

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
13 November 2008 (13.11.2008)

PCT

(10) International Publication Number
WO 2008/136849 A1

(51) International Patent Classification:

C08L 23/08 (2006.01) C08F 2/34 (2006.01)
C08F 255/02 (2006.01) C08F 297/00 (2006.01)

(74) Agent: ASHBURG, Ray; 2030 Dow Center, Midland,
Michigan 48674 (US).

(21) International Application Number:

PCT/US2007/082502

(22) International Filing Date: 25 October 2007 (25.10.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/927,176 2 May 2007 (02.05.2007) US

(71) Applicant (for all designated States except US): DOW
GLOBAL TECHNOLOGIES INC. [US/US]; 2040 Dow
Center, Midland, MI 48674 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): MICHIE, William
[US/US]; 9111 South Fitzgerald Way, Missouri City, TX
77459 (US). WHITED, Stephanie [US/US]; 1915 Huber
Road, Charleston, WV 25314 (US). WIKER, Nathan
[US/US]; 2135 W. Main Street, Houston, TX 77098 (US).
ELLEY-BRISTOW, Dale [CA/CA]; 865 Tudor Close
East, Sarnia, ON N7V 2Z8 (CA).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG,
ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL,
IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK,
LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW,
MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL,
PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA,
ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL,
PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(54) Title: HIGH-DENSITY POLYETHYLENE COMPOSITIONS, METHOD OF MAKING THE SAME, INJECTION
MOLDED ARTICLES MADE THEREFROM, AND METHOD OF MAKING SUCH ARTICLES

(57) Abstract: The instant invention is a high-density polyethylene composition, method of producing the same, injection molded articles made therefrom, and method of making such articles. The high-density polyethylene composition of the instant invention includes a first component, and a second component. The first component is a high molecular weight ethylene alpha-olefin copolymer having a density in the range of 0.920 to 0.946 g/cm³, and a melt index (I_{21.6}) in the range of 1 to 15 g/10 minutes. The second component is a low molecular weight ethylene polymer having a density in the range of 0.965 to 0.980 g/cm³, and a melt index (I₂) in the range of 30 to 1500 g/10 minutes. The high-density polyethylene composition has a melt index (I₂) of at least 1, a density in the range of 0.950 to 0.960 g/cm³. The method of producing a high-density polyethylene composition includes the following steps: (1) introducing ethylene, and one or more alpha-olefin comonomers into a first reactor; (2) (co)polymerizing the ethylene in the presence of one or more alpha-olefin comonomers in the first reactor thereby producing a first component, wherein the first component being a high molecular weight ethylene alpha-olefin copolymer having a density in the range of 0.920 to 0.946 g/cm³, and a melt index (I_{21.6}) in the range of 1 to 15 g/10 minutes; (3) introducing the first component and additional ethylene into a second reactor; (4) polymerizing the additional ethylene in the second reactor thereby producing a second component, wherein the second component being a low molecular weight ethylene polymer having a density in the range of 0.965 to 0.980 g/cm³, and a melt index (I₂) in the range of 30 to 1500 g/10 minutes; and (5) thereby producing the high-density polyethylene composition, wherein the high-density polyethylene composition having a melt index (I₂) of at least 1, a density in the range of 0.950 to 0.960 g/cm³. The injection molded articles according to instant invention comprise the above-described inventive high-density polyethylene composition, and such articles are made via injection molding.

WO 2008/136849 A1