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**Datasheet for the decision  
of 27 April 2009**

**Case Number:** T 0608/07 - 3.3.03

**Application Number:** 01919632.8

**Publication Number:** 1272536

**IPC:** C08F 10/00

**Language of the proceedings:** EN

**Title of invention:**  
Polymerisation process

**Patentee:**  
INEOS EUROPE LIMITED

**Opponent:**  
Basell Polyolefine GmbH

**Headword:**

-

**Relevant legal provisions:**  
EPC Art. 83, 54, 56

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

-

**Keyword:**  
"Disclosure - enabling - general technical knowledge"  
"Novelty (yes)"  
"Inventive step (no) - all requests"

**Decisions cited:**

T 0256/87, T 1110/03, Zipher Ltd. v. Markem Systems Ltd. [2008]  
EWHC 1379

**Catchword:**  
Reasons, 2.5.1 and 2.5.2



Case Number: T 0608/07 - 3.3.03

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.03  
of 27 April 2009

**Appellant:** INEOS EUROPE LIMITED  
(Proprietor of the patent) Hawkslease  
Chapel Lane  
Lyndhurst  
Hampshire SO43 7FG (GB)

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

**Respondent:** Basell Polyolefine GmbH  
(Opponent) Patentstelle E 413  
Industriepark Höchst  
D-65926 Frankfurt (DE)

**Representative:** Luderschmidt, Schüler & Partner  
Patentanwälte  
John-F.-Kennedy-Strasse 4  
D-65189 Wiesbaden (DE)

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office dated 17 January 2007  
and posted 14 February 2007 revoking European  
patent No. 1272536 pursuant to Article  
102(1),(3) EPC 1973.

**Composition of the Board:**

**Chairman:** R. Young  
**Members:** W. Sieber  
H. Preglau

## Summary of Facts and Submissions

I. The mention of the grant of European patent No. 1 272 536, in respect of European patent application No. 01919632.8, based on International application PCT/GB01/01583, in the name of BP Chemicals Limited (now Ineos Europe Limited), filed on 6 April 2001 and claiming priority from GB 0008770 (10 April 2000), was published on 26 May 2004 (Bulletin 2004/22). The granted patent contained 13 claims, whereby Claims 1 and 5-7 read as follows:

"1. Process for the polymerisation or copolymerisation of 1-olefins in which a transition is made from polymerisation using a first catalyst to polymerisation using a second catalyst, comprising the steps of

- a) discontinuing the feed of the first catalyst into the polymerisation reactor in which polymerisation with said first catalyst has been occurring, and then
- b) introducing the second catalyst into the reactor,

wherein one of the catalysts comprises a late transition metal catalyst and the other is a catalyst which is incompatible therewith.

5. Process according to any of claims 1 to 3, wherein subsequent to step a) a deactivating agent in a sufficient amount to deactivate the first catalyst is introduced into the reactor before the second catalyst is introduced into the reactor.

6. Process according to claim 5, wherein the activity of the first catalyst is reduced by up to 50% from its maximum prior to addition of the second catalyst, or alternatively by 50, 70 or 95%, or it may be killed completely.

7. Process according to claim 5, wherein the activity of the first catalyst is reduced by at least 95% from its maximum prior to addition of the second catalyst."

II. Notice of opposition was filed by Basell Polyolefine GmbH on 24 February 2005 requesting revocation of the patent in its entirety on the grounds that the subject-matter of the granted claims was neither novel nor involved an inventive step (Article 100(a) EPC) and that the patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC).

The opposition was *inter alia* based on the following documents:

D1: EP 0 751 965 B1; and

D3: WO 99/12981 A.

III. By a decision which was announced orally on 17 January 2007 and issued in writing on 14 February 2007, the opposition division revoked the patent because none of the claim sets before the opposition division, namely claims as granted (main request) and Claims 1-10 filed with letter dated 14 November 2006, met the requirements of Article 83 EPC.

The opposition division held that in order for the skilled person to work the invention over the whole scope of the claims it was necessary to know what was meant by the term "incompatible" present in Claim 1 of both requests.

On page 2, line 57 to page 3, line 3 of the patent specification it was disclosed that by "incompatible" was meant that the two catalysts satisfied at least one of three conditions which were disclosed as

"1) catalysts which in each other's presence reduce the activity of at least one of the catalysts by greater than 50%;

2) under the same reactive conditions one of the catalysts produces polymers having a molecular weight two times or more that of any other catalyst in the system; and

3) catalysts that differ in comonomer incorporation or reactivity ratio under the same conditions by more than 30%".

The opposition division's decision focussed on the second of these three criteria, ie the molecular weight requirement. The patent in suit did not indicate which molecular weight was meant in condition 2. Since, furthermore, Examples 4.2 and 9.2 of D3 showed that, depending on which molecular weight was used, the same pair of catalysts could be evaluated either as "incompatible" (using the weight average molecular weight) or "compatible" (using the number average molecular weight), the person skilled in the art was not able to work the invention over the whole scope of

the claim. Thus, the opposition division held that both requests failed to meet the requirements of Article 83 EPC.

IV. On 11 April 2007, the appellant (proprietor) filed a notice of appeal against the above decision with simultaneous payment of the prescribed fee. The statement of grounds of appeal was filed on 14 June 2007 together with copies of five new documents and two auxiliary requests.

D5: *Andrew J. Peacock*, Handbook of Polyethylene, Copyright 2000, pages 6-10;

D6: Introduction to Polymer Chemistry, Department of Chemistry, University of Rochester, Copyright 2002, last updated 18 December 2002;

D7: US 5 084 534 A;

D8: EP 0 277 004 A1; and

D9: EP 0 589 364 B1.

(a) The appellant requested as main request that the decision under appeal be set aside and the patent be maintained unamended.

(b) The 1<sup>st</sup> auxiliary request was the amendment of page 3, lines 2-3 of the patent specification by the deletion of criterion 2 (molecular weight) from the conditions which defined the incompatibility of catalysts.

(c) The 2<sup>nd</sup> auxiliary request was the amendment of granted Claim 1 as follows:

"... wherein one of the catalysts comprises a late transition metal catalyst and the other is a catalyst which is incompatible therewith **such that (1) the catalysts in each other's presence reduce the activity of at least one of the catalysts by greater than 50% or (2) the catalysts differ in comonomer incorporation or reactivity ratio under the same conditions by more than 30%.**"

V. The arguments of the appellant presented in the statement of grounds of appeal may be summarized as follows:

The Appellant did not dispute the fact that there were a number of different molecular weights available for the skilled person to describe an individual polymer structure and these included, as highlighted by D3, number average molecular weight ( $M_n$ ), weight average molecular weight ( $M_w$ ) and peak molecular weight ( $M_{peak}$ ). This was also clear from D5. However, in view of the information presented in D6 the skilled person would readily understand the term "molecular weight" to mean weight average molecular weight. In the more general statements of D7 and D8, reference was made to the molecular weight of polymers without further definition. Only when the matter was discussed in more detail, the polymers were defined by their weight average molecular weight. Furthermore, also in D9, an application of the respondent, there was no definition of how to measure molecular weight or indeed whether the reference to molecular weight meant  $M_n$ ,  $M_w$  or  $M_{peak}$ .

The appellant concluded that: 1) the skilled person, in the absence of any other evidence, would consider that molecular weight would be considered to mean weight average molecular weight. 2) When considering the incompatibility of catalysts based on the molecular weights of the resultant polymers, the skilled person would understand that for a meaningful comparison the same molecular weight definition must be used whether it be weight average molecular weight or number average molecular weight. 3) The patent as granted was sufficient in enabling the skilled person to work the invention over the whole scope of the claims.

VI. In its reply dated 26 October 2007, the respondent (opponent) requested that the appeal be dismissed. Apart from that it was also requested that if the board was willing to acknowledge the sufficiency of disclosure of the main request, 1<sup>st</sup> or 2<sup>nd</sup> auxiliary request, the case was not remitted to the first instance, but a final decision was made on the patentability of the claimed subject-matter.

(a) As regards the appellant's main request, the respondent argued that the person skilled in the art reading the patent in suit was not in a position to decide whether catalysts 4.2 and 9.2 and/or catalysts 16 and 17 disclosed in D3 had to be considered as incompatible or not. Thus, it was not possible for the person skilled in the art to carry out the invention in all its essential aspects and to know when he was working within the forbidden area of the claims. In this context, reference was made to T 256/87.



The skilled person might use common general knowledge to supplement the information contained in the patent and even recognise and rectify errors in the description on the basis of such knowledge. However, none of the new documents cited by the appellant, ie D5-D9, had to be considered in this connection. D5 and D6 were published after the priority date of the patent in suit and therefore did not reflect the relevant state of the art. Documents D7-D9 were patent literature not mentioned in the patent specification, and therefore a skilled person would not consider them.

- (b) Further, the respondent argued that the successive performance of polymerisations using catalysts of D3, which were incompatible, such as Examples 6.2 and 8.2 (incompatible based on the values given in D3 for  $M_n$  and  $M_w$ ) in one schlenk tube or reactor anticipated the claimed process.
- (c) The claimed subject-matter as granted was also not based on an inventive step. D1, which had to be considered as the closest prior art, disclosed likewise a process for transitioning using two incompatible catalysts, whereby one catalyst was a metallocene catalyst. Late transition metal complexes falling with the scope of Claim 1 as granted were not explicitly mentioned in D1, but fell within the general definition of ligand transition metal complexes used in D1. Accordingly, the process of Claim 1 as granted differed from D1 only in selecting different transition metal

complexes. Particular advantages and/or effects did not result from this difference. A comparison of the examples of the patent in suit with Example 1 of D1 showed that in both cases a smooth transition without the formation of fines was achieved. Therefore, the underlying problem of the patent in suit could be seen in the verification whether the process of D1 was also applicable to late transition metal complexes. However, the use of late transition metal complexes in polymerisation reactions of 1-olefins was known from D3. Thus, it had been obvious to use the process of D1 wherein one of the catalysts was a late transition metal catalyst.

- (d) Especially in view of D1 giving a different definition for incompatible catalysts, it was essential that the definition for incompatibility of the catalyst was included in the claims. Therefore this request was not in line with Article 84 EPC.

As regards lack of novelty and lack of inventive step similar observations as for the main request applied to the 1<sup>st</sup> auxiliary request.

- (e) Similar observations as for the 1<sup>st</sup> auxiliary request also applied to the 2<sup>nd</sup> auxiliary request.

VII. With letter dated 14. April 2009, the appellant indicated that it would not be attending the oral proceedings scheduled for 27 April 2009. However, the appellant maintained the request noted in the statement

of grounds of appeal filed on 14 June 2007 (see point IV, above).

VIII. On 27 April 2009, oral proceedings were held before the board where the appellant, as announced, was not represented. Since, however, it had been duly summoned, the proceedings were continued in its absence in accordance with Rule 115(2) EPC.

- (a) As regards disclosure of the invention, the respondent basically relied upon its written submissions.
- (b) The respondent maintained its request that the case was not remitted to the first instance, but a final decision was made on the patentability of the claimed subject-matter.
- (c) The respondent maintained its novelty objection against Claim 1 as granted in view of D3. Further, it raised a novelty objection in view of D1.
- (d) The respondent also maintained its objection that the process of Claim 1 as granted was not based on an inventive step over D1 (the closest prior art) in combination with D3. The problem had to be seen in the provision of a mere alternative to the process of D1. Since the late transition metal complexes of D3 fell within the general description of the catalysts used in D1, the person skilled in the art would have used the complexes of D3 in the process of D1.

Further, the respondent argued that D3 would be an alternative starting point for the assessment of inventive step.

- (e) As regards the auxiliary requests, the respondent argued that the definition of incompatibility was unclear in view of the inconsistency in the text of the patent specification. Furthermore, the respondent questioned the deletion of condition 2 (molecular weight) under Article 123(2) EPC.

As regards novelty and inventive step of the auxiliary requests, similar observations as to the main request applied.

## **Reasons for the Decision**

1. The appeal is admissible.
  
2. *Disclosure of the invention, main request (claims as granted)*
  - 2.1 The subject-matter of granted Claim 1 relates to a process for transitioning between different polymerisation catalysts whereby one of the catalysts comprises a late transition metal catalyst and the other is a catalyst which is incompatible therewith.

It is conspicuous to the board that granted Claim 1 does not define what is meant by the term "incompatible". Only in paragraph [0012] of the patent in suit it is disclosed that "By incompatible is meant the definition previously given: namely that the two

catalysts satisfy at least one of the following conditions:

- 1) catalysts which in each other's presence reduce the activity of at least one of the catalysts by greater than 50%;
- 2) under the same reactive conditions one of the catalysts produces polymers having a molecular weight two times or more that of any other catalyst in the system; and
- 3) catalysts that differ in comonomer incorporation or reactivity ratio under the same conditions by more than 30%."

2.2 As regards sufficiency of disclosure, the opposition and opposition appeal proceedings focussed on condition 2) because that definition led to some difficulties in determining whether or not certain combinations of late transition catalysts disclosed in D3 fell inside or outside the scope of granted Claim 1.

D3 relates to polymerisation catalysts comprising Fe, Co, Ru or Mn, whereby Fe, Co and Ru are metals from Group VIIIb of the Periodic Table, ie late transition metals within the meaning of the patent in suit (see patent specification paragraph [0011]). In particular, D3 describes the preparation of 2,6-diacetylpyridine-bis(2-tert.-butylanil)FeCl<sub>2</sub> (Example 4.2) and 2,6-diacetylpyridine-bis(2,4,6-trimethylanil)FeCl<sub>2</sub> (Example 9.2), ie two late transition metal catalysts. Polymerisation tests were carried out in D3 with these iron catalysts under identical reaction conditions (page 35, lines 18-32). The analysis of the solid polyethylenes (page 36, lines 17-22) shows that the polymer produced with the catalyst of Example 4.2 had a

$M_n$  of 4 100 and a  $M_w$  of 228 000, whereas the polymer produced with the catalyst of Example 9.2 had a  $M_n$  of 4 400 and a  $M_w$  of 52 000. Thus, a comparison based on the respective  $M_n$  values of the two polymers (4 100 versus 4 400) would lead to the conclusion that the two catalysts of Examples 4.2 and 9.2 would be evaluated as "compatible" according to definition 2) given in paragraph [0012] of the patent in suit. On the other hand, a comparison of the respective  $M_w$  values (228 000 versus 52 000) would lead to the conclusion that the two catalysts would be evaluated as "incompatible".

Thus, according to the respondent, it was not possible for the person skilled in the art to carry out the invention in all its essential aspects because he did not know when he was working within the forbidden area of the claim. In this context, reference was made to T 256/87.

2.3 However, the board cannot follow this line of argumentation for the following reasons:

2.3.1 There was no dispute amongst the parties that there are a number of different molecular weights available to the skilled person to describe an individual polymer structure and these include, as is apparent from D3, number average molecular weight ( $M_n$ ), weight average molecular weight ( $M_w$ ) and peak molecular weight ( $M_{peak}$ ).

A similar teaching can be found in D6 under the heading "Molecular weight": "Among many possible ways of reporting averages, three are commonly used: the *number average*, the *weight average*, and *z-average* molecular weights." But D6 then goes on to say: "The weight

average is probably the most useful of the three, because it fairly accounts for the contributions of different sized chains to the overall behaviour of the polymer, and correlates best with most of the physical properties of interest." Thus, this statement in D6 supports the appellant's position that the person skilled in the art would readily understand the term "molecular weight" to mean weight average molecular weight ( $M_w$ ).

The respondent tried to query the relevance of D6 because it was published after the priority date of the patent in suit and represented merely a personal opinion rather than common general knowledge. D6 is indeed published after the priority date of the patent in suit (copyright date of 2002). However, D6 relates to published course material from the University of Rochester. As can be seen from the first paragraph of D6 under the heading "Course Description", the course is an introduction to polymer chemistry "which provides an overview of the chemistry and physics of polymers. The structures and synthetic mechanisms of most commercially important polymers are discussed, including step and chain polymerization reactions, as well as polymer modification chemistry. Theories of the physical properties of polymers both in solution and in solid state are covered. Characterization topics include molecular weight averages, thermal transitions, and mechanical properties." It is evident from this passage that D6 is not the personal opinion of the lecturer but clearly relates to subject-matter well known in the art for many years. Hence, albeit published after the priority date of the patent in suit, D6 provides indirect evidence for common general

knowledge well known in the art for many years, ie before the priority date of the patent in suit. Such a document does not stand or fall merely by its publication date (see in this context T 1110/03, OJ EPO 2005, 302).

2.3.2 The conclusion reached from D6, namely that the skilled person would readily understand the term "molecular weight" to mean weight average molecular weight, is further corroborated by the disclosures of D7 and D8. Although D7 and D8 are not common general knowledge on their own (they are patent documents), they show that the more general discussion in these documents refers to the molecular weight without further definition, whereas when it comes to the details of the polymers reference is made to the weight average molecular weight.

Thus, at column 2, lines 2-19 D7 discusses the molecular weight of polymers prepared from metallocene catalyst systems compared to those prepared from Ziegler catalyst systems. The discussion mentions the relative molecular weights without further definition. Further general discussion is made at column 3, lines 35-40 of D7. At column 8, lines 12-19 and in the examples D7 then discloses that the polymer products have a weight average molecular weight.

A similar pattern can be found in D8. At page 2, line 57 to page 3, line 12 D8 reports relevant differences in polymer molecular weights obtained with different metallocene complexes without further definition as to the type of molecular weight described. On page 10, lines 7-22 more general discussion of



molecular weight without definition may be found. However, the reported exemplified polymers are defined by their weight average molecular weights.

2.4 In summary, in the absence of any evidence to the contrary, the indirect evidence provided by D6 together with the corroborating disclosure of D7 and D8 plausibly demonstrate the appellant's position that the person skilled in the art would readily understand the term "molecular weight" to mean weight average molecular weight. Accordingly the board considers that the patent as granted is sufficient in enabling the skilled person to work the invention over the whole scope of the claims.

2.5 Apart from the fact that, in the present case, the person skilled in the art would readily understand the term "molecular weight" to mean weight average molecular weight, the board wishes to add the following remarks.

2.5.1 It appears that the issue with regard to sufficiency of disclosure is quite similar to the situation in T 256/87 of 26 July 1988 (not published in the OJ EPO) cited by the respondent. In T 256/87, amended Claim 1 related to a liquid detergent composition comprising a certain amount of "enzyme-accessible calcium" (EAC), but no method had been described for analytically determining the amount of EAC in the composition. Thus, the question arose whether the information in the description in relation to EAC was "sufficient to enable the skilled person to carry out the invention in the sense of his (a) being able to establish whether a composition containing an amount of EAC falling within

the range claimed, and (b) being able reliably to prepare such a composition" (point 10 of the reasons of the decision). In the end, it was held that "the information given in the specification was sufficient in the context of the general knowledge concerning the behaviour of such formulations at various calcium levels for the skilled person to be in a position relatively simply to arrive at and/or identify a composition as claimed specifically having an EAC level as defined in feature (e)" (point 15 of the reasons of the decision). In the present case it is likewise the context of the general knowledge which enables the person skilled in the art to arrive at/or identify the claimed process.

- 2.5.2 The issue of insufficiency dealt with in T 256/87 and the present case is an insufficiency which arises through ambiguity. Although the board accepts that, depending upon the circumstances, such an ambiguity may very well lead to an insufficiency objection, it should be born in mind that this ambiguity also relates to the scope of the claims, ie Article 84 EPC. Since, however, Article 84 EPC is in itself not a ground of opposition, care has to be taken that an insufficiency objection arising out of an ambiguity is not merely a hidden objection under Article 84 EPC. It is the conviction of this board that for an insufficiency arising out of ambiguity it is not enough to show that an ambiguity exists, eg at the edges of the claims. It will normally be necessary to show that the ambiguity deprives the person skilled in the art of the promise of the invention. It goes without saying that this delicate balance between Article 83 and 84 EPC has to be assessed on the merits of each individual case.

In the present case, for example, it appears that the respondent (opponent) has merely shown the existence of an ambiguity due to a lacking definition of the molecular weight. The respondent has not shown that the "molecular weight problem" permeates the whole claim or is associated with an undue burden. It is accepted that for some pairs of late transition metal catalysts there exists an ambiguity as to whether these pairs should be evaluated as "incompatible" or "compatible". However, the use of two late transition metal catalysts is only one possibility of using incompatible catalysts. It is stated in paragraph [0013] of the patent in suit that "Catalysts which are incompatible with LTM [*late transition metal*] catalysts include Phillips type (chromium) catalysts, metallocene catalysts and Ziegler-Natta Catalysts. However, this invention also includes within its scope the case where two LTM catalysts are incompatible with each other according to the above definition". Whether the ambiguity relating to the classification of "incompatibility" affects other catalyst combinations, for example those with Phillips type catalyst or Ziegler-Natta catalysts, has not been shown by the respondent. Further, it appears from the table on page 36 of D3 that most of the late transition metal catalyst combinations would be evaluated as "incompatible" using either  $M_w$  or  $M_n$  (the skilled person would of course understand that for a meaningful comparison the same molecular weight definition must be used whether it is  $M_w$  or  $M_n$ ). Thus, in the present case, the respondent has shown the existence of an ambiguity without investigating the effect of this ambiguity over the whole scope of the claim, in particular as to whether it is only

significant at the edges or permeates the whole claim (cf decision of the High Court of England and Wales, *Zipher Ltd v. Markem Systems Ltd* [2008] EWHC 1379).

3. *Procedural matter*

- 3.1 The respondent requested that if the board acknowledged the sufficiency of disclosure of the main request, 1<sup>st</sup> or 2<sup>nd</sup> auxiliary request, the case should not be remitted to the first instance but a final decision was made on the patentability of the claimed subject-matter, thus keeping the procedure as short as possible.

This request was filed with the letter dated 26 October 2007 which contained also arguments as to why the claimed subject-matter was, according to the respondent, not novel and not based on an inventive step. Although these submissions had been on file for well over a year, the appellant commented neither on the arguments relating to novelty and inventive step nor on the respondent's request for a final decision. In the letter dated 14 April 2009 where it indicated that it would not be attending the scheduled oral proceedings, the appellant merely maintained the requests noted in the statement of grounds of appeal filed on 14 June 2007 (see point IV(a) and IV(b), above). Under these circumstances the board considers it appropriate to follow the respondent's request and makes use of the discretion given to it by Article 111(1) EPC further to examine the case.

4. *Novelty, main request (claims as granted)*

4.1 In its written submissions and at the oral proceedings the respondent has raised a novelty objection in view of D3.

As set out in point 2.2, above, D3 discloses polymerisation catalysts comprising Fe, Co, Ru or Mn and their use in polyolefin polymerisation. The respondent argued that the successive performance of polymerisations using catalysts of D3, such as those of Examples 6.2 and 8.2 (which comprise a late transition metal and were incompatible based on the values given in D3 for  $M_n$  and  $M_w$  on page 36, lines 19-20) in one schlenk tube or reactor anticipated the process of Claim 1 as granted.

Although the board agrees with the respondent that the wording of Claim 1 as granted does not exclude quenching of the reaction and/or emptying or clearing the reaction vessel so that the successive polymerisation of catalysts of Examples 6.2 and 8.2 in one and the same schlenk tube would fall within the scope of Claim 1 as granted, it is conspicuous to the board that D3 does not disclose such a successive polymerisation. Examples 6.2 and 8.2 are individual examples and there is no information whatsoever in D3 as to whether or not the polymerisations were carried out successively in one and the same schlenk tube. Consequently, D3 does not clearly and unambiguously disclose a polymerisation process as defined in Claim 1 as granted. In other words, the claimed process is novel over D3.

4.2 At the oral proceedings, the appellant also argued for the first time that the claimed process was not novel over D1. Since, however, this objection was not part of the respondent's reply to the statement of grounds of appeal and indeed represented an amendment to the respondent's case which the appellant could not have foreseen, the board exercised its discretion not to admit this objection into the proceedings (Articles 12(2) and 13 of the Rules of Procedure of the Boards of Appeal of the European Patent Office, OJ EPO 2007, 536).

5. *Inventive step, main request (claims as granted)*

5.1 The board agrees with the respondent that D1 represents the closest prior art. D1 relates to the same technical field, namely to a process for transitioning from a polymerisation reaction catalysed by a first catalyst to one catalysed by a second catalyst comprising a metallocene catalyst, wherein said first and second catalysts are incompatible, and the process comprises the steps of:

- a) discontinuing the introduction of the first catalyst into the reactor,
- b) introducing into the reactor an irreversible catalyst killer, and
- c) introducing the second catalyst into the reactor.

According to D1, metallocene catalysts typically comprise bulky ligand transition metal complexes derivable from the formula  $\{[(L^p)_m M(A^q)_n]^{+k}\}_h [B^{i-j}]_i$  wherein M is defined as a metal, preferably a transition metal (page 4, lines 21-33). Late transition

metal complexes falling within the scope of Claim 1 as granted are not mentioned in D1.

"Incompatible catalysts" are defined in the same manner as in the patent in suit, namely as satisfying one of the following conditions (D1: page 3, line 55 to page 4, line 2):

- 1) those catalysts that in each other's presence reduce the activity of at least one of the catalysts by greater than 50%;
- 2) those catalysts such that under the same reactive conditions one of the catalysts produces polymers having a molecular weight greater than two times higher than any other catalyst in the system; and
- 3) those catalysts that differ in comonomer incorporation or reactivity ratio under the same conditions by more than 30%."

5.2 Although the process of Claim 1 of the patent in suit does not require the addition of a catalyst killer, the claimed process encompasses this possibility. In fact, the use of a catalyst killer is even claimed as a preferred embodiment in dependent Claims 5-7 (point I, above). Thus, the advantage of avoiding a catalyst killer cannot be taken into account when formulating the objective technical problem over D1 because it does not pertain to the whole scope of Claim 1 as granted.

In the end, the process of Claim 1 as granted differs from the process of D1 only in the use of a different pair of catalysts. Particular advantages and/or effects due to this difference are not apparent from the patent in suit. The examples in the patent in suit show that a smooth transition between catalysts was possible

(paragraph [0072] of the patent in suit), but the same is true for the process of D1 (page 10, line 30: "The transition process was smooth with no fouling."). Consequently, the objective technical problem over D1 can only be seen in the provision of an alternative to the process of D1.

- 5.3 A person skilled in the art starting from D1 as the closest prior art and faced with the problem of providing an alternative to the process of D1 would immediately contemplate the use of other incompatible catalyst pairs in the process of D1. In principle, any other catalyst capable of forming an "incompatible" catalyst pair might be regarded as a feasible alternative by the person skilled in the art, and therefore obvious, since each alternative "incompatible" catalyst pair would provide an equivalent solution to the objective technical problem. Since, however, metallocene catalysts are transition metal complexes, the person skilled in the art would primarily look for other transition metal complexes. Therefore, there was an incentive for the person skilled to consider the late transition metal complexes disclosed in D3 as possible substitutes for the metallocenes in the process of D1, and the person skilled in the art would combine the closest prior art with D3. Since, most of the catalysts disclosed in D3, in particular in the examples of D3, are the preferred late transition metal catalysts used in the process of granted Claim 1 (paragraph [0030] of the patent in suit), these late transition metal catalysts of D3 would form "incompatible" catalyst pairs with other catalysts so that the person skilled in the art would inevitably arrive at something falling within the scope



of Claim 1 as granted. For example, D3 discloses in Example 9.2 the preparation of 2,6-diacetylpyridine-bis(2,4,6-trimethylanil)FeCl<sub>2</sub> which is the late transition catalyst used in Examples 1 and 2 of the patent in suit in combination with a Phillips (chromium) catalyst. Thus, there cannot be any doubt that the late transition metal catalysts disclosed in D3 will provide "incompatible" catalyst pairs within the meaning of the patent in suit. Consequently, the subject-matter of Claim 1 as granted is obvious over a combination of D1 with D3.

5.4 Under these circumstances there is no need for the board to comment on the respondent's alternative approach on the assessment of inventive step with D3 as the closest state of the art.

5.5 In summary, the subject-matter of Claim 1 as granted is obvious over a combination of D1 with D3. Consequently, the main request has to be refused.

## 6. *Auxiliary requests*

6.1 In the 1<sup>st</sup> auxiliary request the appellant amended the description by deleting criterion 2 (molecular weight) from the conditions which define the incompatibility of the catalysts. Although Claim 1 remained unchanged, the amended description is an "implicit restriction" to Claim 1 as granted which has to be taken into account when interpreting the scope of the claim with respect to the incompatibility of the catalysts. In the 2<sup>nd</sup> auxiliary request the "implicit restriction" of the 1<sup>st</sup> auxiliary request has been made "explicit" by introducing criteria 1 and 3 for the incompatibility

into Claim 1 as granted. This means that the scope of Claim 1 of the 1<sup>st</sup> auxiliary request (taking into account the definition of incompatibility in the amended description) and the scope of Claim 1 of the 2<sup>nd</sup> auxiliary request are identical. Consequently the following considerations apply to both auxiliary requests.

6.2 It is not apparent from the patent in suit how the more restricted definition of incompatibility in the auxiliary requests could possibly have any influence on the assessment of inventive step. On the contrary, the two conditions of the new definition of incompatibility, namely original conditions 1 and 3, are also present in the closest prior art (see point 5.1, above). Furthermore, there cannot be any reasonable doubt that the late transition metal catalysts disclosed in D3 will also provide incompatible catalyst pairs within the more restricted definition of incompatibility, since the group of catalysts disclosed in D3 is almost identical with the preferred class of late transition metal catalysts to be used in the claimed process. Thus, the board agrees with the respondent that the inventive step considerations with respect to the main request equally apply to the subject-matter claimed in the auxiliary requests.

6.3 Since the subject-matter of the auxiliary requests is also not based on an inventive step, the auxiliary requests have to be refused.

6.4 Under these circumstances there is no need to consider the other objections raised by the respondent under Article 84 and 123(2) EPC against the auxiliary

requests either in its written submissions and/or at the oral proceedings.

**Order**

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

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Young