

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization

International Bureau

(43) International Publication Date
10 February 2022 (10.02.2022)



(10) International Publication Number
WO 2022/031397 A1

(51) International Patent Classification:

C08F 210/16 (2006.01) H01B 3/30 (2006.01)

C08F 4/659 (2006.01) H01B 1/22 (2006.01)

(21) International Application Number:

PCT/US2021/040644

(22) International Filing Date:

07 July 2021 (07.07.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/061,369 05 August 2020 (05.08.2020) US

(71) Applicant: **DOW GLOBAL TECHNOLOGIES LLC**
[US/US]; 2211 H.H. Dow Way, Midland, Michigan 48674
(US).

(72) Inventors: **ESSEGHIR, Mohamed**; c/o Union Carbide Corporation, 400 Arcola Road, Collegeville, Pennsylvania 19426 (US). **HE, Chuan C.**; c/o Union Carbide Corporation, 1840 Union Carbide Drive, South Charleston, West Virginia 25303 (US). **KAPUR, Mridula**; c/o Dow Global Technologies LLC, 230 Abner Jackson Parkway, Lake Jackson, Texas 77566 (US). **HEITSCH, Andrew T.**; c/o Dow Global Technologies LLC, 230 Abner Jackson Parkway, Lake Jackson, Texas 77566 (US). **GEUSSENS, Theo**; c/o Dow Europe GmbH, Bachtobelstrasse 3, 8810 Horgen (CH). **SZUL, John F.**; c/o Union Carbide Corporation, 1840 Union Carbide Drive, South Charleston, West Virginia 25303 (US).

(74) Agent: **MOLLOY, Matthew A.** et al.; c/o Dinsmore & Shohl LLP, Fifth Third Center, One South Main Street, Suite 1300, Dayton, Ohio 45402 (US).

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

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report (Art. 21(3))
- with amended claims (Art. 19(1))

(54) Title: THERMOPLASTIC COMPOSITIONS COMPRISING BIMODAL POLYETHYLENE AND ARTICLES MANUFACTURED THEREFROM

(57) Abstract: In various embodiments, a bimodal polyethylene may include a high molecular weight component and a low molecular weight component. The bimodal polyethylene may have a density of from 0.933 grams per centimeter (g/cm^3) to 0.960 g/cm^3 , a melt index (I_2) of from 0.3 decigrams per minute (dg/min) to 1.2 dg/min , a melt flow ratio (MFR_{21}) greater than 80.0, a molecular weight distribution (M_w/M_n) greater than 10, a reverse comonomer distribution, and a shear thinning index of from 5.0 to 20.0. Methods for producing the bimodal polyethylene, articles manufactured from the bimodal polyethylene are also provided.



WO 2022/031397 A1