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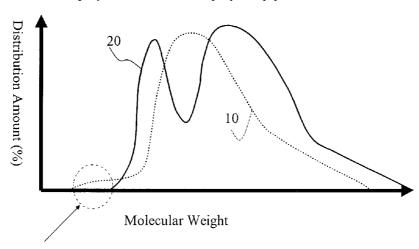
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(54) Title: POLYETHYLENE MELT BLENDS FOR HIGH DENSITY POLYETHYLENE APPLICATIONS

Polymerized Bimodal Narrow Molecular Weight Distribution HDPE Copolymer and HDPE Copolymer pipe resin



Low Molecular Weight Tail

(57) Abstract: A polyethylene composition is provided that has a density of about 0.945 to about 0.960 g/cm³ and a melt flow index of about 0.1 to about 0.4. The composition is a melt blend of a linear low density polyethylene resin and/or a linear medium low density polyethylene resin, and a high density polyethylene resin. A feature of the composition is that the resins can independently be virgin, recycled, scrap and/or wide specification resins, and mixtures of these. Methods of producing the compositions and extruded, molded and formed plastic articles manufactured from the compositions are presented.

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C08L23/06 C08L23/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols) IPC 7 - C08L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Х	US 4 786 688 A (THIERSAULT JEAN P ET AL) 22 November 1988 (1988-11-22) the whole document	1-46
X	US 5 338 589 A (BOEHM LUDWIG ET AL) 16 August 1994 (1994-08-16) the whole document	1-46
A	US 5 631 069 A (GEUSSENS THEO L V ET AL) 20 May 1997 (1997-05-20) the whole document	1–46
E	US 2003/114594 A1 (STARITA JOSEPH M) 19 June 2003 (2003-06-19) the whole document	1
	-/	

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Date of the actual completion of the international search 2 March 2004	Date of mailing of the international search report $09/03/2004$
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INTERNATIONAL SEARCH REPORT

Internation ppplication No
PCT/US 02/31652

C.(Continuat	ion) DOCUMENTS CONSIDERED TO BE RELEVANT	101703 02731032		
	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
E	US 6 649 698 B1 (MEHTA SAMEER D) 18 November 2003 (2003-11-18) the whole document	1		
E	18 November 2003 (2003-11-18)			

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internation ppplication No
PCT/US 02/31652

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 4786688	Α	22-11-1988	FR	2493854 <i>F</i>	\1	14-05-1982
UU 4700000	А	22 11 1700	AT	13546		15-06-1985
			CA	1192333		20-08-1985
			DE	3170762		
						04-07-1985
			EP	0052555 /		26-05-1982
			ES	8300124 <i>F</i>		01-01-1983
			JP	1016264 F		23-03-1989
			JP	1682369 (31-07-1992
			JP	57109845 <i>F</i>		08-07-1982
			PT	73977 /	A ,B	01-12-1981
US 5338589	Α	16-08-1994	AT	142672	Γ	15-09-1996
			CA	2070470 A	41	06-12-1992
			DE	59207090 [17-10-1996
			EP	0517222		09-12-1992
			ES	2094255		16-01-1997
			SG	52612		28-09-1998
				52012 7		
US 5631069	Α	20-05-1997	ΑU	699156 I	32	26-11-1998
			ΑU	3944795 <i>l</i>	4	29-11-1996
			CA	2220439 /	41	14-11-1996
			EP	0824568		25-02-1998
			ĴΡ	11505279		18-05-1999
			WO	9635750 /		14-11-1996
			AU	2585195		29-11-1995
			AU	2696099		15-07-1999
			BR	9507890		23-09-1997
			CA	2190005 /		16-11-1995
			CN	1150441 /		21-05-1997
			DE	69510934 [26-08-1999
			DE	69510934		11-11-1999
			EΡ	0759048 <i>l</i>		26-02-1997
			ES	2133773	Т3	16-09-1999
			FΙ	964481		08-01-1997
			JΡ		T	22-12-1997
			NO	964753		09-01-1997
			NZ	287207		28-10-1998
			WO	9530713		16-11-1995
US 2003114594	A1	19-06-2003	US	2003139530	 A 1	24-07-2003
00 E000II4004	117	17 00 2003	US	2003171492		11-09-2003
	B1	18-11-2003	MO	03099922	Al	04-12-2003
US 6649698						