresponded to the fourth and fifth auxiliary requests filed on 24<sup>th</sup> November 2017 and on a fourth and fifth auxiliary requests that corresponded to the first and second

auxiliary requests filed on 24<sup>th</sup> November 2017 (section 5 of the reasons of the decision under appeal; sections 4, 8 and page 9, first paragraph of the minutes of the oral proceedings).

- Claim 1 of the main request corresponded to claim 1 as granted.
- Claim 1 of the first auxiliary request differed from claim 1 of the main request in that the polyethylene molding composition was further defined by "and the high molecular weight copolymer B contains from 5 to 8% by weight, based on the weight of copolymer B, of comonomers having from 4 to 8 carbon atoms and the ultra high molecular weight ethylene copolymer C contains from 7 to 11% by weight, based on the weight of copolymer C, of comonomers".
- Claim 1 of the second auxiliary request differed from claim 1 of the first auxiliary request in that the polyethylene molding composition was additionally defined as "having a viscosity number  $VN_{\text{Overall}}$ , measured in accordance with ISO/R 1191 in decalin at a temperature of 135°C in the range from 260 to 340 cm<sup>3</sup>/g".
- Claim 1 of the third auxiliary request differed from the second auxiliary request in that the range defining the viscosity number  $VN_{\text{Overall}}$  was limited to "280 to 320 cm<sup>3</sup>/g".
- Claim 1 of the fourth auxiliary request corresponded to claim 1 of the main request further limited in that "said polyethylene molding composition having a viscosity number  $VN_{\text{Overall}}$ ,

measured in accordance with ISO/R 1191 in decalin at a temperature of 135°C in the range from 260 to 340 cm<sup>3</sup>/g".

- Claim 1 of the fifth auxiliary request corresponded to claim 1 of the fourth auxiliary request wherein the viscosity number  $VN_{\text{overall}}$  was limited to "the range from 280 to 320 cm<sup>3</sup>/g".

V. The decision of the opposition division was based *inter alia* on the following documents:

D1: US 6 713 561 B1

D3: WO A1 97/03139

VI. The decision of the opposition division, as far as it is relevant to the present appeal, can be summarized as follows:

- Claim 1 of the main request lacked novelty over D1. In particular, D1 disclosed in column 2, lines 13-46 and in claim 1 a polyethylene molding composition with a multimodal (trimodal) molar mass distribution for which the ranges defining its density ( $\geq 0.940$  g/cm<sup>3</sup>), its melt flow index (MFI<sub>190/5</sub>) (0.01 to 10 dg/min) and the amounts of the low molecular weight (LMW) ethylene homopolymer A (30 to 60 wt.-%), the high molecular weight (HMW) copolymer B of ethylene and another olefin having from 4 to 8 carbon atoms (30 to 65 wt.-%) and the ultra-high molecular weight (UHMW) ethylene homopolymer or copolymer C (1 to 30 wt.-%) all contained the corresponding ranges defining the same properties and constituents in the composition according to claim 1 of the main request. The examples of D1 showed a preference for the use of a

copolymer as UHMW component C. Claim 1 of the main request resulted from a selection within the ranges defining the properties, the composition and the amounts of the components of this composition. The selection in the ranges defining the amount of components A and B within D1 was not narrow. Also, the selection in all the ranges defined above was not sufficiently far removed from specific examples or end-points of known ranges disclosed in D1. It resulted that claim 1 of the main request lacked novelty over D1.

- Sample #3 of example 2 in D3 disclosed a composition with a multimodal molar mass distribution, a density of  $0.941 \text{ g/cm}^3$  and a  $\text{MFI}_{190/5}$  of 1.7 dg/min that comprised 45 wt.-% of a low molecular weight (LMW) ethylene homopolymer A, and 55 wt.-% of a high molecular weight (HMW) copolymer B of ethylene and 1-butene. Since there was no accepted definition of the terms high molecular weight and ultra-high molecular weight defining claim 1 of the main request, the HMW component of sample #3 of example 2 in D3 could be seen as a mixture of both high molecular weight and ultra-high molecular weight components according to claim 1 of the main request in amounts that could still be chosen to be in the ranges of claim 1. Claim 1 of the main request therefore also lacked novelty over D3.
- Amended claim 1 of the first auxiliary request defined the amounts of comonomers in the components B and C of the composition. Amended claim 1 of the first auxiliary request was also not novel over D1.



- Claim 1 of the second auxiliary request defined the viscosity number  $VN_{\text{Overall}}$  by a range that could be seen as a selection in the broader range disclosed in claim 9 of D1. Since the range according to claim 1 of the second auxiliary request was not narrow and was not far removed from the end-points of the range disclosed in D1, claim 1 of the second auxiliary request lacked novelty over D1. That reasoning also applied to the third, fourth and fifth auxiliary requests.
  
- For these reasons, the patent was revoked.

VII. The patent proprietor (appellant) filed an appeal against that decision. In its statement of grounds of appeal the appellant requested that the decision of the opposition division be set aside and the case be remitted to the department of first instance for further prosecution on the basis of the main request or any of the first to the sixth auxiliary requests filed therewith, whereby the main request and the first to fifth auxiliary requests were further stated to be the same as the ones filed with letter of 24 November 2017. The main request was effectively submitted and was identical to the main request filed with letter of 24 November 2017. Although the first auxiliary request was not submitted with the statement of grounds of appeal, it was explicitly stated therein that it derived from the main request by incorporation of the  $VN_{\text{Overall}}$  range of from 260 to 340  $\text{cm}^3/\text{g}$  according to granted claim 4, i.e. it effectively corresponded to the fourth auxiliary request dealt with in the decision under appeal. This was agreed upon by all parties during the whole appeal proceedings (respondent 1's rejoinder to the statement of grounds of appeal: sections 2.10 and 2.11; respondent 2's rejoinder to the

statement of grounds of appeal: paragraph bridging pages 3 and 4; parties' submissions during the oral proceedings before the Board). The second to sixth auxiliary requests are not relevant to the present decision. The appellant also filed the following document with the statement of grounds of appeal:

D29: Encyclopedia of polymer science and engineering, volume 6, Emulsion polymerization to Fibers, Manufacture, 1986, John Wiley & Sons, Inc., pages 490/491

- VIII. With their rejoinder to the statement of grounds of appeal, opponent 1 (respondent 1) and opponent 2 (respondent 2) both requested that the appeal be dismissed and that the sixth auxiliary request not be admitted into the proceedings. In case any of the main request or first to sixth auxiliary requests be found to be novel, remittal of the case to the opposition division for further prosecution was also requested by both respondents.
- IX. The parties were summoned to oral proceedings. Issues to be discussed at the oral proceedings were then specified by the Board in a communication dated 13 November 2020.
- X. Oral proceedings were held on 24 March 2021, the parties being connected remotely by videoconference.
- XI. The appellant's arguments, insofar as relevant to the present decision, may be summarised as follows:

Main request - Novelty over D1

- The subject matter of claim 1 of the main request was a multiple selection in the ranges of D1. The opposition division arrived at the conclusion of lack of novelty over D1 by application of the criteria set up for selection invention to each of the ranges defining the features in claim 1 of the main request independently from one another. These criteria however did not apply to the combination of multiple ranges as defined in claim 1 of the main request. The passage in column 2 in the description of D1 was not novelty destroying for claim 1 of the main request.
  
- Also, none of the examples of D1 disclosed a combination of features as in claim 1 of the main request or that could bring the skilled person to seriously contemplate a composition as claimed. In particular, none of the polymer compositions of the examples of D1 had a value of MFI<sub>190/5</sub> higher than 1.2 dg/min.
  
- In particular, example 1 of D1 disclosed a value of MFI<sub>190/5</sub> of 1.07 dg/min that was outside the range of operative claim 1, as were the amounts of low molecular weight homopolymer A in the composition (35% by weight) and the amount of high molecular weight copolymer B (55% by weight). Moreover, the ultra high molecular weight component C was a homopolymer and not a copolymer, as required in claim 1 of the main request. With respect to example 1, to arrive at claim 1 of the main request the amount of A had to be increased, the amount of B had to be decreased and a copolymer had to be used as component C.

- The present case was similar to the situation of multiple selections described in case T 653/93 of 21 October 1996. Applying the reasoning laid out in that decision to the present case showed that in the absence of a clear indication that a value of  $MFI_{190/5}$  in the range according to claim 1 of the main request was effectively combined with the other features defined said claim 1, that claim was novel over D1.

Main request - Novelty over D3

- D3 was concerned with bimodal compositions. That document did not disclose or taught the presence, the relative amounts, the molecular weights or the chemical composition (homopolymer or copolymer) of an ultra high molecular weight component C in the composition.
- D29 also showed that ultra high molecular weight polymers were known to be defined by a high molecular weight (above  $3 \cdot 10^6$ ) or a relative viscosity of 1.44 or above. Since high molecular weight fractions were known to have a molecular weight of around 50000, D29 taught that the molecular weight of ultra high molecular weight polymers were in the order of millions. That constituted a significant difference with D3 since that document did not contain any disclosure of a polymer of such molecular weight. Also, one could not fictively separate the fraction of high molecular weight polymer of sample #3 of example 2 of D3 to obtain an ultra high molecular weight corresponding to component C according to claim 1 of the main request as that could not be seen as a clear and unambiguous disclosure. Since it was

unclear whether the polymer fraction considered in D3 contained the ultra high molecular weight ethylene copolymer in the range according to claim 1 of the main request, that claim was novel over D3.

#### First auxiliary request

- It had not been shown that the  $MFI_{190/5}$  disclosed in D3, sample #3 of example 2, would result in a viscosity number  $VN_{overall}$  within the range of claim 1 of the first auxiliary request. In particular,  $VN_{overall}$  was a measurement of the viscosity of a polymer in solution; it was a property that was influenced only by the length of the polymer chain and that could not be deduced from D3. That property was different from the  $MFI_{190/5}$  which was a measure of the viscosity of the polymer in a molten state. There was also no correlation between the  $VN_{overall}$  and the  $MFI_{190/5}$ . In the absence of an unambiguous disclosure that the  $VN_{overall}$  of the compositions according to D3 was in the range defining claim 1 of the first auxiliary request, claim 1 of that request was novel over sample #3 of example 2 of D3.

XII. The respondents' arguments, insofar as relevant to the present decision, may be summarised as follows:

#### Main request - Novelty over D1

- D1 disclosed the ranges of components, their amounts and properties according to operative claim 1 in combination with one another. There was a significant overlap in the ranges of properties defining claim 1 of the main request and those

disclosed in the specification of D1 since the ranges according to operative claim 1 were contained in the ranges disclosed in D1. In addition, the examples of D1 would have brought one skilled in the art to seriously contemplate working within the scope of claim 1 of the main request.

- None of the examples of D1 illustrated a polymer falling within the scope of claim 1 of the main request. Example 3 of that document was however relevant since it illustrated amounts of components falling within the scope of claim 1 except for the MFI<sub>190/5</sub> value. There was thus only a single selection to be made in the range defining the MFI<sub>190/5</sub> in the description of D1 in order to arrive at claim 1 of the main request. The criteria of selection invention defined in T 198/84 and T 279/89 applied to the present situation (Case Law of the Boards of Appeal, 9th Edition, July 2019, I.C.6.3.1). The selection within D1 however did not meet these criteria since the claimed range was not narrow and was not sufficiently far removed from the value of 0.3 g/10 min disclosed in the examples of D3. Also, considering the relevant case law T 673/12 of 10 March 2014 for the present case, there was no teaching in D3 that would exclude an MFI<sub>190/5</sub> in the range of 1.2-2.1 g/10 min as defined in claim 1 of the main request. It was in particular clear to the skilled person that by varying process parameters of the polymerisation reaction, one could obtain a higher MFI<sub>190/5</sub> than that disclosed in example 3.

- Alternatively, the Case Law I.C.6.3.2 on overlapping ranges and in particular decisions T 666/89 of 10 September 1991 and T 1571/15 of 2 May 2018 showed that even in case of two overlapping ranges novelty could be denied if the skilled person would not find it difficult to carry out the teaching of the prior art in the overlapping ranges simultaneously. Since D1 did not teach against an MFI<sub>190/5</sub> in the range of 1.2-2.1 g/10 min, he skilled person would have seriously contemplated working in the range of overlap. In that regard, the different values of MFI<sub>190/5</sub> in example 1 and example 3 of D1 could be explained by the use of different amounts of hydrogen during polymerisation. That was however part of the knowledge of the skilled person.
  
- Decision T 653/93 of 21 October 1996 was not applicable to the present case. In view of the consideration of the whole teaching of D1, claim 1 of the main request lacked novelty.
  
- The highest value of the MFI<sub>190/5</sub> of 1.07 dg/min in example 1 of D1 was very close to the claimed range of 1.2 to 2.1 dg/min. A skilled person would have seriously contemplated working within the ranges defined in claim 1 of the main request.
  
- There was no support for the contention that the combination of amounts of components, density and MFI<sub>190/5</sub> was not contemplated in D1. Claim 1 of the main request lacked novelty over D1.

Main request - Novelty over D3

- Sample #3 in Example 2 of D3 was disclosed as a bimodal composite in which the density was 0.941 g/cm<sup>3</sup> and the MFI<sub>190/5</sub> was 1.7 dg/min. That sample was prepared by first preparing a copolymer of ethylene (the LMW component) and then polymerising ethylene and butene (the HMW component) in a ratio of 45:55. The amount of LMW component therefore fell within the range required in claim 1 of the main request.
  
- Any normal distribution of molecular weight fractions could mathematically be split into two or more normal distributions, each one having a different mean. Therefore, the high molecular weight component of sample #3 of example 2 of D3 corresponded to a mixture of high molecular weight and ultra-high molecular weight components according to claim 1 of the main request. The threshold cited in D29 did not correspond to a definition generally recognised. D29 was a general science encyclopedia, not specific to polyethylenes. The passages quoted therein did not even state whether the "molecular weight" was M<sub>w</sub> or M<sub>n</sub>. Also, the reference to the relative viscosity being above 1.44 did not appear in D29.
  
- In view of the above, the main request lacked novelty over sample #3 of example 2 of D3.

#### First auxiliary request

- There was no reason to suppose that the viscosity number VN<sub>overall</sub> of the composition of sample #3 of example 2 of D3 was outside the scope of claim 1 of the first auxiliary request. Since the remaining features of the first auxiliary request were all shown in D3, and in particular in light of the MI<sub>5</sub>



being 1.7 dg/min, almost in the middle of the claimed range in claim 1 of the first auxiliary request, the viscosity number did not impart novelty.

- Alternatively, the  $VN_{\text{overall}}$  defining claim 1 of the first auxiliary request had to be considered as an unusual parameter since it was used to reflect the chain length usually measured by the molecular weight or the melt index. Even though the  $VN_{\text{overall}}$  was as such known in the art, it was unknown as a representation of the chain length of a polymer. The burden of proof to show that the range defining that parameter in claim 1 of the first auxiliary request was novel over D3 was on the appellant. That burden of proof had not been discharged.
  
- Also, the appellant argued that the  $VN_{\text{overall}}$  was influenced by the degree of long chain branching and the crystallinity of the copolymer obtained. Both D3 and the patent in suit however disclosed polymerisation processes based on Ziegler-Natta catalysts which were known to be paramount to the existence of long chain branching in the copolymer. Also, the crystallinity of a copolymer was reflected in its density. Since sample #3 of example 2 of D3 and the patent in suit used the same catalysts and the density in the example of D3 was in the middle of the range defining claim 1 of the first auxiliary request, the  $VN_{\text{overall}}$  of the copolymer of sample #3 of example 2 of D3 had to be as defined in claim 1 of the main request. Claim 1 of that request lacked therefore novelty over sample #3 of example 2 of D3.

XIII. The appellant requested that the decision of the opposition division be set aside, that novelty of the main request or of any of the first to sixth auxiliary requests filed with the statement setting out the grounds of appeal be acknowledged and that the case be remitted to the department of first instance for discussion of inventive step.

XIV. Respondents 1 and 2 requested that the appeal be dismissed and that the sixth auxiliary request not be admitted into the proceedings. In case any of the main request or first to sixth auxiliary requests be found to be novel, remittal of the case to the department of first instance for further prosecution was requested.

### **Reasons for the Decision**

Main request

1. Novelty in view of D1

1.1 Claim 1 of the main request corresponds to claim 1 as granted. According to the contested decision (section 3.2), that claim which pertains to a polyethylene molding composition characterized by:

- a density of 0.94 to 0.95 g/cm<sup>3</sup>,
- an MFI<sub>190/5</sub> of 1.2 to 2.1 dg/min,
- from 45 to 55% by weight of a low molecular weight ethylene homopolymer A,
- from 30 to 40% by weight of a high molecular weight copolymer B of ethylene and another olefin having from 4 to 8 carbon atoms,

- from 10 to 20% by weight of an ultra high molecular weight ethylene copolymer C,

lacked novelty over D1 and in particular over the disclosure in claim 1 and column 2, lines 13-46 of D1 of generic molding compounds defined by:

- a density in the range  $\geq 0.940 \text{ g/cm}^3$ ,
- an  $\text{MFI}_{190/5}$  in the range from 0.01 to 10 dg/min,
- from 30 to 60% by weight of a low molecular weight ethylene homopolymer A,
- from 30 to 65% by weight of a high molecular weight copolymer B of ethylene and another olefin having from 4 to 10 carbon atoms,
- from 1 to 30% by weight of an ultra high molecular weight ethylene homopolymer or copolymer C,

the reasoning being that the ranges defining the density, the  $\text{MFI}_{190/5}$  and the amounts in components A, B and C in claim 1 of the main request taken individually did not fulfil at least one of the criteria devised for assessing novelty of selection inventions and set out in T 198/84 of 28 February 1985 and T 279/89 of 3 July 1991, namely that (a) the selected sub-range was narrow compared to the known range, (b) the selected sub-range was sufficiently far removed from any specific examples disclosed in the prior art and from the end-points of the known range and (c) the selected range was not an arbitrary specimen of the prior art, i.e. not a mere embodiment of the prior art, but another invention.

- 1.2 The parties' arguments as well as the reasons laid down in the decision under appeal raised the question of what was the content of D1 with respect to polyethylene molding compositions and whether said content effectively anticipated the subject-matter being

claimed, in particular the combination of ranges of density, MFI<sub>190/5</sub> and components A, B and C mentioned in claim 1 of the main request. The consistent view in the case law is that for an invention to lack novelty, its subject-matter must be directly and unambiguously derivable from the prior art (Case Law, *supra*, I.C.4 and I.C.4.1).

- 1.3 In the present case, the respondents first relied on the disclosure in claim 1 or on column 2, lines 13-46 of a generic composition according to D1 and argued that claim 1 of the main request did not satisfy the accepted criteria required to constitute a selection invention.
  
- 1.4 However, in the Board's view, the criteria for selection inventions referred to in the contested decision and by respondent 1 and briefly summarised in T 279/89 of 3 July 1991 (not published in the OJ EPO, point 4.1 of the reasons), have been developed for a so-called "selection" of only one single parameter from a numerical range. It is apparent from the disclosure relied upon by the respondents that beside the necessary selection of a specific value/range in MFI<sub>190/5</sub> within the broader range disclosed therein, the skilled reader has to perform further selections in the four ranges defining the density as well as each of the amounts in components A, B and C in the passage of column 2, lines 13-46 of D1 in order to arrive at the ranges defining operative claim 1. In addition, the ultra high polyethylene must be selected to be a copolymer and not a homopolymer. In the Board's view, it is in particular not possible in the present case to treat each of the five features mentioned in claim 1 of the main request individually as was done by the opposition division and the respondents because these

features are to some extent interconnected (e.g. the MFI<sub>190/5</sub> feature is related to some extent to the amounts of components A to C). Also, a series of selections in several (here 5) ranges amounts to a more severe limitation in terms of the scope of the subject-matter so defined (as compared to each single selection). In that regard the situation of the present case is not that of a single selection made in a range of the prior art but rather that of multiple selections in multiple ranges already disclosed in combination in D1. The fact that the ranges defined in claim 1 of the main request do not merely overlap but are fully comprised within the ranges disclosed in D1 do not affect the above conclusion.

- 1.5 A further argumentation against the novelty of claim 1 of the main request over D1 relied on a construction of a disclosure within D1 that was based on the generic passage in column 2, lines 13-46 with the specific composition of example 3. On the basis of that disclosure, it was argued that only one selection, that of the MFI<sub>190/5</sub> in the range defined in column 2, lines 13-46 was needed in order to arrive at claim 1 of the main request. However, that objection amounts to artificially creating a new disclosure, namely a modification of said example 3 in terms of its MFI<sub>190/5</sub>, which is not clearly and unambiguously disclosed in D1. In that regard, example 3 of D1 discloses a specific embodiment and the description of D1 is not a repository from which elements can be exchanged freely in order to generate a disclosure of subject-matter which, whilst within the general scope of the document, is not disclosed per se. In making this argument it is in effect argued that the value of the MFI<sub>190/5</sub> of a polyethylene molding composition can be selected in a range independently of the amounts of the polymer

components of that composition, in the present case, the amount in components A, B and C which are alleged to remain within the ranges defined in operative claim 1. No evidence has been advanced to support this position which is contrary to common chemical knowledge. On the basis of that argument it cannot be concluded that operative claim 1 lacks novelty over D1.

- 1.6 In view of the above, the respondents' arguments based on the concept of selection invention did not convince.
- 1.7 In the case of a composition allegedly resulting from a multiple selection in the prior art, as it is the case for claim 1 of the main request in view of D1, assessing whether a subject-matter is directly and unambiguously derivable from the prior art requires, beyond the identification of the individual selections made in the composition considered in claim 1 or column 2, lines 13-46 of D1, that a careful comparison be carried out in order to assess whether or not the subject-matter being claimed was made available to the skilled person in the prior art in particular because the parameters defining the composition of claim 1 of the main request are to some extent, interconnected to one another.
- 1.8 The question of novelty in the case of a multiple selection of parameters in ranges disclosed in a composition of the prior art can thus not be simply answered by considering the ranges of the various parameters separately from one another, it must also be determined whether the combination of these parameters was directly and unambiguously derivable and was made available to them in the relevant document. In that regard, the mere consideration that the ranges of a multiple selection in the parameters of the prior art

were as such not excluded from that prior art, as argued by the respondents, is not sufficient to establish lack of novelty as that consideration falls short of showing that the combination of the selected ranges was directly and unambiguously derivable from the prior art.

- 1.9 The question that the Board had to answer was thus whether from the broader disclosure of generic compositions in column 2, lines 13-46 (or claim 1), the skilled person would have, in consideration of the whole of D1 and in particular of its examples, directly and unambiguously derived a composition that fell under the scope of claim 1 of the main request. It was not contested to that effect that any of examples 1 to 4 of D1 could be seen as being relevant to answer that question.
- 1.10 The examples of D1 disclose the preparation of polyethylene compositions by polymerization of ethylene in a continuous method in three reactors connected in series in the presence of a Ziegler catalyst wherein the amounts of hydrogen and ethylene are controlled during polymerization (example 1, column 4, lines 13-59). In that process, the copolymer produced is one of ethylene and a C<sub>4</sub> monomer (line 36) which according to column 2, line 33, is butene.
- 1.11 The composition obtained from the process disclosed in example 1 of D1 is reported in table 1. It is apparent from the parameters reported there, that the composition is composed of three components, namely a low molecular weight A in an amount of 35 wt.-%, a high molecular weight B in an amount of 55 wt.-% and a ultra high molecular weight polymer C in an amount of 10 wt.-%. The amounts in A and B are not according to claim 1

of the main request (45-55 wt.-% A and 30-40 wt.-% B). The density of the composition is 0.954 g/cm<sup>3</sup> which is formally not in the range of 0.94-0.95 g/cm<sup>3</sup> according to claim 1 of the main request but by applying the rounding principle was held by respondent 2 to be within the claimed range (rejoinder to the statement of grounds of appeal, page 2, last paragraph), which was not disputed by the appellant. The same conclusion applies to the densities disclosed for examples 2-4, which are between 0.952 and 0.954 g/cm<sup>3</sup>. As to the compositions of examples 2-4, only the amounts of the components A, B and C in examples 3 and 4 (55 wt.-% A, 35 wt.-% B and 10 wt.-% C) are according to operative claim 1, the amount in component B in example 2 (45 wt.-%) being outside the range of 30-40 wt.-% defined in operative claim 1.

1.12 With regard to the MFI<sub>190/5</sub> of the compositions of the examples of D1, table 1 reports the followings values: 1.07 g/10 min (example 1), 0.55 g/10 min (example 2), 0.30 g/10 min (example 3) and 0.36 g/10 min (example 4) which are all outside the range of 1.2-2.1 g/10 min according to operative claim 1. Therefore, none of the examples of D1 satisfies the requirement in terms of MFI<sub>190/5</sub> defined in claim 1 of the main request.

1.13 It was argued that the skilled person considering examples 1-4 of D1 would know how to raise the value of MFI<sub>190/5</sub> of these polyethylene molding compositions by slightly decreasing the molecular weight of the high molecular weight component B or by adjusting the relative amounts of components A and B. There is in the examples of D1 however no direct and unambiguous disclosure of either adjusting the molecular weight of the polymer components of the polyethylene composition or of adjusting the process parameters to produce a



polyethylene composition with modified amounts of components A and B and an  $MFI_{190/5}$  according to operative claim 1.

1.14 Respondent 1 argued that case T 673/12 was relevant to the present situation. In that case the example of a prior art document disclosed an alloy for which all but one of its defining parameters fell under the ambit of the operative claim of the opposed patent. The range defining that parameter in operative claim 1 in the opposed patent was contained in the preferred range of the prior art document and was also close to the value disclosed in the example of the document. The Board considered that the operative claim of the opposed patent was directly and unambiguously derivable from the prior art document. The circumstances of the case T 673/12 are however different from the present case at least in that in the present situation the prior art D1 does not directly and unambiguously disclose the range of  $MFI_{190/5}$  as defined in operative claim 1. In particular, the range disclosed for the  $MFI_{190/5}$  in D1 (0.01-10 g/10 min) in column 2, line 41 is broad compared to the range defining operative claim 1 (1.2-2.1 g/10 min) and there is no disclosure of a generic preferred range in D1 that was close to that of operative claim 1. The Board thus finds that the circumstances of the case in hand differ from those dealt with in T 673/12 so that it cannot be held that the conclusion reached in T 673/12 must apply to the present situation. For that reason, the argument failed to convince.

1.15 The respondents further submitted at the oral proceedings before the Board that a skilled reader of D1 would have known that the use of higher hydrogen concentrations in the preparation process of example 3

of D1 would have led to lower values of  $MFI_{190/5}$  for the composition. As a result the skilled reader of D1 would have known how to adjust that hydrogen concentration in order to bring the  $MFI_{190/5}$  in the range of 1.2-2.1 g/10 min without affecting the individual amounts in components A, B and C in the composition. It is however neither derivable from D1, nor from the facts of the case, that such a modification of example 3 of D1 is directly and unambiguously derivable from the disclosure of D1 as a whole, let alone that it is at all possible. There is in particular no indication in D1 to vary the hydrogen concentration during the process of example 3 in order to raise the  $MFI_{190/5}$  of the composition, which is at 0.3 g/10 min, to such an extent that it would be in the range of 1.2-2.1 g/10 min, while maintaining the other features specified in claim 1 of the main request in the ranges defined therein. There is even no evidence that such a change would have been achievable in the context of example 3. For that reason, that argument is not persuasive.

- 1.16 Also, the respondents argued that the change of the hydrogen concentration during the process would not affect the concentrations in components A, B and C but they did not provide evidence of that statement. In fact, that statement contradicts the information contained in D1 (column 3, lines 29-32) according to which the hydrogen concentration is varied to regulate the molecular weights of the polymers prepared at each step of the process. Since these polymers A, B and C are in fact defined by their molecular weights and corresponding viscosity numbers in D1 (column 2, line 47 to column 3, line 23), the change in the molecular weights obtained at each stage means by implication that the amounts of the components A, B and C would be varied as well. With that in mind, there is no reason

to assume that an increase of  $MFI_{190/5}$  in the process of example 3 by varying the hydrogen concentration in the process would also maintain the amounts of A, B and C in the ranges according to claim 1 of the main request.

1.17 It can thus not be concluded from the description of D1 and/or from its examples that polyethylene compositions having a density, amounts in components A, B and C as defined in operative claim 1 and an  $MFI_{190/5}$  in the range of 1.2-2.1 g/10 min were at all prominent in D1 to such an extent that such compositions could be seen as being directly and unambiguously disclosed in that document. In the Board's view, the respondents' objection amounts to create a novel combination of features by cherry-picking within the disclosure of D1 but which combination is not directly and unambiguously derivable from D1.

1.18 The respondents further argued that the skilled person would have seriously contemplated preparing a composition as defined in said claim 1. However, for the same reasons as indicated in above section 1.17, in the absence of a direct and unambiguous disclosure in D1 of the combination of features defined in operative claim 1, it cannot be concluded that it was shown that D1 provides a teaching or a good reason for the skilled person to prepare specifically such a composition. In particular, all the arguments submitted by the respondents in that respect involving the examples of D1 amount to artificially modify the disclosure of D1 in order to (possibly) arrive at the subject-matter according to claim 1 of the main request, whereby D1 provides no indication in that sense (see in particular the above arguments regarding the modification of the process conditions used in example 3 of D1 in order to achieve the desired  $MFI_{190/5}$  feature). Also, no evidence

was provided that in doing so, the other features of claim 1 of the main request would still be satisfied. For these reasons, the respondents' objection did not convince.

1.19 It follows that the subject-matter of claim 1 of the main request must be seen as being novel over D1.

2. Novelty over D3

2.1 The disclosure in D3 in view of which novelty of operative claim 1 was denied in the contested decision is sample #3 of example 2, which discloses a composition with a multimodal molecular weight distribution comprising 45 wt.-% of a low molecular weight component and 55 wt.-% of a high molecular weight component and having a density of 0.941 g/cm<sup>3</sup> and an MFI<sub>190/5</sub> of 1.7 g/10 min. D3 does not mention that that composition contains an ultra high molecular weight ethylene copolymer component as defined in claim 1 of the main request. The opposition division however concluded that sample #3 of example 2 of D3 anticipated operative claim 1 as the ethylene 1-butene copolymer making up the high molecular weight component described in that example of D3 was seen as containing a high molecular fraction and an ultra-high molecular fraction in the amounts according to operative claim 1.

2.2 The appellant argued in appeal that ultra high molecular weight polyethylenes were a special type of polyethylene, the characteristics of which could not be equated or confused with that of generic polyethylenes. The appellant based that argument on D29 that allegedly defined an ultra-high molecular weight polyethylene (UHMWPE) as a polyethylene of molecular weight above 3.10<sup>6</sup> Daltons.

2.3 D29 is an excerpt of the encyclopedia of polymer science and engineering. The passage cited in D29 (page 490) defines ultrahigh molecular weight polyethylenes (UHMWPE) as high density polyethylenes with a molecular weight over  $3 \times 10^6$ . It is also disclosed that UHMWPEs are identical to high density polyethylenes (HDPEs), both being straight-chain linear polymers, UHMWPEs and HDPEs however differing in their molecular weights, that of HDPEs being rarely above 50000 whereas ASTM definitions requiring a molecular weight of UHMWPEs above  $3 \times 10^6$ . That definition was relied upon by the appellant in appeal to argue that the high molecular weight component of D3 could not be seen as comprising an ultra high molecular weight ethylene copolymer.

2.4 The composition of sample #3 of example 2 is a multimodal ethylene polymer composition according to D3. Table 2 of D3 reports some properties of that composition, such as the melt flow rates, density and mechanical properties. The molecular weights of the polymeric components present in the composition are not mentioned in D3. D3 however defines the multimodal ethylene polymer as being a blend of at least two ethylene polymers having different molecular weights produced in two steps, a first step in which an ethylene polymer having a lower average molecular weight is produced followed by the preparation of an ethylene polymer having a higher average molecular weight in the presence of the first lower molecular weight ethylene polymer (page 3, lines 5-18). It is apparent from that passage but also from claim 1 of D3 that polymeric compositions according to D3 are not limited by their values of molecular weights as long as the multimodal compositions contain a copolymer of ethylene and 1-butene of higher molecular weight than

the first ethylene polymer. In that regard, there is no reason to assume from D3 that the ethylene 1-butene copolymer of higher molecular weight present in the composition of sample #3 of example 2 must be an HDPE of molecular weight below 50000, contrary to what was argued by the appellant. The Board thus finds that the distinction in terms of absolute values of molecular weight between HDPEs and UHMWPEs made in D29 (page 490) was not shown to be applicable to the compositions of D3. Moreover, the passage cited in D29 merely defines that the polymers known as UHMWPE polymers in the art can be understood to be in terms of molecular weight polymers of molecular weight above  $3 \times 10^6$  as a class of their own. That is also clear from the last paragraph of page 490 in D29 and from its Table 2 which sets out that UHMWPEs with molecular weight above  $3 \times 10^6$  are characterized by a unique combination of properties. However, there is no indication in the patent in suit that this specific definition of UHMWPE in terms of molecular weight or properties applies to the definition of component C in the composition of operative claim 1. In that respect, in the absence of any limitation, the terms of claim 1 should be read in their broadest, technically sensible meaning. There is thus no reason to consider that the distinction between HDPEs and UHMWPEs found in D29 would be valid for the compositions of D3 and it was also not shown that the definition of component C in operative claim 1 would imply a molecular weight of above  $3 \times 10^6$  or simply in the order of millions as a threshold value above which a copolymer could be seen as an ultra high molecular weight polymer as put forward by the appellant at the oral proceedings before the Board.

2.5 Operative claim 1 only provides a relative, vague definition of the nature of the component B, present in

an amount of 30-40 wt.-% and component C, present in an amount of 10-20 wt.-%. With regard to that definition, it is sufficient that an ethylene 1-butene copolymer be present in fractions of lower and higher molecular weights to satisfy that definition if the amounts of each fraction can be chosen in the ranges defined in operative claim 1. The decision of the opposition division also established how the ethylene 1-butene copolymer of sample #3 of example 2 in D3 fulfilled that definition on the basis of a chosen split in the amounts of lower and higher molecular weight fractions (last paragraph on page 11). No arguments were put forward in appeal by the appellant to refute that conclusion. In addition, given the multimodal nature of the ethylene polymers of D3 and their associated broad molecular weight distributions (page 2, lines 1-18 of D3), the ethylene 1-butene copolymer present in an amount of 55 wt.-% in the composition of sample #3 of example 2 is inherently the sum of two fractions of for example 40 wt.-% and 15 wt.-% of lower and higher molecular weight ranges. That description of the ethylene 1-butene copolymer of sample #3 in example 2 of D3 fulfils the definition of components B and C in operative claim 1. Therefore, there is no reason for the Board to overturn the decision of the opposition division that claim 1 of the main request lacks novelty over D3.

#### First auxiliary request

### 3. Novelty

- 3.1 The respondents' objection of lack of novelty was directed to claim 1 of the first auxiliary request, which differs from claim 1 of the main request in that the polyethylene molding composition is additionally

defined in that it has a viscosity number  $VN_{\text{overall}}$  measured in accordance with ISO/R 1191 in decalin at a temperature of 135°C in the range from 260 to 340  $\text{cm}^3/\text{g}$ . Since claim 1 of the main request was found to be novel over D1, claim 1 of the first auxiliary request, which comprises the same features than claim 1 of the main request, is also novel over D1. Novelty of claim 1 of the first auxiliary request was however contested in view of D3 by the respondents in appeal.

3.2 The composition of sample #3 in example 2 of D3 was seen as being relevant to the question of novelty of claim 1 of the first auxiliary request. The features characterizing the polyethylene molding composition of claim 1 of the main request have been discussed above in point 2 of the present decision. It was not disputed in appeal that D3 did not disclose the viscosity number  $VN_{\text{overall}}$  of the composition according to sample #3 of example 2. The question with regard to the composition of sample #3 of example 2 was rather whether its viscosity number  $VN_{\text{overall}}$  was nevertheless in the range of 260-340  $\text{cm}^3/\text{g}$  defining operative claim 1, i.e. whether said feature was implicitly satisfied.

3.3 The argument provided by the respondents in the written appeal proceedings was that there was no reason to suppose that the viscosity number  $VN_{\text{overall}}$  of the composition described in sample #3 of example 2 in D3 would be outside the scope of claim 1 of the first auxiliary request (page 3 of respondent 2's rejoinder to the statement of grounds of appeal). It was further argued at the oral proceedings before the Board that since the  $MFI_{190/5}$  of the composition according to sample #3 of example 2 of D3 (1.7 g/10 min) was in the middle of the range defining operative claim 1, it was reasonable to expect that the viscosity number  $VN_{\text{overall}}$



would also be in the range defining operative claim 1.

3.4 However, the respondents based their argument on an alleged correlation between viscosity number  $VN_{\text{overall}}$  and  $MFI_{190/5}$  of polyethylene polymers for which no evidence was provided and which was contested by the appellant who maintained that such a direct and exclusive correlation did not exist. According to the boards' established case law, each of the parties to the proceedings bears the burden of proof for the facts it alleges. If a party, whose arguments rest on these alleged facts, does not discharge its burden of proof, this is to the detriment of that party, who may not shift the onus of proof onto the other party (Case Law of the Boards of Appeal, 9th Edition, July 2019, Law, supra, I.C.3.5.1). Under these circumstances, the respondents' argument, which is not supported by any evidence, fails to convince.

3.5 It was also argued that the parameters of the polymerisation process that had an influence on the viscosity number  $VN_{\text{overall}}$  of the composition were identical in the process of sample #3 of example 2 of D3 and in the example of the patent in suit, for which the viscosity number  $VN_{\text{overall}}$  was according to operative claim 1.

3.6 With regard to that argument as well the respondents did not provide evidence relying on verifiable facts of which parameters were paramount to the variation of the viscosity number  $VN_{\text{overall}}$  of the composition. In that regard, the principles of the apportionment of the burden of proof set out that each party bears the burden of proof for the facts it alleges (Case Law, supra, III.G.5.1.1). The respondents in that case did not provide any evidence of the existence of a

correlation between the value of the viscosity number  $VN_{overall}$  of a polyethylene composition and any of the composition or process parameters for its preparation that could be seen as being of relevance for the composition of sample #3 of example 2 of D3. In particular, in view of the difference in terms of the processes carried out in example 2 of D3 and in the examples of the patent in suit (e.g. number of reactors; no evidence that the same catalysts were used) there is no reason to assume that the  $VN_{overall}$  feature specified in claim 1 of the first auxiliary request has to be met in sample #3 of example 2 of D3 because it is satisfied in the examples of the patent in suit.

- 3.7 The respondents cited decision T 131/03 of 22 December 2004 in which the board had pointed out that, once the opponent had established a strong presumption that unusual parameters as those used to define the claimed subject-matter were inherently disclosed in the prior art, the patent proprietor could not merely claim the benefit of the doubt (Case Law, supra, III.G.5.2.2). In the present case however the respondents have not shown that the viscosity number  $VN_{overall}$  was an unusual parameter for polyethylene compositions. To the contrary, the fact that it is indicated in claim 1 of the first auxiliary request and in paragraph 9 of the patent in suit that the feature  $VN_{overall}$  is determined according to an accepted standard (ISO/R 1191) shows that said feature is not unusual. In addition, the respondents have not established the presence of a strong presumption that the composition according to sample #3 of example 2 of D3 would inherently fulfil the condition set out for the viscosity number  $VN_{overall}$  in operative claim 1.

3.8 It was thus not shown that the polyethylene composition described in sample #3 of example 2 of D3 had a viscosity number  $VN_{\text{overall}}$  in the range of 260 to 340  $\text{cm}^3/\text{g}$  as defined in operative claim 1. The subject-matter of claim 1 of the first auxiliary request is therefore novel over D3.

4. Remittal for further prosecution

4.1 Remittal of the case to the opposition division for further prosecution was requested by all parties on the grounds that the ground of opposition raised against the patent in suit under Article 100(a) EPC (lack of inventive step) had not been dealt with before the opposition division. In view of that and considering that the primary object of the appeal proceedings is to review the decision under appeal (as now explicitly stated in Article 12(2) RPBA 2020), the Board considers that the circumstances of the present case amount to special reasons pursuant to Article 11 RPBA 2020. Accordingly, exercising its discretion under Article 111(1), second sentence, EPC, the board decides to remit 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.

The Registrar:

The Chairman:



B. ter Heijden

O. Dury

Decision electronically authenticated