BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS	BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE	CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [ ] To Chairmen
(D) [X] No distribution

Datasheet for the decision
of 19 February 2010

Case Number:	T 1478/07 - 3.3.01
Application Number:	96922070.6
Publication Number:	0837915
IPC:	C09D 123/04
Language of the proceedings:	EN

Title of invention:
Coating composition

Patentee:
Borealis Technology Oy

Opponent:
THE DOW CHEMICAL COMPANY
Basell Polyolefine GmbH

Headword:
Multimodal polyethylene/BOREALIS TECHNOLOGY OY

Relevant legal provisions:
EPC Art. 100(c), 56, 84
RPBA Art. 13(1)(3)

Keyword:
"Main request - auxiliary requests 1, 2, 2A, 3-5, 7-11: admissibility (yes)"
"Auxiliary request 6 - admissibility (no) - change of subject-matter"
"Main request, auxiliary requests 1, 2, 2A, 3, 4, 5 - objectionable under Article 100(c) EPC (yes)"
"Auxiliary request 7 - inventive step (no) - obvious alternative"
"Auxiliary requests 8-11 - conciseness - clarity (no)"

Decisions cited:

G 0010/91, G 0009/91, T 1164/00, T 0097/00, T 1065/99, T 0914/98, T 0817/93, T 0433/93, T 0125/91, T 0181/82

Catchword:

-

Case Number: T 1478/07 - 3.3.01

DECISION
of the Technical Board of Appeal 3.3.01
of 19 February 2010

Appellant I: (Patent Proprietor)

Borealis Technology Oy
P.O. Box 330
FI-06101 Porvoo (FI)

Representative:

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

Appellant II: (Opponent)

THE DOW CHEMICAL COMPANY
2030 Dow Center
Midland, Michigan 48674 (US)

Representative:

Hayes, Adrian Chetwynd
Boult Wade Tennant
Verulam Gardens
70 Gray's Inn Road
London WC1X 8BT (GB)

Appellant III: (Opponent)

Basell Polyolefine GmbH
Intellectual Property
Industriepark Hoechst - E 413
D-65926 Frankfurt (DE)

Representative:

Mr Hoffmann

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 5 July 2007 concerning maintenance of European patent No. 0837915 in amended form.**

Composition of the Board:

Chairman: P. Ranguis
Members: J.-B. Ousset
C.-P. Brandt

Summary of Facts and Submissions

I. The decision of the opposition division to maintain European patent No. 0 837 915 on the basis of the first auxiliary request has been appealed by the patent proprietor and by the two opponents.

II. The oppositions sought revocation of the patent in suit in its entirety for lack of novelty and lack of inventive step (Article 100(a) EPC). At the oral proceedings, the opposition division introduced the ground of opposition under Article 100(c) EPC.

III. The following documents were cited before the opposition division:

(1) EP-A-369 436
(2) EP-B-057 420
(3) EP-A-603 935 instead of EP-A-940 411
(4) WO-A-92/12182
(5) EP-A-302 242
(6) JP-A-58 210 947 (abstract in English)
(6a) JP-A-58 210 947
(6b) Translation in English of table 2 of (6a)
(6c) Machine translation of (6a)
(6d) Certified translation in English of (6a) submitted by Opponent I at the oral proceedings and re-submitted by Appellant I (proprietor of the patent) at the oral proceedings before the Board
(7) Mannesman MAPEC 3-Schichten-Korrosionsschutz für Stahlleitungsrohre, Januar 1983
(8) K. Omori and T. Kimura, Plastic coated pipes with high density polyethylene, 4th International

Conference on the internal and external protection of pipes, 15-17 September 1981

(9) CAN/CSA-Z245.21-M92 External Polyethylene Coating for Pipes, March 1992

(10) WO-A-97/03124

(11) SE 9502508 (priority document of (10) and EP-A-837 915)

(12) PCT/FI 96/00405 (priority document of (10) and EP-A-837 915)

(13) Table of experiments submitted by Opponent 02 with letter of 11 April 2007

(14) Experimental report submitted by the patentee with letter of 8 June 2007

Documents (6a) to (6c) and (7) to (9) were cited in the course of the written opposition proceedings (after the nine-month opposition period). Documents (6d), (10), (11) and (12) were submitted during the oral proceedings before the opposition division (see point 19 of the decision).

Documents (6a) and (6d) were admitted into the proceedings. Documents (6b) and (6c) were not admitted as no longer relevant vis-à-vis document (6d). Documents (7) to (9) were admitted as relevant for inventive step. Documents (10) to (12) were only relevant for the main request which eventually failed under Article 123(2) EPC. They were no longer relevant.

IV. The opposition division found that the claimed subject-matter of the main request (granted version of the patent) gave rise to objection under Article 100(c) EPC. The first auxiliary request was deemed to fulfil the requirements of Articles 123(2)(3), 84, 83, 54 and 56

EPC and the patent in suit was maintained accordingly (see point I above).

V. In the appeal proceedings further documents or evidence were submitted:

(15) WO-A-96/02583

(16) Borstar - Advanced New Generation Polyethylene Technology from Borealis, 1995

submitted by Appellant II (Opponent I) with the statement of grounds of appeal.

(17) Experimental report submitted by Appellant II with letter of 28 March 2008 in response to the statement of grounds of appeal of Appellant I.

(18) Advanced polymerisation process for tailor-made pipe resins, plastic pipes IX, 18-21 September 1995, pp. 433-441, submitted with letter of 2 July 2009.

(19) On-line inference of polymer properties in an industrial polyethylene reactor, AIChE Journal, Vol. 37, no. 6, pages 825-835, K. McAuley and J. McGregor, submitted with letter dated 12 February 2010.

(20) Prediction of melt flow rate (MFR) of bimodal polyethylenes based on MFR of their components, in: Conference on polymer processing (the Polymer Processing Society), Extended Abstracts and Final Programme, Gothenburg, August 19-21, 1997, 4:13, submitted with letter dated 12 February 2010.

(21) Effect of blending on the molecular weight distribution of polymers, Journal of Polymer Science: Part A , Vol. 2, pp. 2977-3007 (1964), submitted with letter dated 12 February 2010.

(22) G 7/93

Annex 1 (not numbered), submitted with letter dated 12 February 2010.

VI. The present decision is based on the thirteen sets of claims filed by Appellant I (proprietor of the patent) during the appeal proceedings.

Claim 1 of the main request submitted with letter of 16 May 2008 read as follows:

"1. Use of a coating composition for the coating of a metal pipe, preferably an iron or a steel pipe, which coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3, characterized in that said coating composition is obtainable by a process comprising

- a first ethylene polymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system in a first step and

- a second ethylene polymer having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in second step,

said steps being performed in any order and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min."

Claim 1 of the first auxiliary request submitted with letter of 16 May 2008 read as follows:

"1. Use of a coating composition for the coating of a metal pipe, preferably an iron or a steel pipe, which coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3, characterized in that said coating composition is obtained by a process comprising at least two steps in which

- a first ethylene polymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system and an amount of chain transfer agent which gives said melt flow rate in a first step and

- a second ethylene polymer having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in second step,

said steps being performed in any order and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min."

Claim 1 of the second auxiliary request submitted with letter of 12 February 2010 read as follows:

"1. Use of a coating composition for the coating of a metal pipe, preferably an iron or a steel pipe, which coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3, characterized in that said coating composition is obtainable by a process comprising at least two steps in which

- a first ethylene homopolymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system and an amount of chain transfer agent which gives said melt flow rate in a first step and
- a second ethylene copolymer having a C_3-C_{10} α-olefin content of 1.0 to 25% by weight having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in second step,

said steps being performed in any order and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min."

Claim 1 of the second auxiliary request A submitted with letter of 12 February 2010 differs from claim 1 of the second auxiliary request only in that the figure "50g/10min" was replaced with "20g/10min".

Claim 1 of the third auxiliary request submitted with letter of 16 May 2008 read as follows:

"1. A process for producing a metal pipe comprising a coating composition, said process comprising:

applying to said pipe a primer, like an epoxy lacquer, covering said pipe, a layer of a coupling agent, like carboxy modified polyethylene, covering said primer, and a coating composition of said coupling agent layer,

wherein the coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3,

and wherein the coating composition is produced in a process,

said process comprises at least two steps in which

- a first ethylene homopolymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system and an amount of chain transfer agent which gives said melt flow rate in a first step and
- a second ethylene copolymer having a C_3-C_{10} α-olefin content from 1.0 to 25% by weight, having a

second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in a second step,

said steps being performed in any order and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min."

Claim 1 of the fourth auxiliary request submitted with letter of 16 May 2008 read as follows:

"1. A process for producing a metal pipe comprising a coating composition, said process comprising:

applying to said pipe a primer, like an epoxy lacquer, covering said pipe, a layer of a coupling agent, like carboxy modified polyethylene, covering said primer, and a coating composition of said coupling agent layer,

wherein the coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3, and wherein the coating composition is produced in a process,

said process comprises at least two steps in which

- a first ethylene homopolymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system and an amount of chain transfer agent which gives said melt flow rate in a first step and
- a second ethylene copolymer having a C_3-C_{10} α-olefin content of 1.0 to 25% by weight, having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in a second step,

said steps being performed in any order and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min, and wherein the melt flow rate ratio $FRR_{21/5}$ of said blend according to ISO1133 is between 15 and 40."

Claim 1 of the fifth auxiliary request submitted with letter of 16 May 2008 read as follows:

"1. A process for producing a metal pipe comprising a coating composition, said process comprising:

applying to said pipe a primer, like an epoxy laquer, covering said pipe, a layer of a coupling agent, like carboxy modified polyethylene, covering said primer, and a coating composition of said coupling agent layer,

wherein the coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3,

and wherein the coating composition is produced in a process,

said process comprises at least two steps in which

- a first ethylene homopolymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system and an amount of chain transfer agent which gives said melt flow rate in a first step and
- a second ethylene copolymer having a C_3-C_{10} α-olefin content of 1.0 to 25% by weight, having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first

melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in second step,

said steps being performed in any order and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min, said polymerisation step being a combination of slurry polymerisation and gas phase polymerisation."

Claim 1 of the sixth auxiliary request submitted on 19 February 2010 read as follows:

"1. Use of a coating composition for the coating of a metal pipe, preferably an iron or a steel pipe, which coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3, characterized in that said coating composition is obtainable by a process comprising at least two steps in which

- a first ethylene homopolymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system and an amount of chain transfer agent which gives said melt flow rate in a first step and

- a second ethylene copolymer having a C_3-C_{10} α-olefin content of 1.0 to 25% by weight having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in second step,

said first steps being performed first and the ethylene polymer of the first step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min."

Claim 1 of the seventh auxiliary request submitted on 19 February 2010 read as follows:

"1. A process for producing a metal pipe comprising a coating composition, said process comprising:

applying to said pipe a primer, like an epoxy lacquer, covering said pipe, a layer of a coupling agent, like carboxy modified polyethylene, covering said primer, and a coating composition on said coupling agent layer,

wherein the coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3,

and wherein the coating composition is produced in a process,

said process comprises at least two steps in which

- a first ethylene homopolymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system and an amount of chain transfer agent which gives said melt flow rate in a first step and
- a second ethylene copolymer having a C_3-C_{10} α-olefin content from 1.0 to 25% by weight, having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in second step,

whereby said first ethylene polymer is prepared in a first step and said second ethylene polymer is prepared in a succeeding second step and in said first step of the polymerization process, an amount of chain transfer agent is used which gives said melt flow rate MFR^1_2 and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min."

Claims 1 and 7 of the eighth auxiliary request submitted on 16 May 2008 read as follows:

"1. A process for producing a metal pipe comprising a coating composition, said process comprising:

applying to said pipe a primer, like an epoxy lacquer, covering said pipe, a layer of a coupling agent, like carboxy modified polyethylene, covering said primer, and a coating composition on said coupling agent layer,

wherein the coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3,

and wherein the coating composition is produced in a process,

said process comprises at least two steps in which

- a first ethylene homopolymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system and an amount of chain transfer agent which gives said melt flow rate in a first step and

- a second ethylene copolymer having a C_3-C_{10} α-olefin content from 1.0 to 25% by weight, having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in second step,

whereby said first ethylene polymer is prepared in a first step and said second ethylene polymer is prepared in a succeeding second step and in said first step of the polymerization process, an amount of chain transfer agent is used which gives said melt flow rate MFR^1_2 and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min, and wherein the melt flow rate ratio $FRR_{21/5}$ of said blend according to ISO1133 is between 15 and 40."

"7. A process according to any of claims 2 to 5, characterized in that in said second ethylene polymer, the C_3-C_{10} α-olefin, which is preferentially 1-butene or 1-hexene, repeating unit content is from 1 to 25% by weight, preferentially from 2 to 15% by weight, of said second ethylene polymer."

Claim 1 of the ninth auxiliary request submitted on 16 May 2008 read as follows:

"1. A process for producing a metal pipe comprising a coating composition, said process comprising:

applying to said pipe a primer, like an epoxy lacquer, covering said pipe, a layer of a coupling agent, like carboxy modified polyethylene, covering said primer, and a coating composition on said coupling agent layer,

wherein the coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3,

and wherein the coating composition is produced in a process,

said process comprises at least two steps in which

- a first ethylene homopolymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system and an amount of chain transfer agent which gives said melt flow rate in a first step and
- a second ethylene copolymer having a C_3-C_{10} α-olefin content from 1.0 to 25% by weight, having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first

> melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in second step,

whereby said first ethylene polymer is prepared in a first step and said second ethylene polymer is prepared in a succeeding second step and in said first step of the polymerization process, an amount of chain transfer agent is used which gives said melt flow rate MFR^1_2 and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min, said polymerisation step being a combination of slurry polymerisation and gas phase polymerisation."

The wording of claim 7 of the ninth auxiliary request is identical to the wording of claim 7 of the eighth auxiliary request.

Claim 1 of the tenth auxiliary request submitted on 16 May 2008 read as follows:

"1. A process for producing an iron or steel pipe comprising a coating composition, said process comprising: applying to said pipe a primer, like an epoxy lacquer, covering said pipe and a coupling agent, like carboxy modified polyethylene, covering said primer, wherein the coating composition has an environmental stress cracking resistance (ESCR, F2, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20%

by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3, characterized in that said process comprises at least two steps in which

- a first ethylene polymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system in a first step and

- a second ethylene copolymer having a C_3-C_{10} α-olefin content of 1.0 to 25% by weight having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in a second step, whereby said first ethylene polymer is prepared in a first step in a slurry polymerization and said second ethylene polymer is prepared in a succeeding second step in a gas-phase polymerization and in said first step of the polymerization process, an amount of chain transfer agent, preferentially hydrogen, is used which gives said melt flow rate MFR^1_2 and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight of said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min, and wherein the melt flow rate ratio $FRR^3_{21/5}$ of said blend is between 15 and 40."

The wording of dependent claim 7 of the tenth auxiliary request is identical to the wording of dependent claim 7 of the eighth auxiliary request.

Claim 1 of the eleventh auxiliary request submitted on 16 May 2008 read as follows:

"1. A process for producing an iron or steel pipe comprising a coating composition, said process comprising: applying to said pipe a primer, like an epoxy lacquer, covering said pipe and a coupling agent, like carboxy modified polyethylene, covering said primer, wherein the coating composition has an environmental stress cracking resistance (ESCR, F20, ASTM, 1693/A) of at least 2000 h, comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3, characterized in that said process comprises at least two steps in which

- a first ethylene polymer having a first average molecular weight, a first molecular weight distribution and a first melt flow rate MFR^1_2 of between 50 g/10 min and 2000 g/10 min, is prepared by polymerizing ethylene in the presence of a catalyst system in a first step and

- a second ethylene copolymer having a C_3-C_{10} α-olefin content of 1.0 to 25% by weight having a second average molecular weight, a second molecular weight distribution and a second melt flow rate MFR^2_2, which is lower than said first melt flow rate, is prepared by polymerizing ethylene in the presence of a catalyst system in second step, whereby said first ethylene polymer is prepared in a first step in a loop reactor and said second ethylene polymer is prepared in a succeeding second step in a gas-phase reactor and in said first step of the polymerization process, an amount of chain transfer agent, preferentially hydrogen, is used which gives said melt flow rate MFR^1_2 and the ethylene polymer of each step being present in the following step or steps, and producing a blend of 20 to 80% by weight of said first and 80 to 20% by weight of said second ethylene polymer, said blend having a third melt flow rate MFR^3_2 of between 0.1 g/10 min to 50 g/10 min, and wherein the melt flow rate ratio $FRR^3_{21/5}$ of said blend is between 15 and 40, the molecular weight distribution curve showing several peaks or a broad peak lacking small fractions of extremely high molecular weight material."

The wording of claim 7 of the eleventh auxiliary request is identical to the wording of claim 7 of the eighth auxiliary request.

VII. The arguments of appellant I (patent proprietor) as far as they are relevant for the present decision can be summarised as follows:

- In accordance with decision G 10/91 (OJ EPO 1993, 420) of the Enlarged Board of Appeal, the introduction of a ground of opposition not raised initially was to be seen as an exception to the principle established by the Enlarged Board of Appeal and such a new ground was to be admitted only if it was prima facie relevant.

- In decision of the Enlarged Board of Appeal G 9/91 (OJ EPO 1993, 408), it was stated that the introduction of a new ground of opposition before the opposition division should take place only if there were clear reasons to believe that this ground would prejudice the maintenance of the patent in suit. No discussion as to the prima facie relevance of such a ground had taken place and therefore the admission of this ground by the opposition division without asking the parties to present their comments constituted a violation of Article 113(1) EPC. It was conceded that after the admittance of such a ground by the opposition division, a discussion of the arguments had taken place as recited by the minutes of the oral proceedings (see point 9). As the patent proprietor was not given the opportunity to comment as to the prima facie relevance of this new ground, a violation of the requirements of Article 113(1) had taken place. A remittal to the department of the first instance was justified, since the requirements of Article 113(1) EPC were infringed by the opposition division.

- An objection based on Article 83 EPC was raised during oral proceedings by the opposition division without making a decision to admit this new ground of opposition. This was a procedural mistake, because this objection was unfounded and no discussion took place before its admission. Thus the right to be heard had been violated.

- In view of the procedural mistakes made by the opposition division, a remittal of the case to a differently composed opposition division, which should be experienced in handling ethylene polymer composition and the reimbursement of the appeal fee were requested.

- The melt flow rate of the first polymer, which is the polymer with low molecular weight, is originally disclosed in claim 6 and in the application as originally filed on page 4, lines 4 to 8. This feature is disclosed in such a way that the first step is performed before the second step. The reason is that the melt flow rate can be directly measured only if the first step is performed before the second step. This does not mean that there is no disclosure of the melt flow rate if the low molecular weight component is prepared in a second step. The specification makes it clear that the preferred embodiment is to prepare the low molecular weight component first (see claim 3 and page 3, lines 13 to 18). The general principle is however that the steps can be performed in any order (see page 3, lines 12-13). Therefore, if according to the general teaching, the low molecular weight component can be produced in the second step, the question is what information the person skilled in the art can deduce from the original application in respect of the melt flow rate of this low molecular weight component. It is common general knowledge that the low molecular weight component can be produced in the first or the second step. Therefore, the disclosure of the melt flow rate, when the low molecular weight component is prepared in the first step, in the understanding of the person skilled in the art automatically also applies to the embodiment in which the low molecular weight component is prepared in the second step. The information provided in the application as filed on the range of the melt flow rate characterises the molecular weight range of the low molecular weight component. It is a property of the polymer material itself and has nothing to do with the step sequence. It is irrational to assume that the person skilled in the art will deduce from the application that the low molecular weight component will have a different melt flow rate if produced in the second step. On the contrary, the person skilled in the art will understand that precisely the same preferred melt flow rate of 50 g/10min to 2000 g/10min will apply if the low molecular weight component is prepared in the second step. The difficulties of calculating the MFR of a polymer prepared in a second step are irrelevant. The disclosure is not a question of difficulty of measurements. The original disclosure is what a person skilled in the art understands from the original application. If the person skilled in the art understands that the MFR of the first polymer also if prepared in the second step should be in the range of 50 to 2000, then it is irrelevant whether such feature can be accurately measured or whether different methods might lead to different results.

- Regarding inventive step of the seventh auxiliary request, document (6d) could be regarded as the closest state of the art because it was also concerned with a coating composition for steel pipes and disclosed an ethylene polymer composition which is similar to that of the present invention. However, one of the essential features is the requirement to limit the copolymer content of the polymer to 20%, the polymer being a multimodal polymer where the low molecular weight component is a homopolymer and the high molecular weight component is a copolymer with a C_3-C_{10} α-olefin content of 1 to 25%. From the F_{50} value set out in Example 2 of document (6d), i.e. > 1000, it could be assumed that the F_{20} values of document (6d) were well below 1000 h. (Note of the board: F_{20} is the time where 20% of the samples have failed. F_{50} is the time where 50% of the samples have failed.) A disclosure of a value of above 2000 in a manner which is clear and beyond any reasonable doubt cannot be taken from document (6d). A second reason why Example 2 of document (6d) would have an ESCR F_{20} value well below 2000 is the fact that this polymer is a copolymer/copolymer composition. Evidence has been provided in document (14) that in the preferred embodiment, where the first ethylene polymer is a homopolymer, surprisingly extremely high ESCR values are obtained, whereas when the first polymer is a copolymer as well, the values are much lower. In Example A (copo/copo) a value of

1559 was determined. From these considerations it is evident that Example 2 of document (6d) will not provide high ESCR values and it is safe to assume that they are well below 2000. Therefore, there is no clear and unambiguous disclosure in document (6d) of ESCR F_{20} values of >2000. From the examples (Examples 1, 2, 3 and 4) of the patent, the person skilled in the art obtains the information that a combination of a homopolymer for the low molecular weight component and a copolymer for the high molecular weight component leads to coating compositions which have an excellent ESCR, namely an F_{20} value of above 2000. In all examples 1 to 7 (Example 7 having a comonomer in both the low molecular weight and high molecular weight) the winding speed is dramatically higher compared to a commercial steel pipe material as can be seen from Tables 1, 2 and 4 of the patent. The maximum winding speed is an essential property for excellent coating materials. The technical problem in document (6d) can be formulated as providing a coating composition to be used for coating pipes which exhibits exceptionally high ESCR values and by which pipes can be coated in a fast and reliable way. No hint was given in document (6d) for improving the environmental stress cracking resistance (ESCR). Document (6d) does not provide any teaching that it is important to restrict the comonomer content. Nowhere in document (6d) was it mentioned that the C_3-C_{10} α-olefin content had to be lower than 20%. Density cannot be directly connected with the C_3-C_{10} α-olefin content. Document (14) showed a noticeable improvement of the ESCR for the multimodal polymers made according to the patent in suit when compared to multimodal polymers in which the first and the second polymer were copolymers.

- The other documents did not provide any information as to improving the ESCR. Document (2) discloses on page 13 the coating of a steel pipe and mentions properties, namely low temperature resistance, impact resistance and resistance to environmental stress cracking. No experimental data is given for these properties. High winding speed is not disclosed in that document and no teaching can be derived from it as to how such high speeds as given in Table 1 of the patent can be obtained. Document (4) is not concerned with coating compositions to be coated on pipes. This document is silent in respect of high environmental stress cracking resistance and high winding speed of an extruded material. Document (5) is not concerned with coating of metal pipes either. Although stress cracking resistance is mentioned, no values above 2000 h are disclosed. The document is silent in respect of high winding speed. Document (3) has a completely different object, namely to produce polymer components with markedly different melt flow rates so that final compositions with different molecular weight distributions can be made, allowing a polymer with a very high melt flow rate to be produced for the production of pipes. Stress-cracking but not environmental stress-cracking is mentioned. Moreover, values for the comonomer content are disclosed but it seems that the total amount is

25% higher than the amount in the claim. Such a document would not be considered by the person skilled in the art.

VIII. The arguments of both Appellant II (Opponent 1) and Appellant III (Opponent 2) as far as they are relevant for the present decision can be summarised as follows:

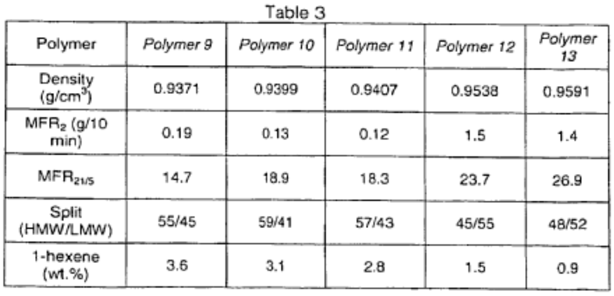
The passage of the application on page 4, lines 5 to 8, clearly indicates that the MFR^1_2 of the first ethylene polymer is from 50 to 2000 g/10min only ***inter alia*** when the first step is performed before the second step. Appellant I's arguments that it would be possible to carry out the steps in the reverse order on the basis of the passage on page 3, line 12, which indicates that that the steps can be performed in any order and that the melt flow rate is a property of the polymer material itself and has nothing to do with the sequence of the steps are irrelevant. The question of whether subject-matter was added to the application after it was filed is one based on the actual disclosure and not on what one skilled in the art may deduce. Appellant I seems to be arguing that embodiments equivalent to one disclosed would be obvious for, or could be deduced by, the skilled person. The standard of Article 123(2) EPC, however, is one of "direct and unambiguous disclosure". Thus if a feature, as in the present case, is disclosed only in association with a particular sequence of steps, it is added subject-matter to disclose that feature with a different sequence of steps. Moreover, only the melt flow rate of the polymer produced in the first reactor and the melt flow rate of the composition that exists in the second reactor can be measured directly. The methods for calculating the melt flow rate of the polymer produced in the second reactor are not reliable. Reference was made to experimental report (17).

Regarding inventive step, document (6d) is the closest state of the art. It discloses the use of a composition for coating a steel pipe, which has a density of 0.935-0.950 g/cm^3, an MFR$_2$ of 0.1-1.0 g/10 min and contains 30-60 parts by weight of component A which is an ethylene polymer having an MFR$_2$ of 5-2000 g/10 min and 70-40 parts by weight of component (B) which is an ethylene copolymer having an MFR$_2$ lower than component (A). The preferred way of making this polymer composition is a two-stage polymerisation method. The compositions have excellent anti-stress crack property.

In Example 2, a coating composition is disclosed which is made by a sequential two-stage polymerisation process. In the first reactor an ethylene polymer having an MFR$_2$ of 430 g/10 min and a density of 0.970 g/cm^3 is made to give a final composition having an MFR$_2$ of 0.2 and a density of 0.945. The second component as produced in the second reactor thus has a lower MFR$_2$ (0.009) and a density of 0.921. From the density of both components and of the final composition one can calculate that the weight ratio is about 50:50. No explicit information is given in Example 2 for the 1-butene content of the composition. Thus what needs to be assessed is whether the composition of Example 2 has a butene-1 comonomer content of between 0 and 20%. It is well known that there is a relationship between density and comonomer content as evidenced by documents (17) and (18).

Table 3, page 4 of document (17) provides data for various ethylene compositions prepared in two stages, which compositions had different densities. For these compositions the hexene-1 content varied between 0.9 wt% for the highest density composition and 3.6 wt% for the lowest.

Table 3



Polymer	*Polymer 9*	*Polymer 10*	*Polymer 11*	*Polymer 12*	*Polymer 13*
Density (g/cm^3)	0.9371	0.9399	0.9407	0.9538	0.9591
MFR_2 (g/10 min)	0.19	0.13	0.12	1.5	1.4
$MFR_{21/5}$	14.7	18.9	18.3	23.7	26.9
Split (HMW/LMW)	55/45	59/41	57/43	45/55	48/52
1-hexene (wt.%)	3.6	3.1	2.8	1.5	0.9

While the effect of butene-1 as comonomer is slightly different, it is unthinkable that a composition as prepared in Example 2 has a butene-1 content >20 wt%. Furthermore, in the examples of the patent in suit, no comonomer percentages are provided for either the components or the composition.

As further evidence on the density vs. comonomer relationship for bimodal compositions, document (18), figure 2, shows the typical relationship between the short chain branches level and density for bimodal compositions. At the density of 0.945, the branching level will be between 4 and 5 branches per 1000 carbon atoms. For butene-1, this would result in a weight percentage of 1.6 to 2.1.

Given the density and the similarity in composition of example 2 of document (6d) with those of the examples of the patent, the comonomer content is not higher than 20 wt.%. This is also shown by document (3), which indicates on page 5, lines 15 to 22, that the α-olefin content of the low melt-index component of a two-part composition is 0.5 to 20% by weight or, alternatively, the α-olefin content of the high melt-index polymer does not exceed 5% by weight. Using either of these results in a composition which contains less than 20 wt% α-olefin units. Document (3) indicates that the compositions are suitable for any pipe uses (see page 6, lines 15 and 18).

Table 2 of document (6d) indicates that the ESCR of the composition of example 2 is greater than 1000 hours. This is a minimum value, and it may well be higher than 2000 hours.

Regarding example A of document (14), butene was introduced in the reactor but it is not stated how much is actually incorporated in the polymer. Furthermore, the same C_4/C_2 was fed, which is likely to lead to similar comonomers levels in both the LMW and HMW components. This is known to affect the ESCR performance. In addition, the fact that example A does not meet the ESCR requirements (>2000) does not necessarily mean that any composition of two copolymers will behave badly.

Document (6d) does not explicitly disclose the coating of a steel pipe with a primer and a coupling agent. However, to improve the adhesiveness to the coating, the steel pipe may be pretreated and furthermore, adhesives or binders may be used as intervening agents. Moreover, those two components are not precisely defined and belong to the general knowledge of the person skilled in the art, who knows from documents (7), (8) and (9) that a three-layer sheet for protection against the corrosion of steel pipe is used, said sheet comprising an Epoxy-Typ as primary layer, an adhesive layer (PE-Copo) and an outer layer of PE. One skilled in the art knows that the use of an epoxy primer and adhesive coating, i.e. a coupler, on a steel pipe provides good peel strength. The patent in suit does not mention any benefits associated with the use of a primer and coupling agent on a steel or iron pipe.

Document (5) discloses that bimodal compositions have improved properties, relating to processability and stress crack resistance. The compositions are suitable for extrusion and blow extrusion and have excellent processability as end use properties. The compositions are made in a two-stage process with different molecular weights. Copolymer may be included up to 10 wt.%, with the comonomer preferably introduced in the polymer with the higher molecular weight. The excellent properties may be used in making films and tapes. As mentioned in document (8), the pipe coating processes either utilise a film or a sheet or utilise a sort of tape which is wound around the pipe.

Document (3) discloses that bimodal PE with good mechanical properties contains a part of homopolymer of low molecular weight and a part of copolymer of high molecular weight. The α-olefin content of the low melt-index component of the two-part composition is 0.5 to 20% by weight. The α-olefin content of the high melt-index polymer does not exceed 1 wt%. The compositions have good ESCR, and bimodal PE is useful for any pipe uses (see page 6, lines 15 to 18).

Document (4) discloses in Example 6 a bimodal polyethylene that contains a homopolymer of low molecular weight and a copolymer of high molecular weight. The density is 0.955 g/cm^3 and the melt index 0.8 g/10 min.

IX. In its provisional opinion, the board let the parties know that it could not be inferred from decisions G 9/91, G 10/91 and T 433/93 that a reason for the prima facie relevance for the introduction of a new ground of opposition must be discussed.

X. Appellants II and III (opponents) requested that the decision under appeal be set aside and that European patent No. 0837915 be revoked.

XI. Appellant I (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request, dated 16 May 2008, or on the basis of the first auxiliary request, dated 16 May 2008, or on the basis of the second auxiliary request or second auxiliary request A, dated 12 February 2010, or on the basis of the third to fifth auxiliary requests, dated 16 May 2008, or on the basis of the sixth or seventh auxiliary requests, filed at the oral proceedings or on the basis of one of the eighth to eleventh auxiliary requests, dated 16 May 2008. The appellant further requested: not to admit the grounds of opposition under Article 100(b) and 100(c) EPC or otherwise to remit the case back to the opposition division; to remit the case to a differently composed opposition division; to remit the case back to an opposition division experienced in handling ethylene polymer compositions; to reimburse the appeal fee; to dismiss the appeal of the opponents; not to admit documents D10-D18 into the proceedings and not to admit the four documents and annex 1 filed on 12 February 2010 into the proceedings.

XII. At the end of the oral proceedings, the decision of the board was announced.

Reasons for the Decision

1. The appeal is admissible.

2. Admissibility of the main request and auxiliary requests 1, 2, 2A, 3-5, 7-11

2.1 With the statement of grounds of appeal filed on 31 October 2007, Appellant I filed twelve sets of claims as main request and first to eleventh auxiliary requests (one page for each request). Those sets of claims did not comprise all the dependent claims set out in the patent as granted.

On 16 May 2008, Appellant I filed thirteen sets of claims as main and first, second, second A and third to eleventh auxiliary requests.

Claim 1 of the set of claims of the main request and the first to eleventh auxiliary requests correspond to those submitted on 31 October 2007 with the following amendments:

In claim 1 of the first auxiliary request "obtainable" has been replaced by "obtained".

In claim 1 of the second auxiliary request, the amount of C_3-C_{10} α-olefin of 1.0-25% by weight has been added. Such an amendment is unambiguously disclosed in claim 9 as originally filed. The same amendment was made in claim 1 of the ninth and eleventh auxiliary requests.

Claim 1 of the set of claims of second auxiliary request A is identical to claim 1 of the second auxiliary request filed on 31 October 2007 with the replacement of "between 0.1 g/10min and 50g/10min" by "between 0.1 g/10min and 20g/10min" and with the adding of the amount of C_3-C_{10} α-olefin of 1.0-25% by weight. (Such amendments are unambiguously disclosed on page 5, lines 9-11 and in claim 9 of the application as originally filed.)

Furthermore, all the sets of claims comprise dependent claims the subject-matter of which is present in the patent as granted which clearly had been omitted from the sets filed with the statement of grounds of appeal.

On 12 February 2010, Appellant I filed two sets of claims as second auxiliary request and second auxiliary request A identical to the second auxiliary request and second auxiliary request A filed on 16 May 2008 with a correction of a clerical error, namely deletion of "to produce" in claim 1 (see first line).

At the oral proceedings before the board, Appellant I filed a set of claims as the seventh auxiliary request to replace the seventh auxiliary request filed on 16 May 2008, wherein the only amendment consists in deleting claims 6 and 7 and renumbering the subsequent claims accordingly.

2.2 None of these requests were submitted with the statement of grounds of appeal, contrary to the requirement of Article 12(2) of the Rules of Procedure of the Boards of Appeal (OJ EPO 2007). However, any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the board's discretion. Discretion be exercised in view of inter alia the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy (see Article 13(1) RBPA).

2.3 In the present case, the amendments raise no complex questions. Concerning the current state of the proceedings, since the subject-matter of these sets of claims was in substance filed on 16 May 2008, these sets of claims were filed early after the statement of grounds of appeal was filed.

2.4 Taking these criteria into account, the board exercises its discretionary power to admit these requests into the appeal proceedings.

3. Admissibility of auxiliary request 6

3.1 This request was filed during the oral proceedings. This set of claims differs from the set of claims filed as sixth auxiliary request on 16 May 2008 in that in claim 1 the first ethylene polymer must be an ethylene homopolymer instead of an ethylene polymer.

3.2 This replacement defines new subject-matter in claim 1. In view of the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy, the board exercises its discretionary power not to admit this request into the proceedings (Article 13(1), (3) RBPA).

3.3 Auxiliary request 6 is not admitted into the proceedings.

4. Admissibility of documents (10) to (22) and Annex

4.1 Admissibility in appeal proceedings is governed by Articles 12(1)(2)(4) and 13(1)(3) of the Rules of Procedure of the Boards of Appeal (OJ EPO 2007, 536).

4.2 Document (14) submitted by the proprietor of the patent during the opposition proceedings is ***de facto*** in the appeal proceedings.

4.3 Document (17) filed in response to the statement of grounds of appeal of Appellant I is admitted in accordance with Article 12(1)(b) RBPA.

4.4 Document (18) was filed by Appellant II in response to the contestation of Appellant I regarding the relevance of document (17) with respect to the relationship between comonomer content and density. It is admitted within the discretionary power of the board into the proceedings in accordance with Article 13(1) RBPA.

4.5 It is not necessary to decide on the admissibility of the documents (10) to (13), (15) and (16) since they play no role in the present decision.

4.6 Documents (19) to (22) and Annex are late-filed and not admitted into the appeal proceedings within the discretionary power of the board in accordance with Article 13(1) RBPA.

5. Admissibility of the grounds of opposition under Article 100(c) and Article 100(b) EPC - alleged procedural violation

5.1 The patent in suit was opposed only on the basis of Article 100(a) EPC for lack of novelty and lack of inventive step. The opposition division introduced the ground of opposition based on Article 100(c) EPC during oral proceedings.

5.2 Appellant I disputed that this new ground of opposition had been properly introduced into the opposition proceedings, given that it had not been given the opportunity to argue as to whether this new ground of opposition was ***prima facie*** relevant. Decisions G 9/91 (OJ EPO 1993, 408), G 10/91 (OJ EPO 1993, 420) and T 433/93 (OJ EPO 1997, 509) were cited in that respect. Failure to respect the right to be heard regarding that issue constituting a procedural violation (Article 113(1) EPC) which justified the refund of the appeal fee as well as the remittal of the case to the department of first instance.

5.3 In view of the content of the minutes of the oral proceedings before the opposition division and the submissions of Appellant I, it appears that the legal framework of the admissibility of a new ground of opposition was discussed (see points 6.1 and 6.2 of the minutes and the statement of grounds of appeal, page 5, second paragraph). After adjournment of the oral proceedings, this new ground was admitted by the opposition division (see point 8.2 of the minutes).

5.4 It cannot be inferred either from the content of decision G 9/91 (or G 10/91) or from decision T 433/93 (cited by Appellant I) that in order to meet the requirements of Article 113(1) EPC, the opposition division must, before discussing the substantive reasons for the objection, give the parties the opportunity to express their views as to the ***prima facie*** relevance of the introduction of a new ground of opposition (Article 114(1) EPC). In that respect no procedural violation occurred.

5.5 The board may, however, assess whether the opposition division exercised its discretion to admit this new ground of opposition in an unreasonable way. In the board's judgment, when an objection under Article 100(c) EPC is raised during oral proceedings, one of the requirements justifying the introduction of this ground is that the contested amendment has no explicit basis in the application as originally filed. That is actually the case here since on the one hand the feature that the MFR^1_2 value of the first ethylene polymer is from 50g/10min to 2000g/10min is only explicitly disclosed in the application as filed in connection with the additional features that i) an amount of chain transfer agent was used and ii) step 1 was performed first and on the other hand the feature that the melt flow rate MFR_2^2 is lower than the first MFR_2^1 is not disclosed. This is sufficient to raise a ***prima facie*** relevant objection because there are clear reasons to believe that such ground is relevant. This ***prima facie*** relevant objection can be reversed on the arguments presented by the proprietor on the substance of the case.

5.6 It is concluded that the opposition division exercised its discretion in an appropriate manner when it decided to introduce the new ground of opposition based on Article 100(c) EPC and that no substantial procedural violation occurred. This ground of opposition is therefore ***de facto*** in the appeal proceedings.

5.7 Appellant I argued that an objection based on Article 83 EPC had been introduced during oral proceedings. This also amounted to a procedural violation in accordance with Article 113(1) EPC, since it had not been aware of the argument in support of this new ground and thus was not prepared to provide an appropriate reply.

5.8 The arguments of Appellant I are based on a misinterpretation of the decision at first instance. Article 100(b) EPC was not introduced by the opposition division. The fact that the opposition division checks whether an amended version of a set of claims as granted as far as the amendments are concerned meets the requirement of Article 83 EPC is in line with the requirement of Article 101(3)(a) EPC. This does not mean that the objection under Article 100(b) EPC has been introduced. Therefore, Appellant I's request is no longer applicable.

Main request and auxiliary requests 1, 2, 2A, 3, 4 and 5

6. Article 100(c) EPC

6.1 In claim 1 of each of these requests, the coating composition is prepared by a process comprising at least two steps: the first ethylene polymer having a value of melt flow rate $MFR^1{}_2$ comprised between 50 g/10min and 2000 g/10min is prepared, the second ethylene polymer having an $MFR^2{}_2$ value lower than $MFR^1{}_2$ is prepared. Moreover, in claims 1 of these requests, it is specified that the process of making the multimodal polymer contains at least two steps which can be performed **in any order** (emphasis added by the board). This combination of characteristics was also present in claim 1 as granted.

6.2 First, the melt flow rate $MFR^1{}_2$ of the first ethylene polymer between 50g/10 min and 2000g/10 min, which is the polymer with low molecular weight since its MFR is higher than the MFR of the second ethylene polymer, is explicitly mentioned in the application as originally filed. However, this MFR for the first ethylene polymer is mentioned in conjunction with the condition that the said first ethylene polymer is made in the first step.

The application states:

"However, it is preferential that in said first step a hydrogen amount is used, leading to a melt flow rate $MFR^1{}_2$ of said first ethylene polymer of from 50 g/10 min. to 2000 g/10min., most preferentially from 100g/10min. to 1000g/10min., provided that said first step is performed before said second step." (see page 4, lines 5 to 8, and claim 6).

Appellant I acknowledged that the disclosure of this feature was such that the first step is performed before the second step (see statement of grounds of appeal, page 6 and point VII, §.5 above).

6.3 The question is whether the skilled person with his common general knowledge would have derived **directly and unambiguously** from the content of the application as filed that the steps of preparation of the ethylene polymers can be performed "in any order", namely that the preparation of the first ethylene polymers having an MFR^1_2 between 50g/10 min and 2000g/10 min can be performed in the second step.

6.4 The specification makes it clear that the preferred embodiment is to prepare the low molecular weight component first (see claim 3 and page 3, lines 13 to 18). The general principle is however that the steps can be performed in any order (see page 3, lines 12-13). It is also stated that when feeding the first ethylene polymer into the mixing step, the melt flow ratio MFR^1_2 of the first ethylene polymer is preferentially from 50 to 2000 g/10 min. Appellant I argued that it is common general knowledge that the low molecular weight component can be produced in the first or the second step. Therefore, the disclosure of the melt flow rate MFR^1_2 when the low molecular weight component is prepared in the first step automatically also applies to the embodiment in which the low molecular weight component is prepared in the second step. The melt flow rate is a property of the ethylene polymer itself and has nothing to do with the step sequence. Therefore, the skilled person will understand that the same preferred melt flow rate MFR^1_2 of 50g/10min to 2000g/10min will apply if the low molecular weight component is prepared in the second step.

6.5 In assessing whether an amendment is objectionable or not under Article 100(c) EPC, care should be taken not to confuse what is to be derived by a person skilled in the art from the content of a disclosure with what is to be derived **directly and unambiguously** by a person skilled in the art from the content of the same disclosure. The first notion is based on what is generically or conceptually disclosed, the second is based on what is disclosed without ambiguity. Thus, in the present case, if it might have been admitted using the first notion, that one of the obvious possibilities which can be derived from the passage cited above (see point 6.4) which reads:

"the preferred embodiment is to prepare the low molecular weight component first (see claim 3 and page 3, lines 13 to 18). The general principle is however that the steps can be performed in any order (see page 3, lines 12-13). It is also stated that when feeding the first ethylene polymer to the mixing step, the melt flow ratio MFR^1_2 of the first ethylene polymer is preferentially from 50 to 2000 g/10 min."

is that the first ethylene polymer having a value of melt flow rate MFR^1_2 comprised between 50 g/10min and 2000 g/10min (ethylene polymer of lower molecular weight) is prepared in a second step, this not the sole possibility, because the application also states that when the first ethylene polymer has a value of melt flow rate MFR^1_2 comprised between 50 g/10min and 2000 g/10min it **must** be prepared in the first step. This ambiguity (several possibilities) is an insuperable objection when assessing the allowability of an amendment.

6.6 Allowability is also doubtful for another reason. Appellant I submits a logical argument, starting from the fact that it is common general knowledge that the low molecular weight polyethylene can be produced in the second step **and** that, therefore, in that case the ethylene polymer will have the same MFR, i.e. 50 g/10 min to 2000 g/10 min. However, the latter is an unsubstantiated allegation and is rendered doubtful by the experiments (17) submitted by Appellant II. Those experiments show that the calculations of the MFR vary considerably depending on the method used. Appellant I does not contest that such a feature cannot be measured accurately and that different methods might lead to different results. However, if, as alleged by Appellant I, the skilled person would understand that the low molecular weight polyethylene can be produced in the second step, he would also know that measurement might lead to different results, namely not 50 g/10 min to 2000 g/10 min. Therefore, he would not understand without any reasonable doubt that the disclosure would disclose that when the low molecular weight polyethylene is produced in the second step the MFR will be 50 g/10 min to 2000 g/10 min. Therefore, it is doubtful that the measured MFR of the first ethylene polymer will remain the same when it is prepared in the second step. For this reason also the "directly and unambiguously" standard is not met.

6.7 For the above reasons the main request and auxiliary requests 1, 2, 2A, 3, 4 and 5 give rise to objections under Article 100(c) EPC and thus are to be rejected.

Auxiliary request 7

7. Amendments

7.1 Appellants II and III argued that the claimed subject-matter extended beyond the content of the application as originally filed because the features introduced into claim 1 are not disclosed in combination in the description as originally filed. This amounted to a selection from several parts of the description and thus contravened Article 123(2) EPC.

7.2 In view of the content of the description as originally filed, the board finds as follows:

- The description as originally filed recites on page 10, lines 3 to 8, that a metal pipe can be coated with a primer and a layer of coupling agent.

- That the coating composition has an ESCR > 2000 h is based on page 8, line 17; 2000 h being the most preferred value.

- Claim 1 as originally filed constitutes a basis for the expression "... comprises a multimodal ethylene polymer containing from 80 to 100% by weight of ethylene repeating units and from 0 to 20% by weight of C_3-C_{10} α-olefin repeating units, having a density of between 0.915 g/cm^3 and 0.955 g/cm^3...".

- Claim 2, dependent on claim 1 as originally filed, constitutes a basis for the process comprising at least two steps, each of these being carried out in the presence of a catalytic system.

- The melt flow rate values for the first ethylene polymer ranging from 50 g/10min to 2000 g/10min is based on page 4, lines 5 to 8. The mention of the presence of a chain transfer agent is required when the melt flow rate values range from 50 g/10min to 2000 g/10min (see page 4, lines 5 to 8). That the first polymer is prepared first is also based on page 4, lines 5 to 8.

- The replacement of the expression "...second ethylene polymer having a second average molecular weight, which is higher than said first average molecular weight..." by the expression "... a second melt flow rate MFR^2_2, which is lower than said first melt flow rate,..." is based on the passage mentioning the inverse relationship between the melt flow rate and the average molecular weight on page 2, lines 22 to 24 of the description as originally filed.

- That the first ethylene polymer is a homopolymer is a choice from the list on page 6, line 9.

- That the second ethylene polymer is a copolymer and that C_3-C_{10} α-olefin is used in a ratio of 1 to 25% weight is the consequence of the choice of a homopolymer for the first ethylene polymer based on page 6, lines 13 to 16.

- The weight ratios of each ethylene polymer (20 to 80% and 80 to 20%) are based on page 5, lines 33-35.

- The melt flow rate for the blend ranging from 0.1 g/10min to 50 g/10min is based on page 6, line 26.

The pipe of claim 13 is prepared by using the composition obtained by the process of claim 1.

7.3 In view of the above, the board concludes that the seventh auxiliary request fulfils the requirements of Article 123(2) EPC.

7.4 The board also concludes that this set of claims does not contravene the requirements of Article 123(3) EPC, in particular in view of the limitation of the nature of the ethylene polymer of the first and second process steps, of the limitation of the values of the melt flow rates for the first polymer and the final blend and of the value of the ESCR.

7.5 The seventh auxiliary request fulfils the requirements of Article 123(3) EPC.

8. Clarity - conciseness

Neither of Appellants II and III raised an objection based on Article 84 EPC. The board is also satisfied that the wording of the claims of this request is clear and concise.

The requirements of Article 84 EPC are met.

9. Novelty

9.1 Appellants II and III did object to novelty. The board is also satisfied that the claimed subject-matter is novel vis-à-vis the disclosure of document (6d), on the basis that the process of claim 1 of the present request requires that the first ethylene polymer is a homopolymer and the second ethylene polymer is a copolymer. Neither example 2 nor any other example of document (6d) describes such a combination of polymers.

9.2 Novelty of the seventh auxiliary request is thus acknowledged (Article 54 EPC).

10. Inventive step

10.1 The board and the appellants agree in considering document (6d) as representing the closest prior art.

Document (6d) relates to a steel pipe which is coated by an ethylene polymer composition comprising two polymers (see claim 1, on page 1).

The steel pipe itself may be treated mechanically or chemically. Furthermore, adhesives or binders may be used as intervening agents (see page 5, lines 20-22). The ethylene polymer of component (A) is a homopolymer of ethylene, or a copolymer of ethylene and a C_3 or more α-olefins (see page 2, lines 27-29). The ethylene copolymer (B) is a copolymer of ethylene and a C_3 or more α-olefins (see page 3, lines 14-15). Both polymers are prepared in the presence of a catalyst (see page 5, lines 5-9). A preferred way of making this polymer composition is a two-stage polymerisation method. Such a two-stage polymerisation method includes, for example, a method of producing component (A) and then producing component (B), or vice versa (see page 5, lines 5 to 11). The material used to coat the pipe requires anti-stress crack properties (ESCR) (see page 2, line 6).

The density of the coating composition ranges from 0.935 to 0.950g/cm^3 (see claim 1).
The melt flow rate value for component (A) is between 5 and 1000g/10min at 2.16kg of load (MFR_2) (see page 2, lines 20-21).
The composition contains 30 to 60 weight percent of component (A) and 70 to 40 weight percent of component (B) (see Claim 1).
The melt flow rate of the coating composition is between 0.1 and 1.0g/10min (see claim 1).
The melt flow rate for the component (B) is between 0.005 and 0.1g/10min (see Claim 1).

There is, therefore, an overlap with respect to those parameters between the content of document (6d) and the claimed subject-matter.

The value of the ESCR (F_{50}) of the composition of Example 2 is greater than 1000 hours (see Table 2).

10.2 The claimed subject-matter differs from the content of document (6d) in that an ESCR F_{20} value of 2000 hours is not disclosed. Furthermore, although document (6d) discloses that the steel pipe may be treated chemically before applying an adhesive or a binder, it does not unambiguously disclose the use of a primer. Moreover, although one of the possibilities encompassed by document (6d) is the use of an ethylene homopolymer as component (A) instead of a copolymer of ethylene and a C_3 or more α-olefins, there is no unambiguous disclosure of a process involving an ethylene hompolymer as component (A). The ratio of ethylene to C_3-C_{10} α-olefin in the multimodal ethylene composition is not mentioned in document (6d).

10.3 According to the constant jurisprudence of the boards of appeal, if the proprietor of the patent wishes to rely on an improved technical effect to define the technical problem to be solved, the burden of proof rests with him (see T 97/00, point 3.1.6). In that respect, a fair comparison must be made between the subject-matter of the said closest prior art and the claimed invention. To meet this requirement, a strict distinction must be drawn between the purely intellectual content and the information content in the sense of a specific teaching (see T 181/82, OJ EPO 1984, 401, point 8). In the present case where the compositions of document (6d) result from combinations of various ethylene polymers having properties defined in terms of ranges and moreover obtained by different methods, it is appropriate to rely on the working examples to obtain a specific teaching. Example 2 is more relevant than example 1, which relates to a blend of components (A) and (B) prepared separately.

10.4 In Example 2, continuous series of two-stage polymerization are performed by using a titanium catalyst containing 3.8 weight% of titanium, 56 weight%

of chlorine, 17 weight% of magnesium and 14.1% of ethyl benzoates by atomic conversion. Hexane, triethylaluminum and polymerizer are supplied to the first stage polymerizer at rates of 50l/hr, 120 mmol/hr and 2.6 mmol/hr (Ti atom basis), respectively, and ethylene, 1-butene, and hydrogen (chain transfer agent according to the patent in suit) are introduced at the respective rates of 15 kg/hr, 100 g/hr and 20Nm^3/hr at 80°C. The overall pressure is 7 kg/cm^2 and the mean residence time is 2 hours. The MFR$_2$ of polyethylene is 430g/10 min, the viscosity [η] = 0.66 dl/g, the density = 0.970g/cm^3.

The polyethylene is transferred to a second-stage polymerization reactor, where ethylene, 1-butene and hydrogen are introduced at the respective rates of 15 kg/hr, 1000 g/hr, and 0.08 Nm^3/hr at 70°C. The overall pressure is 35 kg/cm^2 and the residence time is 2 hours.

The MFR$_2$ of this polymer is 0.2 g/10min, [η] = 2.62 dl/g, HSFR is 350 sec^{-1}, and the density is 0.945 g/cm^3.

The physical property of the polymerization product of the second stage calculated from the theoretical additive property with the first stage property is:

[η] = 4.58 dl/g
MFR$_2$ = 0.009 g/10min

10.5 Instead of submitting comparative experiments related to Example 2 above, the appellant relied on document (14), which compares two multimodal compositions A and B, A being the comparative example.

Example A

In a first reactor, 5000 kg/hr ethylene and 95 kg/hr butene are polymerised in the presence of a Ti containing Zn catalyst. The C_4/C_2 feed ratio Kg/ton is 19 (see Table 2). The resulting polymer has an MFR_2 of 140 g/10 min.

The reaction mixture is transferred into the second reactor where 5000 kg/hr ethylene and 95 kg/hr butene are added for polymerization. The C_4/C_2 feed ratio Kg/ton is 19 (see Table 2). The MFR_2 of the final polymer is 0.11 g/10 min. The density is 948 kg/m^3, i.e. 0.948 g/cm^3.

Example B

No butene was added in the first reactor. The reaction mixture is transferred into the second reactor where 5000 kg/hr ethylene and 200 kg/hr butene are added for polymerization. The C_4/C_2 feed ratio Kg/ton is 40 (see Table 2). The MFR_2 of the final polymer is 0.12 g/10 min. The density is 950 kg/m^3, i.e. 0.950 g/cm^3.

Mechanical testing results

The ESCR and ASTM D 1693h are measured. F_{20} is the time where 20% of the samples have failed. F_{50} is the time where 50% of the samples have failed. F_{80} is the time where 80% of the samples have failed.

The results for A are 1559, 2813 and 4067 respectively for F_{20}, F_{50} and F_{80}. The results for B are for all F_t > 10 000.

There is undeniably a significant improvement in composition B vis-à-vis A.

10.6 However, the question is whether Example A may be seen as representing the closest prior art. There are differences between the butene/ethylene ratios fed in example 2 of document (6d) and comparative example A, namely:

In the first stage polymerisation:

Ex 2: C_4/C_2 (kg/ton) = 6.66 versus Comp Ex A: C_4/C_2 (kg/ton) = 19

In the second stage polymerisation:

Ex 2: C_4/C_2 (kg/ton) = 66.6 versus Comp Ex A: C_4/C_2 (kg/ton) = 19

Contrary to the Appellant I's view, comparative Example A is structurally more remote from the claimed invention than Example 2 of document (6d), because the copolymer obtained in the first stage polymerisation of Example 2 contains less 1-butene than the copolymer obtained in the first stage polymerisation of comparative Example A and is, therefore, structurally closer to an homopolymer than comparative Example A. Hence, document (14) is not a fair comparison between the structurally closest state of the art and the claimed invention.

Furthermore, the experimental data displayed in the description as originally filed, in which polyethylene

#1 and #2 according to the invention are compared to a reference "HE6066" (see Table 1 on page 12) and polyethylene #3 and #4 are compared to a reference "HE6060" (see Table 3 on page 13) cannot show any improvement over the state of the art either, because the nature of the references "HE6066" and "HE6060", namely the nature and the proportions of its different constituents, is nowhere mentioned in the description as originally filed.

Nor can the board consider that the compositions according to document (6d) exhibit an F_{20} lower than 2000 because F_{50} is higher than 1000. No data is available to support such an allegation, the burden of proof in that respect rested with Appellant I.

10.7 Therefore, in the present case, the burden of proof for showing that the claimed method leads to the alleged and unsupported advantageous effects mentioned in the patent in suit rests with the respondent-patentee. In the absence of any corroborating evidence that said advantageous effects are obtained, the allegation that the polymer exhibits higher ESCR values and that pipes can be coated in a fast and reliable way is unsubstantiated, and consequently such alleged effects are not to be taken into account in assessing inventive step.

10.8 In the absence of any evidence showing an improved effect vis-à-vis document (6d), the problem underlying the patent in suit in the form of the present request can only be seen in the provision of an alternative process for preparing a metal pipe coated with a multimodal ethylene polymer composition, said polymer having a good ESCR, and by which pipes can be coated in a fast and reliable way (good winding speed) (see [0010] and page 6, lines 34-35).

10.9 The next step is to verify that the problem has been successfully solved by the claimed invention.
Appellant II had pointed out that in the examples of the patent in suit, no comonomer percentages are provided for either the components or the composition. The board notes that only data related to MFR and density is indicated. As product characteristics of the product of Example B, allegedly according to the invention, of document (14), MFR_2, MFR_5, MFR_{21} in g/10min and density in kg/m^3 are indicated but not the butene content. Relying upon documents (17) and (18), Appellant II had contended that there was a relationship between density and comonomer content. In view of the submissions of Appellant II, the board might admit in Appellant I's favour that the densities of the polymers are sufficient evidence that the polymers in the examples of the patent in suit and Example B have a comonomer content which is within the range defined in Claim 1, i.e. 0 to 20% by weight for the multimodal polymer and 1.0 to 25% by weight for the second ethylene copolymer, so that the technical problem can be considered solved over substantially the whole area.

10.10 It remains to be decided whether the proposed solution (see Claim 1) is obvious in view of the state of the art.

10.10.1 Looking for a solution to the technical problem defined above, the person skilled in the art would have noted that one of the methods taught by document (6d) to prepare a resin coating steel pipe involves first treating the steel pipe itself mechanically or chemically. Those two first layers belong to the general knowledge of the person skilled in the art who knows from documents (7), (8) and (9) that a three-layer sheet for protection against the corrosion of steel pipe is used, said sheet comprising an Epoxy-Typ as primary layer, an adhesive layer (PE-Copo) and an outer layer of PE (see in particular document (7), page 2 or document (9), §. 1.1, 3.1 (coating), §.5.2).

The method for preparing the composition according to document (6d) is a two-stage polymerisation method including a method of producing component (A) (30-60 parts), an ethylene polymer which is a homopolymer of ethylene or a copolymer of ethylene and a C_3 or more α-olefin, produced from a catalyst and a chain transfer agent, namely hydrogen, the ethylene polymer having $5 < MFR_2 < 2000$ g/10 min, and then producing component (B) (70 to 40 parts), a copolymer of ethylene and a C_3 or more α-olefins having an MFR_2 between 0.005-0.1 g/10min, thus lower than component (A). The density of the polymer is 0.935-0.950 g/cm^3 and the MFR_2 is between 0.1 to 1.0 g/10min. The ethylene/C_3-C_{10} ratio is not mentioned. The compositions have excellent anti-stress crack property. The steel pipe may be coated with the ethylene polymer composition by a method consisting of tubular extrusion of the composition around the steel pipe or a method of consisting extruding the composition as a flat sheet and then helically winding the sheet around the steel pipe.

Appellant I contended that one of the essential features is the requirement to limit the C_3-C_{10} α-olefin content of the polymer to 20%, the polymer being a multimodal polymer where the low molecular weight component is a homopolymer and the high molecular weight component is a copolymer with a C_3-C_{10} α-olefin content of 1 to 25%.

That finding is not disputed. However, the person skilled in the art wishing to solve the technical problem defined above would consult the whole prior art, which would enable him to find bimodal polyethylene meeting the requirements defined according to the teaching of document (6d).

Document (3) relates to a method of preparing bimodal polyethylenes with good mechanical properties (see page 5, lines 39-42) and their use for the manufacture of ***inter alia*** tubes or films or sheet (see page 6, lines 15-18). It is noted in particular that document (6d) teaches a method of coating, consisting of extruding the composition as a flat sheet and then helically winding the sheet around the steel pipe (see page 5, lines 15-18). Contrary to Appellant I's view, the person skilled in the art would have considered this document, as it belongs to the same technical field as the present invention.

In document (3), the α-(C_3-C_8)olefin content of the low melt-index polyethylene (0.01 to 2g/ 10min measured under a load of 5 kg) of the two-part composition is between 0.5 and 20 weight% and the α-olefin content of the high melt index polymer (5 to 1000 g/10min measured with a load of 2.16 kg) preferably does not exceed 1%

but the presence of C_3-C_{10} α-olefin in the polyethylene of high melt-index is not compulsory (see [0031]). The ratio is within the defined range in Claim 1, namely (30-70)/(70-30) (see page 2, lines 35 to 48 and page 5, lines 15 to 22). This teaching points to a bimodal polyethylene where the high melt-index polymer (5 to 1000 g/10min measured with a load of 2.16 kg) is a homopolymer and the low melt-index polyethylene (0.1 to 2 g/10min measured under a load of 5 kg) has an α-olefin content of between 0.5 and 20 weight%. This bimodal polyethylene would have an α-olefin content below 20%.

Now, knowing from document (6d) that one of the possible alternatives is to use a bimodal ethylene polymer, the polyethylene of high MFR is a homopolymer and the polyethylene of low MFR is a copolymer, it becomes obvious to the person skilled in the art to use the bimodal polyethylene composition of document (3) within the teaching of document (6d).

Such an obvious alternative falls within the scope of claim 1.

In the absence of any evidence that the claimed process leads to improved properties of the obtained product (see point 10 above), the properties of the said product cannot be taken into account for the assessment of inventive step for the claimed process.

10.11 The board concludes that the person skilled in the art would have arrived at the subject-matter of claim 1 by combining the teachings of documents (6d) and (3) without any inventive skills.

10.12 Since the board can only decide on a request as a whole, the seventh auxiliary request does not fulfil the requirements of Article 56 EPC and is to be rejected.

Auxiliary request 8 to 11

11. Amendments

11.1 Auxiliary request 8

Compared to the wording of claim 1 of the seventh auxiliary request, the following feature has been added at the end of claim 1: "...and wherein the melt flow rate ratio $FRR_{21/5}$ of said blend according to ISO1133 is between 15 and 40.". This feature is based on dependent claim 12 as originally filed, which was dependent on the preceding claims 2 to 11, the latter dependent on claim 1. Thus, the combination of features now present in the claim through the addition of this new feature has a true basis in the originally filed description.

11.2 Auxiliary request 9

Compared to the wording of claim 1 of auxiliary request 7, the feature "...said polymerisation steps being a combination of slurry polymerisation and gas phase polymerisation." has been added. This feature is based on a feature of dependent claim 7 as originally filed, which was dependent on the preceding claims 2 to 11, the latter dependent on claim 1. Thus, the combination of features now present in the claim through the addition of this new feature has a true basis in the originally filed description.

11.3 Auxiliary request 10

Compared to the wording of claim 1 of the auxiliary request 7, the feature "...in a first step in a slurry polymerization and said second ethylene polymer is prepared in a succeeding second step in a gas-phase polymerization..." has been added. This feature is based on the preferred feature of dependent claim 7 as originally filed, which was dependent on the preceding claims 2 to 11, the latter dependent on claim 1. Moreover, the feature "...and wherein the flow rate ration $FRR^3_{21/5}$ of said blend is between 15 to 40." is based on claim 13 as originally filed. Thus, the combination of features now present in the claim through the addition of these new features has a true basis in the originally filed description.

11.4 Auxiliary request 11

Compared to the wording of claim 1 of the auxiliary request 7, the feature "...in a first step in a loop reactor and said second ethylene polymer is prepared in a succeeding second step in a gas-phase polymerization..." has been added. This feature is based on the preferred feature of dependent claim 7 as originally filed, which was dependent on the preceding claims 2 to 11, the latter dependent on claim 1 and page 4, line 22, of the description as originally filed. Moreover, the feature "...the molecular weight distribution curve showing several peaks or a broad peak lacking small fractions of extremely low and extremely high molecular weight material." is based on claim 13 as originally filed. Thus, the combination of features now present in the claim through the addition of these new features has a true basis in the originally filed description.

11.5 Furthermore, the addition of these different features limits the respective claimed scope compared to the granted version of the claims.

11.6 Therefore, these requests fulfil the requirements of Article 123(2) and (3) EPC.

12. Clarity - conciseness

12.1 Claim 7 of each of these requests contains the feature "... said second ethylene polymer, the C_3-C_{10} α-olefin, which is preferentially 1-butene or 1-hexene, repeating unit content is from 1 to 25% by weight...".

Claim 1 of each of these requests also contains the feature that the second ethylene copolymer has a C_3-C_{10} α -olefin content from 1 to 25% by weight. Therefore, claim 7 of all these requests is redundant with the content of claim 1 of the respective request. This redundancy contravenes the requirement of clarity and conciseness as set out in Article 84 EPC.

12.2 Hence, auxiliary requests 8 to 11 all contravene the requirements of Article 84 EPC and are to be rejected.

Reimbursement of the appeal fee

13. An appeal fee is to be reimbursed when the board deems the appeal to be allowable and if this reimbursement is justified by reason of a substantial procedural violation (Rule 103(1)(a) EPC).

In view of the conclusions reached by the board (see above), none of the requests on file meets the requirements of the EPC; the appeal of Appellant I is thus not allowable. Hence for this reason alone, the claimed reimbursement cannot be granted, since the appeal is not deemed to allowable.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The European patent No. 0837915 is revoked.

3. The request for reimbursement of the appeal fee is refused.

The Registrar The Chairman

B. Atienza Vivancos P. Ranguis