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4 March 2010

(54) Title: PROCESS FOR PREPARING RIDIG POLYISOCYANURATE FOAMS USING NATURAL-OIL POLYOLS

(57) Abstract: The present invention provides a process for producing a rigid polyisocyanurate foam involving reacting at an isocyanate index of from about 175 to about 400, a polyisocyanate with at least one natural-oil polyol containing at least about 35 wt. %, based on the weight of the polyol, of natural oil, having a hydroxyl number from about 175 to about 375 and a hydroxyl functionality of about 2.0 to about 2.8, in the presence of a blowing agent and optionally, in the presence of one or more of surfactants, flame retardants, pigments, catalysts and fillers, wherein the resulting foam has a renewable biobased content of at least 8% by weight. The foams provided by the inventive process possess properties similar to foams produced from petroleum-derived materials and may find use in wall or roof insulation systems. The high biobased content (>8%) may allow wall or roof insulation systems containing these foams to be considered for the U.S. Government's preferred procurement program.



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**A. CLASSIFICATION OF SUBJECT MATTER**

*C08J 9/22(2006.01)i, C08J 9/30(2006.01)i, C08G 18/28(2006.01)i, C08G 18/72(2006.01)i, C08G 18/74(2006.01)i, C08G 101/00(2006.01)n*

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)

C08J 9/22; C08G 18/00; C08G 18/42

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 practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords:polyisocyanurate,natural oil,isocynate index, foam

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	ULDIS STIRNA et al. Structure and properties of polyurethane foams obtained from rapeseed oil polyols. 2 January 2006. See page 101-105	1-14
Y	JAVNI et al. Soybean-Oil-Based Polyisocyanurate Rigid Foams. July 2004. See page 123-124	1-14
A	US 2007-0173626 A9 (ERIC J. GEIGER et al.) 26 July 2007 See the whole document	1-14
A	US 6359022 B1 (HICKEY; F. LEO et al.) 19 March 2002 See the whole document	1-14

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

13 JANUARY 2010 (13.01.2010)

Date of mailing of the international search report

**14 JANUARY 2010 (14.01.2010)**

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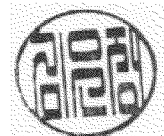
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2009/003327**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007-0173626 A9	26.07.2007	US 2007-037953 A1 US 2007-173626 A9	15.02.2007 26.07.2007
US 6359022 B1	19.03.2002	AT 215101 T AU 9687798 A CA 2305276-A1 DE 69804483 D1 EP 1023351 A1 EP 1171500 A1 ES 2172928 T3 US 05922779A A US 5922779 A1 WO 1999-019377 A1 WO 2000-061654 A1	15.04.2002 03.05.1999 22.04.1999 02.05.2002 02.08.2000 16.01.2002 01.10.2002 13.07.1999 13.07.1999 22.04.1999 19.10.2000