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Datasheet for the decision of 13 May 2009

Case Number: T 1140/06 - 3.3.03

Application Number: 98929463.2

Publication Number: 0991679

IPC: C08F 210/06

Language of the proceedings: EN

Title of invention:
Propylene terpolymers and a process for the production thereof

Patentee:
Borealis Technology Oy

Opponent:
Innovene Manufacturing Belgium N.V.
Basell Poliolefine Italia s.r.l.

Headword:
-

Relevant legal provisions:
EPC Art. 100(b)
EPC R. 80

Relevant legal provisions (EPC 1973):
-

Keyword:
"Opposition grounds - insufficiency of diclosure (yes)"
"Amended auxiliary requests admitted to the proceedings"

Decisions cited:
T 0409/91, T 0435/91, T 0172/99, T 1205/06

Catchword:
See Nos. 4.2.2, 5, 5.1, 5.16, 6 and 7.2.2 of the reasons

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1140/06 **-** 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 13 May 2009

Appellant I: (Opponent 02)
Basell Poliolefine Italia s.r.l.
Via Pergolesi 25
I-20124 Milano (MI) (IT)

Representative:
Giberti, Stefano
Basell Poliolefine Italia S.r.l.
Intellectual Property
P.le Privato G. Donegani 12
Casella Postale 19
I-44100 Ferrara (IT)

Appellant II: (Patent Proprietor)
Borealis Technology Oy
P.O. Box 330
FI-06101 Porvoo (FI)

Representative:
Kador & Partner
Corneliusstrasse 15
D-80469 München (DE)

Respondent: (Opponent 01)
Innovene Manufacturing Belgium N.V.
Scheldelaan 482
B-2040 Antwerpen (BE)

Representative:
Smith, Julian Philip Howard
Compass Patents LLP
120 Bridge Road
Chertsey
Surrey KT16 8LA (GB)

Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office dated 10 February 2006 and posted 30 May 2006 concerning maintenance of European patent No. 0991679 in amended form.

Composition of the Board:

Chairman: R. Young
Members: A. Däweritz
C.-P. Brandt

Summary of Facts and Submissions

I. The grant of European patent No. 0 991 679 in respect of European patent application No. 98 929 463.2, filed on 24 June 1998 as International patent application No. PCT/FI98/00556 and claiming the priority of 24 June 1997 of an earlier application filed in Finland (972714), was announced on 26 November 2003 (Bulletin 2003/48). The patent was granted with sixteen claims, including the following claims:

1. A film-making terpolymer of propylene, comprising a mixture of different propylene terpolymer compositions and said terpolymer further comprising comonomer units derived from ethylene and at least one alpha-olefin selected from the group of C_4-C_8 alpha-olefins, the ratio of ethylene to the C_4-C_8 alpha-olefin(s) being less than 0.3 and the hexane solubles fraction is less than 6.5 % calculated from the total weight of the terpolymer.

5. A process for producing terpolymers of propylene according to claim 1, wherein the process is carried out in at least one slurry reactor in the presence of catalysts at elevated temperature, **characterized by** the following steps:

a) feeding into a slurry reactor a reaction mixture containing 50-85 wt-% of propylene, 1-10 wt-% of ethylene, 15-40 wt-% of other C_4-C_8 alpha-olefin, a catalyst system capable of providing olefin polymerization at said temperature conditions, and optionally hydrogen,
b) polymerizing said reaction mixture at a temperature of less than 70 °C a sufficient time to obtain a propylene terpolymer amounting to 50-99 wt-% of the end product,
c) transferring said reaction mixture into a gas phase reactor operated at a pressure of higher than 5 bars, and
d) continuing polymerization in said gas phase reactor for producing a propylene terpolymer amounting to 1 to 50 wt-% of the end product,

whereby a terpolymer is obtained having a melting temperature of less than 135 °C, preferably less than 132 °C.

9. The process according to any of the preceding claims, wherein said slurry reactor is a loop reactor.

13. The process according to any of the preceding claims, wherein up to 10 wt-% of 1-butene is added into the gas phase reactor.

The remaining product claims 2 to 4 and process claims 6 to 8, 10 to 12 and 14 to 16 were all dependent.

In this decision, any reference to passages in the patent in suit as granted will be given underlined in squared brackets, eg [Claim 1] or [0001]. References in underlined italics concern passages in the application as filed and as published in WO-A-98/058971, eg *page 1, lines 8 to 11*. "EPC" refers to the revised text of the EPC 2000, the previous version is identified as "EPC 1973". Moreover, "C_2" is intended to mean ethylene, "C_4" 1-butene, and "C_{4-8}" the other α-olefins mentioned.

II. On 18 and 26 August 2004, respectively, two Notices of Opposition by Opponents O-01 and O-02 were filed, in

each of which revocation of the patent in its entirety was requested. The oppositions of both Opponents were based on the objections of lack of novelty and lack of inventive step (Article 100(a) EPC 1973) with regard to three documents including

D1: CA-A-2 193 524.

Additionally, O-02 asserted insufficiency of disclosure under Article 100(b) EPC 1973. In particular, O-02 referred to [Examples 1 to 4] and asserted that these examples failed to indicate, which features of the claimed process were essential and how they were to be handled in order to obtain the propylene terpolymer mixtures of [Claim 1], since only [Example 4] met the requirement of a C_2/C_{4-8} ratio of <0.3. It also pointed out that, contrary to the description (in particular with reference to [0014] and [page 4, lines 31 to 34]), *"the feature of 'flashing directly into a gas phase reactor' was missing in the present claim 5 and therefore the wording of present claim 5 encompasses both the possibility of flashing the polymer slurry directly into the gas phase reactor and the possibility of having an intermediate separation-step.*

The disclosure of one way of performing the invention (flashing ...) is only sufficient within the meaning of Art.83 EPC if it allows the person skilled in the art to perform the invention in the whole range that is claimed ..." (Notice of Opposition of O-02, pages 6/7).

In further letters submitted by the parties before and after a summons to oral proceedings, issued by the Opposition Division on 26 October 2005, ie in letters of the Patent Proprietor dated 13 June and 12 December 2005 and in two letters of both Opponents, each dated

12 December 2005, the arguments of the respective other side to the various objections raised were disputed.

At the oral proceedings held on 10 February 2006, the different issues addressed by the parties were dealt with on the basis of a Main Request, of five Auxiliary Requests submitted by the Patent Proprietor with its above letter dated 12 December 2005, a further amended version of Auxiliary Request I and an additionally filed Auxiliary Request VI (both as submitted during the oral proceedings and annexed as "Annexes A and B", respectively, to the Minutes).

III. At the end of these oral proceedings, the Opposition Division refused the Main Request (maintenance of the patent as granted) and Auxiliary Request I in its version of 12 December 2005, but decided that "*Account being taken of the amendments made by the patent proprietor during the opposition proceedings, the patent and the invention to which it relates are found to meet the requirements of the Convention. The currently valid documents are those according to the first auxiliary request dated 12/12/2005 as amended during the oral proceedings and the description adapted thereto.*" The reasons for this interlocutory decision were issued in writing on 30 May 2006.

(1) The refusal of the Main Request was based on the finding that Example 6 of D1 anticipated the subject-matter of [Claim 1], whereas the objection of insufficiency of disclosure was rejected for the following reasons (No. 2.1 of the reasons):

According to claim 1 in suit the propylene based terpolymer contains comonomer units derived from ethylene and at least one C_4-C_8 alpha-olefin, the ratio of ethylene to the C_4-C_8 alpha-olefins is less than 0.3 and the hexane soluble fraction is less than 6.5 % calculated from the weight of the terpolymer. The product of claim 1 is obtained

according to a process as defined by the process steps a) to d) in present claim 5. As illustrated by the worked examples 11 to 13 the claimed terpolymer having the required characteristics is obtained by a process according to claim 5. It is general jurisprudence before the EPO that an invention is sufficiently disclosed if at least one way is clearly indicated enabling the skilled person to carry out the invention. In fact it is immaterial to the sufficiency of disclosure if some of the examples fall within the scope of claims as long as the description of the product and the process for the preparation thereof are sufficiently clear and complete and can be put into practice without undue burden by the skilled person. Thus, even if Examples 1-3 and 5 do not fall within the scope of present claim 1 there is no deficiency in this respect.
Hence, the Opposition Division decided that the requirements of Art 83 EPC are fulfilled.

(2) Claim 1 of Auxiliary Request I as maintained in the interlocutory decision read as follows:

1. A film-making terpolymer of propylene, comprising a mixture of different propylene terpolymer compositions and said terpolymer comprising comonomer units derived from ethylene and at least one alpha-olefin selected from the group of C_4-C_8 alpha-olefins, the ratio of ethylene to the C_4-C_8 alpha-olefin(s) being less than 0.3 and the hexane solubles fraction is less than 6.5% calculated from the total weight of the terpolymer, comprising a terpolymer of propylene produced in a first slurry step, having a content of ethylene monomer in the range of 1 to 4 wt% and a content of C_4-C_8 olefins in the range of 5 to 12 wt%.

Product Claims 2 and 3 of this request, both appendant to the above Claim 1, were followed by independent process Claim 4 and subsequent dependent Claims 5 to 15. The new Claim 4 of this request differed from [Claim 5] (section I, above) only by the wording of its first paragraph reading as follows:

4. A process for producing a film-making terpolymer of propylene, comprising a mixture of different propylene terpolymer compositions and said terpolymer comprising comonomer units derived from ethylene and at least one alpha-olefin selected from the group of C_4-C_8 alpha-olefins, the ratio of ethylene to the C_4-C_8 alpha-olefin(s) being less than 0.3 and the hexane solubles fraction is less than 6.5% calculated from the total weight of the terpolymer, wherein the process is carried out in at least one slurry reactor in the presence of catalysts at elevated temperature, characterized by the following steps:

Dependent process Claims 5 to 15 of this request were derived from [Claims 6 to 16] by renumbering and in the case of Claims 5 to 7, 9 to 11 and 13 to 15 also by adaptation of the appendancies to the new numbering.

IV. On 26 and 28 July 2006, respectively, two Notices of Appeal, were filed against this decision, one by Appellant I (O-02), requesting the revocation of the patent, and the other by Appellant II (the Patent Proprietor), requesting that the decision under appeal "*be set aside to its full extent*". The respective appeal fees were paid by both Appellants in due time.

(1) Since these appeal proceedings focussed in the end only on the ground for opposition under Article 100(b) EPC, the documents and arguments referred to by the parties only with regard to novelty and inventive step need not particularly be dealt with in this decision.

(2) With its Statement of Grounds of Appeal (SGA-II), received on 29 September 2006, Appellant II filed new sets of claims according to a new Main Request and new Auxiliary Requests I to IV, on the basis of which the above decision should be set aside. Its rejoinder of 13 April 2007 to the other appeal was accompanied by a further set of claims to be dealt with as new Auxiliary Request II. Consequently, the previous Auxiliary Requests II to IV were to be treated as Auxiliary Requests III to V. All these requests were, however, replaced by new requests filed with a further letter dated 9 April 2009 (sections V to V(6), below).

With regard to the question of (in)sufficiency of disclosure, Appellant II supported the decision under appeal in that (i) [Examples 11 to 13] were sufficient support for the enabling disclosure for the independent process claim, enabling the person skilled in the art to carry out the process claimed in its full range, and (ii) the feature "*flushing directly into a gas-phase*

reactor" [*sic*] was clearly only a preferred embodiment of the general process (SGA-II, page 3, item 2).

(3) In the Statement of Grounds of Appeal of Appellant I (SGA-I) received on 3 October 2006, the grounds for opposition (ie insufficient disclosure, lack of novelty and lack of inventive step) were maintained and a further document was cited with regard to the latter two objections.

Under the heading of "SUFFICIENCY OF DISCLOSURE & CLARITY" (point 3 of SGA-I), Appellant I disagreed with the Opposition Division "*that the present invention, and in particular the process of Claims 4 to 15, is described in a manner sufficiently clear for it to be carried out by a skilled person*" and argued that "*flashing directly into a gas phase reactor*" had been presented throughout the whole description of the patent in suit as essential for carrying out the process of Claim 4. However, according to Appellant I, who referred in this context to T 409/91 (OJ EPO 1994, 653), Claim 4 did not contain this feature, but encompassed both possibilities either of flashing the polymer slurry directly into the gas phase reactor or of including an intermediate separation step. Therefore, Claim 4 described a different invention.

Moreover, Appellant I pointed out further (i) that in all of [Examples 1 to 5], the ethylene feed in the first slurry step was outside the range of step a) of the claim, ie below 1 wt-%, (ii) that the C_2/C_4 ratios in [Examples 1 to 3 and 5] were too high and (iii) the hexane solubility of the terpolymer product had not been indicated in any one of [Examples 4 or 7 to 9].

Appellant I additionally disputed the finding in the decision under appeal that [Examples 11 to 13] enabled the person skilled in the art to prepare the terpolymer mixtures according to Claims 1 to 3. *"In fact, a careful analysis of these examples reveals that they are absolutely not reproducible because they lack at least one essential information: the description of the composition of monomer mixture (propylene, ethylene, butene) used in the first slurry step. This information is of fundamental importance for the skilled in the art in trying to reproduce the alleged invention and in its absence he would be forced to an unreasonable amount of trial and error work for getting the target. It is therefore clear that examples 11-13 fail to show the 'at least one way to reproduce the invention' because they simply represent a description of a product whose origin is unknown.*
If, with the above hindsight, a complete review of the examples of the patent in suit is carried out, it can be observed that this problem is a general one: there is no example in the whole patent in which all the essential features of the product claims 1-3 are described together with the essential features of process claims 4-15." (SGA-I, page 5, paragraphs 1 and 2).

(4) In its rejoinder dated 13 April 2007 (section IV(2), above), Appellant II disputed the above arguments of Appellant I and took the view that T 409/91 (above) was not applicable to this case. If there had been two possibilities for carrying out the transfer of the reaction mixture to the gas phase reactor and one failed, as assumed by Appellant I, the person skilled in the art would have used the other.

As regards the examples, Appellant II contended that the ethylene feed in the loop reactor would amount to about 1 wt-%. "*As the values in the claims and the description are mathematically rounded, a difference in the third digit is neglectable.*" Moreover, "*As long as the skilled person can carry out the examples he is easily in the position to measure the hexane solubility of the obtained samples.*" (second half of page 2 of the rejoinder).

V. With a further letter dated 9 April 2009, Appellant II submitted a set of six requests (Main Request and Auxiliary Requests I to V) replacing all previous requests and provided further arguments concerning the objections of insufficiency, lack of novelty and lack of inventive step.

(1) The new Main Request differed from the claims of the previous Auxiliary Request I as accepted in the decision under appeal (section III(2), above) only in that the appendancies of Claims 8 and 12 had been changed from "according to any of the preceding claims" to "according to claims 4 to 7" and to "according to claims 4 to 11", respectively.

(2) In new Auxiliary Request I, the claims remained unchanged in comparison with the above Main Request except for Claim 1 which had the following wording:

1. A film-making terpolymer of propylene, comprising a mixture of different propylene terpolymer compositions and said terpolymer comprising 0.3 to 3 wt-% comonomer units derived from ethylene and 1 to 15 wt-% of comonomer units derived from at least one alpha-olefin selected from the group of C_4-C_8 alpha-olefins, the ratio of ethylene to the C_4-C_8 alpha-olefin(s) being less than 0.3 and the hexane solubles fraction is less than 6.5% calculated from the total weight of the terpolymer, comprising a terpolymer of propylene produced in a first slurry step,

having a content of ethylene monomer in the range of 1 to 4 wt% and a content of C_4-C_8 olefins in the range of 5 to 12 wt%.

(3) New Auxiliary Request II differed from the Main Request only by the wording of feature c) of Claim 4 (cf. [Claim 5], section I, above) reading as follows:

c) directly transferring said reaction mixture without separating the reaction medium into a gas phase reactor operated at a pressure of higher than 5 bars, and

(4) New Auxiliary Request III combined the amendments of Auxiliary Requests I and II. Thus, its Claim 1 corresponded to Claim 1 of Auxiliary Request I and its Claim 4 corresponded to Claim 4 of Auxiliary Request II. The other claims remained unamended.

(5) Auxiliary Request IV differed from the Main Request only in that Claims 1 to 3 to the terpolymer had been deleted and the process claims had been renumbered with appropriate amendment of the appendancies.

(6) Auxiliary Request V was derived from Auxiliary Request II by deletion of product Claims 1 to 3 and renumbering of the process claims with appropriate amendment of the appendancies.

(7) Moreover, Appellant II pointed out, that no evidence supporting the arguments concerning its insufficiency objection had been furnished by O-02/ Appellant I at any stage of the proceedings, and disputed, in particular, the argument of this party (sections II and IV(3), above) concerning the direct transfer/flashing of the reactants from the slurry reactor to the gas phase reactor. On the basis of the description of the process in its most general form (*page 3, line 26 to page 4, line 7* and *Claim 5*), it argued that a "*direct transfer feature*" was not mandatory but preferred. Whilst the process would be

facilitated by applying the direct flashing of the polymer slurry into the gas phase reactor, "*it is clear that the claimed process can be carried out also without the 'direct flashing' step in spite of the fact that this may be more difficult, i.e. associated with higher costs.*" (item 3.3 of the letter).

(8) Appellant II also denied that the person skilled in the art would be unable to carry out [Examples 11 to 13]. Rather, the skilled person could find details of the production of the polymers on *page 13, lines 11 to 13* and in *Table 5* (*page 14*), as well as properties of the polymers produced in this way in *Table 6* (*page 15*). Based on this information, (s)he would well be in the position to carry out these examples and to obtain the described polypropylene compositions.

(9) In the context of its arguments to inventive step with regard to D1 (item 5.5), Appellant II additionally submitted a new "Table 1" listing properties of the final products of [Examples 1 to 15]. These data included values concerning the MFR, total C_2 and C_4 percentage, C_2/C_4 ratio, melt temperature and C_2+C_4 percentage of each final product. Moreover, the new table repeated from *Table 6* the values of the hexane solubles contents in the final polymers of [Examples 11 to 13], and additionally listed the corresponding values of the polymers of [Examples 1 to 10] for the first time. Moreover, [Examples 4, 9 and 11 to 13] were identified as complying with the claims, whereas the others were indicated as being comparative.

VI. Oral proceedings were held on 13 May 2009.

(1) At the beginning, the Chairman summarised the relevant facts as appearing from the file and

established that the parties had been summoned in due time. Consequently, the proceedings were continued in the absence of the Respondent/O-01 (Rule 115(2) EPC).

(2) The attending parties confirmed their respective requests as appearing from the file. When Appellant II was asked to explain the reasons for the short-term replacement of the previous requests, in particular of Auxiliary Request I as accepted in the decision under appeal, it referred to "obvious errors" in process Claims 8 and 12 of that request containing appendancies to "any of the preceding claims" (section V(1), above), which had now been corrected.

The modification gave rise to the question of whether this amendment could be accepted as being a correction according to Rule 139 EPC or an amendment in line with Rule 80 EPC. Appellant I pointed out that an error must be apparent and could only be corrected in accordance with Rule 139 EPC, when it was evident that no other meaning would have been possible than what was offered as the correction, and that, in this case, the change as suggested was not the only possible amendment.

Appellant II argued that these claims relating to a process and being appendant to a product claim were not, in any case, clear. Both claims starting with "*The process ...*" had been intended to be sub-claims to independent process Claim 4 and to further specify features of that process claim. In a different interpretation of the claims, the combination of Claims 1 and 8 might, however, be construed to relate to a process broader than the process of Claim 4 of the new Main Request, because it did not contain all the essential limiting features of the independent process

claim. This might give rise to new objections of lack of novelty or lack of inventive step, which were to be circumvented by means of the amendment.

Such a danger was not seen by Appellant I, who, moreover, referred to Claim 12 relating to the gas phase reactor, which had no antecedent in Claim 1. In its opinion, the combination of either Claim 8 or 12 with Claim 1 could not be construed to be related to a process. In any case, the amendment should not be admitted because of its late filing.

In reply thereto, Appellant II indicated that it would withdraw the suggested Main Request and would like to return to the wording of Auxiliary Request I as maintained in the decision under appeal as the Main Request, if the new version of the Main Request was not admitted.

(3) After deliberation, the Board informed the parties that the Main Request as submitted with the letter dated 9 April 2009 was admitted into the proceedings.

(4) Thereafter, Appellant I was invited by the Board to present its case with respect to the objection of insufficient disclosure (Article 100(b) EPC).

(5) Appellant I drew a line between the product according to Claim 1 and the process of Claim 4. Neither of these claims contained in its opinion all the essential features necessary to produce a propylene polymer having, at the same time, a C_2/C_4 ratio of <0.3 and a content of hexane solubles of <6.5% of its total weight. However, Article 83 EPC and the case law based thereon, eg T 409/91 (above), No. 3.5, required that the person skilled in the art be put in a position by

the specification to repeat all embodiments covered by the claims without difficulties. In the Appellant's opinion, the specification did not, however, disclose anywhere that the product as defined in Claim 4 could be produced without the reaction mixture of the slurry polymerisation being flashed directly into the gas phase reactor. In support of its arguments, that the direct flashing was essential for the claimed process, the Appellant pointed to the following passages: the paragraph bridging ***pages 2/3***, ***page 4, lines 9 to 12***, ***page 6, lines 16 to 25***, ***page 7, lines 20 to 23*** and ***page 9, lines 33/34***, and took the view that the general description did not support the allegation in the letter of Appellant II of 9 April 2009 (section V(7), above), that direct flashing was not essential, but only preferred. Consequently, Claim 4 not requiring the ***direct*** flashing did not comply with Article 83 EPC.

(6) With regard to the examples, Appellant I pointed out that the patent in suit contained, on the one hand, [Examples 1 to 5 and 7 to 9] and, on the other hand, [Examples 11 to 13].

Whilst providing process details concerning the realization of the respective polymerisation stages, including references to the monomer feed and the direct flashing into the gas phase reactor, the first group of these examples failed to provide the content of hexane solubles of their products. Hence, it was not possible on the basis of the [specification] to identify which of these products had had contents of hexane solubles of <6.5% of their total weights.

By contrast, in [Examples 11 to 15], the relevant properties of the products were listed, but mandatory

process features of Claim 4, namely the quantities of the monomers used and the rate of their feeding (cf. ***page 13, line 10*** and ***Table 5***) were not described, which prevented the reproduction of these polymers.

Thus, none of these examples complied, in the Appellant's opinion, with the requirements of Claim 4 or described a product in accordance with the requirements of Claim 1.

(7) Appellant II, by contrast, argued that the properties of the polymers obtained in the examples, as presented in "Table 1" of 9 April 2009, were clearly the result of the process as carried out and described in the examples of the patent in suit. These properties could be verified by repeating the [examples] and had, therefore, been accessible for the person skilled in the art by means of the description of these examples and of the data provided in ***Tables 1 to 4***, despite the regrettable fact that, by error, the content of hexane solubles had not been disclosed in the ***application***.

In view of the properties of the polymers provided in "Table 1" of 9 April 2009 (section V(9), above), it was, according to Appellant II, evident that the products of [Examples 4 and 9] having hexane solubles contents of < 6.5 % complied with the claims.

(8) However, during the preparation for the oral proceedings, Appellant II had realised that "Table 1" contained an error which should be corrected. The hexane solubles value for [Example 8] should read "6.1" instead of "6.9" as provided therein. This error had been, according to the Appellant, a transcription error due to the poor legibility of a fax received from the

premises of the company in Finland received for the preparation of the letter dated 9 April 2009.

That the value of 6.9 was wrong could be derived from a comparison of the further data in [Tables 4 and 6] provided for [Examples 8 and 13], both of which described, in fact, the same experiment. To this end, Appellant II referred in particular to the melt flow rate (MFR), the total comonomer contents, the melt temperature, the tensile modulus, the 1% secant modulus and, in particular, the sensitive optical properties (haze and gloss), all of which proved, according to Appellant II, that the products of these two examples had been identical. Therefore, [Examples 8 and 13] seen together and also [Examples 4 and 9] as addressed in section VI(7), above, provided all the data and particulars necessary for enabling the person skilled in the art to carry out the invention. Furthermore, the Appellant repeated that no evidence had been filed by the opponents to prove the contrary.

(9) The request for correction of the above "Table 1" gave rise to a discussion about the question of reliability of the data provided by Appellant II, in general, and their admissibility.

(10) Appellant I argued that it had only been Appellant II, who had had ***knowledge and control*** of these data. Since these data had been withheld during all the stages of these proceedings up this hearing, although the insufficiency objection had been raised from the start of the opposition proceedings, the filing of the data at this very late stage of the appeal proceedings might, in its opinion, be considered as being an abuse of the procedure.

(11) Appellant II pointed out that the data in question (the content of hexane solubles) could have easily been obtained by repeating the examples.

(12) Despite the concern caused by the above facts and findings, which might have prompted the Board not to admit these late-filed data into the discussion, the Board informed the parties at a later stage of the discussion about the sufficiency issue with regard to Claim 1, that "Table 1" would be taken into account.

(13) In the meantime, Appellant II refrained from using the data of "Table 1" in the further discussion, which focussed at first on process Claim 4, and based its arguments only on the disclosure in the printed versions of the ***application*** and [patent], respectively.

(14) With regard to the other product parameters, in particular the optical properties, as listed in [Tables 4 and 6], Appellant II maintained that [Examples 8 and 13] described the same experiment.

Furthermore, Appellant II referred, besides the description of the examples on from [page 5, line 15] to [page 9, line 25], to the general description of the process in [0013] to [0016] and to the more detailed explanations in [0026] to [0028], [0031], [0033] and [0034], where, in the Appellant's opinion, all the details necessary for successfully carrying out the claimed process had been provided: two reaction stages (slurry and gas phase polymerisations), monomer feed, catalyst, product of the slurry process, transfer of the reaction mixture to the gas phase reactor and gas phase polymerisation conditions. Particulars not explicitly disclosed could, in addition, be deduced

from repetitions of the experiments, as disclosed, in combination with common general knowledge.

(15) As far as the question of direct transfer/flashing between the slurry and gas phase reactors was concerned, Appellant II reiterated the statement that the claimed process could in principle be carried out by a skilled person by applying his/her general knowledge without direct flashing, even though with difficulties. Therefore, this feature was not essential to the invention, ie the final terpolymer product *per se*, because the process of Claim 4 related only to one way for its production.

Anyhow, the present wording of Claim 4 would, however, clearly exclude any embodiment without direct flashing, in particular any embodiment involving the use of a conventional flash line (see *page 4, lines 9 to 12*). The expression of "*transferring said reaction mixture into a gas phase reactor*", as used in feature c) of Claim 4, meant nothing else than "*the polymer slurry is transferred directly into a gas phase reactor without separating the reaction medium*". Nor could it be interpreted differently, because "*the reaction mixture*" contained "*everything*", ie all components of the slurry polymerisation carried out in the first reactor.

(16) Appellant I maintained its position and referred to the statement in the description inconsistent with Appellant II's arguments, as already referred to in sections V(7) and VI(5) (above). Moreover, it asked whether the filing of the new Auxiliary requests did not disprove the above arguments of Appellant II.

Additionally, Appellant I commented on the arguments of Appellant II concerning the [examples], in particular

with respect to the C_2/C_4 ratio as could be calculated from the product data in [Tables 2, 4 and 6]. With regard to process feature a) of Claim 4, ie the monomer feed into the first slurry reactor ([Tables 1 and 3]), Appellant I pointed out that none of the examples in [Table 1] complied with this requirement, because the ethylene content of the monomer feed in each of these examples was <1 wt-%, namely the lowest value was 0.7 in [Example 4]. In [Table 3], the corresponding values were 1.0, 1.1 and 0.8 in [Examples 7, 8 and 9], respectively. Furthermore, Appellant I pointed out that the C_2/C_4 ratios calculated from the monomer contents of the final polymers in [Table 2] had all been above 0.3, except for [Example 4] (0.25). Only those values calculated from the data in [Examples 7 to 9 and 11 to 13] of [Tables 4 and 6] had been <0.3. The correctness of these values was not disputed by Appellant II.

(17) Appellant II accepted that [Examples 11 to 13] had been attacked by Appellant I, but maintained that [Examples 8 and 13] were identical as demonstrated by the identical polymer parameters in [Tables 4 and 6] und would meet the requirements of Claim 4.

Moreover, in view of the comparability of the parameters and features in [Tables 3 and 4], the finding concerning [Examples 8 and 13] was held valid by Appellant II not only for [Example 8], but also for [Examples 7 and 9]. Furthermore, it considered the ethylene feed value in [Example 4] as being borderline (the value of 0.7 possibly corresponding to a normal rounding error), which would nevertheless illustrate the claimed subject-matter as seen by a person skilled in the art.

(18) The allegation of identity of [Examples 8 and 13] was qualified by Appellant I as a "hypothesis", the validity of which was open to doubt, even for the reason alone, that it was brought forward for the first time at oral proceedings "eight or nine years after filing". At most, the process conditions in these examples could be described as being similar, but not as being the same. The Appellant argued that the alleged identity of the terpolymer parameters would be strange, in particular having regard to the finding that there were discrepancies between the reaction conditions in [Examples 8 and 13], ie the split calculated from the data in [Table 3]: 82:18 vs. those in [Table 5]: 80/20, the pressures in [Table 3]: 38 and 15 bar vs. those in [Table 5]: 38.5 and 15 bar, respectively, and in particular, the residence times of 114 min in the loop and no data provided for the gas phase reactors of [Table 3] as opposed to 1.3 h in the loop and 2.5 h in the gas phase reactors as reported in [Table 5].

The lack of a clear teaching in the [patent] would require the person skilled in the art to devote a high amount of experimentation to achieve the goal of the patent in suit with trial and error. The probability of failure would be up to 100% when starting from the general description alone. In Appellant I's view, no link was provided in Claim 4 or the description between the process features and the product features. The broad general instructions in the specification would require the person skilled in the art to single out those conditions necessary to achieve the goal. The new data of the products' properties in "Table 1" of 9 April 2009 even added, in the Appellant's view, to this finding and strengthened its arguments, because

they demonstrated that there was no clear link between the reaction conditions in the [examples] and the properties of their final products.

(19) Appellant II maintained that the product according to Claim 1 could be obtained by starting from [Examples 8 and 13] and the general description, and by optimising the reaction conditions on the basis of measured product properties. The description would in any case give enough information to the person skilled in the art even without considering the examples.

(20) When the Board raised the question concerning the situation of the Auxiliary Requests I to V on file if the Main Request was refused, Appellant II asked for permission to file two Auxiliary Requests from which the process claims would be deleted.

(21) The oral proceedings were then interrupted for deliberation of the Board. After resumption of the proceedings, the decision was announced that the Main Request was refused.

(22) After this announcement, Appellant II submitted two new Auxiliary Requests as indicated in section VI(20), above, to replace Auxiliary Requests I to V as filed with the letter dated 9 April 2009 (section V, above). The first of these new auxiliary requests comprised only Claims 1 to 3 of the above Main Request, the second comprised only Claims 1 to 3 of previous Auxiliary Request I (sections V(1) and V(2), above).

(23) Appellant I maintained that neither of these requests would disclose the claimed subject-matter in a clear and sufficient manner to be carried out by the person skilled in the art. The arguments provided with

regard to the Main Request would also have an impact on Claim 1 of the first new Auxiliary Request. In its view, the disclosure was still insufficient, because, when following the general guidelines in the specification, the products would be found to be outside rather than within the scope of the independent claim. Moreover, none of the [examples] provided any data concerning the composition of its product obtained in the first slurry step as defined in the last three lines of Claim 1 (cf. sections VI(22) and III(2), above). In the Appellant's opinion, the claimed invention could not be carried out without executing an undue amount of experimentation, because a product in accordance with the requirements of the claim could be obtained only by chance after experimentation using trial and error.

(24) Appellant II argued that the only requirement relating to a process feature in Claim 1 ("in a first slurry step") was met by [Examples 1 to 5, 7 to 9 and 11 to 13]. Moreover, [Examples 4, 7 to 9 and 11 to 13] additionally met the C_2/C_4 ratio requirement. Furthermore, the process details given in [Example 8] would be a good starting point for carrying out [Example 13], and the results in [Examples 11 and 13] would be largely comparable with one another.

Although, admittedly a fully reliable calculation could not be done with the data in these two [examples], it was highly likely, in the opinion of Appellant II, that the composition of the product obtained in the first slurry step of eg [Example 11] was inside the relevant range as defined at the end of Claim 1, (i) because according to [0061], ***in particular*** [page 7, line 56], obviously all of "***Propylene, ethylene, butene and hydrogen were fed into the loop reactor***", (ii) because,

according to the split value reported in [Table 5], the fraction of the polymer produced in the first slurry step in this example was >80%, and (iii) because the comonomer contents in the final product had been 1.9% of ethylene and 7.4% of butylene as shown in [Table 6].

In the Appellant's opinion, the rigorous standard for determining the allowability of an amendment under Article 123(2) EPC should not be applied to the present situation concerning sufficiency of disclosure. Instead, the balance of probabilities would be the right criterion for the evaluation of whether the feature of Claim 1 was complied with by this example. On this basis, it could be assumed that all the requirements of Claim 1 were met by the example, although the extra requirement was admittedly not *expressis verbis* disclosed.

Therefore, it took the view that the [examples] together with the disclosure in the specification and common general knowledge put the person skilled in the art in a position to prepare the claimed product.

(25) Appellant I disputed these arguments, because no one would know the composition of the products prepared in the first slurry step of Claim 1 from the specification. It could only be speculated, eg with regard to the feed of the monomers, whether the above requirement of Claim 1 might, perhaps, be fulfilled. However, the specification simply did not provide any disclosure in this respect.

(26) Upon the question of the Chairman of whether a party wished to provide additional arguments with regard to the second Auxiliary Request, Appellant I pointed out that the description (*page 3, last*

paragraph and [0013]) disclosed only one way for preparing these polymers, which included the requirement that the monomer feed to the first slurry reactor should contain at least 1 wt-% of ethylene. [Example 4], however, demonstrated that a terpolymer having an ethylene content of 2.9 wt%, ie close to the upper limit of 3 wt-% (as defined in Claim 1 of the Auxiliary Request), had been obtained with an ethylene feed of as low as 0.7% to the loop reactor, whereas higher ethylene feeds in other examples of [Tables 1 and 2] resulted in ethylene contents above the 3 % limit. On the other hand, higher amounts of ethylene in the monomer feed to the slurry reactor in [Examples 7 and 8] had resulted in lower ethylene contents in the final terpolymer.

In summary, it could only be established that the patent in suit gave conflicting information, but not a clear general rule as to what the person skilled in the art should do in order to prepare the polymer as defined in Claim 1.

(27) Since no one wanted further to address the Board on the issue of sufficiency of disclosure with regard to the Main, the first or the second Auxiliary Requests, the Chairman established the requests of the two present parties at this stage and closed the debate about the above issue and interrupted the oral proceedings for deliberation of the Board.

VII. The requests of the parties at this stage of the proceedings were as follows:

Appellant I requested that the decision under appeal be set aside and that the patent be revoked.

Appellant II requested that the decision under appeal be set aside and that the patent be maintained on the basis of Claims 1 to 15 of the Main Request as filed with the letter dated 9 April 2009 or, in the alternative, on the basis of Claims 1 to 3 of the first Auxiliary Request or of Claims 1 to 3 of the second Auxiliary Request, both filed during the oral proceedings.

Reasons for the Decision

1. The appeals are admissible.

Procedural matters

2. As regards the new submission of requests (cf. sections V to V(6) and VI(2), above), the Board has at the oral proceedings come to the conclusion that the requirements for correction of Claims 8 and 12 under Rule 139 EPC, second sentence were not fulfilled, because the wording of these two claims can be interpreted in two different ways. On the one hand, they can be interpreted as relating only to process features and further specifying the process of Claim 4, which had been the initial intention of Appellant II, or, on the other hand, they can be seen as true process claims, which, in their broadest scope, are unrelated to Claim 4 and concern the preparation of the terpolymers as claimed in any one of Claims 1 to 3 which are defined differently from the products aimed at in Claim 4, which are worded in a completely independent way. According to the second interpretation, above, the process of each of Claims 8 and 12 is limited only by the process feature in their own text

and the requirement that a slurry process is involved as a first stage and in that they provide a polymer as defined in any one of Claims 1 to 3 (section VI(2), above).

2.1 This second possible interpretation, which was also accepted by Appellant II during the oral proceedings as a possible reading of the claims (section VI(2), above, paragraph 3), thus refers to a process, the scope of which is much broader than Claim 4, because it includes neither the percentages of the monomer feed (feature a) of Claim 4), nor the reaction temperature (feature b) of that claim), nor the transfer and the pressure as defined in feature c) of Claim 4, nor any reference to the particular split as derivable from the percentages in steps b) an d) of that claim.

2.2 Amendments of the patent in suit can be admitted according to Rule 80 EPC, if "the amendments are occasioned by a ground for opposition under Article 100, even if that ground has not been invoked by the opponent." This is clearly the case here, because, as pointed out in section 2, above, it is conceivable that further objections under Article 100 EPC could be based on the second interpretation of Claims 8 and 12 relating to a process claim having a much broader scope than [Claim 4].

In view of this finding, the Board has admitted the amended requests to be discussed at the hearing.

Main Request

3. The Main Request includes two independent claims, Claim 1 to the film-making terpolymer of propylene and

Claim 4 to the process for making film-making terpolymers of propylene.

3.1 The terpolymer of Claim 1 is required to comprise (i) comonomer units of propylene, ethylene and at least one C_{4-8}-α-olefin and to fulfil the requirements (ii) of a C_2/C_{4-8} ratio of <0.3 and (iii) of a hexane solubles fraction of <6.5 wt-% calculated from the total weight of the terpolymer. It must, furthermore, comprise as an intermediate product obtained in a first slurry step (iv) a terpolymer of propylene having (v) contents of ethylene in the range of 1 to 4 wt-% and of C_{4-8} olefins in the range of 5 to 12 wt-%. This claim does not, however, contain any limitation to a specific range of melt temperatures of the claimed terpolymer.

3.2 By contrast, Claim 4 relates to a catalysed polymerisation process (also referred to in [0013]) for the preparation of a terpolymer of propylene, which is defined in terms of the above features (i) to (iii) and, additionally, (vi) a melting temperature of <135°C, it does not, however, require the product of the first slurry step to have the particular composition as referred to above as feature (v).

According to Claim 4 and [0013] (*page 3, line 26 to page 4, line 7*), the process features, required to be fulfilled in order to obtain this product, include

a) feeding a reaction mixture of 50 to 85 wt-% of propylene, 1 to 10 wt-% of ethylene, 15 to 40 wt-% of other C_{4-8} α-olefin, an appropriate catalyst system and optionally hydrogen into a slurry reactor,

b) polymerising this reaction mixture at a temperature of <70°C,

c) transferring this reaction mixture into a gas phase reactor operated at a pressure of >5 bar, and

d) continuing the polymerisation in the gas phase reactor, so that

e) the split, ie the ratio of terpolymer obtained in step b) to that obtained in step d) is (50 to 99)/(50 to 1) (in terms of weight percentages).

4. In the passage starting at [0026] (*page 6, line 12*), the process is described as a process including two polymerisation zones. The first of these zones comprises at least one slurry reactor, eg a loop reactor, as opposed to at least one gas phase reactor required to be used in the second reaction zone, whereby the reaction mixture *can be* directly flashed from the slurry stage into the gas phase reactor. This process design allows to tailor the properties of the final polymer ([0015]/*page 4, lines 14 to 19*).

4.1 According to [0029], [0032] and [0034], suitable reaction conditions for the slurry polymerisation are temperatures of <70°C at pressures in the range of 30 to 90 bar and residence times of between 15 to 120 min. Those mentioned there for the gas phase polymerisation are temperatures of 60 to 90°C at pressures of >5 bar, optionally with additional monomers being added to the gas phase reactor. Hydrogen, a well-known molecular weight and chain regulator used in catalysed α-olefin polymerisations, may be added to both stages of the polymerisation (*page 7, lines 17/18, and 29/30*).

4.2 Conceivable catalysts include any stereospecific Ziegler-Natta catalysts containing as an essential solid component a Ti component having at least one Ti-

halogen bond, an electron donor compound and a Mg halide in active form ([0028]/*page 6, lines 27 to 30*). A broad variety of compounds of different chemical nature is referred to as possible internal electron donor compounds ([0028]/*page 6, lines 30 to 32*). The polymerisation can be carried out in the presence of an organoaluminium compound and an optional external donor compound ([0029]/*page 6, lines 34 to 35*).

4.2.1 Other conceivable catalysts are "*any metallocene catalysts capable of catalyzing the formation of a terpolymer of propylene*". These catalysts comprise "*a metallocene/activator reaction product impregnated in a porous support at maximum pore volume*". Moreover, "*The catalyst complex comprises a ligand which is typically bridged, and a transition metal of group IVA...VIA, and organoaluminium compound. The catalytic metal compound is typically a metal halide.*" ([0030]/*page 7, lines 6 to 11*).

4.2.2 According to common general knowledge, even slight modifications of the catalyst system (eg by addition of internal/external electron donors, by the use of specific co-catalysts or activators, a change of the physical structure of the carrier, if present, etc.) or the use of a regulator affect, often significantly, the nature (eg the composition and/or stereoregularity) of the olefin polymers prepared therewith and, therefore, also their physical properties. However, the Board cannot see a coherent and convergent teaching in the general description, which would provide the person skilled in the art with specific information which would enable him/her to arrive at products as claimed in Claim 1 or as defined in Claim 4 without carrying

out an extensive research programme (ie an undue amount of experimentation on the basis of trial and error).

5. Although examples according to the claimed invention are not mandatory parts of a patent/patent application disclosing an invention, they are however, in general, construed to illustrate, within the framework of the description, the core section of the claimed invention and to relate to preferred embodiments thereof. In general, they serve the purpose of demonstrating the benefits of the claimed invention, and their results should, apart from few accidental failures, therefore fulfil the requirements of the claims. Hence, examples should, in the Board's view, provide the person skilled in the art with all the essential details necessary for the verification of their reported results (eg by repetition, if necessary), such as starting materials, process features and process conditions.

In other words, the examples should confirm that the description of the patent or patent application in suit provides a coherent, convergent teaching enabling the skilled person to arrive at the goals of the claimed invention, and should thus make an extensive research programme, as mentioned in section 4.2.2, above, superfluous.

5.1 Therefore, the question arose of whether these requirements for a sufficiently clear and complete description of the claimed subject-matter have been met in the present case.

5.2 The reaction temperatures and pressures reported for the slurry and gas phase reactors, respectively, in *Tables 1, 3 and 5* for the e*xamples* correspond to the ranges referred to in section 4.1, above.

5.3 The description of the catalyst used, however, reaches hardly beyond the generic explanations mentioned in sections 4.2 and 4.2.1, above. Thus, it refers in *Examples 1 to 4* only to "*a prepolymerized catalyst prepared according to FI Patents Nos. 70028 and 86472, and the activity of the catalyst was 35 kg PP/g cat h.*". This finding is also valid for Examples 7 to 9, wherein reference is made only to "*a wax-prepolymerized catalyst made according to Finish Patent No. 88047*", and for Examples 11 to 13 describing the catalyst as "*a prepolymerized catalyst prepared according to FI Patent No. 88 047 (EP-B1- 591 224), the activity of which was 35 kg/g cat h.*". In other words, these explanations do not unambiguously identify the chemical composition and constitution of the specific catalysts actually used in these examples, irrespective of whether they are or are not referred to as being comparative.

5.4 Nor has the Board been in a position, on the basis of the general description or the above statements in the [examples] or on the basis of the Finnish documents mentioned therein, to identify the individual catalysts described in the [examples] as having been used therein.

5.5 However, as already mentioned in section 4.2.2, above, the nature of the catalyst system used in the polymerisation of ethylene and α-olefins may have a significant influence on the nature of the polymers prepared therewith and also on their properties, moreover, when used in combination with hydrogen as a polymerisation regulator.

5.6 As already addressed in section 4.1, above, the possibility to use hydrogen in one or both of the polymerisation stages is also foreseen in the [patent].

However, the description of the [examples] mentions the use of hydrogen only in general terms without providing any data as to when or in which amounts it was used. Thus, it was only stated that (i) ***"Propylene, ethylene, butene and hydrogen were fed into the loop reactor."*** in ***Examples 1 to 4*** (***page 9, lines 27 and 28***), and in ***Examples 11 to 13*** (***page 13, line 10)***. (ii) In ***Example 5*** and ***Example 6 (comparison)***, it was said that "The polymerization was carried out as in Examples 1 to 4" (***page 10, lines 1 and 8***) and that, in ***Examples 7 to 9*** and ***comparative Example 10***, (iii) ***"Polymerization was carried out as in Examples 1-5 ..."*** (***page 11, line 30***).

5.7 Consequently, for the above reasons alone, the argument of Appellant II (sections IV(4), V(8), VI(7) and VI(11), above) is not convincing, that the person skilled in the art could have easily and reliably determined the content of hexane solubles of the polymers missing in all of [Examples 1 to 10] (see [Tables 2 and 4]) by simple repetition of these [examples], irrespective of the question of whether (s)he applied common general knowledge. This argument must therefore fail.

Instead and contrary to the argument of Appellant II as referred to in sections V(8), VI(11) and 5.7, above, a long series of experiments including the use of all conceivable combinations of catalyst components within the scope of the Finnish documents, as mentioned in the description of the [examples] in combination with different amounts of added hydrogen (see sections 5.3 to 5.6, above) would have been necessary to find out the right combination of starting materials, catalyst system and chain regulator and, moreover, the correct reaction conditions which would allow to repeat the

[examples], to verify the identity of the products with those described in the [tables] and to obtain the missing values of the hexane solubles contents. This means nothing else than that the description of the [examples] provides only a vague indication of how a given [example] might be carried out. In other words, the skilled person skilled is only invited to carry out countless experiments and, having done so, to evaluate, after the completion of a given experiment, the respective product obtained as to whether it does or does not meet the requirements of the claims. This is not only valid for the process defined in Claim 4, but also for the product of Claim 1. Hence, the person skilled in the art is left alone by the [patent] with the undue burden requiring him to carry out countless experiments without an clear expectation of success.

5.8 This finding is further confirmed by the fact that [Table 1] does not contain a single experiment wherein all the process requirements of Claim 4, in particular those concerning the composition of the monomer feed in feature a) of Claim 4 and the pressure in the gas phase reactor (feature c) in Claim 4), were met at the same time. This finding is also valid with regard to the polymerisation process as described in [0013] to [0015].

5.9 Whilst according to [Tables 3 and 4]), the C_2/C_{4-8} ratio of <0.3 was complied with in [Examples 7 to 9] and the requirement of 1 to 10 wt-% of ethylene in the monomer feed to the slurry reactor was met in [Examples 7 and 8], this was not the case in [Example 9] disclosing an ethylene amount of 0.8 wt-% in the monomer feed. [Example 8] does not, however, provide the residence time for the gas phase reactor, so that it is not possible to evaluate whether the split in this example

complied with the definition in features b) an d) of Claim 4 given in terms of the respective polymer yields in the two polymerisation stages. In fact, none of [Examples 1 to 10] provides explicitly the percentages of polymer fractions as obtained in steps b) and d) of Claim 4, ie the split.

Nor does any one of the examples in [Tables 1 to 4] (ie of [Examples 1 to 10]), as already addressed before, explicitly disclose the hexane solubles content of their final products and can thus neither be directly classified as complying with the claims or as being comparative.

5.10 The properties of the polymer aimed at are, furthermore, affected not only by the presence and quantity of hydrogen in a given polymerisation reaction catalysed by a given Ziegler-Natta or metallocene catalyst system, but also, to a significant degree, by the site, time and way of monomer addition to the polymerisation mixture and its feed conditions (eg intermittently or continuously). As already mentioned above, the monomers were, according to those statements quoted in section 5.6, above, fed like the hydrogen into the loop reactor, which meant according to Appellant II (section VI(24), above), that the whole amount of all the monomers had been fed into the loop reactor, ie to the first slurry step. A closer view to [Tables 1 and 3] shows, however, that this had clearly not been the case in [Examples 1 to 4 and 8], in each of which ethylene had, in accordance with [page 3, lines 23 and 24], additionally been fed to the gas phase reactor.

5.11 This finding confirms again what has already been established in section 5.7, above, that the patent in

suit does not provide the person skilled in the art with all the details necessary to enable him/her to repeat the [examples] without undue burden in order to obtain the values of hexane solubles missing therefrom.

5.12 By contrast, the hexane solubles contents missing from the above [examples] are provided only in [Table 6] for [Examples 11 to 13]. However, as pointed out correctly by Appellant I (sections IV(3) and V(8), above), the description of these further examples is also deficient, in that these examples are completely silent about the composition of the monomer mixture used in the first slurry step (cf. [Table 5]). As already pointed out above, it is also silent about the exact composition of the catalyst used and about the feed of hydrogen. Hence, the finding in section 5.11, above, is ***prima facie*** also valid for these examples.

5.13 However, as addressed in section VI(8), above, Appellant II argued that [Examples 8 and 13] would have related to the same experiment and that, therefore, the missing value of the hexane solubles of the terpolymer according to [Example 8] could be taken from [Example 13] or the process parameters valid for [Example 13] could be derived from [Example 8] as disclosed in [Table 3], respectively. This assertion is, however, not convincing for several reasons:

5.13.1 Firstly, the particulars in [Tables 3 and 5] concerning the process conditions in the two examples are inconsistent with one another. Thus, both the residence times in the slurry and gas phase polymerisation steps differ in [Examples 8 and 13]. In [Example 13], the slurry step took 1.3 hours and the gas phase step 2.5 h, whereas, in [Example 8], the slurry step took 114 min

(= 1.9 h), and no residence time has been provided for the gas phase step.

5.13.2 Secondly, as a consequence of this difference in the residence time in the loop reactor and of the missing data for the gas phase reaction, the split cannot be calculated for [Example 8], as argued by Appellant I.

5.13.3 Thirdly, Appellant II argued that, in [Examples 11 to 13], the monomers had been fed completely to the loop reactor. However, as disclosed in [Table 3], [Example 8] clearly referred to an additional amount of ethylene having been fed into the gas phase reactor, as already addressed in section 5.10, above.

5.13.4 Fourthly, even the data provided in "Table 1" of 9 April 2009, which had been submitted by Appellant II in order to remedy the evident deficiency of the ***specification*** by supplementing the missing hexane solubles contents to [Examples 1 to 10], contradict the allegation of Appellant II, because the value of the hexane solubles in [Example 8] had been reported as being "6.9", ie outside the scope of the claim. At the hearing, the Appellant asserted that the value would be wrong and should, because of the alleged identity of [Examples 8 and 13], be corrected to "6.1", ie a value within the scope of the claim (cf. sections V(9) and VI(7) to VI(9), above).

5.13.5 In view of these inconsistencies in the descriptions of the examples in question, the Board cannot concur with the allegation of Appellant I, that [Examples 8 and 13] would relate to the same experiment. At the hearing, Appellant II had qualified this allegation as being only a "hypothesis" open to doubt (section VI(18), above).

In view of the finding that the identity of the experiments disclosed in [Examples 8 and 13] has not convincingly been proved, the suggested amendment of "Table 1" does not, in the Board's opinion, comply with the requirements in Rule 139 EPC, which would be applicable, if the [specification] was to be corrected in this way. Rather, this suggested amendment cannot be accepted as being a justified correction. Moreover, this finding is not, in the Board's view, disproved by the hint of Appellant II to the identity of a number of other properties of the polymers concerned in [Tables 4 and 6], however unlikely the coincidence of such properties of different polymers may be. It may, instead, give rise to the questions of the care taken in drafting of the documents of the ***application*** and the reliability of the data provided therein. Thus, despite the fact that the C_2/C_{4-8} ratio of <0.3 had already been a mandatory feature of ***Claim 1***, it is noteworthy that each of [Examples 1 to 3 and 5] was marked for the first time in handwriting as "Comparison" in the amended version of the description submitted by Appellant II at the oral proceedings before the Opposition Division on 10 February 2006 (Annex C as enclosed to the Minutes of those proceedings).

5.14 Consequently, the Board cannot concur with the arguments and assertions of Appellant II, that the person skilled in the art could have easily found out which [examples] complied with the requirements and definitions in Claim 4. Nor can it see any convincing argument for the assertion that the skilled person could have derived from the general description which modifications in the details of the examples would be appropriate for arriving at something within the scope

of Claim 4 and within the definitions in this claim. Rather, the Board takes the view, as already indicated in sections 5.7, 5.11 and 5.12, above, that the disclosure of the patent in suit provides neither a clear and reliable starting point nor a coherent, convergent teaching which would allow the person skilled in the art to achieve this goal by simple experimentation without undue burden, but with a justified expectation for success (ie without pure trial and error).

5.15 Insofar the situation of the skilled reader is in this case similar to or even worse than the circumstances dealt with in T 1205/06 of 29 January 2009 (not published in the OJ EPO), as set out in particular in Nos. 2.3 to 2.9 of the reason for that decision.

In that case, the first issue concerned the question of whether the extent of the monopoly, as defined by the claims, corresponded to the technical contribution of the patent in suit to the art or whether the claims extended to subject-matter, which, after reading the description, was still not at the disposal of the person skilled in the art.

Like the present patent in suit, the patent underlying that case aimed at the provision of polymer products having particular properties defined in the claims in terms of two parameters, which had, however, been achieved in only one half of the examples disclosed in that specification.

"Furthermore, given that all compositions exemplified in the patent in suit are relatively complex - each contains at least eight components - and that the nature of the modifications upon which success or

failure seems to depend is relatively inconspicuous, coupled with the complete absence of any general guidance in this respect in the description of the patent itself, ... the subject-matter ... can only be considered as a matter of chance, because, instead of providing a practical technical teaching, it is evident that it would be necessary for the skilled person to establish with considerable trial and error how to realise the combination of properties as defined in (Claim 1)" (No. 2.7, 2nd paragraph of the reasons in T 1205/06).

In that case, the Board stated furthermore that "*It does not see, in the specification of the patent in suit, a technical concept fit for generalisation, which would make available to the skilled person the host of variants encompassed by the respective functional definition of (Claim 1). Rather, the specification offers only the invitation to perform a research programme (...) in order to find out which combinations of which ingredients (...) would meet the requirements of (Claim 1) and would provide a product having properties as set out .... In other words, the patent specification (description and claims) does not place all the information necessary for achieving the desired product at the disposal of the skilled person (...; cf. T 435/91 ..., in particular No. 2.2.1 of the reasons).*

This finding is, if anything, confirmed by the Appellant's argument, that the question of whether a particular composition (derived from any conceivable combination of compounds within the definitions of (Claim 1)) complied with the claims could easily be established by simply measuring its properties" (No. 2.8 of the reasons in T 1205/06).

5.16 In other words, this latter argument of the Appellant in that case, is similar to the argument of Appellant II in the present case (sections VI(14) and VI(19), above) that the skilled person could modify the examples in the patent in suit on the basis of his/her general knowledge in order to arrive at the desired terpolymers. Accepting this approach would mean nothing less than inviting the person skilled in the art to start a research programme by carrying out various modifications of the examples in the patent in suit, followed by the determination of the relevant product parameters of the products thus obtained in order to find out whether the requirements of Claim 4 would be met (sections 4 to 5.14, above).

6. Consequently, the Board has come to the same conclusion as set out in T 1205/06 and T 435/91 (above), that the requirements for sufficiency of disclosure have not been met by the operative Main Request, because the specification as a whole does not place all the information necessary for achieving the desired product at the disposal of the skilled person. Therefore, this request is refused.

First Auxiliary Request

7. Auxiliary Request 1 differs from the Main Request in that it has been limited to Claims 1 to 3 of that request (sections V(1), VI(20) VI(22) and 3.1, above).

7.1 On the basis of this fact, Appellant II took the view that [Example 4, 7 to 9 and 11 to 13] and the process details in [Examples 8 and 13] would have put the skilled reader in a position allowing him to prepare the terpolymer composition according to Claim 1 without

difficulty. Furthermore, these details would also provide sufficient information for the preparation of the product of [Example 11]. With regard to the additional requirement concerning the composition of the intermediate product obtained in the first slurry step, the Appellant referred to the split disclosed in [Table 5] of at least 80:20 (or "82:12" in [Example 11], ie >80:<20) and polymer details in [Table 6]. Since the composition of the final polymer of [Example 11] was quite in the middle of the range of the composition of the intermediate product, it would, in the Appellant's opinion, have been highly likely that this requirement concerning the composition of the intermediate product was also met by the product (section VI(24), above).

7.2 However, these arguments of Appellant II and the facts that the patent in suit neither contains a single example disclosing all the features required in Claim 1 nor provides a coherent and convergent teaching in [0013] to [0015] show that the person skilled in the art is, with respect to Claim 1 according to the first Auxiliary Request, in the same position as with regard to the process according to Claim 4 of the Main Request as summarised in sections 5.16 and 6, above, for the reasons given in detail in sections 4 to 5.15, above.

7.2.1 Apart from the fact that as shown in sections 5.13 to 5.14, above, [Examples 8 and 13] relate to different though to some extent still similar experiments, the arguments of Appellant II on the basis of [Example 11] are in no way convincing, because the reaction conditions in this example are still further remote from those in any one of the examples in [Table 3]. Thus, the reaction temperatures, the pressures and the residence times in the first loop reactor as provided

in [Tables 3 and 5] for [Examples 8 and 11], respectively, also differ from one another ([Example 8]: 60°C/38 bar/114 min; [Example 11]: 65°C/33 bar/1 h). This finding would also be valid with regard to [Examples 7 or 9].

7.2.2 Neither the [description], in general, nor the [examples] provide a coherent and convergent teaching of how to arrive at the claimed product defined not only in terms of its C_2/C_{4-8} ratio, its content of hexane solubles as in both Claims 1 and 4 of the Main Request, but additionally in terms of the composition of the intermediate polymer obtained in the first slurry step as explained in [0031] (cf. ***page 7, lines 13 to 15***), ie the sole passage in the patent in suit dealing with this latter mandatory feature of the product of Claim 1. However, no hints are provided in this passage or in any one of the [examples] of how reliably to obtain the intermediate product having the specific composition, as defined in Claim 1, which is a fraction contained in the final terpolymer and must, therefore and besides the percentages of the at least two fractions obtained in steps a) and d) (representing the split), clearly be manifest in the final product, and at the same time obtain the final product fulfilling the requirements concerning the C_2/C_4 ratio and the hexane solubles content.

7.2.3 Instead, the person skilled in the art would have to carry out, as for the Main Request, an extensive research programme to find out how to obtain the intermediate and the final claimed product, namely by selecting the right catalyst system, feeding hydrogen and the monomers in the appropriate moment, at the appropriate sites of the polymerisation zones and in

the appropriate manner in the appropriate reaction conditions in the process of [0013].

7.3 The burden of providing the complete information and teaching necessary for achieving the goal of the first Auxiliary Request, ie the product of Claim 1, cannot, in the Board's view, be shifted to the public or, in this case, to the opposing party. In this respect, the Board maintains the view taken by another composition of this Board in case T 172/99 of 7 March 2002 (not published in the OJ EPO, No. 4.5.9 of the reasons) "*that the question of whether the requirements of Article 83 EPC are fulfilled in relation to the claimed subject-matter or whether it is a valid ground for opposition according to Article 100(b) EPC, respectively, can only be answered on the basis of the content of the application as originally filed. Further information cannot be relied upon to heal any deficiencies in the original disclosure (...)*", in particular, in view of the deficiencies of the description concerning the question of how to prepare the claimed terpolymer with the justified expectation for success, as considered in detail above with regard to the Main Request. Nor can the Board, therefore, accept the argument of Appellant II that, for the evaluation of further information presented for the purpose of healing such deficiencies (as addressed above), the balance of probabilities would be the right criterion (section VI(24), above) in the present circumstances.

7.4 Consequently, the first Auxiliary Request is also refused for the reason of insufficient disclosure.

Second Auxiliary Request

8. Claim 1 of this request (cf. sections V(2) and VI(22), above) differs from Claim 1 of the Main Request and of the first Auxiliary Request only by the limitation of the comonomer contents of the terpolymer to 0.3 to 3 wt-% of ethylene units and 1 to 15 wt-% of C_{4-8} α-olefin units. Therefore the requirements of Article 123(3) EPC are met. Nor do, in view of ***Claim 2***, objections arise under Article 123(2) EPC.

This limitation does not, however, invalidate any one of the arguments set out above with regard to the Main or the first Auxiliary Request.

Therefore, the Board has come to the conclusion that the objection raised under Article 100(b) EPC prevails also with regard to this second Auxiliary Request, which is, consequently, also refused.

9. Since no request under consideration complies with the requirements of the EPC, the Appeal of Appellant II cannot be successful, whereas the appeal of Appellant I must succeed.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

M. Kiehl R. Young