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**Datasheet for the decision  
of 14 February 2025**

**Case Number:** T 2534/22 - 3.3.03

**Application Number:** 06803917.1

**Publication Number:** 1948355

**IPC:** B01J19/00, B01J19/18, B01J19/24

**Language of the proceedings:** EN

**Title of invention:**  
MULTIPLE COMPONENT FEED METHODS AND SYSTEMS

**Patent Proprietor:**  
CHEVRON PHILLIPS CHEMICAL COMPANY LP

**Opponents:**  
TotalEnergies OneTech Belgium  
Borealis AG

**Relevant legal provisions:**  
EPC Art. 54, 56, 84, 123(2)  
EPC R. 80  
RPBA 2020 Art. 12(6), 13(2)

**Keyword:**

Late-filed evidence - admitted in first-instance proceedings  
(no)

Novelty - Main Request (no) - Auxiliary request 1 (yes) -  
Auxiliary request 2 (no) - Auxiliary requests 3 and 4 (yes) -  
Auxiliary request 7 (yes)

Inventive step - Auxiliary request 1 (no) - Auxiliary requests  
3 to 5 (no) - Auxiliary request 7 (yes)

Amendments - allowable Auxiliary request 7 (yes)

Claims - lack of clarity no ground for opposition - Auxiliary  
request 7

Amendment after summons - exceptional circumstances - Auxiliary  
request 7 (yes)

Amendment occasioned by ground for opposition - Auxiliary  
request 7 (yes)

**Decisions cited:**

G 0003/14



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Case Number: T 2534/22 - 3.3.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.03**  
**of 14 February 2025**

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**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 13 October 2022  
revoking European patent No. 1948355 pursuant to  
Article 101(3)(b) EPC.**

**Composition of the Board:**

<b>Chairman</b>	D. Semino
<b>Members:</b>	D. Marquis
	L. Basterreix

## **Summary of Facts and Submissions**

- I. The appeal lies against the decision of the opposition division revoking European patent Nr. 1 948 355.
- II. The decision under appeal was based on the claims as granted (main request) and renumbered auxiliary requests 1 to 25, whereby auxiliary requests 1, 2, 16 and 17 were filed as auxiliary requests 1-4 with letter of 20 December 2019, auxiliary requests 3-15 and 22-25 were filed as main request A, auxiliary requests 1A-12A and auxiliary requests 9-12 with letter of 15 December 2021 and auxiliary requests 18-21 were filed as auxiliary requests 5-8 with letter of 6 November 2020.
- III. Claim 1 as granted read as follows:
- "1. A method for introduction of multiple components into a polymerization system, comprising the steps of: adding at least one polymerization catalyst component into the polymerization system at a controlled rate; adding at least one activator compound component into the polymerization system at a controlled rate; adding at least one co-catalyst component into the polymerization system at a controlled rate; introducing an amount of all of the components in at least one pre-contactor; directing output from the pre-contactor to at least one polymerization reactor; and directing remaining amounts of the components that were not sent to the pre-contactor to the at least one polymerization reactor".

IV. The following documents were *inter alia* submitted during the opposition proceedings:

D1: WO 2006/012321 A2

D4: WO 96/34899 A1

D6: EP 0 887 380 A1

D11: WO 00/22489 A1

D16: Declaration of Mr Scott E. Kufeld dated 15  
December 2021

V. The decision under appeal, as far as it is relevant to the present appeal, can be summarized as follows:

- Document D16 was not admitted into the proceedings.
- Claim 1 of the main request lacked novelty over D1. The same conclusion applied to claim 1 of auxiliary requests 1-7, 16 and 17.
- Claim 1 of auxiliary request 8 was novel over D4 and D6 but lacked an inventive step in view of D4 taken as the closest prior art. The same conclusion applied to claim 1 of auxiliary requests 9-15 and 18-25.

VI. The patent proprietor (appellant) lodged an appeal against the decision of the opposition division. With their statement of grounds of appeal the appellant submitted 25 sets of claims as auxiliary requests 1-25 and the following documents:

D18: Extract from Online Merriam-Webster dictionary showing the definition of "rate" as a noun.

D19: Extract from the on-line Big Chemical Encyclopedia "Carreau Yasuda", 7 pages.

D19a: Extract from the on-line Big Chemical Encyclopedia, Melt Rheology, page 663.

- VII. Both opponent 1 (respondent 1) and opponent 2 (respondent 2) replied to the appeal. Respondent 2 submitted D20 (ISO 6721-10:2015) with their rejoinder.
- VIII. Oral proceedings before the Board were held on 14 February 2025.
- IX. The final requests of the parties were as follows:
- The appellant requested that the decision of the opposition division be set aside and that the patent be maintained as granted (main request) or on the basis of one of the sets of claims of auxiliary requests 1-5, 7, 6 and 8-25 filed with the statement of grounds of appeal in this order.
  - Respondent 1 and respondent 2 requested that the appeal be dismissed.

Claim 1 of auxiliary request 1 corresponded to granted claim 1 further characterized in that "adding the components into the polymerization system at a controlled rate comprises the steps of:

selecting a desired flow rate for each component;  
conveying each component into the polymerization system at an actual flow rate;  
measuring the actual flow rate for each component;  
and adjusting the actual flow rate for each component to substantially equal the desired flow rate".

Claim 1 of auxiliary request 2 corresponded to granted claim 1.

Claim 1 of auxiliary request 3 corresponded to granted claim 1 further characterized in that "the components are added into the polymerization system as separate streams".

Claim 1 of auxiliary request 4 corresponded to claim 1 of auxiliary request 1 further characterized in that "the components are added into the polymerization system as separate streams".

Claim 1 of auxiliary request 5 corresponded to claim 1 of auxiliary request 3.

Claim 1 of auxiliary request 7 corresponded to claim 1 of auxiliary request 4 further amended in that "the at least one polymerization catalyst component comprises at least one polymerization metallocene solution component".

- X. The parties' submissions, in so far as they are pertinent, may be derived from the reasons for the decision below. The disputed points concerned the admittance of documents D16, D18, D19, D19a and D20 into the proceedings, novelty of claim 1 as granted and of auxiliary request 1 over D4, inventive step of claim 1 of auxiliary request 1 over D4 as the closest prior art, novelty of claim 1 of auxiliary request 2 over D4, inventive step of claim 1 of auxiliary requests 3-5 over D4 as the closest prior art, novelty over D1 and inventive step over D4 of claim 1 of auxiliary request 7, and the fulfilment of the requirements of Rule 80 EPC, Article 123(2) EPC and Article 84 EPC for claim 1 of auxiliary request 7.

## Reasons for the Decision

1. Admittance of documents
  - 1.1 D16 is a declaration which was submitted with letter of 15 December 2021, two months prior to the oral proceedings before the opposition division. D16 comprises experimental results in support of inventive step of auxiliary request 8. The opposition division decided not to admit D16 into the proceedings (decision under appeal, section 9.3.1). The appellant contested that decision and requested that D16 be admitted into the proceedings (statement of grounds of appeal, pages 2 and 3, section 4).
  - 1.2 The opposition division established in their decision that D16 had been filed late and that its admittance into the proceedings was at the discretion of the opposition division (decision under appeal, page 29, last paragraph). The opposition division came to the conclusion that D16 lacked the necessary information to be considered *prima facie* relevant for the question of inventive step (decision under appeal, page 29, first to third paragraphs). In particular, D16 was found to lack sufficient information in order to establish a causal link between any effect allegedly shown in D16 and the control of the addition rates of the catalyst components and, ultimately, that lack of information meant that D16 lacked reproducibility (decision under appeal, page 29, penultimate paragraph). The opposition division in particular mentioned the undefined metallocene catalyst and unspecified acid activator as well as the absence of their flow rates in the table of D16 and the lack of information on the parameter "CY-A" mentioned in D16 (decision under appeal, page 28, last

two paragraphs, page 29, second to fourth paragraphs). The assessment of the additional evidence in D16 by the opposition division therefore relied on a lack of reproducibility of the evidence.

1.3 According to consistent case law, to be of relevance in demonstrating that a technical improvement is achieved in comparison with the closest state of the art, any comparative test presented must be reproducible on the basis of the information thus provided, thereby rendering the results of such tests directly verifiable. This requirement implies, in particular, that the procedure for performing the test relies on quantitative information enabling the person skilled in the art to reproduce it reliably and validly (Case Law of the Boards of Appeal, 10th Edition 2022, in the following Case Law, I.D.4.3.2).

1.4 It is apparent in the present case that D16 does not disclose a number of parameters of the process of polymerization of ethylene with 1-hexene that would have an impact on the polymer obtained and its properties, such as its rheological properties. The opposition division identified, in the course of a *prima facie* assessment of the content of D16, a lack of disclosure of the catalyst, activator and flow rates of the components (which are all part of granted claim 1) for which the Board does also not find a disclosure in D16.

1.5 The appellant contested the conclusion of the opposition division and argued that the decision was based on the discussion of details of experimental design which were not relevant to the issue of inventive step (letter of 27 November 2024, pages 1 and 2). The appellant mentioned the kind of pre-contactor,

the means for controlling the rates of addition of the components into the polymerisation system, how the components were fed to the system and the CY-"a" parameter. While it could be accepted that the value of the CY-"a" parameter does not concern the reproducibility of the experiments reported in D16, it remains that the flow rates of the metallocene catalyst and of the activator, which are given some relevance in D16 itself (item 9) and the identification of the components of the catalyst system would have been paramount to the reproducibility of D16. It follows that the reasoning of the opposition division is based on elements that without doubt are relevant to the reproducibility of D16 and therefore also relevant for the question of admittance of D16.

1.6 The reasoning provided by the opposition division on the admittance of D16 is performed on a *prima facie* review of the information contained in D16 which is the established criterion to be applied in the situation (Case Law, IV.C.4.5.3). The Board does therefore not see any reason to assume that the opposition division used its discretion not to admit D16 in an unreasonable way as argued in section 4 of the statement of grounds of appeal.

1.7 It is established case law that a board of appeal shall only overrule the way in which a department of first instance has exercised its discretion when deciding on a particular case if it is concluded that it has done so according to the wrong principles, or in an unreasonable way, and has thus exceeded the proper limits of its discretion (Case Law, IV.C.4.5.2). As this is not the case here and no reasons have been presented why there should be circumstances in appeal justifying the admittance of D16, the decision of the

opposition division is not overturned and document D16 is not admitted into the proceedings (Article 12(6) RPBA).

1.8 Since D19/D19a submitted by the appellant with their statement of grounds of appeal and D20 submitted by respondent 2 with their rejoinder were filed to address elements contained in D16 and D16 is not admitted into the proceedings, there is also no reason to admit D19/D19a and D20.

1.9 D18 is a copy of the Merriam-Webster definition of "rate" that was provided by the appellant with their statement of grounds of appeal. The admittance of D18 into the appeal proceedings was not contested nor does the Board see any reason not to admit that evidence which is part of the common general knowledge.

Main request (claims as granted)

2. Novelty over D4

2.1 Respondent 2 contested the novelty of granted claim 1 in view of D4 (rejoinder, pages 22 and 23, section 4.1.3). The process disclosed on pages 17 and 18 of D4 with reference to Figure 1 was seen as the most relevant disclosure of D4.

2.2 Granted claim 1 requires the addition of multiple components (catalyst, activator and co-catalyst) at a controlled rate into a polymerization system.

2.3 The process on pages 17 and 18 of D4 (paragraph bridging the two pages and first full paragraph on page 18) discloses pre-contacting a catalyst, a co-catalyst and an external donor component before they are added

to a polymerization reactor. The apparatus used for that process is shown in Figure 1 of D4 (also mentioned on page 17). The apparatus shows, in accordance with the disclosure on page 18, the addition of an external donor (vessel 1), a co-catalyst (vessel 2) and a catalyst (vessel 3) to a pre-contactor 4 used for catalyst activation. It was not disputed that the catalysts components shown in Figure 1 of D4 that are also discussed on page 18 effectively correspond to the catalyst components of granted claim 1.

- 2.4 Figure 1 of D4 also discloses a method showing a combination of pre-contactor (vessel 4) and polymerization reactor (vessel 5). It was not disputed that the pre-contactor and the polymerization reactor taken together could be seen as representing a "polymerization system" as mentioned in granted claim 1.
- 2.5 Granted claim 1 also sets out, for each of the catalyst components, that it is added into the polymerization system at "a controlled rate". While granted claim 1 did not further define the "controlled rate", the appellant argued that the structure of granted claim 1 required individual addition rates for each catalyst component, implying that a desired rate could be predetermined and the system could be arranged such that, when the actual rate differed from the desired rate, the system adjusted the actual flow rate to bring it closer to the desired flow rate (statement of grounds of appeal, paragraph bridging pages 4 and 5). The Board however finds no reason to read that additional feature into the wording of granted claim 1. Granted claim 1 only sets out three conditions for the addition of the component catalysts into the polymerization system "adding at least one

polymerization catalyst component into the polymerization system at a controlled rate; adding at least one activator compound component into the polymerization system at a controlled rate; adding at least one co-catalyst component into the polymerization system at a controlled rate". Granted claim 1 does not per se require any means of measuring and adjusting the flow rates of the three components to a desired value, let alone independently from one another. Furthermore, the wording of granted claim 1 with respect to the addition of the catalyst components into the polymerization system does not even require that the three catalyst components are added into the polymerization system separately from one another as feeding any combination of the components into the polymerization system using the same means would also fulfil the condition laid out in the claim.

- 2.6 D4 discloses in the passage bridging pages 17 and 18 how the process equipment of Figure 1 operates and in particular discusses the procatalyst, which is the catalyst before it is activated in the pre-contactor (page 2, first full paragraph). The first paragraph on page 18 discloses that the procatalyst "may be added by any method, either continuously or in batches" and Figure 1 shows the feed line from the procatalyst vessel 3 to the pre-contactor 4. The continuous addition of the procatalyst to the pre-contactor referred to on page 18 necessarily implies for the skilled person that the rate of addition of the procatalyst is somewhat regulated (at a minimum with a valve) to ensure continuous flow. With no further limitation in claim 1 as to what is intended by "controlled", the continuous flow of D4 therefore implies addition at a controlled rate read in its broadest technical sense. The Board considers that the

continuous addition of the procatalyst implies that the external electron donor and co-catalyst are also added continuously in order to perform the activation of the procatalyst in the pre-contactor. This is also in line with the disclosure in the second full paragraph of page 18 of D14 which mentions the use of a CSTR (i.e. a Continuous Stirred Tank Reactor) as a pre-contactor. This means that the external electron donor and co-catalyst are also added in this embodiment of D4 at a controlled rate in the sense of granted claim 1.

2.7 Claim 1 finally requires "directing remaining amounts of the components that were not sent to the pre-contactor to the at least one polymerization reactor". That wording does not define the ratio of components sent to the pre-contactor or directly to the polymerization reactor. In fact, the wording used in granted claim 1 mentioning "remaining amounts" merely sets out a possibility of directing the components directly to the polymerization reactor should there be any catalyst components remaining after the compulsory introduction of an amount of all of the components to the pre-contactor. In this respect, granted claim 1 formally also encompasses a method in which there are no remaining amounts of catalyst components to the polymerization reactor as this is the case in the method on page 18 of D4.

2.8 On this basis, the embodiment with a continuous addition of the catalyst components to the pre-contactor on pages 17 and 18 and Figure 1 of D4 anticipates the subject matter of claim 1 of the main request. The Board therefore concludes that D4 takes away the novelty of claim 1 of the main request.

Auxiliary request 1

3. Inventive step over D4

3.1 It was common ground that document D4 could be considered as the closest prior art for the method of claim 1 of auxiliary request 1 (statement of grounds of appeal, section 5.3.1, 5.3.3 and last three paragraphs of section 6; rejoinder of respondent 1, page 2, Inventive Step; rejoinder of respondent 2, section III. 2).

3.2 It was also common ground that the specific steps added to the method of claim 1 could be referred to as a "feedback control" (rejoinder of appellant 2, page 12, last paragraph). The feedback control in the method of claim 1 of auxiliary request 1 corresponds to the following combination of steps  
"adding the components into the polymerization system at a controlled rate comprises the steps of:  
selecting a desired flow rate for each component;  
conveying each component into the polymerization system at an actual flow rate;  
measuring the actual flow rate for each component;  
and adjusting the actual flow rate for each component to substantially equal the desired flow rate". It was also acknowledged that the passages on pages 17 and 18 of D4 did not disclose that combination of steps (rejoinder of appellant 2, page 42, first paragraph; also confirmed by all parties at the oral proceedings before the Board). The Board, considering the passages on pages 17 and 18 and Figure 1 of D4, does not see any reason to come to a different conclusion.

3.3 The appellant argued that the control of the rates of addition of the catalyst components into the

polymerization system according to the "feedback control" would render possible a control of the contact time of the catalyst components in the pre-contactor and therefore allow a control of the polymer properties that are affected by the duration of the pre-contacting step (statement of grounds of appeal, page 17, third full paragraph). The appellant also referred to paragraph 47 of the patent in suit for a basis for that effect (statement of grounds of appeal page 15, fourth paragraph) and formulated the problem as "to improve control of the properties of the polymer product" (statement of grounds of appeal, page 17).

- 3.4 The patent in suit suggests, in a very general way, that the addition rates of the catalyst components will have an impact on the polymerization but there is no further information on file on how the control of the flow rates or contact time in the pre-contactor should allow to obtain a polymer with specific controlled properties. The passage in paragraph 47 of the patent in suit cited by the appellant provides a non exhaustive list of properties that are affected by the control of the addition rates of the catalyst components (such as responses to the creep tests, stress relaxation, tau eta, tensile at yield and break, elongation at yield and break, secant moduli that can include 0.1 and 2 %, tensile (Youngs, elongation) modulus, storage and loss moduli, environmental stress crack growth, PENT, and combinations thereof) but there is no evidence in the patent in suit that these effects were effectively achieved when performing the feedback control as defined in claim 1 of auxiliary request.
- 3.5 According to the established case law of the boards of appeal, alleged advantages to which the patent proprietor/applicant merely refers, without offering

sufficient evidence to support the comparison with the closest prior art, cannot be taken into consideration in determining the problem underlying the invention and therefore in assessing inventive step (Case Law, I.D. 4.3.1). It follows that, in the absence of any evidence that the effects mentioned in paragraph 47 of the patent in suit were obtained, these effects cannot be taken into account in the formulation of the problem solved over D4.

- 3.6 The respondents accepted that the problem could be generically seen as the provision of a method allowing an improved control (rejoinder of respondent 2, section III.2, paragraph 322; both respondents at the oral proceedings). It is of course acceptable that the addition of further control means to a polymerization method, such as the addition of a feedback control as defined in operative claim 1, could result in a generic overall improvement of the control over the method. On this basis, the problem over D4 can be seen as the provision of a method allowing an improved control of the polymerization system.
- 3.7 The question of obviousness starting from D4 was whether a skilled person seeking generically an improved control of the polymerization system would have arrived at the feedback control defined in operative claim 1.
- 3.8 In essence, the standard feedback control defined in granted claim 1 requires the selection of a desired flow rate for each catalyst component, the measure of each flow rate during addition of the components into the polymerization system and adjusting the actual flow rate for each component to substantially equal the desired flow rate. While the Board considers that the

addition of an standard feedback control system at an arbitrary position in order to improve control is nothing more than a tautology and as such cannot be acknowledged to involve an inventive step, the same conclusion can be derived from the documents cited by the parties.

3.9 In this respect, respondent 2 argued that D9, D13, D10, D11, D12, D14 and D17 taught the use of feedback control systems that were relevant to that defined in operative claim 1. Within these documents the Board finds that D11 is the most relevant as it discloses general means of controlling process variables of polymerization systems.

3.9.1 D11 relates to a system for on line inference and control of the physical and chemical properties of olefin polymers either isolated or combined in series, with the aid of mathematical models (D11, page 1, lines 5-10). The control system of D11 is said to enable the "maximization of production rate and catalyst yield of producing process" (page 1, lines 13/14). In this respect D11 also deals with the general improvement of a polymerization system. The teaching of D11 is therefore relevant to the object of D4 which also concerns the improvement of the polymerization system (page 4, third paragraph).

3.9.2 Respondent 2 referred to the passage on page 9, lines 13-20 of D11 as being relevant to the question of inventive step (rejoinder, page 28, last paragraph). This passage of D11 sets out a control strategy for polymerisation reactors involving process variables that interplay with one another, such as controlled and manipulated variables (page 8, last three paragraphs and Figure 1). Controlled variables are variables whose

value must be maintained as close as possible to a desired value (D11, page 8, lines 24/25), such as the flow rate of the components relating to the operating conditions of the plant (D11, page 9, line 1-8). Manipulated variables are variables that must be adjusted so that controlled variables are maintained close to a set point or within certain limits, such as the monomer flow rates, catalysts and cooling water (D11, page 9, lines 13-20). This passage on pages 8 and 9 of D11 confirms that control strategies for the optimization of the operation of polymerization systems are generally known. These strategies can be performed by selecting variables of the process, such as the flow rate of the components, including the catalyst (manipulated variable, page 9, lines 17 and 18), that must be measured and adjusted to keep them at a desired value. It is apparent that what is called control strategy in D11 essentially corresponds to the feedback control described in the patent in suit (paragraph 8).

- 3.9.3 D11 does not specifically point to setting up such a control strategy for catalyst components when they are added to a pre-contactor. D11 however, as argued by respondent 2 (rejoinder, page 29, first full paragraph), teaches the control, among others, of the flow rates of addition of catalyst, electron donor and co-catalyst to the reactor(s) (D11, page 21, lines 3-6). The passage of D11 alluded to by respondent 2 mentions these variables in the context of controlling the melt flow index of the polymer produced which means that they are instrumental in achieving an improved control of the polymerization system in the sense of the patent in suit. Even if D11 does not mention the application of that feedback control to the pre-contactor specifically, the Board finds that, in the absence of a specific improvement by the selected

control system and with the generic aim of improving control, the skilled person starting from D4 as the closest prior art would realise, especially in the context of Figure 1 of D4 that a feedback control could be used for controlling the flow rates of the catalysts components as they are added to the pre-contactor.

- 3.10 The Board therefore concludes that the skilled person starting from D4 as the closest prior art would have arrived at claim 1 of auxiliary request 1 in view of their common general knowledge and also specifically of the disclosure of D11. The method of claim 1 of auxiliary request 1 therefore lacks an inventive step.

#### Auxiliary request 2

#### 4. Novelty over D4

- 4.1 Claim 1 of auxiliary request 2 is identical to claim 1 of the main request. The reasoning and conclusion on the lack of novelty outlined for claim 1 of the main request therefore equally apply to claim 1 of auxiliary request 2.

#### Auxiliary request 3

#### 5. Inventive step over D4

- 5.1 Claim 1 of auxiliary request 3 corresponds to claim 1 of the main request with the addition that "the components are added into the polymerization system as separate streams".
- 5.2 Figure 1 of D4 discloses a process in which the external electron donor and the co-catalyst are added to the pre-contactor through the same pipe A while the

catalyst is added from vessel 3 directly into the pre-contacter. Claim 1 of auxiliary request 3 therefore differs from the process shown in Figure 1 of D4 in that each catalyst component is added as a separate stream while D4 discloses a process with a common stream for the external electron donor and the co-catalyst. On this basis the method of claim 1 of auxiliary request 3 is novel over D4.

5.3 The selection of D4 as the closest prior art for auxiliary request 3 was not disputed nor does the Board see any reason to do so. The appellant argued with respect to auxiliary request 3 that it was highly plausible that the process of the invention allowed greater control and consistency of polymer properties because the contact time distribution of the components being introduced into the reactor from the pre-contacter will not change over time (letter of 1 December 2023, page 13, second paragraph). Respondent 2 contested the presence of an effect going beyond the individual control of the addition rates of the catalyst components (rejoinder, page 48, item 4).

5.4 The appellant did not provide evidence of a greater control and consistency of polymer properties resulting from the addition of the catalyst components into the polymerization system as separate streams. The patent in suit also does not contain examples that could support an effect on the polymer properties or on the process. If the absence of any evidence that the use of separate streams has an impact on the properties of the polymer, the Board cannot acknowledge an effect over D4. It follows that the problem over D4 can be formulated as the provision of an alternative method of operating the polymerization system.

5.5 D4 teaches in Figure 1 that catalyst components can be added to a pre-contactor in a separate stream (the catalyst from vessel 3 is added as a single stream to the pre-contactor 4). The appellant argued at the oral proceedings before the Board that D4 would not point to the use of separate streams for all three catalyst components. There is however also no teaching in D4 limiting the addition of the catalyst components to combined streams as used in the method of Figure 1 in the case of the external electron donor and the co-catalyst. Using separate streams or combined streams are options that are normally available to a skilled practitioner. Starting from Figure 1 of D4, selecting the use of separate streams for the external electron donor and the co-catalyst in order to provide an alternative method of operating the polymerization system is, in the view of the Board, obvious as it is nothing more than an arbitrary way of feeding the catalyst components the pre-contactor. The Board therefore concludes that claim 1 of auxiliary request 3 lacks an inventive step in view of D4.

#### Auxiliary request 4

6. Inventive step over D4

6.1 Claim 1 of auxiliary request 4 corresponds to claim 1 of auxiliary request 1 with the addition that "the components are added into the polymerization system as separate streams".

6.2 All the parties stated at the oral proceedings before the Board that their arguments relating to inventive step over D4 submitted for claim 1 of auxiliary requests 1 and 3 applied to claim 1 of auxiliary request 4 and agreed that any conclusion reached on

inventive step for the previous requests would equally apply to claim 1 of auxiliary request 4.

6.3 The Board came to the conclusion that claim 1 of auxiliary request 1 introducing the feature referred to as "feedback control" lacked an inventive step over D4 and that claim 1 of auxiliary request 3 in which "the components are added into the polymerization system as separate streams" also lacked an inventive step over D4.

6.4 There is no element on file showing that the feature characterizing claim 1 of auxiliary request 1, the "feedback control", and that characterizing claim 1 of auxiliary request 3, the addition of each catalyst component in a separate stream, taken in combination with one another, have a particular effect going beyond the individual effects of each feature in view of the closest prior art D4.

6.5 In view of this and in the absence of any further argument, the Board comes to the conclusion that claim 1 of auxiliary request 4 also lacks an inventive step over D4 for the reasons outlined for the previous requests.

#### Auxiliary request 5

7. Inventive step over D4

7.1 Since claim 1 of auxiliary request 5 is identical to claim 1 of auxiliary request 3, the same reasoning and conclusion on inventive step over D4 apply. On that basis, the method of claim 1 of auxiliary request 5 lacks an inventive step over D4.

Auxiliary request 7

8. Article 123(2) EPC

8.1 Claim 1 of auxiliary request 7 corresponds to claim 1 of auxiliary request 4 which is further limited in that "the at least one polymerization catalyst component comprises at least one polymerization metallocene solution component".

8.2 Respondent 2 maintained their objection under Article 123(2) EPC concerning the formulation "wherein the components are added into the polymerization system as separate streams" raised against claim 1 of auxiliary request 3 for claim 1 of auxiliary request 7 which contained the same formulation.

8.3 The appellant referred to claims 1 and 2, paragraph 12 and the figures as originally filed as a basis for claim 1 of auxiliary request 7. Indeed claim 2 as originally filed sets out that "adding the components into the polymerization system at a controlled rate comprises the steps of:  
selecting a desired flow rate for each component;  
conveying each component into the polymerization system at an actual flow rate;  
measuring the actual flow rate for each component; and  
adjusting the actual flow rate for each component to substantially equal the desired flow rate". The wording of claim 2 as originally filed refers to "each component" which in the context of claim 1 can only mean the catalyst, the activator and the co-catalyst, the three components of the catalyst system. The wording of claim 2 as originally filed also defines that each component has a flow rate that can be measured and adjusted to a desired flow rate in order

to convey each component into the polymerization system at an actual flow rate. This situation implies that the three catalyst components flow into the polymerization system as separate streams. The Board therefore finds that claim 2 provides a basis for the addition of the catalyst components into the polymerization system as separate streams. This formulation is confirmed by the wording of paragraph 12 of the application as originally filed mentioning the possible addition of multiple components including a metallocene catalyst, treated solid oxide and aluminium alkyl individually to the polymerization system and by Figures 1/4 and 2/4 of the application as originally filed showing three separate streams, one for the polymerization catalyst component (102), one for the activator compound component (104) and one for the co-catalyst component (106). Even if these disclosures are more specific as far as the catalyst components and the streams are concerned, they provide a confirmation for the skilled person of what can be directly derived from claim 2.

8.4 In view of this, claim 1 of auxiliary request 7 meets the requirements of Article 123(2) EPC.

9. Rule 80 EPC

9.1 At the oral proceedings before the Board respondent 2 raised an objection under Rule 80 EPC against claim 1 of auxiliary request 7 after the Board had decided on Article 123(2) EPC for this request. It was in particular argued that the amendment "wherein the components are added into the polymerization system as separate streams" in claim 1, if it was added as a mere clarification as stated by the appellant at the oral proceedings before the Board, was not occasioned by a ground of opposition and was therefore not admissible

under Rule 80 EPC.

9.2 The objection under Rule 80 EPC is an amendment to respondent 2's case for which the Board finds exceptional circumstances justifying its admittance into the proceedings under Article 13(2) RPBA. In particular, the appellant based their defence against the objection under Article 123(2) EPC mainly on claim 2 of the application as originally filed for the first time at the oral proceedings before the Board. While their defence was within the previous framework, this argumentation shed a new light on the assessment of Article 123(2) EPC for which the Board found reasonable to allow respondent 2 to react in a manner they saw fit at the oral proceedings, in particular by submitting an objection under Rule 80 EPC. In view of this, the objection under Rule 80 EPC is admitted into the proceedings.

9.3 Claim 1 of auxiliary request 7 had already been filed as claim 1 of auxiliary request 4A with letter of 15 December 2021 during the opposition procedure. It is apparent from the letter of the appellant (then patent proprietor), that the set of auxiliary requests to which auxiliary request 4A belongs was filed in response to the comment in the first bullet point in part 8.2 b) on page 5 of the preliminary opinion of the opposition division dated 17 March 2021 which dealt with the interpretation of granted claim 1 in view of its novelty assessment over D1 and D4. It is also apparent from the third paragraph on page 2 of the letter of 15 December 2021 that the amendment under consideration, namely the specification that the components are added to the polymerization system as separate streams, was added to claim 1 of these requests in an attempt to limit the claim by adding a

feature which was not considered as implied by the wording of claim 1 of the broader requests. The amendments in claim 1 of auxiliary request 4A, and therefore also in claim 1 of auxiliary request 7, were thus filed in order to address objections of lack of novelty over D1 or D4. It follows that the amendments in claim 1 of auxiliary request 7 considered in appeal were occasioned by the ground for opposition specified in Article 100(a) EPC and are therefore allowable (Case Law, IV.C.5.1.2). In this respect the question whether an amendment is appropriate and successful to achieve the intended scope is not relevant for the requirements of Rule 80 EPC to be met, as far as it is clear that it is occasioned by a ground of opposition. The Board therefore concludes that auxiliary request 7 is allowable under Rule 80 EPC.

10. Article 84 EPC

10.1 Respondent 2 argued that claim 1 of auxiliary request 7 lacked clarity because it was unclear where the boundaries of the "polymerization system" were defined and thus it was unclear at what stage in place and time the streams of each component would need to be separate. In particular, the open wording "comprising" in operative claim 1 meant that further components could be present and it was unclear whether a hypothetical scenario wherein streams left the component feed vessels separately but were combined prior to entry into the pre-contactor fulfilled this feature or not.

10.2 Decision G3/14 established that in considering whether, for the purpose of Article 101(3) EPC, a patent as amended meets the requirements of the EPC, the claims may be examined for compliance with Article 84 EPC only

when, and then only to the extent that, the amendment introduces non-compliance with Article 84 EPC (order of the decision).

10.3 The term "polymerization system" was already an essential part of the definition of the method of granted claim 1, involving the same steps as in claim 1 of auxiliary request 7. The definition of operative claim 1 by the type of catalyst used (metallocene), by the presence of a feedback control or the limitation to separate streams does not change the question of the interpretation of the polymerization system and does not introduce a new ambiguity that was not present before.

10.4 The Board therefore concludes that the definition of the polymerization system in claim 1 of auxiliary request 7 is not open to objection under Article 84 EPC (G 3/14).

11. Novelty over D1

11.1 Respondent 2 maintained their objections of lack of novelty over D1, a document according to Article 54(3) EPC, raised for claim 1 of auxiliary requests 1 and 6 against claim 1 of auxiliary request 7 (rejoinder of opponent 2, page 51, section IX). The passages on pages 54-56 of D1 were seen as the relevant passages for the question of novelty (rejoinder of opponent 2, pages 19-22, section 4.1.2; pages 38-41, section 1).

11.2 It was not disputed that document D1 concerns metallocene catalysts. Indeed, claim 1 and also the passage page 55, lines 2-23 define the "catalyst components" as a metallocene (representing the polymerization catalyst component in operative claim

1), an organoaluminum compound (representing the co-catalyst component in operative claim 1), an acidic activator-support (representing the activator compound in operative claim 1) and an olefin or alkyne including therefore the three components of operative claim 1. Operative claim 1 does not mention the presence of an olefin or alkyne but since its wording is open ("comprising the steps of") their presence is not excluded either.

- 11.3 The passage on page 54, lines 16-29 of D1 discloses a general method comprising several variants for the preparation of a catalyst. One of these variants concerns the addition of all catalysts components to a pre-contacting vessel (line 18) "prior to introducing them into the reactor" (line 19), which, as not disputed, is a polymerization reactor as required by operative claim 1.
- 11.4 As the same passage discloses the continuous feeding of the catalyst components to the polymerization reactor and optionally pre-contactor(s) (page 54, lines 17-19), this can be considered to anticipate the addition of these components to the pre-contactor "at a controlled rate" for the same reasons as detailed in the analysis of granted claim 1 over D4 (see points 2.5 and 2.6, above).
- 11.5 It remains to be analysed whether the method disclosed on pages 54-56 discloses the addition of the catalyst components as separate streams into the polymerization system with a "feedback loop" for each component.
- 11.6 Respondents 1 and 2 mentioned page 55, last paragraph to page 56, first paragraph as a passage referring to the use of a feedback loop that would correspond to the

definition in operative claim 1 (rejoinder of opponent 1, page 2, first paragraph; rejoinder of opponent 2, page 20, item 158 to page 21, item 166).

11.7 While it is correct that this passage discloses that "each ingredient can be fed to the reactor, either directly or through at least one precontacting vessel, using known feeding, measuring, and controlling devices, such as pumps, mass and volumetric flow meters and controllers, and the like" adding that "Feed-back signals and control loops can be used in connection with this continuous catalyst formation and introduction" and "Various combinations of means for feed and control can also be used for each respective component depending upon the type of component, chemical compatibility of the component, and the desired quantity and flow rate of the component, and as well known to one of ordinary skill in the art", formally encompassing the steps of the method of operative claim 1, these disclosures are generic and correspond to a very large number of possible feeding and control systems without providing a direct and unambiguous disclosure of the combination of a continuous addition of the three components, of an addition of each of them in a separate stream and of a specific feedback control loop for each of them. In other words, several selections within the disclosure of D1 are needed to come to the method of claim 1, namely to feed the three specific components to a pre-contacter in a continuous manner, to feed each of them separately and to add for each of them a specific feedback loop.

11.8 In view of this, the method of claim 1 of auxiliary request 7 is novel over D1.

12. Inventive step over D4

12.1 As already stated above, claim 1 of auxiliary request 7 corresponds to claim 1 of auxiliary request 4 (which was found not to involve an inventive step over D4 as the closest prior art) with the further limitation that "the at least one polymerization catalyst component comprises at least one polymerization metallocene solution component".

12.2 It was acknowledged by all parties in appeal that the method for the polymerization of olefins of D4 relied on the use of Ziegler-Natta catalysts (claim 1, page 11, first paragraph) and not of metallocene catalysts as now required in claim 1 of auxiliary request 7. It was also not disputed that this distinguishing feature was not causally linked to a surprising effect. The problem relating to that distinguishing feature over D4 is therefore the provision of an alternative method of operating the polymerization system.

12.3 While it is not disputed that both metallocene catalysts and Ziegler-Natta catalysts are known catalysts for the polymerization of olefins, the question of obviousness was whether the skilled person starting from the process of D4 would have considered metallocene catalysts to be suitable to the method of D4 and therefore would have replaced the Ziegler-Natta catalyst with a metallocene catalyst while maintaining the same pre-contacting system when looking for an alternative method.

12.4 The method of D4 (second paragraph of page 18 and Figure 1) requires a catalyst comprising an external electron donor, a co-catalyst and a catalyst that are added to a pre-contactor for the activation of that

specific type of catalyst system, prior to being added to the polymerization reactor.

- 12.5 Respondent 2 argued in appeal that metallocene catalysts were suitable to the method of D4, in particular because any minor adjustments needed to be made in order to switch from the Ziegler-Natta based catalyst system of D4 to a metallocene based catalyst system would be well within the common general knowledge of the person skilled in the art (rejoinder, argumentation relating to the selection of metallocene for auxiliary request 6, page 50, last paragraph). Respondent 2 however did not provide evidence of that common general knowledge and did not show that the skilled reader of D4 concerned with the activation of a Ziegler-Natta catalyst system in a pre-contactor by contacting three specific components of such a system would have considered metallocene catalysts to be applicable to the method and would have had the knowledge to make any necessary adjustments to the method of D4 to accommodate for the metallocene catalyst.
- 12.6 D6 was the only document cited by the respondents in this respect. D6 discloses a multistage process for the polymerization of propylene with comonomers in the presence of a catalyst (claim 1). D6 discloses in column 7 that the catalyst can be prepolymerized prior to feeding into the first polymerization reactor. Respondent 2 considered that the prepolymerization reactor could be seen as a pre-contactor (rejoinder, page 15, section 3.4). D4 however defines the pre-contacting vessel 4 of Figure 1 (pre-contactor) as a vessel in which the catalyst is activated by putting into contacts its three components (page 17, last paragraph). The passage in D6 (column 7, lines 5-30)

concerning the prepolymerization reactor discloses instead that the catalyst can be prepolymerized by contact with a monomer resulting in a catalyst being stable during storage and handling. There is however no disclosure in D6 of a catalyst being activated in the prepolymerization reactor in the sense of D4, nor could the skilled person deduce therefrom that the two processes are interchangeable. D6 discloses the use of Ziegler-Natta catalyst systems including a catalyst, a co-catalyst and an electron donor or alternatively of metallocene catalysts having a bridged ligand structure with the active complex impregnated on a carrier (column 6, lines 39-52) but there is no incentive in D6 towards the activation of these catalysts as required in D4 and in claim 1 of auxiliary request 7, nor any indication that an activation step suitable for the three components of Ziegler-Natta systems would equally be applicable to metallocene systems.

- 12.7 On the basis of the available prior art and in the absence of further evidence, the Board therefore concludes that it was not shown that claim 1 of auxiliary request 7 lacks inventive step starting from D4.
13. The respondents confirmed at the oral proceedings before the Board that they had no further objection against auxiliary request 7 (minutes, page 3, last sentence of last full paragraph). As none of the objections raised against auxiliary request 7 is successful, there is no need for the Board to decide on any other issue and the patent is to be maintained in that form.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of auxiliary request 7 filed with the statement of grounds of appeal after any necessary consequential amendment of the description.

The Registrar:

The Chairman:



D. Hampe

D. Semino

Decision electronically authenticated