



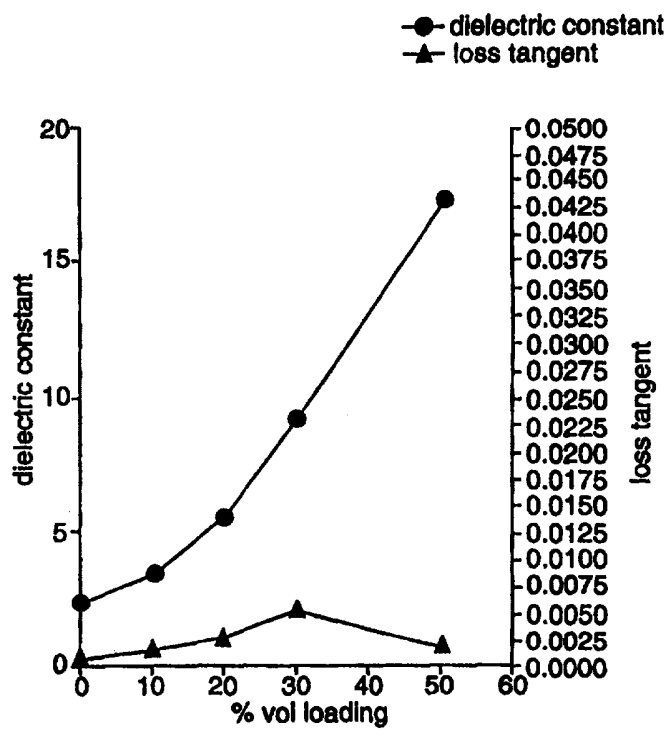
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : H01B 3/44, B32B 15/08, H05K 1/03</p>	<p>A3</p>	<p>(11) International Publication Number: WO 97/32314 (43) International Publication Date: 4 September 1997 (04.09.97)</p>
<p>(21) International Application Number: PCT/US97/01570 (22) International Filing Date: 29 January 1997 (29.01.97) (30) Priority Data: 08/608,779 29 February 1996 (29.02.96) US (71) Applicant: MINNESOTA MINING AND MANUFACTURING COMPANY [US/US]; 3M Center, P.O. Box 33427, Saint Paul, MN 55133-3427 (US). (72) Inventors: BRENNAN, Joan, V.; P.O. Box 33427, Saint Paul, MN 55133-3427 (US). GINKEL, Scott, T.; P.O. Box 33427, Saint Paul, MN 55133-3427 (US). SKOGLAND, Timothy, S.; P.O. Box 33427, Saint Paul, MN 55133-3427 (US). (74) Agents: GWIN, H., Sanders et al.; Minnesota Mining and Manufacturing Company, Office of Intellectual Property Counsel, P.O. Box 33427, Saint Paul, MN 55133-3427 (US).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p> <p>(88) Date of publication of the international search report: 4 December 1997 (04.12.97)</p>	

(54) Title: THERMOPLASTIC ELASTOMERIC SUBSTRATE MATERIAL WITH TUNABLE DIELECTRIC PROPERTIES AND LAMINATES THEREOF

(57) Abstract

A thermoplastic elastomer which may be formulated to have a wide range of dielectric properties as required for a particular application. The material of the invention is preferably provided in the form of a film, which may be bonded to metallic layers, additional dielectric layers, or other circuit structures to form a laminate structure with the desired dielectric properties.



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INTERNATIONAL SEARCH REPORT

Intern al Application No
PCT/US 97/01570

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H01B3/44 B32B15/08 H05K1/03

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 6 H01B B32B H05K

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 223 568 A (LANDI VINCENT R ET AL) 29 June 1993 see column 2, line 42 - line 54 see column 3, line 1 - line 7 see claims 1-32	
A	---	
A	FR 2 090 713 A (BASF) 14 January 1972 see page 1, line 1 - line 3; claims 1-4; example 5	
X	---	
X	FR 2 594 193 A (BRIDGESTONE CORP) 14 August 1987 see page 5, line 1 - page 15, line 7; claims; figure 1	6,13

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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search 24 September 1997	Date of mailing of the international search report 23. 10. 97
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patendaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+ 31-70) 340-3016	Authorized officer De Jonge, S

INTERNATIONAL SEARCH REPORT

Intern al Application No

PCT/US 97/01570

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	PATENT ABSTRACTS OF JAPAN vol. 097, no. 002, 28 February 1997 & JP 08 258207 A (BRIDGESTONE CORP), 8 October 1996, see abstract	6,13
A	--- EP 0 398 672 A (MINNESOTA MINING & MFG) 22 November 1990 see column 3, line 12 - line 16; claims	6
A	--- EP 0 382 557 A (JUNKOSHA CO LTD) 16 August 1990 see page 2, line 48 - line 49 see claims; example 1	6,8-11, 13
A	--- GB 2 224 464 A (YOKOHAMA RUBBER CO LTD) 9 May 1990 see claims	6,8-11, 13
A	--- EP 0 243 161 A (YOKOHAMA RUBBER CO LTD) 28 October 1987 see column 2, line 38 - line 55; claims; figure	6,8-11, 13

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 97/01570

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful international Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. Claims 1-5, 12
2. Claims 6-11, 13

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 97/01570

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