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Datasheet for the decision of 2 October 2018

Case Number: T 0430/15 - 3.3.03

Application Number: 06827206.1

Publication Number: 1954730

IPC: C08F210/16, C08J5/18

Language of the proceedings: EN

Title of invention:
HETEROGENEOUS, COMPOSITIONALLY PHASE SEPARATED, ETHYLENE ALPHA-OLEFIN INTERPOLYMERS

Patent Proprietor:
Dow Global Technologies LLC

Opponent:
Borealis AG

Relevant legal provisions:
EPC Art. 54, 56, 100(b), 123(2)
RPBA Art. 12(4)

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It can be changed at any time and without notice.

Keyword:

Amendments - allowable (main request: no; first auxiliary request: yes)
Grounds for opposition - insufficiency of disclosure (no)
Novelty - (first auxiliary request: yes)
Inventive step - (first auxiliary request: yes)
Late-filed facts - admitted (yes and no)

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Case Number: T 0430/15 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 2 October 2018

Appellant: (Patent Proprietor)	Dow Global Technologies LLC 2040 Dow Center Midland, MI 48674 (US)
Representative:	Beck Greener Fulwood House 12 Fulwood Place London WC1V 6HR (GB)
Respondent: (Opponent)	Borealis AG IZD Tower Wagramerstrasse 17-19 1220 Wien (AT)
Representative:	Kador & Partner PartG mbB Corneliusstraße 15 80469 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 16 December 2014 revoking European patent No. 1954730 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 from the decision of the opposition division posted on 16 December 2014 revoking European patent No. 1 954 730.

II. A notice of opposition to the patent was filed requesting revocation of the patent in its entirety.

III. In the contested decision the following documents were *inter alia* cited:

D4: WO 03/048213
D5: US 4 547 475
D6: Shenoy, A.V. and Saini, D.R.; Adv. Polym. Tech., 1986, 6, pages 1-56, 58
D7: Handbook of Polyethylene, Structures, Properties and Applications, Marcel Dekker, Inc., 2000, pages 208-210 and 239
D8: Stehling F.C. et al., Macromolecules, 1981, 14, pages 698-708

IV. The contested decision was based on the sets of claims according to the main request (15 claims) filed with letter of 1 August 2013 and the first to the fifth auxiliary requests filed with letter of 30 September 2014, whereby only the main request and the first auxiliary request are relevant for the present decision. Also, an amended Table 2 and an amended Figure 1 of the patent in suit had been filed with letter of 30 September 2014.

Claims 1 to 12 of the **main request** read as follows:

"1. A copolymer comprising ethylene interpolymerized with at least one C_{3-10} α-olefin, characterized by:

a) a melt index range from 1.1 to 1.6 dg/min., as determined according to ASTM D-1238, Condition 190°C/2.16 kg,

b) a density from 0.913 to 0.921 g/cc, as determined according to ASTM D-792,

c) an I_{10}/I_2 from 7.0 to 7.7, as determined in accordance ASTM D-1238, Condition 190°C/2.16 kg and Condition 190°C/10 kg, and

d) the normalized SCBD as determined by CRYSTAF at a cooling rate of 0.2 °C/min comprises a bimodal distribution in the temperature range from 30 to 90 °C having peaks corresponding to a low crystalline component (having a peak height in relative amount of RA_1) and high crystalline polymeric component (having a peak height in relative amount of RA_2) and a curve minimum at a temperature between said first and second peaks, (having a curve minimum height, MA) wherein the ratio of the low crystalline component peak height divided by the curve minimum height (RA_1/MA) is greater than 2.2."

"2. A copolymer according to claim 1 wherein the melt index range is from 1.2 to 1.4 dg/min., the density is from 0.915 to 0.919 g/cc, the I_{10}/I_2 is from 7.2 to 7.5, and the ratio of the low crystalline component peak height divided by the high crystalline polymer peak height (RA_1/RA_2) of less than 3.0."

"3. A copolymer according to Claim 1 which has a melt index of 1.3 g/10 minutes."

"4. A copolymer according to Claim 1 which has a melt flow ratio of 7.4."

"5. A copolymer according to Claim 1 which has a Mw/Mn from 3.3 to 3.6."

"6. A copolymer according to any one of the preceding claims which is a copolymer of ethylene and 1-hexene or ethylene and 1-octene prepared under Ziegler/Natta solution polymerization conditions."

"7. A copolymer according to Claim 6 wherein the solution polymerization conditions comprise a temperature from 170 to 174°C, and a cocatalyst/ catalyst (Al:Ti) molar ratio of from 4:1 to 5:1."

"8. A copolymer according to any one of the preceding claims in the form of a sheet, a film; or at least one layer of a multilayer film; or a laminated article, a bag, a sack, or a pouch comprising said sheet, film or multilayer film."

"9. A polymer blend comprising a copolymer according to any one of the preceding claims and one or more additional ethylene containing homopolymers or interpolymers."

"10. A polymer blend containing from 40 o 95 percent based on the total polymer weight of a copolymer according to any one of claims 1 to 8 and from 60 to 5 percent of a second polymer."

"11. A polymer blend according to Claim 10 containing from 60 to 90 percent of said copolymer and 40 to 10 percent of said second polymer".

"12. A polymer blend according to Claim 11 containing 70 to 90 percent of said copolymer and 30 to 10 percent of said second polymer".

Claims 13 to 15 of that main request were directed to further embodiments of polymer blends according to claim 10.

The wording of claims 1 to 15 of the **first auxiliary request** corresponded to the one of claims 1 to 15 of the above main request, respectively, whereby the following amendments were made:

- Claim 6 was only dependent on claims 1 or 2;

- Each of claims 8 to 10 was only dependent on claims 1, 2 or 6;

- Claims 11 and 12 were dependent on claims 11 and 12 (sic), respectively.

V. In its decision the opposition division held, *inter alia*, that while the set of claims of the main request satisfied the requirements of Article 123(2), 54 and 56 EPC, it did not meet the requirements of sufficiency of disclosure. Also, none of the first to the fifth auxiliary requests was considered to satisfy the requirements of sufficiency of disclosure.

The opposition division further considered that amended Figure 1 satisfied the requirements of Article 123(2) EPC but that amended Table 2 did not. Finally, whereas document D4 was admitted into the proceedings, documents D6 to D8 were not.

VI. The patent proprietor (appellant) lodged an appeal against the above decision and, in its statement of grounds of appeal, requested that the decision of the opposition division be set aside and that the patent be maintained in amended form according to either the main request or any of the first to the fifth auxiliary requests filed therewith. Each of the main request and the first to the fifth auxiliary requests were identical to the main request and the first to the fifth auxiliary requests dealt with in the contested decision, respectively. Also, a "main description request", a "first auxiliary description request" and a "second auxiliary description request" directed to an amended Figure 1 optionally together with an amended Table 2 (two different versions), were submitted.

VII. With letter dated 28 August 2015, the opponent (respondent) requested an extension of the deadline for replying to the appellant's statement of grounds of appeal, arguing that they were carrying out additional experiments which required some time to be done and evaluated. However, that request was refused and the respondent informed accordingly with communication dated 7 September 2015.

VIII. With letter dated 10 September 2015, the respondent requested that the appeal be dismissed and submitted additional experimental data (see sections 4.8 to 4.11 of that letter, in particular the table of section 4.8). Reference was further made to experimental data submitted with letter of 18 August 2014 during the opposition proceedings (see the table of section 4.12 of that letter). The respondent further requested that the decision of the opposition division not to admit documents D6 to D8

into the proceedings be overturned.

IX. With a further letter, the appellant requested that the decision of the opposition division not to admit documents D6 to D8 into the proceedings be confirmed and that the new experimental data filed by the respondent with letter of 10 September 2015 not be admitted into the proceedings.

X. With a communication sent in preparation of oral proceedings, the Board set out its preliminary view of the case. Concerns pursuant to Article 123(2) EPC were in particular indicated in respect of claim 9 (in particular when depending on claim 5) and in respect of Figure 1 and Table 2 (both versions) filed with the statement of grounds of appeal (see sections 5.1 to 5.3).

XI. With letter dated 15 August 2018 the appellant submitted additional auxiliary requests 3A to 5A and a third auxiliary description request consisting of page 19 of the description (which included Table 2) and Figure 1, both according to the corresponding passages of the granted patent.

XII. With letter dated 29 August 2018, the respondent submitted the following document:

D9: Handbook of thermoplastics, Marcel Dekker Inc., 1997, front pages and pages 1-4

XIII. During the oral proceedings, which were held on 2 October 2018 in the presence of both parties, the appellant filed an **amended first auxiliary request**, which only differed from the first auxiliary request filed with the statement of grounds of appeal in that

claims 11 and 12 were amended in order to depend on claims 10 and 11, respectively. All auxiliary requests apart from said amended first auxiliary request submitted during the oral proceedings before the Board were withdrawn. Also all requests directed to an amended description (in any form) were withdrawn.

In respect of the amended first auxiliary request, the respondent acknowledged, in answer to a question of the Board, that they had no objections pursuant to Article 123(2) EPC.

XIV. The arguments of the appellant, as far as relevant to the present decision, were essentially as follows:

Main request - Article 123(2) EPC

(a) The wording of claim 9 was identical to paragraph 13 of the application as filed and the dependency on claims 1 to 8 was derivable from the combination of said paragraph 13 with other passages of the application as filed. In particular, the subject-matter of claim 9, depending on claim 5, was based on the combination of paragraphs 10, 13 and 35 of the application as filed, whereby the skilled person would have seen from the application as a whole that said combination was contemplated. Therefore, claim 9 satisfied the requirements of Article 123(2) EPC.

First auxiliary request

(b) Sufficiency of disclosure

Although the burden of proof resided on the respondent, there was no evidence on file that

copolymers according to claim 1 of the first auxiliary request could not be prepared on the basis of the information provided in the patent in suit, in particular in the examples or in paragraphs 11, 55, 58 and 70 thereof. In that respect, it was in particular derivable from paragraphs 55 and 58 that an Al:Ti ratio from 4:1 to 5:1 had to be used, whereby that ratio was calculated on the basis of the aluminium present in the cocatalyst which was added to the catalyst during the polymerisation process, i.e. not considering aluminium originating from the preparation of the catalyst itself. Reading that that ratio should be calculated taking into account the aluminium present in the catalyst itself, as argued by the respondent, did not make sense in view of the teaching of the patent in suit.

Although the amount of catalyst used was not indicated in the examples of the patent in suit, it could be derived from the ethylene conversion rate given therein. Also, there was no evidence showing that it was not possible to prepare a copolymer as defined in operative claim 1 by following the teaching of those examples and using usual working conditions and, if required, common general knowledge.

In view of the above, the patent in suit was sufficiently disclosed.

(c) Admission of D6 to D8 and of the new experimental data filed by the respondent with letter of 10 September 2015

D6 to D8 were not to be admitted into the

proceedings because they were late-filed and *prima facie* not relevant.

The same was valid for the experimental data filed by the respondent with letter of 10 September 2015, i.e. only in appeal, since they were not related to a rework of example "3+4" of D4 but concerned other polymers prepared using a different catalyst system.

(d) Novelty over D4

There was no evidence on file showing that the copolymer prepared in example "3+4" of D4 satisfied feature c) according to operative claim 1. In particular, the overestimation of 17 % of the value of that feature obtained by linear extrapolation of the melt flow data disclosed in D4 for example "3+4", which was relied upon by the respondent in view of the experimental data filed with letter of 18 August 2014, could not be applied to example "3+4" of D4 because those data concerned a different copolymer, prepared under different conditions. Therefore, the respondent's novelty objection was to be rejected.

(e) Inventive step

Example “3+4” of D4 constituted the closest prior art and the subject-matter of claim 1 of the first auxiliary request differed therefrom only in the requirement that feature I_{10}/I_2 should be in the range of 7.0 to 7.7 (feature c) of claim 1), which was not specifically disclosed in D4.

Examples 1-3 and Tables 3-4 of the patent in suit

showed that the technical problem effectively solved over the closest prior art resided in the provision of copolymers having improved properties in terms of haze, dart impact and tear.

Independently of whether or not an improvement over the closest prior art was acknowledged, there was no hint in the prior art regarding how to proceed in order to arrive at a copolymer satisfying the specific combination of features a) to d) in the ranges defined in operative claim 1. In that respect, it was not sufficient to show that it was possible to modify feature c) according to operative claim 1. Rather, it should be shown that when doing so, the other features a), b) and d) remained in the ranges mentioned in operative claim 1. In the present case, it was to be noted that the melt index I_2 and the density of the copolymer prepared in example "3+4" of D4 were close to one of the ends of the ranges specified for those parameters in features a) and b), respectively, according to operative claim 1. Also, the teaching of D7 and D8 was not relevant since it was not directed to copolymers according to example "3+4" of D4 or according to operative claim 1.

In view of the above, the subject-matter of operative claim 1, and therefore of operative claims 2-15, was inventive.

XV. The arguments of the respondent, as far as relevant to the present decision, may be summarised as follows:

Main request - Article 123(2) EPC

(a) Claim 9, when read in combination with claims 3, 4, 5, 7 or 8, extended beyond the content of the application as filed. In particular the subject-matter of claim 9, when depending on claim 5, could only be arrived at after combining paragraphs 10, 13 and 35 of the application as filed. However, such a combination was not directly and unambiguously derivable from the application as filed. Therefore, claim 9 did not satisfy the requirements of Article 123(2) EPC.

First auxiliary request

(b) Sufficiency of disclosure

The objection of lack of sufficiency of disclosure was based on the examples of the patent in suit itself. In particular, examples 1-3 thereof were directed to the preparation of a catalyst according to example 7 of D5, whereby triethyl aluminium (TEA) was further fed as a cocatalyst together with said catalyst at a molar ratio such that Al/Ti was in the range 4:1 to 5:1. Considering that it was nowhere indicated in the patent in suit that said ratio only referred to the aluminium contained in TEA added as cocatalyst, in particular not in paragraphs 55 and 58 thereof, there was no reason not to take into account, for the calculation of that ratio, any aluminium originating from the preparation of the catalyst itself. That reading of paragraphs 70, 55 and 58 was further supported by

common general knowledge directed to Ziegler-Natta catalysts, as illustrated e.g. in D9. Since the catalyst prepared in example 7 of D5 contained an Al/Ti ratio of 15:1, it was not possible to adjust the Al/Ti molar ratio to 4-5 as indicated in paragraph 70 of the patent in suit. Therefore, the examples of the patent in suit could not be repeated.

The patent in suit further did not disclose the amount of catalyst used in the examples according to the invention.

Also, as already discussed in the first instance proceedings, Table 2 of the patent in suit contained multiple errors. Therefore, the patent in suit did not contain any example for producing a copolymer according to operative claim 1 and the skilled person was not in a position to prepare a copolymer according to operative claim 1 without undue burden.

For those reasons, the patent in suit was not sufficiently disclosed.

(c) Admission of D6 to D8 and of the new experimental data filed by the respondent with letter of 10 September 2015

D6 to D8 were first filed in reply to the preliminary opinion of the opposition division. In particular, D6 was related to the issue of calculating a melt index under unusual loads and was highly relevant in respect of feature c) of operative claim 1, in particular for the assessment of novelty over D4 since said feature was argued to

be implicitly disclosed in D4. Also, D7-D8 were both related to the relationship between haze and molecular weight distribution and were highly relevant in respect of inventive step since improvement of haze was an effect relied upon in the patent in suit and molecular weight distribution was reflected in feature c) of operative claim 1.

The new experimental data filed by the respondent with letter of 10 September 2015 had been submitted as soon as possible, albeit the deadline of 4 months to reply to the statement of grounds of appeal could not be respected. Although it was correct that those data were directed to polymers different from those prepared in example "3+4" of D4, they were suitable to estimate the missing parameter according to feature c) of operative claim 1, which was not explicitly disclosed therein.

For those reasons, D6 to D8 as well as the new experimental data filed by the respondent with letter of 10 September 2015 were *prima facie* highly relevant and should be admitted into the proceedings.

(d) Novelty over D4

The subject-matter of operative claim 1 differed from the copolymer prepared in example "3+4" of D4 at most in that no information was explicitly disclosed in D4 regarding feature c) as defined therein. However, D4 provided information regarding the melt index measured at loads of 2.16 kg and 21.6 kg and it was derivable from a linear

interpolation between those values that the ratio I_{10}/I_2 for the copolymer prepared in example "3+4" of D4 was close to the range defined in feature c) according to claim 1 of the first auxiliary request. Also, it was derivable from the experimental data filed with letter of 18 August 2014 (as reported in the table of section 4.12 of the respondent's letter of 10 September 2015) that the calculated I_{10}/I_2 ratio calculated by linear interpolation was overestimated by 17 %: applying that result to the value of the calculated I_{10}/I_2 ratio for the copolymer prepared in example "3+4" of D4 led for example "3+4" of D4 to a ratio I_{10}/I_2 within the range of 7.0 to 7.7 defined in operative claim 1. In that respect, it was in particular acknowledged during the oral proceedings before the Board, that the experimental data filed with letter of 18 August 2014 (table contained in section 4.12 of the respondent's letter of 10 September 2015) were obtained from copolymers which had not been made according to the teaching of D4, in particular its example “3+4”.

Also, since the estimation of I_{10} calculated by linear interpolation for the copolymer prepared in example "3+4" of D4 led to a ratio I_{10}/I_2 close to the range defined for feature c) in operative claim 1, the requirements of a selection invention to acknowledge novelty over example "3+4" of D4 were in any case not satisfied.

Consequently, the subject-matter of operative claim 1 was not novel over example "3+4" of D4.

(e) Inventive step

Example "3+4" of D4 constituted the closest prior art and the subject-matter of claim 1 of the first auxiliary request differed therefrom only in the requirement that feature I_{10}/I_2 should be in a range of 7.0 to 7.7 (feature c) of claim 1), which was not specifically disclosed in D4.

No effect related to that distinguishing feature only had been shown to be achieved, in particular not in the examples and comparative examples of the patent in suit. Also, the compositions according to Table 4 of the patent in suit could not be fairly compared with the copolymers of Table II of D4. Therefore, the technical problem effectively solved over the closest prior art merely resided in the provision of an alternative copolymer.

It was obvious to arrive at a copolymer satisfying feature c) of operative claim 1 merely by varying the amounts of copolymers "3" and "4" used to prepare the blend "3+4" according to the closest prior art D4. In that respect, it was in particular known in the art, e.g. in D7 and D8, that improved haze could be obtained by controlling the molecular weight distribution.

For those reasons, the subject-matter of operative claim 1 was not inventive.

XVI. The appellant requested that the decision under appeal be set aside and the patent be maintained in amended form according to the set of claims of the main request filed with the statement of grounds of appeal or the

set of claims of the first auxiliary request filed during the oral proceedings before the Board.

The respondent requested that the appeal be dismissed.

Reasons for the Decision

Main request

1. Article 123(2) EPC

1.1 According to standard jurisprudence an amendment is to be regarded as introducing subject-matter extending beyond the content of the application as filed, and hence unallowable, if the overall change in the content of the application/patent results in the skilled person being presented with information that is not directly and unambiguously derivable from the information presented by the application as filed (see Case Law of the Boards of Appeal of the EPO, 8th edition, 2016, II.E.1).

1.2 The respondent argued *inter alia* that claim 9, when read in combination with claim 5, extended beyond the content of the application as filed.

1.3 The appellant was of the opinion that the subject-matter of claim 9, referring to claim 5, could be arrived at by combining paragraphs 10, 13 and 35 of the application as filed.

In that respect, said paragraph 10 is directed to the "fifth aspect of the present invention" of the application as filed, namely a copolymer characterised

by the combination of four parameters according to claim 1 of the operative main request, whereby the application as filed further contained four other "aspects of the invention", directed to copolymers defined by the combination of the three parameters a) to c) of claim 1 of the main request with various features which defined the shape of the normalised SCBD curve in a different manner than the one indicated in feature d) of claim 1 of the main request. Those four other aspects are indicated in paragraphs 6 to 9 of the application as filed, respectively.

Paragraph 13 of the application as filed is directed to "another aspect of the invention", which is indicated as being a polymer blend comprising a copolymer according to any of the foregoing aspects of the invention and one or more additional ethylene containing homopolymers or interpolymers (i.e. according to the wording of operative claim 9). Therefore, the combination of paragraphs 10 and 13 relied upon by the appellant already amounts to making a choice among the five "aspects" disclosed in paragraphs 6 to 10 the application as filed and then combining that specific disclosure with paragraph 13.

In paragraph 35 of the application as filed, it is further mentioned that "generally, the present polymers have a Mw/Mn from 3.2 to 3.6, preferably from 3.3 to 3.6", whereby the latter, preferred, range corresponds to the feature of operative claim 5. However, no passage of the application as filed was identified by the appellant to show that there was a direct and unambiguous connection between the specific passages of paragraphs 10, 13 and 35 (in particular the preferred range indicated therein) of the application as filed. Under such circumstances, the combination of features

now defined in claim 9, depending on claim 5, can only be arrived at by artificially creating an embodiment by combining three passages of the application as filed, namely paragraphs 10, 13 and the preferred range indicated in paragraph 35. In the absence of any pointer thereto, such a combination cannot be held to amount to a disclosure which is directly and unambiguously derivable from the application as filed (Case Law, *supra*, II.E.1.4.1).

1.4 For that reason, operative claim 9 does not satisfy the requirements of Article 123(2) EPC and the main request, as a whole, is not allowable.

First auxiliary request

2. It was clarified during the oral proceedings before the Board that, in respect of the first auxiliary request, the respondent had no objections pursuant to Article 123(2) EPC (see section XIII above). The Board has no reason to deviate from that view.

3. Sufficiency of disclosure

3.1 In order to meet the requirement of sufficiency, an invention has to be disclosed in a manner sufficiently clear and complete for it to be carried out by the skilled person in the whole area claimed without undue burden, on the basis of the information provided in the patent specification and, if necessary, using common general knowledge. This means, in the present case, that the skilled person should be capable of preparing copolymers according to operative claim 1, which is disputed by the respondent.

3.2 In that respect, the main argument of the respondent was, as also held by the opposition division (pages 11-12 of the decision), that the patent in suit failed to provide sufficient information regarding the catalyst system (catalyst, cocatalyst and relative amount thereof) to be used in order to prepare a copolymer according to operative claim 1.

3.2.1 However, in examples 1 to 3 of the patent in suit, ethylene copolymers are produced by first preparing a catalyst "essentially according to the procedure described in" example 7 of D5 and then feeding said catalyst to the polymerisation reactor together with TEA as cocatalyst, whereby the Al/Ti molar ratio is adjusted to 4-5 (paragraph 70 of the patent in suit).

3.2.2 With regard to the question whether the skilled person would understand that the Al/Ti ratio indicated therein should take into account any aluminium present in the catalyst (from its preparation process), as argued by the respondent, it is noted that no mention is made in paragraph 70 to aluminium present in the catalyst so prepared. Rather, the only explicit reference to aluminium is related to the aluminium component added in the form of TEA, as cocatalyst.

3.2.3 Moreover, it is derivable from paragraphs 55 and 58 of the patent in suit that the ratio Al/Ti indicated in said paragraph 70 is indeed directed to the molar ratio of aluminium of the cocatalyst to the titanium from the catalyst. In particular, the TEA:Ti molar ratio indicated at page 9, line 7 (paragraph 55), which deals with a preparation process suitable to carry out the invention of the patent in suit (page 9, line 1), clearly relates to a ratio of components comprised in the cocatalyst and in the catalyst, respectively

(according to page 9, line 3, the catalyst is prepared using a different aluminium compound than TEA; also, according to page 9, line 5, the catalyst prepared before adding a solution of TEA already exhibited a ratio Al/Ti of 12.5:3.0, i.e. of 4.2). That reading is further in line with the wording "cocatalyst/catalyst (Al:Ti) molar ratio" of paragraph 58 of the patent in suit and granted claim 7.

3.2.4 Under such circumstances, the teaching of the patent in suit as a whole is consistent and unambiguously points to defining the Al/Ti ratio of 4-5 throughout the patent in suit, and in particular in paragraph 70 thereon, on the basis of the aluminium of the cocatalyst to the titanium of the catalyst.

3.2.5 The respondent argued additionally that the teaching of paragraph 70 could not be carried out because example 7 of D5 disclosed the preparation of a titanium catalyst comprising TEA in a ratio such that the molar ratio Al/Ti was of 15/1 when considering the aluminium originating from the preparation of the catalyst itself, as argued in the contested decision (middle of page 11).

3.2.6 However, the fact that the catalyst prepared in example 7 of D5 already contained aluminium in an amount of 15/1 is, in the Board's view, not in contradiction with the teaching of the patent in suit.

3.2.7 First of all, the teaching of paragraph 70 of the patent in suit is that the catalyst is first prepared "essentially according to" example 7 of D5, which, as indicated by the opposition division, would be understood as meaning that the catalyst used in the patent in suit is "essentially" the same as that of

example 7 of D5, i.e. that example was reproduced as closely as possible (decision: page 11, third paragraph). Therefore, it is accepted that the catalyst used in the examples of the patent in suit exhibited a molar ratio Al/Ti of 15/1, as argued by the respondent.

3.2.8 On the other side, as explained in paragraphs 3.2.1 to 3.2.4 above, the teaching of the patent in suit is that the Al/Ti molar ratio of 4-5 indicated in paragraph 70 is to be understood as referring to the molar ratio of aluminium in the cocatalyst (TEA) to titanium in the catalyst (prepared according to example 7 of D5).

3.2.9 On top of that, reading paragraph 70 of the patent in suit as suggested by the respondent would not make sense from a technical point of view, since adjusting the ratio Al/Ti from about 15 (according to example 7 of D5) to around 4-5 (as indicated in paragraph 70 of the patent in suit) would either not be technically possible (since it would require to lower the Al/Ti ratio by addition of an aluminium containing component) or would mean that a completely different catalyst than the one explicitly taught in the patent in suit (example 7 of D5) would have to be prepared (which would not be considered since the catalyst system is known to have a decisive impact on the properties of the polymer produced therewith).

3.2.10 Under such circumstances, the reading of paragraph 70 of the patent in suit contemplated by the respondent would, in the Board's view, not make sense and would not be retained by the skilled person.

3.2.11 D9, which was further referred to by the respondent, is an excerpt of a textbook and provides general information regarding Ziegler-Natta catalysts such as

those used in the patent in suit. Although it is indicated therein that such catalysts comprise a transition metal compound (such as titanium) as catalyst and an alkyl aluminium compound (such as TEA) as cocatalyst (D9: pages 3-4, section A and Table 1), it contains no information to refute the conclusions reached from the information provided in paragraphs 70, 55 and 58 of the patent in suit itself according to which, in the examples of the patent in suit, a catalyst is first prepared (which may include an aluminium compound) and then fed to the polymerisation reactor together with a cocatalyst (TEA) in an amount such that the Al/Ti ratio of the aluminium contained in the added cocatalyst (TEA) to the titanium contained in the catalyst is of 4-5. In other words, the teaching of D9 does not allow to deviate from the teaching regarding the Al/Ti ratio which is derivable from the patent in suit itself.

3.2.12 In view of the above, the respondent's line of argumentation based on paragraphs 55, 58 and 70 of the patent in suit, also in combination with D9, is rejected.

3.3 The respondent argued additionally that the patent in suit was insufficiently disclosed because it failed to provide any information regarding the amount of catalyst to be used to carry out the examples thereof.

However, according to EPO case law, an objection of insufficient disclosure presupposes that there are serious doubts, substantiated by verifiable facts and the burden of proof is primarily on the opponent, here the respondent (Case Law, *supra*, II.C.8). Considering that, in the present case, there is no evidence on file that working according to the teaching of paragraph 70

of the patent in suit and using conditions usual in the art does not allow to prepare polymers according to operative claim 1, the respondent's objection is not supported by facts and, thus, fails to convince.

3.4 The respondent further argued that in view of the various errors contained in Table 2 of the patent in suit, there was no evidence that a copolymer according to operative claim 1 was effectively prepared in the examples of the patent in suit.

Although it was not disputed by the appellant that Table 2 of the patent in suit indeed contained some errors, in particular in respect of feature d) indicated in operative claim 1 (see statement of grounds of appeal: page 2, section "Added Matter", starting from the fifth paragraph), there is, also in that respect, no evidence on file showing that the copolymer according to operative claim 1 cannot be prepared following the teaching of paragraph 70 of the patent in suit, if needed completed by the information provided elsewhere in the patent in suit and/or common general knowledge. Therefore, also that objection is, in view of the evidence on file, not persuasive.

3.5 For those reasons, the respondent's objections regarding a lack of sufficient disclosure is rejected.

4. Admission of D6 to D8 and of the new experimental data filed by the respondent with letter of 10 September 2015

4.1 In its letter dated 10 September 2015, the respondent made reference to two different sets of experimental data, namely some new data filed for the first time with said submission (sections 4.8 to 4.11, in

particular the table of section 4.8) and experimental data that were already submitted with letter of 18 August 2014 during the opposition proceedings (table of section 4.12 of that letter). It is noted that the appellant's request regarding non-admittance into the proceedings is only directed to the new experimental data filed in appeal (i.e. the data contained in sections 4.8 to 4.11 indicated above).

4.2 D6 to D8 were filed by the respondent (then opponent) in reply to the preliminary opinion of the opposition division. Since those documents were then not admitted into the proceedings by the opposition division, the respondent requested their admittance once more in appeal with its letter dated 10 September 2015.

4.3 Therefore, each of D6 to D8 as well as the new experimental data filed by the respondent with letter of 10 September 2015 are considered to have been submitted by the respondent after the deadline of four months defined in Article 12(1)(b) RPBA, which ended on 1 September 2015 (see EPO notification dated 21 April 2015). It is further noted in that respect that the respondent’s request for an extension of that deadline submitted with letter of 28 August 2015 was refused. Under those circumstances, the admittance into the proceedings of each of D6 to D8 as well as that of the experimental data submitted with letter of 10 September 2015 is subject to the Board’s discretion pursuant to Article 13(1) RPBA.

4.4 Although D6 to D8 and the new experimental data were not filed within the deadline pursuant to Article 12(1)(b) RPBA, they were filed less than 10 days later. Besides, those experimental data were already announced in the respondent’s letter of

28 August 2015. Finally, all those documents were filed early enough in the proceedings so that they could be taken into account by the appellant and by the Board. Therefore, the resubmission of D6 to D8 on appeal as well as the submission of the new experimental data do not constitute an abuse of the proceedings.

4.5 D6 was filed to derive information regarding the melt flow parameter I_{10}, which is mentioned in feature c) of claim 1 of the first auxiliary request (and of claim 1 of the then pending main request), but which is not explicitly disclosed in the closest prior art D4.

D7 and D8 contain some information relating to broadness of the molecular weight distribution (corresponding to feature c) of operative claim 1) and haze, which is one of the technical effects considered as being improved in the patent in suit and assessed in the examples (whereby haze is also referred to therein as "good optical properties"; see paragraphs 1, 2, 8, 73, 74 and Tables 2-3 of the patent in suit).

Therefore, each of D6 to D8 addresses the central issue of a point which was decided against the opponent (inventive step) in the contested decision and may be seen as a direct reaction to the opposition division's decision.

4.6 The new experimental data filed by the respondent with letter of 10 September 2015 concern a new objection (lack of novelty over D4), which was never raised in opposition. In that respect, there is no apparent reason why that objection was put forward at such a late stage since the claims defended by the appellant at the onset of the appeal proceedings were the same as the ones defended during the opposition proceedings.

Moreover, while those data were submitted in order to show that the copolymer prepared in example “3+4” of D4 implicitly satisfied feature c) of operative claim 1, they were related to polymers that were not made according to the teaching of D4, in particular its example “3+4”, casting therefore strong doubts on their relevance.

4.7 In view of the above, the Board finds it appropriate to exercise its discretion pursuant to Article 13(1) RPBA by deciding that:

- D6 to D8 are admitted into the proceedings;

- the additional experimental data submitted by the respondent with letter of 10 September 2015 (data contained in sections 4.8 to 4.11) are not admitted into the proceedings.

5. Novelty

5.1 The respondent argued that operative claim 1 was anticipated by example "3+4" of D4.

5.1.1 Example "3+4" of D4 discloses the preparation of a blend of ethylene hexene copolymers prepared according to examples "3" and "4" of D4, whereby both copolymers comprise a first component produced by a non-single-site polymerisation catalyst and a second component produced by a single-site polymerisation catalyst (page 35, line 4 to page 36, line 24 and Table II, page 40). The copolymer blend so prepared exhibits a melt index I_2 according to feature a) of operative claim 1 of 1.5 g/10 min and a density according to feature b) of operative claim 1 of 0.913 g/cm^3 (D4:

Table II). The opposition division's finding according to which it was derivable from Figure 5 of D4 that the copolymer of example "3+4" exhibited a ratio RA_1/MA according to feature d) of operative claim 1 of 7 (see the table of section 5.3 of the decision) was further not contested by the appellant. Therefore, the subject-matter of operative claim 1 differs at most from the copolymer prepared in example "3+4" of D4 in the requirement that the ratio I_{10}/I_2 according to feature c) of operative claim 1 should be in the range of 7.0 to 7.7, which is not explicitly disclosed in D4.

5.1.2 To compensate for that lack of information in respect of feature I_{10}/I_2 regarding the copolymer prepared in example "3+4" of D4, it was discussed during the proceedings whether that feature could be derived from the melt index at loads of 21.6 kg - I_{21} - and 2.16 kg - I_2- (see page 29, lines 8-11 of D4) reported in Table II of D4. In that respect, both parties agreed that on a logarithmic scale, melt indexes vary as a function of the applied load in a manner represented in the figure shown in section 4.5 of the respondent's letter of 10 September 2015, namely as a curve having a concave shape whereby the melt index is smallest at the smallest load and increases with load with increasing slope. Therefore, it may be agreed with the respondent that knowing the melt index at loads of 2.16 kg (I_2) and 21.6 kg (I_{21}) indicated in Table II of D4 allows to conclude that the melt index at a load of 10.6 kg (I_{10}) must be below 12.7 g/10 min (as obtained by linear interpolation between I_2 and I_{21}), which means that the copolymer prepared in example "3+4" of D4 has a ratio I_{10}/I_2 of maximum 8.46 (see sections 4.4 to 4.6 of the respondent's letter dated 10 September 2015). In that respect, it was not contested by the appellant that the value of 8.46 derived from the data of D4 was an

overestimation of the unknown melt index ratio I_{10}/I_2 for the copolymer "3+4" of D4. However, in the absence of any information regarding the magnitude of that overestimation, it is not possible to conclude that the ratio I_{10}/I_2 of the copolymer prepared in example "3+4" of D4 is within the range of "7.0 to 7.7" indicated in feature c) of claim 1 of the first auxiliary request.

5.1.3 The respondent argued that it was derivable from the experimental data filed with letter of 18 August 2014, in particular example 3 thereof, that the extrapolated value of 8.46 was overestimated by 17 %.

However, it was not contested by the respondent (see above section XV(d)), that the experimental data filed with letter of of 18 August 2014 (table contained in section 4.12 of the respondent's letter of 10 September 2015) were obtained from copolymers which had not been made according to the teaching of D4, in particular its example “3+4”. Further considering that it is generally known that properties such as melt index are affected by the composition of the polymer and its preparation process, it cannot be concluded that an overestimation by 17 %, as obtained in example 3 of the data filed in table 4.12 of the respondent's letter of 10 September 2015, also mandatorily applies to the copolymer prepared in example "3+4" of D4. For that reason, the respondent's objection is rejected.

5.1.4 The respondent argued additionally that the estimated value of 8.46 was so close to the range of "7.0 to 7.7" indicated in feature c) of operative claim 1, that the subject-matter being claimed did not fulfill the criteria of a "selection invention".

However, that argument is related to the concept of "selection inventions" (Case Law *supra*, I.C.6.3), i.e. the selection of a sub-range of numerical values from a broader disclosed range, which is not the issue at stake in the present case, in which it is to be assessed if a feature not disclosed in the prior art may be held to be nevertheless implicitly satisfied. Therefore, that argument is not persuasive.

5.2 Under such circumstances, the respondent's novelty objection in view of example "3+4" of D4 is rejected.

6. Inventive step

6.1 Closest prior art and distinguishing feature

In agreement with the opposition division’s finding, both parties were of the opinion that example “3+4” of D4 constituted the closest prior art. There is no reason to deviate from that view.

The subject-matter of operative claim 1 differs from the copolymer according to said example “3+4” only in the requirement that feature I_{10}/I_2 should be in a range of 7.0 to 7.7 (feature c) of claim 1), which is not specifically disclosed in D4 (see section 5, above).

6.2 Technical problem effectively solved

6.2.1 The appellant argued that the problem to be solved resided in the provision of a copolymer exhibiting improved processability, which would be derivable from the comparison of example 1 and comparative example A of the patent in suit and/or from the comparison of

examples 1-3 with example "3+4" of D4 (see Tables 3 and 4 of the patent in suit and Table II of D4).

6.2.2 In that respect, the respondent argued that, since the appellant had admitted that the data of Table 2 of the patent in suit were wrong, in particular in respect of feature d) according to operative claim 1, the examples of the patent in suit were not illustrative of the operative claims.

However, independently of whether or not the corrected data provided in Annex 1 of the "main description request" filed with the appellant's statement of grounds of appeal were allowable pursuant to Article 123(2) EPC, those amended data may be considered as supplementary technical information provided by the appellant, which may be considered for the assessment of the inventive step. In view of those data and in absence of any evidence to the contrary, examples 1 to 3 of the patent in suit are considered to illustrate the subject-matter of operative claim 1.

6.2.3 Nevertheless, it remains that no comparison between a copolymer according to operative claim 1 with a copolymer according to example "3+4" of D4 is on file. Also, it is derivable from the amended data indicated in Annex 1 of the "main description request" filed with the statement of grounds of appeal that the copolymer of comparative example A differs from the copolymer prepared in example 1 of the patent in suit not only in that it does not satisfy the feature I_{10}/I_2 but also in that it exhibits a different value of the feature RA_1/MA (according to feature d) of operative claim 1), which is neither in line with the teaching derivable from Figure 5 of D4, nor according to the requirement of feature d) of claim 1.

It is further noted that it is not clear whether or not the copolymers prepared in example 1 and in comparative example A of the patent in suit may be fairly compared since no indication of their respective comonomer (1-octene) amounts, which appears to be known to possibly affect the copolymer properties (see e.g. D4: page 25, lines 9-30), was provided by the appellant.

Table 4 of the patent in suit is further related to 80/20 blends of a copolymer according to operative claim 1 with LDPE (paragraph 73 and title of Table 4 of the patent in suit). Therefore, the comparison of the properties of the blends shown in Table 4 of the patent in suit with those of the copolymer prepared in example "3+4" of D4 may not demonstrate that an effect is obtained in relation to the distinguishing feature identified above, contrary to the appellant's argumentation.

In view of the above and further considering the properties indicated in Table 3 of the patent in suit and in Table II of D4 (page 40), the problem effectively solved over D4 is seen as residing in the provision of further copolymers suitable for film applications, in particular packaging applications, and having good impact and tear strength as well as low haze, good gloss and good stiffness.

6.3 Obviousness

6.3.1 The question remains to be answered if the skilled person, aiming at solving the identified problem, would, in view of the prior art, have modified the disclosure of the closest prior art in such a way as to

arrive at the subject matter of operative claim 1.

6.3.2 In that respect, the question arises if the skilled person, aiming at preparing further compositions, would have known how to proceed in order to obtain a composition satisfying all the requirements according to claim 1, in particular a composition satisfying simultaneously features a) to d) as defined therein. However, in the present case, no evidence was provided by the respondent, in particular not in reply to the Board's communication in which that issue was identified (see section 8.4.2, first bullet point), that it would be possible to do so following the teaching of D4. It may further be noted that, since use is made in D4 of a specific catalytic system (see section 5.1.1 above: combination of a single-site catalyst and a non-single-site catalyst), which does not correspond to the teaching of patent in suit (as is derivable from paragraphs 39-58 and 70 thereof), there is no reason to expect that this is mandatorily the case. Therefore, there is in the present case no evidence that the skilled person may arrive at the subject-matter of operative claim 1 on the basis of the teaching of D4, optionally completed by common general knowledge.

6.3.3 The respondent argued that D4 suggested to work in the I_{10}/I_2 range according to operative claim 1.

However, even if this were to be correct (to the respondent's benefit, although this was contested by the appellant), the question remains if the skilled person would have known how to achieve this while still satisfying the other features a), b) and d) according to operative claim 1, whereby the ranges for those features disclosed in D4 may be outside the ranges

defined in said claim 1 (see e.g. D4: page 26, line 25 to page 27, line 11 for features a) and b); see also Figure 5 of D4 for feature d)). There is further no evidence on file that this could be done in an obvious manner on the basis of the teaching of D4, if necessary in combination with other prior art documents and/or common general knowledge. To the contrary, it appears that the respondent himself argued, in the framework of the objection regarding sufficiency of disclosure, that the skilled person would not know, even when taking into account the teaching of the patent in suit, how to achieve this on the basis of his common general knowledge.

It is further noted that, should the ratio I_{10}/I_2 of the copolymer prepared in example "3+4" of D4 be modified, also the melt index I_2, corresponding to feature a) of operative claim 1 would automatically be simultaneously affected. However, in the Board's view, it is not possible to conclude, on the basis of the evidence on file, that modifying the ratio I_{10}/I_2 of the copolymer prepared in example "3+4" of D4 so as to satisfy feature c) of operative claim 1, would lead to a copolymer still satisfying feature a) according to operative claim 1 (in particular considering that that the copolymer of example "3+4" has a melt index I_2 of 1.5 g/10 min, which is close to the upper end of the range defined in said feature a), namely 1.6 dg/min).

Besides, the value of the density of the copolymer of example “3+4” is exactly at the lower end of the range defined for that parameter in feature b) of operative claim 1 (0.913 g/cc). Considering that densities lower than 0.913 g/cc are within the teaching of D4 (see bottom of page 26) and in the absence of any information regarding both the densities and the

respective amounts of each of the polymers “3” and “4” used to prepare the blend "3+4" of D4, it cannot be concluded that it was shown that the skilled person may arrive at the subject-matter being claimed, in particular in respect of feature b) (density), merely by mixing polymers “3” and “4” in different ratios, as argued by the respondent.

6.3.4 D7 and D8 were relied upon by the respondent to argue that it was known in the art that haze of ethylene polymers could be improved by controlling the molecular weight distribution of the polymers. However, although it is accepted that feature c) is related to molecular weight distribution (as indicated in paragraph 33 of the patent in suit), D7 and D8 provide no information in respect of the issue here at stake, namely if the skilled person would have been in the position to modify the teaching of example "3+4" of D4 so as to prepare, in an obvious manner, a copolymer satisfying the combination of features a) to d) specified in operative claim 1. Under such circumstances, the respondent's argumentation based on D7 and D8 is not convincing.

6.3.5 Finally, it is agreed with the appellant that comparative example A of the patent in suit is not suited to show that the specific combination of features defined in operative claim 1 is usual in the art, in particular because it does not illustrate the teaching of D4 (see appellant’s letter of 18 February 2016 at page 9, penultimate paragraph).

6.3.6 For those reasons, the subject-matter of claim 1 of the first auxiliary request is not obvious and an inventive step is to be acknowledged over example "3+4" as

closest prior art.

6.3.7 The same conclusion applies to the subject-matter of claims 2 to 15 of the first auxiliary request, which either depends on said claim 1 or makes reference thereto.

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 first auxiliary request as filed during the oral proceedings before the Board and after any necessary consequential amendment of the description.

The Registrar: The Chairman:

B. ter Heijden D. Semino

Decision electronically authenticated