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**Datasheet for the decision  
of 27 February 2018**

**Case Number:** T 0429/15 - 3.3.03

**Application Number:** 07754871.7

**Publication Number:** 2010603

**IPC:** C08L23/04

**Language of the proceedings:** EN

**Title of invention:**

POLYOLEFIN COMPOSITIONS, ARTICLES MADE THEREFROM AND METHODS  
FOR PREPARING THE SAME

**Patent Proprietor:**

Dow Global Technologies LLC

**Opponent:**

Ineos Sales (UK) Limited

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

Inventive step - (no) - main request, first to fifth auxiliary  
requests



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Case Number: T 0429/15 - 3.3.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.03**  
**of 27 February 2018**

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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 9 January 2015  
revoking European patent No. 2010603 pursuant to  
Article 101(3) (b) EPC.**

**Composition of the Board:**

**Chairman** D. Semino  
**Members:** M. C. Gordon  
R. Cramer

## Summary of Facts and Submissions

- I. The appeal lies from the decision of the opposition division posted on 9 January 2015 revoking European patent number 2 010 603.
- II. The patent was granted with a set of 35 claims, whereby claim 1 read as follows:

"A composition comprising a high molecular weight component and a low molecular weight component, and wherein the high molecular weight component comprises an ethylene interpolymers that has a density from 0.920 g/cm<sup>3</sup> to 0.950 g/cm<sup>3</sup>, and an I<sub>21</sub> from 0.05 to 1 dg/min, and wherein the low molecular weight component comprises an ethylene polymer that has density from 0.965 g/cm<sup>3</sup> to 0.985 g/cm<sup>3</sup>, and an I<sub>2</sub> from 600 to 2000 dg/min, and wherein the composition has a density from 0.950 g/cm<sup>3</sup> to 0.970 g/cm<sup>3</sup>, and comprises from 45 to 80 weight percent of the high molecular component, and comprises from 55 to 20 weight percent of the low molecular weight component, and wherein the weight percentages are based on the sum weight of the high molecular weight component and the low molecular weight component."

- III. Two oppositions were filed against the patent, one of which was withdrawn prior to the issue of a summons to oral proceedings by the opposition division.

The following documents cited in the decision under appeal are relevant to the present decision:

D2: WO-A-01/14122

- D6: Hagström, B. "Prediction of melt flow rates (MFR) of bimodal polyethylene's [*sic*] based on MFR of their components", Conference of Polymer processing, Gothenburg (SE) 19-21 August, 1997.
- D14: Böhm L. L., et al. "High Density Polyethylene Pipe Resins"; Advanced Materials 4, No. 3 (1994) pages 234-238

IV. The decision was based on a main request and three auxiliary requests, all filed with letter dated 20 October 2014.

Claim 1 of the main request differed from claim 1 of the patent as granted in that:

- the density of the high molecular weight (HMW) component was specified as  $0.925 \text{ g/cm}^3$  to  $0.950 \text{ g/cm}^3$
- the density of the composition was defined as  $0.955 \text{ g/cm}^3$  to  $0.970 \text{ g/cm}^3$
- the proportion of HMW component was 50-75 weight percent and the amount of low molecular weight (LMW) component was 25 to 50 weight percent.

V. According to the decision the subject-matter claimed in the main request met the requirements of added subject-matter, clarity, sufficiency of disclosure, and novelty.

The closest prior art was represented by D2, example 3 from which the subject-matter claimed was distinguished by two features:

- the  $I_2$  of the LMW component in D2 was 330 g/10min whereas the claim required a value of 600-2000 dg/min

- the density of the final composition in D2 was 952 kg/m<sup>3</sup> (0.952 g/cm<sup>3</sup>) whereas the claim required a density of 0.955 g/cm<sup>3</sup> to 0.970 g/cm<sup>3</sup>.

The I<sub>21</sub> of the HMW component was held not to provide a distinction over the composition of example 3 of D2. This conclusion was reached on the basis of a calculated value under application of the Hagström relationship disclosed in D6.

On the basis of the examples and comparative example in the patent the only feature for which an effect could be identified was the density of the overall composition. The Environmental Stress Crack Resistance (ESCR) of the comparative examples was superior to that of the inventive examples whereas the stiffness of the comparative example was inferior. It was however known in particular from D14, that stiffness and density were intimately related. Thus the demonstrated result appeared to be predictable.

The objective problem was formulated as the provision of a polyethylene blow moulding composition having a balance of properties shifted towards greater stiffness, possibly at the expense of poorer ESCR, which was solved by specifying the overall density and the I<sub>2</sub> of the LMW component.

There was no evidence to show that the latter feature contributed to the solution of the problem. The range claimed for this feature was encompassed by the general teaching of D2 and was hence to be seen as an arbitrary selection.

Regarding the density of the whole composition, the resulting increase in stiffness appeared to be

predictable and thus obvious as followed from D14. The claimed range was also foreshadowed by D2. Any other improvements in properties had to be seen as mere bonus effects.

Hence an inventive step was denied.

The amendments made to the auxiliary request did not overcome said objections.

Consequently the patent was revoked.

- VI. Together with the statement of grounds of appeal the patent proprietor (appellant) submitted a technical report (D16).

The sets of claims considered by the opposition division were maintained, however a new set of claims was submitted with letter of 6 June 2016 as second auxiliary request, the previous second and third auxiliary requests being redesignated third and fourth auxiliary requests.

- VII. The opponent (respondent) made two written submissions, submitting further documents as follows:

D17: Handbook of Polyethylene; Structures, Properties and Applications, (Peacock, A.J (Ed)), 2000, Pages 125 and 126;

D18: Knuuttila, H *et al.* "Metallocene Catalyst Technology in a Bimodal Polymerization Process" in "Metallocene-based Polyolefins; Preparation, properties and technology", Volume two, Schiers, J. and Kaminsky, W. (Ed) "Wiley Series in Polymer Science"; 2000, pages 365-367;

D19: Yoshikiyo, T., et al. "High performance PE100 Resin with extraordinary resistance to Slow Crack Growth" (<http://www.pochem.co.jp/jpe/reference/> under entry dated 2006.11.13), pages 1-4.

VIII. The Board issued a summons to oral proceedings and a communication in which it set out its preliminary view of the case.

IX. The respondent made a further written submission.

X. The appellant made two further written submissions, including providing with letter of 26 January 2018 a new third auxiliary request. The second and third auxiliary requests filed at the outset of the appeal proceedings were refiled and redesignated fourth and fifth auxiliary requests.

The first auxiliary request differed from the main request by specifying in claim 1 additionally a range of 15 to 35 for the melt flow ratio  $I_{21}/I_5$  of the composition.

The second auxiliary request differed from the main request in that claim 1 specified that the proportions of the two components were 55 to 75 weight percent HMW and 25 to 45 weight percent LMW.

The third auxiliary request differed from the second auxiliary request in specifying that the high molecular weight ethylene interpolymer was an ethylene/ $\alpha$ -olefin interpolymer wherein the  $\alpha$ -olefin was 1-hexene.

The fourth and fifth auxiliary requests were directed to a blow moulded article comprising a composition substantially as defined in claim 1 of the patent as

granted and of the main request respectively. The further details of these requests are not of significance to the present decision.

XI. Oral proceedings were held before the Board on 27 February 2018.

XII. The arguments of the appellant can be summarised as follows:

Closest prior art was represented by example 3 of D2, from which the claimed subject-matter was distinguished by at least the features of the melt index ( $I_2$ ) of the LMW component and the overall density whereby the highest density exemplified in D2 was below the minimum density required by the operative claims.

The problems underlying D2 and the patent in suit were different. Whilst D2 was directed to the provision of large volume blow moulded containers having excellent ESCR values, the patent in suit was concerned in general with providing compositions exhibiting an optimised balance of properties for producing reduced weight bottles and containers, whereby the stiffness of the polymers was increased whilst maintaining acceptable stress crack and impact resistance. The skilled person would thus be reluctant to modify the properties of example 3 of D2 so as to result in particular in a lower ESCR in view of the fact that these properties were essential to solving the problem underlying D2. If anything such a modification would be contrary to the teaching of D2.

Said problem was solved by the claimed subject-matter as shown by the data of D16. At a constant melt index of the LMW component, ESCR decreased with increasing



composition density, but - unexpectedly - the ESCR also increased with increasing melt index of the LMW component. This showed that if the melt index of the LMW was increased, whilst maintaining the same melt index of the whole composition ESCR, could be increased for a given density.

Similarly the flexural modulus not only increased with density, but also increased with the melt index of the LMW component whereby compositions having a melt index in the claimed range showed higher flexural modulus than compositions having a LMW component with lower melt index. The melt index of the HMW fraction was not disclosed in D2 and attempts to show otherwise were not reliable.

The arguments of the respondent that:

- the stiffness was primarily controlled by the LMW whereas the ESCR was mainly influenced by the HMW fraction;
- increased ESCR could be obtained either by decreasing the density of the HMW fraction or decreasing the MFR of the HMW fraction or increasing the proportion of the HMW fraction;
- increased stiffness could be obtained either by increasing the density of the LMW fraction or by increasing MFR of the LMW fraction

represented a hindsight approach to explain the results obtained in the patent.

There was no teaching to this optimised combination of properties in D2. Nor did any of the further documents cited (D14, D17, D18, D19) provide any teaching how to make the necessary modifications to the composition of

D2 in order to achieve the effects demonstrated. Thus D14 taught simply that a bimodal resin had better properties than a unimodal resin in terms of ESCR despite the higher density, but did not address improvements of a bimodal resin and provided no guidance to accomplishing such an aim.

D17 and D18 related to metallocene based polyolefins and showed in general terms the control of molecular weight distribution of a bimodal polyethylene, and concluded that the low molecular weight fraction provided good processability and stiffness whilst the high molecular weight fraction provided mechanical strength. Similarly, D19 - notwithstanding that it was published after the priority date of the patent in suit - was principally concerned with PE100 resin for pipe applications. Thus both D18 and D19 addressed in general terms the mechanical properties of bimodal polymer compositions and discussed the separate contributions of the two fractions to the overall properties. However neither document provided any guidance as to how to achieve a particular balance of properties or specifically how to tailor the characteristics of the individual fractions in order to attain such a balance of properties.

If anything, D14, D17, D18 and D19 taught that the various properties which were optimised according to the patent ran contrary to each other, and the documents provided no indication that a particular range of melt index of the LMW component in combination with the other features of the claim would allow the indicated balance of properties to be obtained.

It was considered that the respondent relied on a oversimplified "binary" approach, treating the effects of the HMW and LMW components separately, i.e. the LMW

component resulted in stiffness and the HMW component provided ESCR, but disregarded the interaction between the different components and the necessary balance of properties.

On that basis an inventive step should be acknowledged for claim 1 of the main request and even more so for claim 1 as limited according to the auxiliary requests.

XIII. The arguments of the respondent can be summarised as follows:

The closest prior art was D2, example 3. The difference in the properties of the claimed composition, in particular the higher density resulted in improved tensile modulus and poorer ESCR. D14 taught that a higher density of a polymer was due to higher crystallinity which in turn rendered the resin stiffer but reduced ESCR. D2 focused on improved ESCR, but at the cost of the tensile modulus. The patent achieved precisely the opposite. The fact that a different balance of properties was obtained did not render the claimed subject-matter inventive. There was no evidence for any unexpected effect arising from the nature of the LMW fraction - the observed effect was merely an artefact or consequence of the properties of the HMW fraction. D18 and D19 taught that mechanical strength and good ESCR were provided by the HMW fraction, and flexibility and stiffness by the LMW fraction. The MFR of the LMW fraction was related to the density such that an increase in density was inevitably associated with an increase in the MFR i.e. a reduction in the molecular weight. This emerged from D17 and nothing else was shown by the results of D16. If, for example, the melt index of the LMW fraction was increased, i.e. the molecular weight reduced in order to improve the

flexibility, and it was required to maintain the same overall density of the whole composition, then inevitably the density of the HMW fraction had to be reduced, i.e. the molecular weight increased. This in turn would inevitably and necessarily lead to an increase in ESCR. This was known from D14. The other parameters of the claim were within the ranges disclosed in D2. Accordingly the claimed subject-matter represented a routine adjustment or optimisation of the composition of D2 taking into account known dependencies and interrelationships of the influence of the various components of the composition on the properties.

On that basis the subject-matter of claim 1 of the main request did not involve an inventive step. The same conclusion applied to the auxiliary requests.

XIV. The appellant requested that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the main request filed with letter of 20 October 2014, or alternatively be maintained on the basis of the first auxiliary request filed with letter of 20 October 2014, or on the basis of the second auxiliary request filed with letter of 6 June 2016, or on the basis of one of the third to fifth auxiliary requests filed with letter of 26 January 2018.

XV. The respondent requested that the appeal be dismissed.

### **Reasons for the Decision**

1. Main request - inventive step

### 1.1 Closest prior art

Both parties invoked the disclosure of D2 in particular example 3 thereof as the closest prior art. The Board can identify no reason to come to a different conclusion.

D2 relates to improvements relating to the production of containers by blow moulding, in particular of a high density polyethylene (HDPE, page 1, lines 1-4). The composition consists of at least two polyethylene components having different molecular weight distributions, at least one of which is an ethylene copolymer (page 2, lines 7-9). Put differently, at least one of the components is not a polyethylene homopolymer (page 2, lines 26, 27). By "HDPE" is meant a composition having a density of 940-980 kg/m<sup>3</sup>, most preferably 945-960 kg/m<sup>3</sup> (page 3, lines 11-14). The polymer is bimodal or multimodal (page 3, line 16). The compositions are used for preparing large containers of volume 2-1000 litres whereby the compositions have a "surprisingly increased" value for ESCR (page 5, last 4 lines - page 6 first line). The containers exhibit an ESCR of at least 500 hours, preferably 1000-2000 hours whereby this high ESCR value is achieved without any loss of impact strength (page 7, lines 25, 26, 29-33).

The appellant argued that whilst D2 was principally directed to the provision of large volume containers having excellent ESCR, the patent was concerned with compositions having an optimised balance of stiffness, ESCR and impact resistance for preparing low weight containers and bottles. However, although D2 initially discusses processability of the compositions (page 1, second to fourth paragraphs), at the top of page 2 the necessary properties of the final products are

identified, namely impact resistance, stiffness and ESCR.

Nothing else is said in paragraph [0001] of the patent in suit in terms both of good processability and the indicated material properties, however with the added requirement of reduced bottle weights. The patent also addresses blow moulding. Regarding the weight of the containers of D2, although the wording "reduced weight" is not employed, this is inherently part of the disclosure thereof in view of the ranges of density given on page 6, first full paragraph and claim 1 which cover the range of 945 to 975 kg/m<sup>3</sup> which at its lower end is below the minimum given in claim 1 of the patent as granted and the upper limit is only slightly above the maximum specified. Consequently it emerges that also this aspect of the problem underlying the patent is addressed by D2, even if not couched in the same terms.

Accordingly the Board considers that D2 does indeed address essentially the same problem as the patent in suit. In this respect it is noted that the patent gives no restriction on the size of the containers and in paragraph [0002] refers to both household and industrial containers.

Example 3 of D2 relates to a bimodal HDPE composition having a density of 952 kg/m<sup>3</sup>. The polymer was prepared in a two-step process whereby the product of the first step, prepared according to example 2 of D2, was an ethylene/propylene copolymer having I<sub>2</sub> of 330g/10 min, i.e. 330 dg/min and a density of 974 kg/m<sup>3</sup> which constituted 48 wt% of the total polymer.

## 1.2 Distinguishing features

There is no doubt that the subject-matter of claim 1 is distinguished from the disclosure of D2 example 3 at least by the following features:

- $I_2$  of the low molecular weight fraction is 600-2000 dg/min whereas the composition of D2 example 3 has  $I_2$  330 dg/min;
- the density of the composition is 0.955 to 0.970 g/cm<sup>3</sup> whereas the composition of D2, example 3 has a density of 0.952 g/cm<sup>3</sup>.

As to the properties of the high molecular weight component, i.e. that formed in the second reactor, these are not explicitly disclosed in D2. The respondent calculated (letter of 24 September 2015, page 5) that the density would be 0.931 g/cm<sup>3</sup>, i.e. within the range required by operative claim 1, which conclusion has not been challenged by the appellant. In addition, during the course of the opposition and appeal proceedings the respondent provided calculations in order to demonstrate that the melt index of the HMW component -  $I_{21}$  - fell within the scope of the operative claims. The Board considers that it was not proven that the value of the  $I_{21}$  of the HMW component necessarily falls within this range. However it is not necessary for the purpose of this decision to address this matter in any further detail since no arguments were provided to support an effect of this feature or its relevance for inventive step.

## 1.3 Technical effects

The examples of the patent are not suitable to demonstrate whether the above identified distinguishing

features are associated with a technical effect. This matter is not in dispute.

The appellant provided with the statement of grounds of appeal an experimental report - D16 - Table 2 of which is reproduced here:

Sample #	HMW I <sub>21</sub> dg/min	HMW Density g/cc	H <sub>2</sub> /C <sub>2</sub> LMW molar ratio	Temp LMW °C	Est. LMW I <sub>2</sub> dg/min	Est. LMW Density g/cc	Split	Final I <sub>21</sub> dg/min	Final MFR I <sub>21</sub> /I <sub>5</sub>	Final Density g/cc
P1	0.29	0.9396	1.3	100	240	0.970	0.58	6.1		0.9575
P2	0.33	0.9450	0.8	95	48	0.967	0.55	6.3	17.0	0.9587
P3	0.25	0.9396	1.3	100	240	0.970	0.56	6.1	21.3	0.9582
P4	0.23	0.9398	0.8	95	48	0.967	0.52	6.0	18.2	0.9567
P5	0.25	0.9400	0.6	95	22	0.965	0.51	6.2	16.2	0.9565
P6	0.33	0.9410	1.8	110	970	0.973	0.60	5.9	21.9	0.9590
P7	0.28	0.9437	1.8	110	970	0.973	0.59	6.0	22.7	0.9610
P8	0.30	0.9412	1.8	110	970	0.973	0.61	5.8	22.0	0.9592
C1	0.29	0.9408	1.8	110	970	0.973	0.59	5.9	22.4	0.959
Example #2 from patent	0.30	0.9380	1.8	110	970	0.973	0.68	6.3	20.0	0.9574

Example P2 relates to two ethylene homopolymers, as emerges from D16 itself (Table 1, C<sub>6</sub>/C<sub>2</sub> molar ratio for HMW component) and was confirmed by the appellant in paragraph 6 of a letter of 26 January 2018. It is therefore not representative of the subject-matter of claim 1. Examples P1 and P3-P5 also do not correspond to the subject-matter of claim 1 because the melt index of the LMW component is below the minimum of 600 dg/minute. Examples P1-P8 were prepared on the same reactor system as employed in the examples of the patent, indicated generally in paragraph [0172] whereas example C1 had been prepared in a commercial scale version of said reactor (D16, page 1, 4th paragraph).

The properties of these compositions are reported in Table 3 of D16:



Part #	ESCR F50, 10% hr	1% SEC MOD psi	2%SEC MOD psi	FLEX MOD psi
P1	296	199704	168175	213927
P2	65	198438	167013	212530
P3	177	193583	162986	207082
P4	141	191026	160248	206054
P5	106	179700	152462	190289
P6	201	208075	174656	234254
P7	160	226183	182617	277514
P8	223	201166	163318	247484
C1	290	202877	164600	246847
Example #2 from patent	773	201218	164693	249515

From this it is apparent that for examples P6-P8 the flexural modulus is uniformly higher than that of examples P1 and P3-P5 whereby the ESCR varies, the highest value being below the maximum of P1-P5 series of examples.

The appellant extracted two principal trends from these data and their graphical representation in figures 1 and 2 of D16 (statement of grounds of appeal, page 5):

- At constant  $I_2$  for the LMW component, the ESCR decreases with increasing density of the overall composition, however the ESCR increases with increasing  $I_2$  of the LMW component, meaning that if the  $I_2$  of the LMW component was increased whilst keeping constant the overall  $I_{21}$  of the composition, a higher ESCR for a given density would result;
- The flexural modulus increased with the  $I_2$  of the LMW component and also with increasing density of the composition whereby compositions where the  $I_2$  of the LMW component fell within the scope of the claims had a higher flexural modulus than compositions with a lower  $I_2$  LMW falling outside the claimed range.

While the Board observes that some trends may appear from the graphical representation in the figures of D16, it considers that a direct comparison of the examples to show dependence on a single parameter ( $I_2$  of the LMW component or total density) is not possible as the examples differ from each other in various respects including in particular the split and density of the HMW component, which both have an effect on stiffness and ESCR of the composition. In this connection it is noted that all examples in the tables with a high value of ESCR are characterised by a high value of the split independently of the value of  $I_2$  of the LMW component. On this basis it cannot be accepted that the data in D16 are able to lead to a clear conclusion with regard to a comparison between example 3 of D2 and a composition according to claim 1 and an effect derivable from the distinguishing features.

Some information on effects of an increase in  $I_2$  of the LMW component and of the density is however derivable from documents available in the art and representative of the knowledge of the skilled person.

Thus from D14 it is known that in semi-crystalline thermoplastic polymers the rigidity is principally a function of the degree of crystallinity and that in polyethylene resins the macroscopic density and the stiffness are correlated such that an increase in one is associated with an increase in the other (Section 2 on pages 234 and page 235, figure 1).

Moreover, from D17 it is known that the melt index and density increase together, i.e the density falls as the molecular weight is decreased (D17, left hand column, last line).

From D18 (section 2 on page 366) it is known that in bimodal polyethylene resins the high molecular weight component provides good mechanical and impact strength, whilst the low molecular component provides higher stiffness and better processability. This is confirmed by D19 (Table 1 on page 3).

On the basis of these teachings of D14, D17 and D18, it can be accepted - **even in the absence of unambiguous evidence** - that an increase of  $I_2$  of the LMW component results in an increase in density of the same (and therefore also of the overall density of the composition) and as a consequence of this in an increase in stiffness not only of the component but of the whole composition.

#### 1.4 The objective technical problem

In the light of the foregoing analysis the objective technical problem can be formulated as the provision of compositions based on those known from D2 having a higher stiffness, whilst maintaining satisfactory overall properties.

#### 1.5 Obviousness

As already explained in the previous section (see 1.3, above), the influences of the nature of the components or fractions of bimodal polyethylene compositions on the total properties are well studied and understood. Indeed D14 teaches that rigidity, crystallinity and density are correlated, D17 teaches that melt index and density and molecular weight are correlated and D18 and D19 teach that in bimodal polyethylene compositions the high molecular weight component gives rise to good

mechanical and impact strength whilst the low molecular weight component provides stiffness and processability.

Regarding other properties of the compositions, in addition to the foregoing, D14 teaches in section 3 that the slow crack growth resistance (ESCR) increases with decreasing melt flow index, i.e. increasing molecular weight of the polymer and that this correlation is observed for all homo- and copolymer samples (passage bridging pages 235 and 236). D14 also addresses - in section 4 - the issue of combining high stiffness with good ESCR. It is explained that the problem is that high molecular weight resins with high values for ESCR and toughness have low densities. It is then taught that this balance of properties can be achieved with a combination of a low molecular weight homopolymer fraction (semi-crystalline) and a high molecular weight copolymer, resulting in polymers with "unusual properties" and furthermore that this can be achieved with Ziegler Natta catalysts, i.e. the type of catalyst employed in the examples of D2 and of the patent in suit. In the passage bridging pages 237-238 of D14 it is stated that the bimodal high density polyethylene exhibits good ESCR despite having high density and improved mechanical properties.

On this basis the skilled person seeking to provide a composition with higher stiffness over that of example 3 of D2 would be directed in the light of the knowledge of the prior art to modify the LMW component, in particular to increase its density, which, it is taught, is accomplished by decreasing the molecular weight and so - inevitably - increasing the melt index of the same. An increase in density of the LMW component will automatically result in an increase of the total density of the composition.

By means of said increase in  $I_2$  and increase in the total density the skilled person will therefore necessarily obtain a composition according to claim 1 when seeking to solve the posed problem and following the teaching of the prior art.

Consequently an inventive step cannot be acknowledged for the subject-matter of claim 1 of the main request.

2. First auxiliary request

Claim 1 of the first auxiliary request differs from the main request by additionally specifying the melt flow ratio ( $I_{21}/I_5$ ) of the composition as being 15-35.

It was a matter of consensus between the parties that this additional feature did not introduce any further aspects in respect of inventive step.

Accordingly, the same conclusion is reached as for the main request that an inventive step cannot be recognised for the subject matter of the first auxiliary request.

3. Second auxiliary request

Claim 1 restricts the proportions of the two components, i.e. the split, to 55 to 75 weight percent HMW and 25 to 45 weight percent LMW component.

Example 3 of D2 employs 48 weight percent of the LMW fraction. However example 2 of D2 employs 45 weight percent thereof.

Since there is no evidence for any technical effect

associated with this amended split of the components, nor any arguments in this respect, no inventive step can be recognised for making a modification within the ambit of the explicit disclosure of D2.

4. Third auxiliary request

Claim 1 differs from claim 1 of the second auxiliary request by restricting the comonomer to hexene. There is no evidence for any technical effect associated with this modification, nor any arguments in this respect. Furthermore the use of hexene as a comonomer is explicitly suggested in D2 at the last line of page 2.

Accordingly this subject-matter can not be acknowledged as supporting an inventive step over the disclosure of D2.

5. Fourth and fifth auxiliary requests

As explicitly acknowledged by the appellant the purpose of these requests were to address other matters, not however inventive step.

Consequently the above conclusions apply with the result that no inventive step can be recognised for either of these requests.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:



L. Stridde

D. Semino

Decision electronically authenticated