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Datasheet for the decision of 30 November 2022

Case Number: T 0415/20 - 3.3.03

Application Number: 15001844.8

Publication Number: 3109275

IPC: C08L23/04

Language of the proceedings: EN

Title of invention:
POLYETHYLENE COMPOSITION FOR PIPE APPLICATIONS WITH IMPROVED SAGGING AND EXTRUSION PROPERTIES

Patent Proprietor:
Abu Dhabi Polymers Company Limited
(Borouge) L.L.C.
Borealis AG

Opponents:
Chevron Phillips Chemical Company
TotalEnergies One Tech Belgium

Relevant legal provisions:
RPBA 2020 Art. 12(4), 13(2)
EPC Art. 54, 56

Keyword:

Admittance of documents
Novelty - Main request (yes)
Inventive step - Main request (no) - Auxiliary request 2a (yes)
Admittance - Auxiliary request 1 (no)

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Boards of Appeal

Chambres de recours

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

Case Number: T 0415/20 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 30 November 2022

Appellant: (Opponent 1)	Chevron Phillips Chemical Company 10001 Six Pines Drive The Woodlands, TX 77387-4910 (US)
Representative:	Potter Clarkson The Belgrave Centre Talbot Street Nottingham NG1 5GG (GB)
Appellant: (Opponent 2)	TotalEnergies One Tech Belgium Zone Industrielle C 7181 Seneffe (BE)
Representative:	Garcia Martin, Margarita TotalEnergies One Tech Belgium Patent Department Zone Industrielle C 7181 Seneffe (Feluy) (BE)
Respondent: (Patent Proprietor 1)	Abu Dhabi Polymers Company Limited (Borouge) L.L.C. Sheikh Khalifa Energy Complex Borouge Tower Corniche Road P.O.Box 6925 Abu Dhabi (AE)
Respondent: (Patent Proprietor 2)	Borealis AG Trabrennstrasse 6-8 1020 Vienna (AT)
Representative:	Kador & Partner PartG mbB Corneliusstraße 15 80469 München (DE)

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted on 12 December 2019 concerning maintenance of the European Patent No. 3109275 in amended form.**

Composition of the Board:

Chairman D. Semino
Members: D. Marquis
A. Bacchin

Summary of Facts and Submissions

I. The appeal lies against the decision of the opposition division concerning maintenance of European patent No. 3 109 275 on the basis of the second auxiliary request filed with letter of 20 September 2019.

II. Claims 1 and 10 of that request read as follows:

"1. Polyethylene composition comprising,
a base resin (A) comprising
a copolymer of ethylene and at least one comonomer selected from alpha-olefins having from three to twelve carbon atoms,
wherein the ethylene copolymer comprises a low molecular weight component (A-1) and a high molecular weight component (A-2) with the low molecular weight component (A-1) having a lower weight average molecular weight than the high molecular weight component (A-2),

(B) carbon black in an amount of 1.0 to 10 wt% based on the total amount of the polyethylene composition, and

(C) optional further additives other than carbon black;

wherein the low molecular weight component (A-1) has a melt flow rate MFR_2 (190°C, 2.16 kg) of equal to or more than 150 g/10 min to equal to or less than 400 g/10 min, determined according to ISO 1133,

the base resin (A) has a density of equal to or more than 943 kg/m3 to equal to or less than 957 kg/m3, determined according to ISO 1183, and

the composition has a flow rate ratio $FRR_{21/5}$ being the ratio of melt flow rate MFR_{21} (190 °C, 21.6 kg) to melt flow rate MFR_5 (190 °C, 5 kg), determined according to ISO 1133, of 30 to 40, a melt flow rate MFR_5 (190°C, 5 kg) of equal to or more than 0.14 g/10 min to equal to or less than 0.30 g/10 min, determined according to ISO 1133, a viscosity at a constant shear stress of 747 Pa, eta_{747}, of equal to or more than 800 kPa*s to equal to or less than 1300 kPa*s, and complies with the in-equation (I)

eta_{747} [kPa*s] > - 1800 x MFR_5 [g/10 min] + 1200 (I)

with eta_{747} referring to said viscosity at a constant shear stress of 747 Pa of the polyethylene composition and MFR_5 referring to said melt flow rate MFR_5 (190°C, 5 kg) of the polyethylene composition".

"10. A polyethylene composition obtainable by a multistage process, the process comprising the steps of

a) polymerizing ethylene in the presence of a Ziegler-Natta catalyst for obtaining an intermediate material having a melt flow rate MFR_2 (190°C, 2.16 kg) of equal to or more than 150 g/10 min to equal to or less than 400 g/10 min, determined according to ISO 1133,

b) transferring the intermediate material to a gas phase reactor

(i) feeding ethylene and an alpha-olefin comonomer having from 3 to 12 carbon atoms to the gas phase reactor

(ii) further polymerizing the intermediate material

to obtain a base resin (A) which comprises the intermediate material polymerized in step a) and a material polymerized in step b) which has a higher weight average molecular weight as the intermediate material of step a), wherein the base resin (A) has a density of equal to or more than 943 kg/m^3 to equal to or less than 957 kg/m^3, determined according to ISO 1183,

c) extruding the base resin (A) in the presence of 1 to 10 wt% carbon black (B), based on the amount of the polyethylene composition, and optional further additive(s) (C), into a polyethylene composition having a flow rate ratio $FRR_{21/5}$ being the ratio of melt flow rate MFR_{21} (190°C, 21.6 kg) to melt flow rate MFRs (190 °C, 5 kg), determined according to ISO 1133, of 30 to 40, a melt flow rate MFR_5 (190°C, 5 kg) of equal to or more than 0.14 g/10 min to equal to or less than 0.30 g/10 min, determined according to ISO 1133, a viscosity at a constant shear stress of 747 Pa, eta_{747}, of equal to or more than 800 kPa*s to equal to or less than 1300 kPa*s, and complying with the in-equation (I)

$$eta_{747} > -1800 \times MFR_5 + 1200 \quad (I)$$

with eta_{747} referring to said viscosity at a constant shear stress of 747 Pa of the polyethylene composition and MFR_5 referring to said melt flow rate MFR_5 (190°C, 5 kg) of the polyethylene composition".

III. The following documents were cited among others in the opposition procedure:

D1: WO 00/22040
D4: EP 2 860 204 A1

D12: US 2012/0108725 A1

D13: Determination of the melt flow rate (MFR) and melt volume flow rate (MVR) of thermoplastics, ISO 1133-1

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

- Claims 1 and 11 of the main request were sufficiently disclosed. The composition corresponding to material A in D1 took away the novelty of claim 1 of the main request.
- Starting from material A of D1 as the closest prior art, claim 1 of auxiliary request 1 lacked an inventive step.
- Claim 1 of auxiliary request 2, which defined the flow rate ratio $FFR_{21/5}$ as being in the range of 30-40, was novel over material A of D1.
- Starting from material A of D1 as the closest prior art, the difference was the value of $FFR_{21/5}$ for which no effect was shown over the whole scope of claim 1. The problem was the provision of an alternative polyethylene composition having a balanced set of good sagging, without drawbacks on processability and impact strength. There was no incentive in D1, nor in any other cited prior art on file to shift from a value of 29 according to Material A of D1 to a range of 30 to 40. The requirements of Article 56 were therefore met.

V. Both opponent 1 (appellant I) and opponent 2 (appellant II) lodged an appeal against the decision of the opposition division.

VI. The patent proprietors (respondents) submitted auxiliary requests 1, 2a, 2b, 3a, 3b and 4 and document D14 (Charpy NIS (0°C) measurements of IE1-3 of the opposed patent) with the reply to the statements setting out the grounds of appeal.

VII. The parties were summoned to oral proceedings and a communication pursuant to Article 15(1) RPBA 2020 indicating specific issues to be discussed at the oral proceedings was sent to the parties.

VIII. The respondents filed a further auxiliary request 4a with letter of 27 October 2022 and the following documents by letter of 28 November 2022:

D15: ISO 179, second edition, 15 May 1993
D16: ISO 179-1, first edition, 15 December 2000

IX. Oral proceedings were held on 30 November 2022 in the presence of all parties.

X. The final requests of the parties were as follows:

- The appellants I and II requested that the decision under appeal be set aside and that the European patent be be revoked. The appellants I and II further requested that document D14 be not admitted into the proceedings.

- The respondents requested that the appeal be dismissed (main request), or that the patent be maintained on the basis of the claims of one of auxiliary requests 1, 2a, 2b, 3a, 3b, 4, filed with the reply to the statement of grounds of appeal, or auxiliary request 4a, filed with letter of 27 October 2022. The respondents further requested

that documents D15 and 16 be admitted into the proceedings and that document D12 be not admitted.

Claims 1 and 10 of auxiliary request 1 corresponded to claims 1 and 10 of the main request (second auxiliary request in opposition) with the amendment of the range defining the flow rate ratio $FRR_{21/5}$ of "30 to 40" to "32 to 38".

Claims 1 and 10 of auxiliary request 2a corresponded to claims 1 and 10 of the main request with the limitation of the comonomer of the ethylene copolymer of the base resin (A) to 1-hexene.

XI. The appellants' arguments, in so far as they are pertinent, may be derived from the reasons for the decision below. The appellants essentially argued that D12 had to be admitted into the proceedings but not D14-D16. It was argued that claims 1 and 10 of the main request lacked novelty and inventive step in view of Material A of D1. Auxiliary request 1 should not be admitted into the proceedings. Also, claims 1 and 10 of auxiliary request 2a lacked an inventive step over Material D of D1.

XII. The respondents' arguments, in so far as they are pertinent, may be derived from the reasons for the decision below. The respondents essentially argued that D14-D16 had to be admitted into the proceedings but not D12. It was argued that claims 1 and 10 of the main request was novel and involved an inventive step in view of Material A of D1. Auxiliary request 1 should be admitted into the proceedings. Also, claims 1 and 10 of auxiliary request 2a involved an inventive step over Material D of D1.

Reasons for the Decision

1. Admittance of documents D12, D14, D15 and D16

1.1 D12 is a document that was submitted by opponent 1 shortly before the oral proceedings before the opposition division. The opposition division decided not to admit D12 into the proceedings on the grounds that it was not *prima facie* relevant (contested decision, page 9). Appellant I referred to D12 in their letter of 22 December 2020 (section 2.1).

1.2 Decision G 7/93 (OJ EPO 1994, 775), point 2.6 of the reasons, sets out that the Boards of appeal should only overturn discretionary decisions of the first instance if it is concluded that the first instance exercised its discretion according to the wrong principles, or without taking into account the right principles or in an unreasonable way. The principles used by the opposition division in the present case, namely the lack of *prima facie* relevance, are according to constant case law (Case Law of the Boards of Appeal, 10th Edition, 2022, IV.C.4.5.1). Moreover, the Board has no reason to consider that the first instance exercised its discretion in an unreasonable way, nor sees any new circumstances which would justify admittance at the appeal stage. In accordance with the provisions of Article 12(6) RPBA 2020, the Board therefore decides not to overturn the decision of the opposition division with the consequence that D12 is not admitted into the appeal proceedings.

1.3 D14 is a new document submitted by the respondents with their reply to the statements of grounds of appeal. The admittance of D14 into the proceedings is contested by the appellants. D14 constitutes an amendment of the

case of the respondents and its admittance into the proceedings is subject to the discretionary power of the Board in accordance with Article 12(4) RPBA 2020.

1.3.1 D14 provides additional measurements performed on the compositions of examples IE1-IE3 disclosed in the patent in suit. The property measured in D14 (Charpy impact strength at 0°C) is closesy related to the Charpy impact strength at -30°C, -20°C and 23°C that are discussed in the patent in suit. The Board therefore does not find that D14 adds a particular complexity to the present case.

1.3.2 D14 appears to be filed in reaction to the decision of the opposition division not to acknowledge an effect for the subject-matter of claim 1 of auxiliary request 2 (present claim 1 of the main request), a request that was discussed at the oral proceedings before the opposition division for the first time. D14 therefore is formally suitable to address the issues which led to the decision under appeal and was filed at the earliest possible time in reaction to the decision of the opposition division.

1.3.3 D14 does also not affect the procedural economy of the present case.

1.4 The Board therefore finds it appropriate to make use of its discretion under Article 12(4) RPBA 2020 and admit D14 into the appeal proceedings.

1.5 D15-D16 were filed by the respondents with their letter of 28 November 2022, after notification of the summons to oral proceedings. The admittance of these documents into the proceedings is subject to the provisions of Article 13(2) RPBA 2020 which set out that they shall,

in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons by the party concerned.

1.6 D15 and D16 are ISO standards filed in support of an argument concerning the measurement of the Charpy impact strength in D14. D15 a D16 were submitted in reaction to an argument of appellant I raised only in section 1 of their letter of 18 November 2022. It follows that the submission of D15 and D16 results from the development of the case in appeal and took place at the earliest possible point in time which in view of the Board constitute exceptional circumstances in favour of their admittance in the sense of Article 13(2) RPBA 2020. The Board therefore finds it appropriate to admit documents D15 and D16 into the appeal proceeding.

Main request

2. Novelty over D1

2.1 The opposition division concluded that claim 1 of auxiliary request 2 (corresponding to claim 1 of the main request in appeal) was novel over Material A of D1 because the value of the flow rate ratio $FFR_{21/5}$ (29) disclosed for that material in D1 was outside the range of 30-40 defined in operative claim 1 (decision under appeal, page 11, section Novelty).

2.2 Appellant I contested the conclusion of the opposition division and argued on the basis of D13 (point 11, page 16) that, since the measurement of the melt flow rate had a precision of ±5%, a value of the flow rate ratio $FFR_{21/5}$ of 29 for Material A in fact fell in the range

of claim 1 of the main request.

2.3 The passage cited by the appellant in D13 however is ambiguous as to the precision of the measurement. In particular, the passage clearly sets out that the precision of the method was not known because interlaboratory data were not available and that a single precision statement was not available either. There is also in D13 no direct and unambiguous disclosure of a precision for the measurement of melt flow rates on polyethylene compositions, let alone a precision applied to the calculation of flow rate ratios $FFR_{21/5}$. On that basis the arguments of appellant I concerning the flow rate ratio $FFR_{21/5}$ are not convincing.

2.4 The question of whether Material A of D1 contained carbon black in an amount according to claim 1 of the main request was also in dispute between the parties in appeal. The opposition division concluded in their decision (passage bridging pages 8 and 9) that the amount of 5.7 wt.-% of carbon black masterbatch added in Material A fell into the range of 1.0-10 wt.-% carbon black. That conclusion was contested by the respondents in appeal.

2.5 Claim 1 of the main request sets out that the polyethylene composition comprises (A) a base resin and (B) carbon black in an amount of 1.0 to 10 wt.-% "based on the total amount of the polyethylene composition". By contrast, the preparation of Material A in example 2 of D1 sets out in the passage on page 29, lines 11-12 that the polymer obtained was compounded with 5.7 wt.-% of a "carbon black master batch". There is no further information in D1 from which the amount of carbon black in the master batch used could be derived nor is there

a disclosure of the amount of carbon black in material A in D1.

2.6 The opposition division considered that paragraphs 58 and 59 of the patent in suit allowed an interpretation of the amount of carbon black in claim 1 which covered the amount of carbon black masterbatch in D1. The Board however does not share that conclusion. The wording of claim of the main request is clear as to how the amount of carbon black is defined, namely "1.0 to 10 wt.-% based on the total amount of the polyethylene composition". There is therefore no reason to consider the description of the patent in suit in order to interpret differently a feature that is otherwise clearly set out in the claims of the main request.

2.7 According to established case law, it is a prerequisite for the acceptance of lack of novelty that the claimed subject-matter is "directly and unambiguously derivable from the prior art". In other words, it has to be "beyond doubt – not merely probable – that the claimed subject-matter was directly and unambiguously disclosed in a patent document" (Case Law, supra, I.C.4.1). In the present case, it has not been established that Material A of D1 had a flow rate ratios $FFR_{21/5}$ in the range of 30-40 and that that material contained carbon black in an amount of 1.0-10 wt.-% as defined in claim 1 of the main request. The Board therefore finds that it has not been shown that claim 1 of the main request lacks novelty over D1. The same conclusion holds for claim 10 of the main request which also includes the two disputed features.

3. Inventive step

3.1 D1 was chosen as the closest prior art in the decision of the opposition division and it is also the document seen as the closest prior art for claim 1 of the main request by the parties in appeal. The Board does not see any reason to depart from that view.

3.2 Starting from Material A in Tables 1 and 2 considered by all parties to be the most relevant starting point within D1, the polyethylene compositions according to claims 1 and 10 of the main request differ therefrom by a flow rate ratio $FRR_{21/5}$ being in the range of 30-40 and an amount of carbon black being in the range of 1.0-10 wt.-%.

3.3 The opposition division concluded that the choice of the flow rate ratio $FRR_{21/5}$ in the range of 30-40 was not associated with a technical effect over the whole scope of the claims so that the problem in view of D1 was to provide an alternative polyethylene composition having a balanced set of good sagging, without drawbacks on processability and impact strength (decision of the opposition division, page 13). The respondent contested the formulation of that problem and argued that an effect resulting from the choice of flow rate ratio $FRR_{21/5}$ in the range of 30-40 had to be acknowledged based on D14. An amount in carbon black in the range of 1.0-10 wt.-% was not argued to result in an effect over Material A of D1.

3.4 D14 is in the form of a table showing measurements of Charpy impact strength at 0°C for the examples IE1-IE3 of the patent in suit. The measurements provided in D14 were meant to supplement the data provided in Table 2 of the patent in suit since the respondents stated that the measurements were carried out on retained samples

of the compositions IE1 to IE3.

3.5 It is established case law that an unexpected effect demonstrated in a comparative test can be taken as an indication of an inventive step, but where comparative tests are submitted as evidence of an unexpected effect, these tests had to show the closest possible structural approximation in a comparable type of use to the subject-matter claimed. The reason for this is that if comparative tests are chosen to demonstrate an inventive step on the basis of an improved effect over a claimed area, the nature of the comparison with the closest state of the art must be such that the alleged advantage or effect is convincingly shown to have its origin in the distinguishing feature of the invention compared with the closest state of the art (Case Law, *supra*, I.D.4.3.2).

3.6 The respondents made a direct comparison between the values of the Charpy impact strength at 0°C reported for examples IE1-IE3 in D14 and those given for Material A in D1. It is however apparent that the impact strengths in D14 and D1 were measured on compositions that were not prepared under comparable conditions (the patent in suit uses a triethylaluminium cocatalyst while D1 does not, the step by which carbon black and other additives are added to the polymer on page 29 of D1 and in paragraph 193 of the patent in suit are different and 1-butene is used as a comonomer in D1 and 1-hexene in the patent in suit). These differences in the process and in the polymer compositions were not shown to have a negligible impact on the properties of the resulting polymer compositions including their Charpy impact strength at 0°C. It can therefore not be concluded from a direct comparison of D1 with the patent in suit that any effect is causally

linked to the choice of a flow rate ratio $FRR_{21/5}$ in the range of 30-40.

3.7 The respondents also based their argument on an internal comparison of the examples of the patent in suit. It was argued that example IE2 was a fair representation of Material A of D1 and that its comparison with IE1 and IE3 showed that an improvement of Charpy impact strength at 0°C could be attributed to the flow rate ratio $FRR_{21/5}$. It is however apparent from Table 2 of the patent in suit that the flow rate ratio $FRR_{21/5}$ of the composition of example 2 (34) is in fact within the scope of claim 1 of the main request and not outside that range as it is the case for the composition of Material A of D1. The composition of example 2 of the patent in suit therefore does not represent the closest prior art and it cannot show that the choice of flow rate ratio $FRR_{21/5}$ within the range of 30-40 results in an effect that is not present outside that range. Moreover, an analysis of the three examples does not show a clear trend of the Charpy impact strength at 0°C with respect to increasing values of the flow rate ratio $FRR_{21/5}$.

3.8 Since the data available in D14 and the patent in suit do not show the presence of an effect resulting from any of the choice of the $FRR_{21/5}$ in the range of 30-40 or the amount in carbon black present in the composition, the only problem that can be formulated is the provision of further polyethylene compositions.

3.9 The question of obviousness in the present case is whether the skilled person of D1 would have expected, starting from material A of D1, that a similar composition having a $FRR_{21/5}$ of 30-40 instead of 29.41 (or 29 depending on how the value is obtained in D1)

and an amount of carbon black of 1-10 wt.-% would solve the problem.

3.10 D1 does not limit the values of flow rate ratio $FRR_{21/5}$ of the compositions disclosed. The appellants therefore argued that the skilled person would have raised the flow rate ratio without an inventive activity. The respondents replied that the skilled person starting from D1 would not have considered an increase of the flow rate ratio $FRR_{21/5}$ because it was common general knowledge that doing so would deteriorate the sagging resistance of pipes produced from these materials. That knowledge, it was argued, was also consistent with the teachings of D1 (page 33, lines 3-7) and D4 (paragraphs 8 and 12).

3.11 It is however apparent from Table 2 of D1 and the discussion on page 31, lines 3-11 that all materials A-D disclosed in Tables 1 and 2 of that document have satisfactory non-sagging properties, excellent physical properties including good impact strength at 0°C and that Material A in particular is the best material for these properties. Increasing the flow rate ratio $FRR_{21/5}$ can result in a deterioration of the mechanical properties of the material as argued by the respondents but the results reported for Materials B-D in Table 2 show that a higher $FRR_{21/5}$ with values within the range in claims 1 and 10 (38, 37 and 36 respectively) resulting in a somewhat worse sagging resistance (higher gravity flow) and lower impact resistance than for Material A are still considered to be satisfying for pipe applications. Considering the proximity of the $FRR_{21/5}$ of Material A (29.41) with the range according to operative claim 1 (30-40) and its very good properties reported in Table 2, the Board finds that the skilled person would expect starting from Material

A that a slight raise of flow rate ratio $FRR_{21/5}$ would still result in viable solutions of the posed problem. The small increase in flow rate ratio $FRR_{21/5}$ needed to arrive at claim 1 of the main request starting from Material A of D1 is therefore not inventive.

3.12 D1 discloses on page 29, lines 11 to 14 that material A was compounded with 5.7 wt% of a carbon black masterbatch. The amount of carbon black in material A cannot be derived from D1. However, the use of carbon black in polyethylene compositions is at least established in D1 (page 27, line 27-29 and page 29, line 12). The use of carbon black in polyethylene composition is also known from the prior art (D4, paragraph 26) and it was not contested by the respondents that amounts according to claim 1 were usual in the field. In that regard, the use of such an amount of carbon black in the composition of material A does not involve an inventive step.

3.13 In view of these reasons the Board finds that claims 1 and 10 of the main request lack an inventive step starting from D1, Material A, as the closest prior art.

Auxiliary request 1

4. Admittance

4.1 Claims 1 and 10 of auxiliary request 1 differ from claims 1 and 10 of the main request in that the range defining the flow rate ratio $FRR_{21/5}$ is changed from "30 to 40" to "32 to 38". The admittance of that request into the proceedings was contested by the appellants on the ground that it had not been part of the opposition proceedings and that it could and should have been

filed before the appeal proceedings.

4.2 Auxiliary request 1 was indeed filed with the reply to the statements of grounds of appeal for the first time. The amendment relating to the limitation of the flow rate ratio $FRR_{21/5}$ being in the range of 32 to 38 in claim 1 of that request might have been present in other requests filed in opposition, such as in auxiliary request 13, but that amendment was made there in combination with other amendments that are not part of auxiliary request 1. Claims 1 and 10 of auxiliary request 1 were therefore only filed in appeal and as such the admittance of auxiliary request 1 into the appeal proceedings is subject to the discretion of the Board in accordance with the provisions of Article 12(4) RPBA 2020.

4.3 The respondents argued that auxiliary request 1 was filed to address an objection of lack of novelty but that the request was also relevant to the question of inventive step. The respondents however had no further arguments in support of an inventive step of auxiliary request 1 and only relied on the arguments already provided for the main request. As the respondents rely exclusively on arguments of which were already found to result in a conclusion of lack of inventive step, the Board does not see how the amendment made in auxiliary request 1 could overcome the objection of lack of inventive step pursued against that request.

4.4 The discretion of the Board for the admittance of auxiliary request 1 shall be exercised *inter alia* in view of the suitability of the amendment to address the issues which led to the decision under appeal, in the present situation the objection of lack of inventive step based on D1. In view of the conclusion of lack of

inventive step reached for the main request and that inventive step of auxiliary request 1 is to be supported by the same arguments as those submitted for the main request, the Board does not find the amendment made in auxiliary request 1 to fulfil the criterion of suitability laid out in Article 12(4) RPBA 2020. The Board therefore decides not to admit auxiliary request 1 into the appeal proceedings.

Auxiliary request 2a

5. Inventive step over D1

5.1 Claim 1 of auxiliary request 2a differs from claim 1 of the main request in that the comonomer of the ethylene copolymer in the base resin (A) is limited to 1-hexene.

5.2 All the parties in appeal considered that the most relevant starting point for claim 1 of auxiliary request 2a within D1 was Material D which is based on a copolymer of ethylene and 1-hexene. It was not disputed that claim 1 of auxiliary request 2a differ from Material D in D1 in that the low molecular weight component (A-1) of the base resin has an MFR_2 of 150 to 400 g/10 min, the value of that parameter in Material D being 1060 g/10min (Table 1 on page 30). Furthermore, as for the main request, the amount of carbon black used in the composition of Material D is unknown.

5.3 For the same reasons as for the main request, a direct comparison of properties between D1 and the patent in suit does not allow a meaningful conclusion on the compositions of the closest prior art with respect to the ones of the patent in suit. It has also not been shown that the selection of the loop melt flow rate MFR_2 in the range defined for component (A-1) in claim

1 of auxiliary request 2a was causally linked to an effect over D1.

5.4 In the absence of further evidence of an effect linked to the distinguishing features of claim 1 of auxiliary request 2a over material D of D1, the problem can only be formulated as the provision of further polyethylene compositions suitable for pipes.

5.5 Example 2 of D1 (leading to Material A) shows that in the first step of the reaction an ethylene polymer with a MFR_2 of as low as 280 g/10 min (loop MFR_2 in Table 1) can be prepared by the process of D1 as argued by the appellants. It is therefore credible, as argued by the appellants, that a skilled person would be able to prepare polyethylene compositions having a loop MFR_2 in the range of 150-400 g/10 min also in a system in which 1-hexene is used as a copolymer. In order to arrive at a composition according to claim 1, it is, however, necessary to show that, when changing so dramatically the loop MFR_2 in the process leading to Material D of D1, all other conditions imposed by claim 1 of auxiliary request 2a would still be satisfied while retaining properties compatible with an application to pipes (which is the scope of D1 and is the case in the patent in suit). The onus of proof was on the appellants, who claimed that the compositions of claim 1 lacked an inventive step. The appellants however failed to discharge such a burden of proof. It is in particular apparent from Table 1 of D1 that none of the polyethylene compositions based on 1-hexene have a loop MFR_2 below 1000 g/10 min (Material D has a loop MFR2 of 1060 g/10 min, which is more than twice the maximum value foreseen by claim 1).

5.6 It has therefore not been shown by the appellants that the polyethylene compositions as defined in claim 1 of auxiliary request 2a were available to the skilled person starting from Material D of D1 as the closest prior art. The same conclusion applies to claim 10 of auxiliary request 2a which concerns a polyethylene composition obtainable by a multistage process and that is characterized by the same set of features as the polyethylene composition according to claim 1.

5.7 Claims 1 and 10 of auxiliary request 2a therefore involve an inventive step starting from Material D of D1 as the closest prior art.

6. As the parties confirmed at the oral proceedings before the Board that they had no further objection against auxiliary request 2a, there is therefore no need for the Board to deal with any other issue and the patent can be maintained on the basis of this request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the claims 1 to 14 of auxiliary request 2a filed with the reply to the statement of grounds of appeal after any necessary consequential amendment of the description.

The Registrar: The Chairman:

D. Hampe D. Semino

Decision electronically authenticated