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**Datasheet for the decision
of 16 February 2022**

Case Number: T 2943/18 - 3.3.03

Application Number: 12709068.6

Publication Number: 2686382

IPC: C08L23/14, C08J5/18

Language of the proceedings: EN

Title of invention:

PROPYLENE-ETHYLENE RANDOM COPOLYMER

Patent Proprietor:

INEOS Manufacturing Belgium NV

Opponent:

Borealis AG

Relevant legal provisions:

EPC Art. 56, 84, 100(b)

RPBA Art. 12(4)

Keyword:

Claims - clarity (yes)

Grounds for opposition - insufficiency of disclosure (no)

Inventive step - (yes)

Late-filed evidence - submitted with the statement of grounds
of appeal

Decisions cited:

G 0003/14, T 0608/07



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Case Number: T 2943/18 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 16 February 2022

Appellant: INEOS Manufacturing Belgium NV
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 16 October 2018
revoking European patent No. 2686382 pursuant to
Article 101(3) (b) EPC.**

Composition of the Board:

Chairman D. Semino
Members: O. Dury
R. Cramer

Summary of Facts and Submissions

- I. The appeal by the patent proprietor lies against the decision of the opposition division posted on 16 October 2018 revoking European patent No. 2 686 382.
- II. The decision under appeal was based on a main request and on the first to third auxiliary requests, all filed with letter of 10 August 2018. Claim 1 of the **main request**, which is the sole claim relevant to the present decision, read as follows:
- "1. Propylene random copolymer composition comprising
- (A) 60-85wt% of a copolymer of propylene and from 0.1 to 2wt% of units derived from ethylene; and
- (B) 15-40wt% of a copolymer of propylene and from 7 to 17wt% of units derived from ethylene,
- said composition having a total ethylene content of from 3 to 4.5wt%, a melt flow rate value according to ISO 1133 (230°C, 2.16 kg) of from 10 to 120 g/10 min, and having a crystallisation temperature (T_c), as measured by Differential Scanning Calorimetry (DSC) with a cooling rate of 10°C/min, of above 123°C."
- III. The following documents were *inter alia* cited in the decision under appeal:

D3: WO 2005/090467

D4: EP-A1-1 873 173

D13: M. Gahleitner et al., Nucleation of Polypropylene Homo- and Copolymers,

International polymer processing XXVI, 2011,
pages 2-20

D17: Plastics Additives Handbook, H. Zweifel,
R.D. Maier and M. Schiller, 6th Edition
2009, Hanser, pages 967-982

IV. In that decision the opposition division held *i.a.*
that:

- The main request met the requirements of Article 84 EPC and of sufficiency of disclosure. However the subject-matter of claim 1 thereof was not inventive starting from D3 as the closest prior art document in combination with D17. In that respect, the decision was reached considering that the feature related to a crystallisation temperature (T_c) of above 123°C mentioned in said claim 1 was equivalent to having nucleating agents in the composition being claimed (reasons: section 4.6, fourth paragraph);
- The subject-matter of claim 1 of each of the first to the third auxiliary requests was also not inventive for similar reasons as outlined for the main request.

Therefore, the patent was revoked.

V. The patent proprietor (appellant) appealed the above decision. With the statement setting out the grounds of appeal the appellant requested that the decision of the opposition division be set aside and that the patent be maintained in amended form according to any of the main request or the first to third auxiliary requests filed therewith.

Claim 1 of the **main request** was identical to claim 1 of the main request dealt with in the decision under appeal.

Also, the following documents were filed:

D20: WO 2011/086583

D21: WO 2008/012144

D22: Simanke et al; Polimeros; Influence of nucleating agent on the crystallization kinetics and morphology of polypropylene; 2015

- VI. In their rejoinder to the statement of grounds of appeal the opponent (respondent) requested that the appeal be dismissed and that D20 to D22 be not admitted into the proceedings.
- VII. The parties were summoned to oral proceedings. Issues to be discussed at the oral proceedings were then specified by the Board in a communication.
- VIII. With the explicit agreement of both parties, oral proceedings were held on 16 February 2022 in the form of a videoconference.
- IX. The appellant's arguments, insofar as relevant to the decision, may be summarised as follows:

Admittance of D20 to D22

- (a) The opposition division's decision on inventive step was reached under the assumption that if example 1 of D3 contained a nucleating agent, it would inevitably have a Tc above 123°C. D20 to D22 were filed at the outset of the appeal proceedings to show that said assumption was not correct, as

already put forward during the opposition proceedings. Since that issue was essential to assess inventive step of claim 1 of the main request, D20 to D22 should be admitted into the proceedings.

Main request - Article 84 EPC

- (b) The respondent's objection that the Tc limitation of operative claim 1 could have been replaced by stating that the composition being claimed contained a nucleating agent was irrelevant to the question of clarity. The objection that the determination method of the crystallisation temperature lacked clarity was not supported by any evidence. In addition, the DSC method specified in operative claim 1 was a very well known technique and the skilled person knew how to erase the thermal history of a sample. Therefore, the respondent's objections should be rejected.

Main request - Sufficiency of disclosure

- (c) The feature of the ethylene content mentioned in claim 1 of the main request was a usual parameter, which the skilled person could determine following well-known techniques. Even if there were an ambiguity in the definition of the scope of operative claim 1, there was no evidence that it was not possible to prepare a composition as defined therein. For these reasons, the requirements of sufficiency of disclosure were met.

Main request - Inventive step

- (d) D3 was a suitable document to be taken as the closest prior art, whereby example 1 thereof was particularly relevant.

The subject-matter of operative claim 1 differed therefrom in that the composition being claimed had a Tc of above 123°C.

In the statement of grounds of appeal, the technical problem effectively solved over said closest prior art was formulated, in view of the examples of the patent in suit, as the provision of a propylene random copolymer composition suitable for moulded articles having improved rigidity, clarity and processability i.e. reduced cycle time in injection moulding. At the oral proceedings before the Board, the improvement in terms of clarity and rigidity was however not relied upon any longer.

Although it was agreed that it would be obvious to add a nucleating agent to the composition of example 1 of D3 in order to increase its mechanical properties, there was no evidence on file that in doing so, one would arrive at a composition exhibiting a Tc above 123 °C as defined in operative claim 1. To the contrary, considering the relationship between Tm and Tc derivable from D20 to D22 and taking into account that the teaching of D3 was limited to polymers prepared with metallocene catalysts, it was not credible that such a high value of Tc could be obtained at all. No counter-evidence in that regard had been provided by the respondent to refute this position. To simultaneously add a nucleating agent and modify the nature of the catalyst used to prepare the

composition of example 1 of D3, namely to use a Ziegler-Natta catalyst instead of a metallocene catalyst as contemplated by the respondent, in order to arrive at the subject-matter of operative claim 1, was based on hindsight.

For these reasons, the subject-matter of claim 1 of the main request was inventive.

- X. The respondent's arguments, insofar as relevant to the decision, may be summarised as follows:

Admittance of D20 to D22

- (a) D20 to D22 were filed as additional evidence to support the appellant's argument already put forward during the opposition proceedings regarding an allegedly generally applicable relationship between the melting point and the crystallisation temperature of a polypropylene composition. These documents could therefore have been filed earlier. In addition they were neither *prima facie* relevant, nor more relevant than the data in the patent in suit and D4, which were relied upon during the opposition proceedings. Therefore, D20 to D22 should be not admitted into the proceedings.

Main request - Article 84 EPC

- (b) The Tc limitation specified in claim 1 of the main request should be avoided in the present case because the composition being claimed could be defined by indicating the presence of a particular nucleating agent in a suitable amount instead. In addition, said parameter Tc could not be determined unambiguously and amounted to defining the subject-

matter being claimed in the form of a result-to-be achieved. For these reasons, operative claim 1 did not meet the requirements of Article 84 EPC.

Main request - Sufficiency of disclosure

- (c) Considering that the details of the measurement method for the determination of the ethylene content features mentioned in claim 1 of the main request were not indicated in the patent in suit, said method was not accurately defined. It was further derivable from D1a that the resulting ambiguity in respect of that method was such that it was not a mere issue of clarity but amounted to a lack of sufficiency of disclosure.

Main request - Inventive step

- (d) It was agreed with the appellant that claim 1 of the main request differed from example 1 of D3, which constituted the closest prior art, in the feature that the claimed composition had a Tc of above 123°C. In that respect, considering that said composition was not nucleated and in view of the general teaching derivable from D4 and D20 to D22, it was agreed at the oral proceedings before the Board that the composition prepared in example 1 of D3 had to have a Tc below 123°C.

In view of the examples of the patent in suit and of the experimental part of D3, the technical problem effectively solved over said closest prior art was to provide a propylene random copolymer composition suitable for moulded articles having improved rigidity and processability, i.e. reduced cycle time in injection moulding while maintaining

good clarity.

In view of the teaching of D13 and D17, it was obvious to solve that problem by adding a nucleating agent which was known to improve processability and rigidity. In addition, should a Tc above 123°C not be obtained in doing so, as argued by the appellant, it was derivable from D3 and D13 that the use of a Ziegler-Natta catalyst instead of a metallocene catalyst would also lead to increased rigidity. Therefore, it would further be obvious to solve the above problem by additionally preparing the composition of example 1 of D3 using a Ziegler-Natta catalyst instead of a metallocene catalyst.

For these reasons, the subject-matter of claim 1 of the main request was not inventive.

XI. The appellant requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the claims according to any of the main request or the first to third auxiliary requests filed with the statement of grounds of appeal.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. Admittance of D20 to D22

1.1 The respondent requested that D20 to D22 be not admitted into the proceedings.

- 1.2 Considering that these documents were filed with the appellant's statement of grounds of appeal, which was submitted before the date of entry into force of the Rules of Procedure of the Boards of Appeal (RPBA) 2020, their (non)admittance underlies the stipulations of Article 12(4) RPBA 2007 (see Article 25(2) RPBA 2020).
- 1.2.1 Since D20 to D22 were filed in support of an argument already put forward during the opposition proceedings, namely to show that there was a correlation between melting point (T_m) and crystallisation temperature (T_c) (rejoinder to the notice of opposition: page 3, section "novelty"), these documents could have been filed earlier. However, these documents were filed at the first opportunity in appeal in order to strengthen the appellant's case regarding a correlation between T_m and T_c . In addition, on the basis of findings derived from D20 to D22, the appellant in their statement of grounds of appeal further attempted to refute the opposition division's assumption that adding a nucleating agent to the composition of example 1 of D3 would lead to the subject-matter of claim 1 of the operative main request (statement of grounds of appeal: page 3, fourth paragraph), which argument was already put forward during the opposition proceedings (rejoinder to the notice of opposition: page 4, fifth paragraph, last sentence; letter of 10 August 2018: page 4, last sentence) but did not succeed (reasons of the decision under appeal: page 16, second and fourth paragraphs). In view of the above, D20 to D22 were filed at the outset of the appeal proceedings in support of the same line of argumentation as the one submitted during the opposition proceedings and in direct reaction to the decision under appeal, which was not in favour of the appellant.

1.2.2 The considerations put forward by the respondent in appeal (e.g. that documents D20 to D22 only supported the appellant's argument based on the data of the patent in suit and of D4 which were relied upon during the first instance proceedings, or that these documents were even less relevant since they were directed to different kinds of polymers than the ones defined in the operative claims or in example 1 of D3) do not relate to the absence of a justification for filing D20 to D22 in appeal and therefore are no obstacle to the admittance of these documents but may have to be considered at a later stage, namely when assessing whether they fulfill their purpose according to the argumentation of the appellant.

1.3 Under these circumstances, the Board does not find it appropriate to make use of its power to hold D20 to D22 inadmissible pursuant to Article 12(4) RPBA 2007 for the sole reason that they could have been filed earlier.

Main request

2. Article 84 EPC

2.1 The sole objection pursuant to Article 84 EPC pursued in appeal by the respondent is the one related to the requirement of operative claim 1 that the claimed composition should have a crystallisation temperature T_c as measured by DSC with a cooling rate of $10^\circ\text{C}/\text{min}$ of above 123°C .

2.2 In that respect, it was not disputed that said T_c feature was not present in the granted claims so that it may be examined whether it introduces non-compliance

with Article 84 EPC (G 3/14, OJ EPO 2015, 102).

- 2.3 The respondent argued that such a parametric limitation should be avoided in the present case because the composition being claimed could be defined by indicating the presence of a particular nucleating agent in a suitable amount instead (rejoinder to the statement of grounds of appeal: section 23).

However, it is agreed with the appellant (letter of 1 October 2019: page 1, last sentence) that this argument is not relevant to the question of clarity pursuant to Article 84 EPC. Rather, the question to be answered is whether the definition chosen by the patent proprietor to define the subject-matter being claimed satisfies the requirements of Article 84 EPC, i.e. whether it allows to define said subject-matter in an unambiguous manner so that the skilled person is able to identify whether he is working within or outside the scope of the claims.

- 2.4 Regarding the ability of the skilled person to determine unambiguously said parameter T_c , which is also objected to by the respondent (rejoinder to the statement of grounds of appeal: section 27; letter of 20 February 2020: section 29), it is further agreed with the appellant that the respondent's objection is not supported by any evidence (appellant's letter of 1 October 2019: page 2, second paragraph) and, therefore, provides no reason to the Board to overturn the opposition division's view in that respect (decision under appeal: page 9, penultimate paragraph starting with "ii. and iii."). The mere fact that more information is provided in paragraph 50 of D4 how said feature may be determined is not sufficient to demonstrate that the information given in the operative

claims and in paragraph 27 of the patent in suit does not allow an unambiguous determination of said Tc feature. Also, it is agreed with the appellant that DSC is a well known technique and that the skilled person knows how to erase the thermal history of a sample (letter of 1 October 2019: page 2, second paragraph).

- 2.5 The respondent further put forward that the requirements of Article 84 EPC were not satisfied because the Tc feature mentioned in operative claim 1 amounted to a "result to be achieved" corresponding to the problem underlying the opposed patent and that said result could only be achieved by using an appropriate nucleating agent as an essential feature, which was however not reflected in said claim 1 (rejoinder to the statement of grounds of appeal: sections 24 and 25; letter of 20 February 2020: sections 21-25).

In that respect, it is agreed with the opposition division (decision under appeal: page 9, penultimate paragraph; page 14, section iv) that the Tc feature indicated in operative claim 1 is not a functional feature relating to the result to be achieved (Case Law of the Boards of Appeal of the EPO, 9th edition, 2019, II.A.3.4) but is rather a usual parameter related to the composition being claimed (Case Law, *supra*, II.A.3.5) for which it was not shown that it cannot be determined reliably by objective procedures. Therefore, it is not mandatory in the present case to indicate in the claim itself how said product is to be obtained as long as it is possible to verify whether or not said requirement is satisfied. It is further agreed with the respondent that said feature depends on the various components making up the composition being claimed (letter of 1 October 2019: page 2, first paragraph).

2.6 In view of the above, in order to satisfy the requirements of Article 84 EPC, it is in the present case not mandatory to indicate in operative claim 1 the presence of a nucleating agent, let alone of a specific type and/or specific amounts thereof, contrary to the respondent's view (letter of 20 February 2020: section 25).

2.7 For these reasons, the respondent's objections pursuant to Article 84 EPC are not persuasive and provide no reason for the Board to overturn the opposition division's decision in that regard.

3. Sufficiency of disclosure

3.1 In order to meet the requirements of sufficiency of disclosure, an invention has to be disclosed in a manner sufficiently clear and complete for it to be carried out by the skilled person, without undue burden, on the basis of the information provided in the patent specification, if needed in combination with the skilled person's common general knowledge. This means in the present case that the skilled person should in particular be able to prepare a composition according to operative claim 1, which is contested by the respondent.

3.2 In that respect, it was not contested that the description and the examples of the patent in suit provide information, in particular concerning the preparation process, the catalyst system and the additives, how to prepare a composition according to operative claim 1, in particular satisfying the ethylene contents of polypropylene copolymers (A) and (B) defined therein.

- 3.3 The respondent's objections of lack of sufficiency of disclosure were all related to an alleged ambiguity in respect of the measurement method of ethylene contents specified in operative claim 1. The respondent was in particular of the opinion that said method was not accurately defined in the patent in suit and that D1a showed that different methods of determination of ethylene content by NMR were known in the literature and led to different results. This amounted to a lack of sufficiency of disclosure. In addition, in view of that deficiency, the skilled person was neither in the position to determine the limits of the claims, nor to assess that the invention was effectively reworkable.
- 3.3.1 In that respect, the sole information provided in the patent in suit regarding the method of determination of the ethylene contents mentioned in operative claim 1 is paragraph 19, in which it is stated that "The ethylene content of both fraction (A) and the overall composition is measured by FTIR", whereby the ethylene fraction (B) is then derived therefrom.
- 3.3.2 However, it is agreed with the appellant that the ethylene content parameter mentioned in operative claim 1 is very common in the art, whereby it is further credible that, in the present technical field, controlling the comonomer content of a polymerisation process is well within the ability of the skilled person without any burden. In particular, it is agreed with the appellant (as put forward at the oral proceedings before the Board) that comonomer contents are commonly controlled and determined in industrial plants. Under these circumstances, and further considering that it was never argued by the respondent that there were no known methods in the art to determine such ethylene contents, it is credible that

the skilled person would know, on the basis of common general knowledge, how to determine the ethylene contents specified in operative claim 1.

3.3.3 Regarding the respondent's objections related to D1a, it is derivable therefrom (middle of page 2 to middle of page 3) that quantitative IR spectroscopy - such as the FTIR method indicated in the patent in suit - is a secondary method that requires calibration based on a primary method of determination of ethylene content (such as ^{13}C NMR). It is further shown in D1a that different values of ethylene content may be obtained depending on how various methods known in the art are carried out (in view of e.g. the various key experimental parameters indicated at the bottom of page 2 as well as on top and in the middle of page 3 of D1a, and as shown in Figure 1 and Table 2 of D1a in relation to the known methods indicated in Table 1). However, these results only demonstrate that depending on which method is used, the definition of the ranges of ethylene contents specified in claim 1 and/or the ethylene content of a specific sample prepared according to the teaching of the patent in suit may vary. In other words, these data show that the scope of operative claim 1 may not be unambiguously defined, but constitute no evidence that the skilled person is not in a position to prepare a composition as defined in operative claim 1 on the basis of the information provided in the patent in suit (if needed complemented by common general knowledge).

3.3.4 Although the data reported in Table 2 of D1a show that, depending on the method of determination and/or calibration used, a specific polypropylene-co-ethylene sample could be found to be either within or outside the scope of operative claim 1, these data also only

show that the scope of operative claim 1 may not be unambiguously defined, but provide no evidence that the skilled person is not in a position to rework the invention.

3.4 The respondent further put forward that D1a showed that the uncertainty of measurement of ethylene content extended to the entire narrow ranges of ethylene content claimed. Under these circumstances, the ambiguity of measurement was not only present at the edges but permeated the whole claim. Therefore, said ambiguity was not only an issue of clarity but amounted to a lack of sufficiency of disclosure (see T 608/07 of 27 April 2009).

3.4.1 The respondent's objection is primarily related to the narrower range of 0.1-2 wt.% ethylene specified in operative claim 1 in relation to fraction (A), in view of the standard deviation derivable from the RMSE values indicated in Table 3 of D1a for various methods of determination of ethylene content (NMR methods 1 to 6) and various standards used for calibration (sets 1 to 3; see also Table 4 of D1a). As indicated in D1a (page 9, paragraph above Table 3), in order to be confident that the obtained result is within the range defined in the claim (here 0.1-2 wt.%), said range should be compared with the value of at least four times the RMSE. However, although several of the methods reported in Table 3 of D1a appear to exhibit high values of RMSE as compared to the target range (several values are around or above 0.5, which would lead to high errors of prediction for the narrow range of 0.1-2 wt.% defined in operative claim 1 for fraction (A)), it remains that some of these methods exhibit lower RMSE values, whereby it was not argued that none of the methods used in D1a could be suitably used.

Under these circumstances, the Board is of the opinion that the skilled person, who is well aware that various methods may be used (at least the six methods indicated in Table 1 of D1a are known in the art), would select a method which is appropriate, i.e. a method having a low error of prediction.

3.4.2 In addition, it was not argued that the six methods indicated in Table 1 of D1a and/or standards indicated in Table 4 of D1a were exclusive and that no other method/standards could be used. To the contrary, it was even acknowledged by the respondent at the oral proceedings before the Board that other, more accurate methods were known in the art. Further considering that, as indicated in section 3.3.2 above, the determination of ethylene contents is usual in the art, the Board is satisfied that the skilled person could, if necessary, use another method of determination of ethylene content than any of the ones used in D1a. In that respect, operative claim 1 contains no limitation in that regard and, accordingly, should be read in its broadest sense.

3.4.3 In view of the above, the respondent's objection that in view of the error of prediction related to the determination of ethylene content, the ambiguity in said determination method was not a mere clarity issue at the edges of the claim but effectively permeated the whole claim and amounted therefore to a lack of sufficiency of disclosure, is rejected.

3.5 In view of the above, the respondent's objections of lack of sufficiency of disclosure are directed to an alleged ambiguity regarding the determination of the ethylene content of propylene copolymers (A) and (B), i.e. they are related to the question whether or not

the skilled person knows whether he is working within or outside the scope of the granted claims, which, in the circumstances of the present case, is at most a matter of clarity pursuant to Article 84 EPC (which cannot be dealt with here at the appeal stage: see decision G 3/14, cited above). However, these objections do not constitute evidence that, carrying out the teaching of the patent in suit, the skilled person is not in a position to prepare a composition according to operative claim 1, in particular satisfying the ethylene contents of polypropylene copolymers (A) and (B) defined therein.

3.6 For these reasons, the respondent's arguments provide no reason for the Board to overturn the opposition division's decision concerning the grounds pursuant to Article 100(b) EPC.

4. Inventive step

4.1 Closest prior art

It was undisputed that D3 is a suitable document to be taken as the closest prior art and that the composition prepared in example 1 thereof is a particularly relevant starting point for the assessment of the inventive step of claim 1 of the main request. There is no reason for the Board to deviate from that view

4.2 Distinguishing feature(s)

4.2.1 Example 1 of D3 discloses the preparation of a propylene copolymer composition comprising two fractions of propylene-ethylene copolymers and exhibiting a melt flow rate of 10 g/10 min and a DSC melting point of 145.5 °C (D3: Tables 1 to 3 on

pages 25-27).

4.2.2 It is undisputed that the subject-matter of operative claim 1 only differs from the composition prepared in example 1 of D3 in that it should have a crystallisation temperature T_c as defined in claim 1 of above 123°C . In that respect, although the crystallisation temperature of the composition prepared in example 1 of D3 is not explicitly disclosed in D3 and no evidence in that respect was provided by the parties, it is not contested by the respondent that said crystallisation temperature must be below 123°C . In that regard, the respondent explicitly admitted at the oral proceedings before the Board that, although D4 and D20 to D22 did not allow to conclude that there was a generally applicable correlation in absolute terms between T_m and T_c , it was to be expected in view of the melting temperature of 145.5°C disclosed for the polymer composition prepared in example 1 of D3 (page 27: Table 3, second entry) and further taking into account that said composition was not nucleated, that it must have a T_c below 123°C . However, the exact value of said T_c was not known, so the respondent. Under these circumstances, the Board is satisfied that the subject-matter of operative claim 1 differs from the composition prepared in example 1 of D3 in that it should have a T_c above 123°C , which is not the case of the closest prior art composition.

4.3 Problem effectively solved

4.3.1 The appellant argued in its statement of grounds of appeal that the problem effectively solved over the closest prior art resided in the provision of a propylene random copolymer composition suitable for moulded articles having improved rigidity, clarity and

processability, whereby the improvement in processability was related to reduced cycle time in injection moulding (statement of grounds of appeal: page 4, first paragraph). According to the appellant (statement of grounds of appeal: page 3, last two paragraphs) that problem was derivable from paragraphs 1 and 27 of the patent specification and examples 1 to 6 of the patent in suit showed that it was indeed solved. In that respect, the improvement in processability was derivable from the requirement of operative claim 1 that the compositions should have a T_c above 123°C , which was not the case of the composition of example 1 of D3, so the appellant. However, the improvement in terms of clarity was not relied upon by the appellant any longer at the oral proceedings before the Board.

- 4.3.2 At the oral proceedings before the Board, the respondent formulated the problem effectively solved over the closest prior art as residing in the provision of a propylene random copolymer composition suitable for moulded articles having improved rigidity and processability while maintaining good clarity.
- 4.3.3 In view of the above and since it is not contested that the composition of example 1 of D3 does not satisfy the T_c requirement defined in operative claim 1 and further considering that it remained undisputed that a higher T_c implies improved processability by injection moulding, the improvement in terms of processability/reduced cycle time relied upon by both parties is credible.
- 4.3.4 As to the other properties, no fair comparison between a composition according to operative claim 1 and one according to the teaching of example 1 of D3 is present

on file. In particular, the propylene copolymers prepared in example 1 of D3 and in examples 1 to 6 of the patent in suit (which illustrate the subject-matter defined in operative claim 1) differ in significant features (e.g. preparation process using different types of catalysts - Ziegler-Natta in the patent in suit vs. metallocene in example 1 of D3, which is known to significantly determine the properties of the compositions so prepared -; different splits and/or amounts of ethylene comonomer), so that they cannot provide a fair comparison between the compositions being claimed and the one according to example 1 of D3.

a) However, the respondent acknowledged that, although no fair comparison was available, an improvement in terms of rigidity was, in view of the considerable difference in rigidity and melting temperatures disclosed and of the different kind of catalysts used in D3 and in the patent in suit, indeed credible and could be acknowledged (letter of 15 December 2021: sections 20-25, which was pursued at the oral proceedings before the Board). The Board has no reason to deviate from that view.

b) Nevertheless, no similar arguments were put forward regarding the improvements in terms of clarity relied upon by the appellant in their statement of grounds of appeal. To the contrary, the preliminary view of the Board that said improvement may not be taken into account in the formulation of the problem solved over example 1 of D3 (Board's communication: sections 9.3.4 and 9.3.5), was not contested and even agreed upon by the parties at the oral proceedings before the Board, in particular by the appellant, who did not rely to an improvement in clarity any longer. Under these circumstances, no improvement in terms of clarity may

be taken up in the formulation of the problem effectively solved over the closest prior art. However, considering that it was undisputed that the compositions being claimed and the one of example 1 of D3 exhibited good clarity, whereby the Board has no reason to be of a different opinion, the maintenance of a good clarity is allowable.

4.3.5 In view of the above, the technical problem effectively solved over example 1 of D3 resides in the provision of a propylene random copolymer composition suitable for moulded articles having improved rigidity and processability in terms of reduced cycle time in injection moulding while maintaining good clarity.

4.4 Obviousness

4.4.1 The question has to be answered whether the skilled person, desiring to solve the problem identified above, would, in view of the closest prior art, possibly in combination with other prior art or with common general knowledge, have modified the disclosure of the closest prior art in such a way as to arrive at the claimed subject matter.

4.4.2 In that respect, it is derivable from D17 (bottom of page 976, top of page 977; page 975: Figure 18.4 and paragraph above it) that it is known in the art that the processability in terms of reduced cycle time in injection moulding of a composition such as the one according to example 1 of D3 may be increased by the use of a nucleating agent, which is further accompanied by an improvement in terms of rigidity and optical properties and an increase in terms of crystallisation temperature. The improvement in rigidity and the good properties in terms of clarity obtainable by using a

nucleating agent is also known from D13 (abstract; page 5: section 2.2.2, second paragraph; page 6: Table 1; page 12: section 5.1, beginning of first paragraph and Figure 17; section 5.2: Figures 21 and 25). Further considering that D3 already teaches the optional (and even preferred) use of nucleating agents (D3: page 8, third and sixth paragraphs; page 9, first three paragraphs), it is agreed with the respondent that adding a nucleating agent to increase processability/reduce cycle time in injection moulding and increase rigidity would be obvious, which was not contested by the appellant.

- 4.4.3 However, should a nucleating agent be added to the composition of example 1 of D3 as contemplated by the respondent, it still remains to be assessed whether or not in doing so, one would effectively arrive at the subject-matter of operative claim 1, in particular at a composition having a T_c above 123°C as defined therein, which is contested by the appellant.
- 4.4.4 In that regard, in view of the evidence on file and in particular in the absence of any indication of the crystallisation temperature of the composition of example 1 of D3, both nucleated and not nucleated, it cannot be concluded that this would obviously be the case. The Board is further of the opinion that in opposition the burden of proof in that respect primarily lies on the opponent, here the respondent. However, it was not shown that nucleated propylene copolymers prepared in a similar manner to the ones of example 1 of D3 may have a T_c above 123°C , in particular not in reaction to the Board's communication in which said issue was identified (section 9.4.3, second paragraph). Nor was it shown that such compositions were usual in the art. To the contrary,

the arguments put forward by the appellant to explain why it was to be expected that such a Tc would not be satisfied (statement of grounds of appeal: page 4, fourth paragraph, first three sentences), which appear credible, were neither refuted, nor even contested by the respondent.

4.4.5 Under these circumstances, it cannot be agreed with the opposition division's finding that the sole addition of a nucleating agent in the composition prepared in example 1 of D3 mandatorily leads to a composition having a Tc of above 123°C as defined in operative claim 1.

4.4.6 In view of the above and in the absence of any data regarding the crystallisation temperature of a composition according to example 1 of D3 which further comprises a nucleating agent, the respondent argued that, in order to improve the rigidity of the composition of the closest prior art, the skilled person would further contemplate preparing said composition using a Ziegler-Natta catalyst instead of a metallocene catalyst as used in D3 (section 65 of the rejoinder to the statement of grounds of appeal; letter of 15 December 2021: section 30-31, which was pursued at the oral proceedings). In doing so, the Tc of the composition would mandatorily increase and be above 123°C, as required by operative claim 1.

a) In that respect, it is well known in the present technical field that metallocene and Ziegler-Natta catalysts constitute two different families of catalysts which generally lead to fundamentally different properties of the polymers prepared therewith. Therefore, already for that reason, it appears highly questionable that it may be held obvious

to modify example 1 of D3 by changing the catalyst specifically disclosed therein.

b) This finding is further confirmed by the fact that D3 as a whole only discloses the preparation of propylene-ethylene compositions using specifically a metallocene catalyst (claim 4; middle of page 3; page 11, second full paragraph to page 20, last paragraph; example 1, page 24), whereby D3 nowhere mentions that Ziegler-Natta catalysts may be used for preparing the polymer compositions being claimed therein. To the contrary, D3 rather appears to even teach away therefrom (page 1, third paragraph).

c) Although it may be derived from the data reported in Table 4 on page 32 of D3 (first entry: film stiffness in machine direction "MD") that the comparative compositions prepared therein with a Ziegler-Natta catalyst exhibit increased rigidity as compared to the composition of example 1 of D3 prepared using a metallocene catalyst, a fair comparison between these comparative examples and example 1 of D3 (illustrative of its teaching) is not possible in view of the different kind of polymers being prepared therein (comparative examples 2 to 6 disclose a different kind of polymers than the one prepared in example 1; comparative example 7 discloses a random copolymer of propylene with ethylene but having a melt flow rate significantly lower than the one of example 1 of D3) and/or of the differences in the additive packages used (all comparative examples). In addition, the clear teaching of D3 is that the copolymers of propylene with ethylene prepared in the comparative examples using a Ziegler-Natta catalyst are not satisfactory as compared to the one prepared using a metallocene catalyst according to example 1 thereof (page 32: paragraphs

just below Tables 4 and 5; page 33, first and second paragraphs). That finding, in the Board's view, confirms that D3 effectively teaches away from preparing copolymers of propylene with ethylene using a Ziegler-Natta catalyst, in particular starting from the one prepared in example 1 thereof.

d) During the oral proceedings before the Board, the respondent further argued that the skilled person would also have been prompted to prepare a composition according to example 1 of D3 using a Ziegler-Natta catalyst in order to increase the rigidity of the composition in view of the teaching of D13 (page 13: paragraph above Figure 18). However, even if, to the respondent's benefit, that passage of D13 were to be read in that sense, it would not be sufficient to alter the unambiguous teaching derivable from D3 itself, which is as explained above specifically directed to the preparation of propylene copolymers with ethylene using a metallocene catalysts and not a Ziegler-Natta catalyst.

e) In view of the above, the respondent's argument that the skilled person would contemplate changing the catalyst used in D3 and prepare the composition of example 1 of D3 using a Ziegler-Natta catalyst instead of a metallocene catalysts as taught in D3 while at the same time adding a nucleating agent, is based on hindsight.

f) As a consequence, the respondent's objection that it is obvious to solve the above problem by adding a nucleating agent and further modify the composition of example 1 of D3 by using a Ziegler-Natta catalyst, thereby mandatorily arriving at the subject-matter of operative claim 1 and in particular at a T_c above 123°C

is also based on hindsight, which is not allowable.

- 4.4.7 For these reasons, the distinguishing feature identified above is not obvious in view of the teaching of the prior art documents cited. Therefore, the respondent's objection concerning lack of inventive step of the the subject-matter of claim 1 starting from D3 as the closest prior art document is rejected.
5. Questioned by the Board, the respondent confirmed at the oral proceedings before the Board that they had no further objections against the main request. In view of the conclusions reached above in respect of claim 1 of the main request, the Board has no reason to deal with any further point.
6. Since none of the objections raised by the respondent against the main request is successful, the decision under appeal is to be set aside and the patent is to be maintained in amended form on the basis of the claims of the main request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent in amended form on the basis of the claims of the main request filed with the statement of grounds of appeal, after any necessary consequential amendment of the description.

The Registrar:

The Chairman:



B. ter Heijden

D. Semino

Decision electronically authenticated