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**Datasheet for the decision  
of 11 May 2010**

**Case Number:** T 0188/07 - 3.3.03

**Application Number:** 99110914.1

**Publication Number:** 0962474

**IPC:** C08F 297/08

**Language of the proceedings:** EN

**Title of invention:**

Propylene block copolymer and resin composition

**Patentee:**

Japan Polychem Corporation

**Opponent:**

Basell Polyolefine GmbH

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 54, 56, 100(a), 100(b)

**Relevant legal provisions (EPC 1973):**

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**Keyword:**

"Opposition grounds - insufficiency of disclosure (no)"

"Novelty (yes)"

"Inventive step - ex post facto analysis"

"Inventive step - different problem"

**Decisions cited:**

T 0035/85, T 0409/91

**Catchword:**

-



Case Number: T 0188/07 - 3.3.03

**DECISION**  
of the Technical Board of Appeal 3.3.03  
of 11 May 2010

**Appellant:** Basell Polyolefine GmbH  
(Opponent) Brühler Strasse 60  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office of 22 November 2006  
posted 4 December 2006 rejecting the opposition  
filed against European patent No. 0962474  
pursuant to Article 102(2) EPC 1973.

**Composition of the Board:**

**Chairman:** R. Young  
**Members:** A. Däweritz  
H. Preglau

## Summary of Facts and Submissions

I. The grant of European patent No. 0 962 474 in respect of European patent application No. 99 110 914.1, filed on 4 June 1999 and claiming the priorities of two earlier applications filed in Japan (P1: 15582098 and P2: 15582198) of 4 June 1998, was announced on 7 April 2004 (Bulletin 2004/15). The patent was granted with 14 claims reading as follows:

1. A block copolymer comprising one or more blocks of a polymer made of a polypropylene (hereinafter referred to as "PP block") and one or more blocks of a polymer made of an ethylene-propylene copolymer (hereinafter referred to as "EPR block") connected to each other, wherein the block copolymer and each of said blocks have the following properties (1) to (7):

- (1) the thickness of the interface of PP block with EPR block in the dispersion structure of the block copolymer is from 20 nm to 1,000 nm;
- (2) the weight-average molecular weight of the polypropylene in PP block (hereinafter referred to as " $M_{W,PP}$ ") is from 10,000 to 1,000,000;
- (3) the proportion of mesopentad chain in the polypropylene in PP block is not less than 95%;
- (4) the particle diameter of the disperse phase of the ethylene-propylene copolymer in EPR block is from not less than 0.2  $\mu\text{m}$  to not more than 3  $\mu\text{m}$  as calculated in terms of weight-average area;
- (5) the weight-average molecular weight of the ethylene-propylene copolymer in EPR block (hereinafter referred to as " $M_{W,R}$ ") is from 50,000 to 1,000,000;
- (6) the propylene content in the ethylene-propylene copolymer in EPR block is from 20 mol-% to 80 mol-%; and
- (7) the composition fluctuation in molecular weight of the ethylene-propylene copolymer in EPR block is within  $\pm 5\%$  from the average composition.

2. A resin composition comprising as main components a polypropylene resin (hereinafter referred to as "PP resin") and an ethylene-propylene copolymer rubber (hereinafter referred to as "EPR") in an amount of from 5 to 100 parts by weight based on 100 parts by weight of said PP resin, wherein the composition and each of said various components have the following properties (1) to (7):

- (1) the weight-average molecular weight of PP resin (hereinafter referred as " $M_{W,R}$ ") is from 10,000 to 1,000,000;
- (2) the proportion of mesopentad chain in PP resin is not less than 95%;
- (3) the weight-average molecular weight of EPR (hereinafter referred to as " $M_{W,PP}$ ") is from 50,000 to 1,000,000;
- (4) the propylene content in EPR is from 20 mol-% to 80 mol-%;
- (5) the fluctuation in molecular weight of EPR is within  $\pm 5\%$  from the average composition;
- (6) the thickness of the interface of PP resin component with EPR resin component in the dispersion structure of the resin composition is from 20 nm to 1,000 nm; and
- (7) the particle diameter of the disperse phase of EPR in the resin composition is from 0.2  $\mu\text{m}$  to 10  $\mu\text{m}$  as calculated in terms of weight-average area.

The further claims 3 to 14 related to further elaborations of the subject-matter of Claim 1 or Claim 2, respectively.

II. In this decision, references to passages in the patent in suit as granted will be given underlined in squared brackets, eg [0001]. References in underlined italics concern passages in the application as filed, eg page 1, line 1.

The following abbreviations will be used herein below:

EPC 1973	European Patent Convention, 1973 version
EPC	European Patent Convention as amended in 2000
RPBA 2005	Rules of procedure of the Boards of Appeal under EPC 1973 (cf. OJ EPO 2004, 541)
RPBA	Rules of procedure of the Boards of Appeal under the EPC (Supplement to OJ EPO 2009, 40)
SGA	Statement of Grounds of Appeal
dec	decision (under appeal)
rej	rejoinder
Case Law	Case Law of the Boards of Appeal of the European Patent Office, 5 <sup>th</sup> edition, 2006
PP	polypropylene (block or resin) moiety; cf. <u>[0014]</u>
EPR	ethylene/propylene (block or rubber) moiety; cf. <u>[0014]</u>

III. On 7 January 2005, a Notice of Opposition was filed, wherein the Opponent invoked Articles 100(a) and 100(b) EPC 1973, asserted lack of novelty, lack of inventive step and insufficiency of disclosure and, therefore, requested revocation of the patent in its entirety. The opposition relied on the first Examination report of 20 August 2002 issued in this case and the Applicant's reply thereto of 30 December 2002, on one publication, on an enlarged version of a figure of this publication and on five patent documents, including

- D3: EP-A-0 846 696 (Article 54(3) EPC 1973/EPC),
- D4: EP-A-0 646 624 and
- D8: D. Fischer et al., "*Metallocene Catalysts in The BASF Novolen<sup>R</sup> Gas Phase Process: A New Horizon For Impact Copolymers*", Worldwide Metallocene Conference *Met Con '94*, May 25-27, 1994, Houston, TX USA.

Moreover, the Opponent asserted that D3, which claimed the priority dates of 9 December 1996, 10 April 1997 and 24 July 1997, had been filed on 9 December 1997 and disclosed the same invention, so that the above Japanese patent applications P1 and P2 would not be

first filings in the sense of Article 87(4) EPC 1973. Consequently, the claimed priorities were not, in the Opponent's opinion, valid.

However, according to the minutes (item 5) of oral proceedings held before the Opposition Division on 22 November 2006, this objection was not pursued further by the Opponent, nor did it play any role in the further proceedings. Therefore, there is no need to consider it further in this decision.

IV. In the decision announced at the end of the above oral proceedings, which was issued in writing on 4 December 2006, the following reasons were given:

(1) The objection under Article 100(b) EPC 1973 was rejected, because it was held that at least one way was clearly indicated in the examples, which enabled the person skilled in the art to carry out the invention. Moreover, the claimed subject-matter was directed to a block copolymer and to a resin composition, respectively, both having specific properties. The way of determining those properties had been exhaustively reported in the description and the properties had furthermore been measured in the [examples] and [comparative examples].

(2) Furthermore, the Opposition Division found that none of the cited patent documents mentioned the combination of the features required by [Claims 1 or 2]. Nor had the Opponent provided any evidence that the claimed block copolymer or resin composition, respectively, having all the above features would have inherently been disclosed in any one of the cited documents, as asserted by the Opponent.

(3) In particular, it was established in the decision that D3 belonged to the state of the art according to

Article 54(3) EPC. Although its Example 10 was very similar to Example 1 of the patent in suit, the Opposition Division held that none of the features (1) to (7) mentioned in [Claim 1] had been measured in that example of D3. Although there was a strong presumption that Example 10 of D3 might have anticipated the block copolymer of the patent in suit, there was no certitude that the combination of all those properties was comprised in the product of D3's Example 10.

Consequently, it was held that the claimed subject-matter was novel (Article 54 EPC 1973).

(4) With respect to inventive step, D4 was identified as being the closest piece of prior art. This document related to propylene polymer compositions which were excellent in heat resistance, mechanical strength and tensile elongation at break. However, it was not specifically directed to solve the problem underlying the patent in suit, which was seen in the provision of a propylene block copolymer or resin composition excellent in impact strength and rigidity as set out in paragraph [0006]. Nor did D4 suggest that the combination of features (1) to (7) as referred to in the operative claims, would lead to a resin having improved impact strength and rigidity.

(5) Furthermore, the patent in suit demonstrated in its Comparative examples 1 to 3 that, when some of the features required in the claims were not fulfilled, in particular those relating to the thickness of the interface and the fluctuation in the molecular weight of the ethylene/propylene rubber phase, the resulting products were inferior in impact strength and rigidity. As this finding was also valid for the other cited pre-published documents, it was held that the claimed subject-matter was based on an inventive step.

(6) Consequently, the opposition was rejected, because the grounds for opposition did not prejudice the maintenance of the patent as granted.

V. On 2 February 2007, the Opponent lodged an appeal with simultaneous payment of the prescribed fee and, as a precautionary measure, requested oral proceedings. On 4 April 2007, the SGA was received in which the Appellant reiterated its previous objection concerning the asserted insufficiency of disclosure and based its arguments for the asserted lack of novelty exclusively on Example 10 of D3 and those concerning the asserted lack of inventive step only on D4.

(1) More particularly, the Appellant repeated its argument that the person skilled in the art would have to select the right catalyst system (which included even conventional Ti catalysts, cf. [0042], which according to the Patent Proprietor's statements at the examination and opposition stages were not successful) and the right polymerisation conditions in order to obtain the desired product, *"in other words he should achieve a new invention"* (SGA: page 2). Based on arguments presented by the Patent Proprietor in reply to D4 during the opposition proceedings, the Appellant concluded that *"there would be some non-specified process features that allow to obtain the claimed products, and these features can be found by the skilled person only by an extensive trial and error procedure lacking any information in the opposed patent. Thus, in conclusion, the claimed invention does not meet the requisite of Art 83 EPC for the reason that it is not possible in view of the description to carry out the invention in the whole range claimed without undue burden."* (the two paragraphs below the quotation on page 3 of the SGA), and it referred, furthermore, to decision T 409/91 (OJ EPO 1994, 653).

(2) With respect to the issue of novelty, the Appellant conceded that the products of Example 10 of D3 (which is the sole example relating the preparation of a block copolymer) and of [Example 1] differed in their EPR rubber contents (14.5 vs. 21 wt-%), which, according to the Appellant, was only the logical result of the longer second polymerisation step in the [example] (100 min as opposed to 80 min in D3; cf. D3: page 48, lines 27 and 32; [page 16, lines 10/11 and 14/15]). *"Since the two examples are very similar the fact that in example 10 of D3 the features of the block copolymer of the main claim of the opposed patent have not been measured is not relevant for the reason that the same process has to give rise to the same product."* (SGA: page 4, 2<sup>nd</sup> paragraph below Table 2). Therefore D3 would be novelty destroying for [Claim 1].

(3) In its arguments dealing with inventive step, the Appellant referred to features (1) to (7) of the block copolymer and resin composition, respectively, in [Claims 1 and 2]. As regards [Claim 2], it mentioned properties of each of the components, namely  $M_{w,PP} = 10^4$  to  $10^6$  ( $10^4 \dots 10^6$ );  $M_w/M_n = 1.5 \dots 5$  and the mesopentad chain of the PP of  $\geq 95\%$  ([0020], [0023] and [0024]) and  $M_{w,R} = 5 \cdot 10^4 \dots 10^6$  and propylene content = 20...80 mol % of the EPR ([0034] and the "main claim"), respectively, and the fact that the EPR was not limited to a "substance having a so-called rubber elasticity" ([0106]). On this basis, the Appellant argued that "lacking any other evidence, when a block copolymer is made of a polypropylene polymer and an EPR having the above features the resulting blend must be endowed with the claimed features, ie features 1-7 of the main claim." (SGA: page 5, penultimate paragraph).

(4) In the Appellant's opinion as presented in the SGA, D4 itself rendered the claimed subject-matter of the



patent in suit obvious. To this end, the Appellant referred to the seventh propylene polymer composition (D4: page 49, lines 5 to 31 in conjunction with page 41, lines 12, 13, 17 and 21, and page 48, lines 25, 26 and 41 to 43; page 51, lines 31 to 57 and page 52, lines 1 and 2) and to the examples of D4. In particular, the Appellant listed, in a table on page 6 of the SGA, values concerning the triad tacticity, the  $M_w/M_n$ , the ethylene content and the intrinsic viscosities of the propylene and EPR components of "*propylene polymers 7 to 9, and 11 to 14*" and of "*EPR-1, EPR-2, EPR-3 and EPR-5*", respectively, as used in Examples 9 to 11 and 13 to 22 and Comparative examples 11 to 13 (cf. Tables 9, 10 and 12 to 16) of D4, and it took the view that "*All these polymers meet the features of the PP and EPR of the opposed patent. They are blended in various proportions in the examples. We can take for instance example 20 on page 85.*" (SGA: page 6).

(5) According to the Appellant, the difference between the patent and D4 resided in missing measurements of several features of the final compositions of D4. This difference would not give rise to any technical effect even when taking into account that the claimed compositions were excellent in impact resistance and rigidity ([0006]), because in the passages of D4, mentioned above, the ranges for flexural modulus and Izod impact strength were reported and the respective measurements in the [examples] "*are fully comprised in these ranges.*" Therefore the person skilled in the art could, in view of D4, easily achieve the claimed invention by following the teaching of D4 and "*simply measuring the features reported in the claim.*" (SGA: page 6, last paragraph and page 7, 1<sup>st</sup> and 2<sup>nd</sup> paragraphs).

VI. In the rejoinder dated 5 September 2007, the Respondent disputed all the arguments of the Appellant and requested that the patent in suit be maintained as granted or, in the alternative, be maintained on the basis of a first Auxiliary Request filed therewith, and also requested, as an auxiliary measure, oral proceedings. Since this Auxiliary Request, consisting of Claims 1 to 14, played no role in these proceedings, it is not necessary further to consider it.

(1) With regard to the objection under Article 100(b) EPC, the Respondent pointed out that the Appellant's arguments had already been considered by the Opposition Division as being not conclusive. Moreover, the Appellant had not contested that the patent in suit provided several examples and a detailed general description of a method by which the claimed block copolymer and resin composition, respectively, could be obtained. In the knowledge of this disclosure and of the [examples], the person skilled in the art could, based on his experience in this field, modify the conditions/starting materials in order to obtain further block copolymers and resin compositions which fell under the claims. Therefore there was no undue burden for a skilled person to put the invention into practice. Nor would he have to achieve a new invention, since he could find ample guidance in the application.

(2) In particular, the Respondent quoted a passage from [0042], according to which the polymerisation catalyst was not specifically limited "*so far as it allows the preparation of block copolymers or resin compositions satisfying the foregoing requirements*".

(3) With regard to novelty, the Respondent quoted the wording of [Example 1], and indicated all differences thereto in the text describing D3's Example 10, in

order to show that *"there are many differences between the two examples and not just a difference in the reaction time as suggested by the opponent."* Due to these differences, it would be highly likely that the resultant copolymers would be different, as confirmed by the significant differences between the rubber contents, the melt flow rates and the MFR of the first stage PP as shown in the table on page 6 of the SGA. Therefore, *"it can not be automatically assumed that the copolymer disclosed therein will possess properties (1) to (7) of claim 1 as alleged by the opponent. Since the opponent has failed to prove that the copolymer disclosed in example 10 of D3 has properties (1) to (7) required by claim 1 of the patent-at-issue novelty should be acknowledged."* (rej: pages 3 to 6).

(4) With regard to the Appellant's arguments based on D4, the Respondent argued that the assessment of inventive step by the Appellant was based on the seventh polymer composition of D4 (cf. section V(3), above) and, moreover, *"on the incorrect assumption that when a block copolymer is made of a polypropylene polymer having*

*a) a molecular weight from 10.000 to 1.000.000;*  
*b) a distribution of molecular weight preferably between 1.5 and 5; and*

*c) a mesopentad chain of not less than 95%;*  
*and an EPR having*

*a) a molecular weight from 50.000 to 1.000.000; and*  
*b) a propylene content from 20 mol.-% to 80 mol.-%*

*it must possess all the features mentioned in claims 1 and 2 ... In essence the opponent tries to ignore features (1), (4) and (7) of claim 1 (features (6), (7), and (5) of claim 2) instead of providing detailed arguments why a skilled person would come to these features which are missing in D4."*

(5) However, neither [Claim 1] nor [Claim 2] mentioned, according to the Respondent, the molecular weight

distribution or the triad tacticity as disclosed in D3 for the polypropylene homopolymer. Instead, both claims required the proportion of the mesopentad chain of the PP and the thickness of the interface of the PP with the EPR in the dispersion structure. Consequently, the seventh polymer composition to which reference had been made in the SGA did not disclose features (1) and (3) of [Claim 1] and features (6) and (2) of [Claim 2], respectively (rej: page 7).

(6) Moreover, as pointed out by the Respondent, the passage concerning the mandatory elastomer component of D4's composition was not necessarily an EPR as required by [Claims 1 and 2]. Rather, various possible elastomers were mentioned in the list on page 48 of D4 (lines 29 to 54), from which one had been picked out by the Appellant. In order to arrive at the EPR of the operative [claims], a further selection had to be made within this option. This would show that the approach chosen by the Appellant was not based on an objective assessment of the prior art but rather on hindsight knowledge of the claimed subject-matter.

(7) In connection with the Appellant's arguments relating to the examples of D4 (section V(4), above), the Respondent set forth that none of the features of the polymers in the table on page 6 of the SGA was mentioned in either [Claim 1 or 2]. Nor would it be evident why, as asserted in the SGA, these polymers should meet the requirements of [Claims 1 or 2]. Moreover, the Appellant had not, according to the Respondent, explained the relevance of the individual examples mentioned in the SGA, none of which taught or suggested any of the features (1), (2), (3), (4), (5) or (7) of [Claim 1] or features (6), (1), (2), (7), (3)

or (5) of [Claim 2]. Nor were these features taught or suggested elsewhere in D4.

(8) Finally, the Respondent asserted that the claimed block copolymers of [Claim 1] and the claimed polymer compositions of [Claim 2], respectively, showed a superior balance of rigidity and impact strength.

VII. On 11 February 2010, the parties were summoned to oral proceedings to be held on 11 May 2010.

VIII. In a letter dated 29 April 2010, received by fax on the same day, the Appellant withdrew its request for oral proceedings.

IX. Since the parties had been duly summoned, the oral proceedings were held as scheduled in the absence of the Appellant (Rule 115(2) EPC).

(1) After the opening of the oral proceedings and the summary of the relevant facts by the Chairman, the Respondent was given the floor to present its case.

(2) The Respondent pointed out that D3 did not anticipate the claimed subject-matter, as could already be seen from the table on page 6 of its rejoinder. In this table, the block copolymers as obtained in [Example 1] and in Example 10 of D3, respectively, were characterised by three properties (ie the content of the rubber component, the melt flow rate and the MFR of the first stage PP), which differed from each other to a more than "*just minor*" extent. Particular reference was made to the MFR values of 36 (patent in suit) and 14.2 g/10 min (D3), respectively.

Moreover, the Respondent argued that features (1) to (7) of each of [Claims 1 or 2] were not necessarily fulfilled by D3. It would have been the task of the opposing Appellant to demonstrate that the products of

D3 were indeed identical to those claimed. However, the Appellant had not discharged the burden of proof. Therefore, novelty should be acknowledged.

(3) Having regard to the objection of lack of inventive step, the Respondent referred to the vast breadth of the disclosure in D4, which was reflected in a high number of embodiments which differed from one another to a significant degree. Moreover, D4 did not contain a teaching similar to that in the patent in suit, which aimed at the provision of polymers having a good balance of rigidity and impact strength, in particular at low temperature, as demonstrated in the [Tables]. Nor did D4 provide the combination of features (1) to (7) of both independent [claims], which turned out to be the relevant criteria for achieving this goal (cf. [0006] and [0007]).

Rather D4 contained a conglomerate of completely different teachings without presenting where they actually got. Moreover, D4 referred in no way to the question of impact strength at low temperature, nor to the properties concerning the interface between the PP and EPR moieties, the mesopentad chains or the fluctuation in molecular weight of EPR.

(4) As could be seen from the [examples] and [comparative examples] ([Tables 2 and 3] on [pages 22 and 23]) and, in particular, as demonstrated in the experimental report submitted during the opposition proceedings (letter dated 5 January 2006), the good combination of properties was not achieved, unless the respective products complied with all the ranges of features (1) to (7) as defined in [Claims 1 or 2]. In this connection, the Respondent explained that the additional example in this experimental report had been carried out in order to obtain a product as close as

possible to the product of [Comparative Example 3], so that their results could be better compared with one another, and put, furthermore, emphasis on the fact that its [comparative examples] were comparisons neither with nor according to D4. Moreover, all the results provided in the examples of the patent and of the experimental report demonstrated that the impact strength at  $-30^{\circ}\text{C}$  could, within the scope of the patent in suit, be improved without compromising the rigidity of the samples.

(5) With regard to the fact that according to [0042] a  $\text{TiCl}_3$  catalyst could be used to prepare the claimed product and that the EPR used in [Comparative Example 3] had not been made by means of a metallocene but with a  $\text{TiCl}_3$  catalyst, whereas in all [examples] a metallocene catalyst had been used, the Respondent referred again to the prerequisite for the use of particular catalysts as addressed in its rejoinder (section VI(2), above). Moreover, it would be much easier to achieve a product having the desired properties by using a metallocene catalyst. However, it could not be excluded at the priority date, that the desired products could also be made by means of other catalysts. However, the Respondent had not been aware of such a process, which explained, in its opinion, its statements during the opposition and appeal proceedings concerning the use of Ti (Ziegler) catalysts as used in the prior art, eg in D4 (cf. D4: page 74).

(6) The Respondent additionally commented on the further documents initially cited in the opposition, which have not, however, been referred to in the SGA. According to the Respondent, none of them related to the claimed subject-matter either.

(7) When the Respondent indicated that it did not wish further to comment on the Main Request, the debate was closed in this respect and the state of the requests at this moment was established again. Then the hearing was interrupted for deliberation of the Board on the Main Request and optionally on the final decision.

X. At this stage, the requests were as follows:

The Appellant requested that the decision under appeal be set aside and that the patent in suit be revoked.

The Respondent requested that the appeal be dismissed or, in the alternative, that the decision under appeal be set aside and that the patent be maintained on the basis of Claims 1 to 14 according to Auxiliary Request 1 dated 5 September 2007 as submitted with the response to the Statement of Grounds of Appeal.

## **Reasons for the Decision**

1. The appeal is admissible.

### *Main Request*

2. *Sufficiency of disclosure*

2.1 The Appellant put its arguments concerning its objection under Article 100(b) EPC under the heading of "*Undue burden*" and concluded its respective arguments with the statement that the person skilled in the art "*should achieve a new invention*", because the skilled person would have to select the right catalyst system and to find the appropriate reaction conditions for the preparation of the claimed block copolymers or claimed compositions, respectively (section V(1), above; SGA, item 1). In other words, the Appellant's arguments were directed to the breadth of the claims ("*in the whole*



- range claimed without undue burden*"), rather than to a deficiency in the disclosure which would completely hinder the person skilled in the art from carrying out the invention.
- 2.2 For supporting its arguments, the Appellant referred to decision T 409/91 (above), which, however, concerned an *ex-parte* case, concerning the refusal of an application, but not an *inter-partes* case as the present one. This means however that, in that case, it had been the appealing applicant's task to discharge the burden of proof for sufficiency of disclosure, but not, as in the present case, the appealing opponent's task to show that, based on the original disclosure, the product as claimed could not be obtained. However, the Board has not become aware of any convincing argument of this kind, let alone any proof therefor, so that it cannot be established that the Appellant would have discharged this burden of proof for its assertion.
- 2.3 Moreover, according to the case dealt with in T 409/91, above (Nos. 3.2 and 3.3 of the reasons), it had already been known to achieve "*the modification of both the size and the shape of ... wax crystals*" in diesel fuel by adding additives which acted as pour-point depressants, and the asserted invention resided in the finding that the size of wax crystals could be reduced below a particular limit "***by the addition of certain additives***". Although being a technical feature "*which is described and highlighted in the description as being an essential feature of the invention*", these specific additives had not, however, been defined in the claims.
- 2.4 As pointed out by the Respondent, the Appellant had not contested that the patent in suit contained a number of examples and a detailed general description describing

that and how the claimed subject-matter could be obtained. Moreover, as also argued by the Respondent, the selection of a particular catalyst system which, according to the Appellant (section V(1), above), was required to achieve the desired results, had never been disclosed as being an essential feature of the claimed subject-matter (cf. [0042]/page 16, lines 7 to 14). The Board has therefore no reason to query the Respondent's argument (section VI(1), above), that the skilled person was put by the description and, in particular, by the [examples] (in comparison with the [comparative examples]) in a position optionally to modify, *based on his/her professional experience*, the starting materials and conditions for obtaining products which were still within the scope of the claims. In the Board's opinion, this finding is not invalidated by the clause from [0042] as quoted in section VI(2), above.

2.5 Hence, the situation in the present case is different from that in the case of T 409/91 (above) not only in respect of formal, but also substantive aspects, since, as admitted by the appellant in that case, there had been no common general knowledge available to the skilled person, which would have put him/her in a position to make fuel of the kind as claimed (T 409/91, No. III, paragraph 3 of the facts and submissions).

2.6 Consequently, decision T 409/91 does not, in the Board's view, provide anything, under the formal or the substantive aspect, which would back up the Appellant's arguments with regard to the question of (in)sufficiency of disclosure in the present case.

2.7 In view of these facts and findings, the Board has come to the conclusion that the Appellant's arguments for the alleged insufficiency of disclosure are not

convincing, so that its objection under Article 100(b) EPC cannot prevail. It is therefore rejected.

3. *Novelty*

3.1 Novelty was contested by the Appellant on the basis of the disclosure of Example 10 of D3 (section V(2), above). Its arguments were, however, disputed by the Respondent (section VI(3), above).

3.2 The Appellant's arguments, as referred above, were, in the Board's view, clearly refuted by the Respondent's detailed comments in the rejoinder. In the Board's view, it has not been convincingly demonstrated by the Appellant that Example 10 of D3 anticipated the claimed subject-matter of either [Claim 1 or 2].

This finding is not only based on the absence of any measurements of features (1) to (7) of either claim, as admitted by the Appellant, but also on the fact that the realization of Example 10 of D3 differed largely from that of [Example 1], as shown by the Respondent in its comparison of the individual reaction steps and conditions in the two examples (section VI(3), above). In view of the fact that this presentation of details in the rejoinder has not been disputed by the Appellant, the Board considers it appropriate and adequate to refer here for the details of this comparison to the file (rej: pages 3, line 10 to page 6, including the table). The Appellant did not provide any counter-arguments thereto or any further arguments concerning novelty, but only withdrew its request for oral proceedings and informed the Board that it would not attend the hearing (section VIII, above).

3.3 Consequently, the Board does not see any reason to depart from the findings on novelty in No. 4 of the

reasons in the decision under appeal. The objection of lack of novelty is therefore rejected.

4. *The problem to be solved with respect to the prior art*

4.1 The patent in suit relates (i) to propylene polymer compositions which were to show a good balance between impact resistance and rigidity, in particular at low temperatures, in comparison with the prior art block copolymers or polymer compositions, prepared on a trial and error basis depending on the purpose (cf. [0001] to [0006]).

4.2 The solution offered in the patent in suit resides in two different embodiments, ie (i) a block copolymer having PP and EPR moieties ([Claim 1]) and (ii) a resin composition comprising as main components (a) a PP resin and (b) an EPR ([Claim 2]), each being characterised by seven features relating to identical properties, sorted in the claims, however, in different order (cf. section I, above).

In [Tables 1 and 2], each block copolymer and resin composition of [Examples 1 to 5], respectively, is described not only in terms of these seven properties but additionally characterised by further features as defined in the dependent claims. Moreover, the performance of each composition is provided in terms of its low temperature impact strength (-30°C) and its rigidity expressed either as the flexural modulus or as the Olsen flexural rigidity. The same data were also provided for the additional example of the experimental report (sections IX(3) and IX(4), above).

4.3 Whilst having initially based its objection of lack of inventive step on D4 and D8, the Appellant relied in its SGA solely on D4 (cf. Article 10a(2) RPBA 2005, corresponding to Article 12(2) RPBA) which had been

- identified in the decision under appeal as the closest piece of pre-published prior art, relevant for the assessment of inventive step (section IV(4), above).
- 4.4 Document D4 relates (i) to propylene polymer compositions each comprising two kinds of propylene polymers and (ii) to propylene polymer compositions each comprising a propylene polymer and other olefin (co)polymer. More particularly, these compositions are to be "*excellent in heat resistance, mechanical strength, tensile elongation at break, etc. as compared with the conventional propylene polymers or propylene polymer compositions*" (D4: page 3, lines 3 to 5 and 45 to 48).
- 4.5 The solution offered in D4 consists in 19 different types of "*propylene polymer composition(s)*", many of which encompass different compositional variations. Thus, the "*seventh propylene polymer composition*" (D4: page 47, line 44 to page 49, line 31), on which the Appellant's arguments were based, comprises a propylene homopolymer "(A5)" (as further explained on its pages 41 to 45) and an olefin elastomer (D). The ninth composition, to which one short reference was made in the SGA (ie to D4: pages 51/52; sections V(4) and V(5), above), additionally contains a propylene polymer "(A6)" different from the above homopolymer "(A5)".
- 4.5.1 As pointed out by the Respondent (sections VI(4) to VI(7) and IX(3) to IX(5), above), the definition of the olefin elastomer (D) refers to a broad variety of such elastomers grouped together in seven different groups (D4: page 48, lines 35 to 54) ranging from (firstly) copolymers of at least two  $C_{2...20}$  olefins or of at least one  $C_{2...20}$  olefin and one  $C_{5...20}$  polyene to (lastly) "*others*" such as "*a styrene/butadiene rubber (SBR) and a styrene block copolymer (SEBS) ...*". In the SGA, specific reference

had been made to the third group of such elastomers, which relates furthermore to two different kinds of ethylene copolymers, ie copolymers of ethylene and a further monomer selected from propylene or butene (D4: page 48, lines 41 to 43; SGA: page 6, lines 8 to 12).

4.5.2 The Appellant had additionally referred to a number of examples and comparative examples in D4, each describing a composition containing a propylene homopolymer and one of three different EPR polymers (section V(4), above). Each of these compositions was further described in terms of four or five physical properties. Thus, in each of Tables 9, 10 and 12 to 14 and 16 of D4, specifically mentioned in the SGA (page 6, lower half), the five following parameters of D4's final compositions were provided: melt flow rate (MFR), flexural modulus (FM), Izod impact strength (at 23°C) (IZ), tensile elongation at break (EL) and heat distortion temperature (HDT). In Table 10, instead of HDT, the film haze was given, and in Table 15 only four of those parameters (excluding HDT) were mentioned.

4.5.3 On page 6 of its SGA, the Appellant additionally referred to the Mw, the Mw/Mn and the triad tacticity of the PP component, and to the ethylene and the comonomer contents and the intrinsic viscosity of the EPR, in general. Furthermore, in the table on this page, a list is provided containing the Mw/Mn and the triad tacticity of the PP and the ethylene contents (in mol %) and the intrinsic viscosities of both the PP and the EPR components as used in the above mentioned examples and comparative examples of D4.

4.5.4 However, the triad tacticity is a less stringent requirement for the stereoregularity than the proportion of the mesopentad chain as defined in the

patent in suit. Moreover, except for the  $M_w$  of the PP (SGA: page 6, lines 3/4) and the propylene content as the compensating amount to the ethylene content in the EPR, D4 did not refer to, let alone teach or suggest any other of the seven features defined in [Claim 1 or 2].

4.5.5 Nor does D4 refer, as pointed out by the Respondent, to the balance of rigidity and impact strength at low temperature, let alone to an improvement in this respect, for the demonstration of which the Respondent had filed the additional experimental report already mentioned above. In this report, two polymers were compared with one another, which had about the same rigidity, and wherein the composition according to definition in the claims of the patent showed a performance which was clearly improved over that of [Comparative Example 3] (sections VI(5), VI(7), IX(3), IX(4) and IX(5), above).

4.6 In view of the available experimental data and the general disclosures in the patent in suit, on the one hand, and in D4, on the other hand, the Board sees the technical problem to be solved by the claimed subject-matter in relation to D4 in the provision of a block copolymer and of a composition of PP and EPR moieties (cf. section II, above), respectively, showing an improved balance of rigidity and impact strength at low temperatures.

5. *Inventive step*

It remains to be decided whether the solution of this problem, as claimed, derives in an obvious way from the cited document.

5.1 Since, firstly, a certain polypropylene and a certain second polymeric component have to be chosen from the

numerous conceivable combinations of polymers offered in D4 (even within "*The seventh propylene polymer composition*" out of the 19 general embodiments) and, secondly, since it is not evident, that, in spite of the reference to the triad tacticity, the PP resins of D4, as described on page 41 of the document, would fulfil the mesopentad requirement of [Claims 1 or 2], at most a vague similarity of the compositions of D4 to those of the patent in suit can retrospectively be seen.

Moreover, D4 points clearly to compositions fulfilling a certain temperature requirement, ie heat resistance (D4: page 3, lines 46/47), which is referred to in its examples as heat distortion temperatures (HDT) ranging from 95 to 128°C (see Tables 2 and 6/Examples 2 and 6 of D4) and which high temperature mechanical integrity is quite remote from, if not even of an opposite tendency to the requirement to be met by the compositions of the patent in suit, ie high impact strength at low temperatures (ie at -30°C) in good balance with rigidity of the copolymer or composition as claimed in [Claims 1 and 2], respectively.

5.2 Hence, it is evident to the Board that D4 does not even contemplate the provision of compositions having an improved performance at low temperature and, therefore, is in no way related to the relevant technical problem to be solved by the patent in suit (cf. section 4.6, above).

Nor can it, consequently, contribute at all to the solution of this technical problem, let alone suggest a particular type of polymeric material to achieve the goals referred to above. Therefore, the subject-matter is not rendered obvious by the disclosure or teaching of D4 for this reason alone.



- 5.3 However, for the sake of completeness, the Board wants to add some further comments on the experimental results presented in the patent in suit and in the additional experimental report (section 4.2, above), which demonstrate that the relevant technical problem (section 4.6, above) was indeed solved by the claimed subject-matter.
- 5.3.1 The above experimental report contains an additional example relating to a composition of two particular polymers in comparison with [Comparative example 3]. For each of these experiments, the polymeric components used were defined in terms of the  $M_{W,PP}$ , proportion of the mesopentad chain, the  $M_{W,R}$ , the propylene content and the fluctuation in molecular weight of the EPR (features (1), (2), (3), (4), and (5) of [Claim 2], respectively). The resulting compositions were furthermore described in terms of the thickness of the interfaces and the particle diameter (features (6) and (7) of [Claim 2], respectively). By contrast, the only features provided by the Appellant on page 6 of its SGA or being directly derivable from the data provided on that page, are features (4) and (1), respectively, of [Claim 2].
- 5.3.2 The properties provided for each of these compositions demonstrates that, at comparable rigidity of the two final compositions, the impact strength at  $-30^{\circ}\text{C}$  of the composition according to the operative claims was distinctly better than that of the composition according to [Comparative example 3], which represents a newly prepared variant of the closest state of the art making identical the features common with the invention in order to have a variant lying closer to the invention than any definitely identifiable composition composed of a propylene homopolymer and an

- EPR as disclosed in D4, so that the advantageous effect attributable to the distinguishing features of the invention is thereby more clearly demonstrated (cf. decision T 35/85 of 16 December 1986, not published in the OJ EPO, No. 4 of the reasons).
- 5.3.3 In other words, the Respondent has discharged the onus of proof in respect to the claimed solution of the relevant problem, ie achievement of an improved balance of the rigidity and the impact strength at low temperature. By contrast, the Appellant has not provided any proof for its assertions mentioned in section V(3), above. Hence, the Appellant has not discharged the onus of proof for its allegations.
- 5.3.4 In summary of the findings in sections 5.2, 5.3.2 and 5.3.3, above, the Board has come to the conclusion that the Appellant's arguments disputing the presence of an inventive step are not convincing. They must therefore fail.
- 5.4 The Opposition Division had already come to the same conclusion as above with regard to the other documents as far as they were relevant to this question (page 6, line 3 of the decision under appeal). This conclusion has not been disputed by the Appellant. Therefore, the Board has no reason to depart from the findings of the Opposition Division concerning inventive step (decision under appeal, page 5, lines 1 and 2 of No. 5 of the reasons).
- 5.5 Consequently, the Board has come to the conclusion that the subject-matter of the two independent [Claims 1 and 2] is based on an inventive step.
- 5.6 By the same token, the above findings are also valid for the elaborations as defined in the remaining claims which are appendant to either [Claim 1 or 2].

5.7 In summary, none of the objections raised by the Appellant against the patent in suit as granted can prevail, and, consequently, the Main Request of the Respondent is successful.

*Auxiliary Request 1*

6. In these circumstances, there is no need to consider the Auxiliary Request of the Respondent.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Young