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(54) Title: IMPACT-RESISTANT POLYURETHANES

(57) Abstract: The present invention teaches a new process to produce novel, hard, optically clear, impact-resistant polyurethane polymers that are characterized by excellent thermo mechanical properties and chemical resistance, and the polymers made as a result of such a process. The polyurethanes are made by reacting a) a prepolymer made by reacting a polyisocyanate with a primary amine-terminated polyether with an amine functionality of about 2 and a molecular weight of >1000, and in which the free -NCO content of the resulting prepolymer is >18% by weight; with b) (i) a polyol having an average hydroxyl functionality greater than or equal to 2 and an average hydroxyl equivalent weight of from about 300 to about 1,000, and (ii) a curing agent that has isocyanate reactive groups, a functionality of 2 to 3 and a molecular weight of <400. More preferably the prepolymer is made by reacting a cycloaliphatic polyisocyanate with a primary amine-terminated polyether diamine of 2000 to about 2500 molecular weight, the polyol is either a polyester polyol triol with a molecular weight of between about 540 and 900, or a polyether glycol with a molecular weight of between about 650 and 2000, or a polyester polyol diol with a molecular weight of up to 2,000, and the curing agent is either dianhydroxitol, an aromatic diamine, an aromatic ring containing diol or a cyclohexanedimethanol.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C08G

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 705 814 A (GRIGSBY JR ROBERT A [US] ET AL) 10 November 1987 (1987-11-10) column 2, line 17 - column 5, line 3 examples 12,16	1-20
A	US 4 383 051 A (MEYBORG HOLGER [DE] ET AL) 10 May 1983 (1983-05-10) example 1	1-20
A	US 4 476 292 A (HAM NANCY M [US] ET AL) 9 October 1984 (1984-10-09) column 1, line 4 - column 2, line 58 examples 1-4	1-20

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Information on patent family members

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