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(71) Applicant (for all designated States except US):
HENKEL CORPORATION [US/US]; 1001 Trout
Brook Crossing, Rocky Hill, CT 06067 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **NGUYEN, My**
[US/US]; 13015 Edina Way, Poway, CA 92064 (US).
TAKANO, Tadashi [JP/US]; 16772 Algonquin Street,
Huntington Beach, CA 92649 (US). **LIU, Puwei**
[CN/US]; 815 Via Barquero, San Marcos, CA 92069
(US).

(74) Agents: **CUNNINGHAM, Marina, F. @** et al.; Mc-
Cormick, Paulding & Huber LLP, 185 Asylum Street,
CityPlace II, Hartford, CT 06103-3410 (US).

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CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ,
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MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to the identity of the inventor (Rule 4.17(i))

[Continued on next page]

(54) Title: ADHESIVE COMPOSITIONS FOR USE IN DIE ATTACH APPLICATIONS

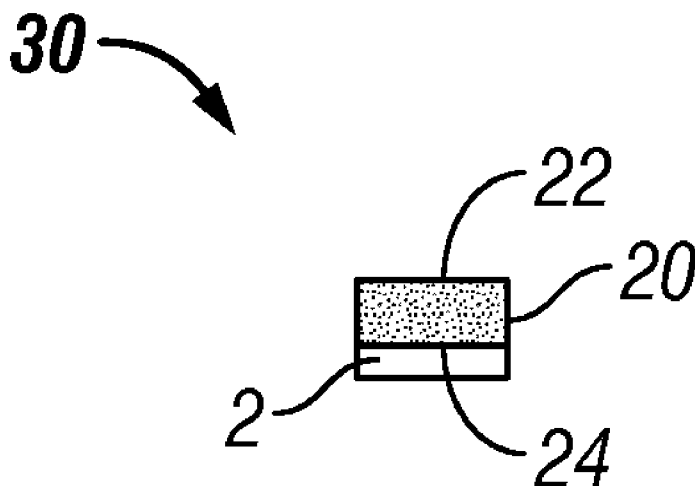


FIG. 1

(57) Abstract: Novel adhesive compositions that can be used in the die attach process. The adhesives include a curable resin component, a curing agent, and a block copolymer additive. The block copolymer additive has a glass transition temperature of at least about 400C. The block copolymer additive improves the affinity of the adhesive composition to a hydrophilic substrate, such as a silicon wafer, during the die pickup process. Also disclosed is an assembly which includes a hydrophilic substrate and a layer of adhesive and methods of producing the assembly.

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15 April 2010

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/037246**A. CLASSIFICATION OF SUBJECT MATTER***C09J 135/00(2006.01)i, C09J 123/00(2006.01)i, C08F 222/06(2006.01)i*

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)

C09J; C09K; B32B; C08G; C08K; C08L; G03F

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

(Chinese Patents and application for patent)

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

eKOMPASS(KIPO internal)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2006-291098 A (HITACHI CHEM CO., LTD.) 26 October 2006 See abstract; paragraphs <17> - <20>, <61> - <70>; all examples.	1-10, 12-19
Y	US 6613839 B1 (GAN; JOSEPH et al.) 02 September 2003 See abstract; column 1, lines 7 - 21, column 4, line 60 - column 6, line 28,	1-10, 12-19
X	JP 2004-189815 A (NIPPON KAYAKU CO., LTD.) 08 July 2004 See abstract; paragraphs [0010] - [0012]; examples.	25
X	WO 2006-090794 A1 (ASAHI KASEI CHEM. CORP. et al.) 31 August 2006 See abstract; paragraphs [0039], [0107], [0162].	26-27
X	US 2007-0282081 A1 (ICHIROKU; NOBUHIRO) 06 December 2007 See abstract; paragraphs [0025] - [0046]; example 3.	28-30
PX	JP 2008-244351 A (FURUKAWA ELECTRIC CO., LTD.) 09 October 2008 See the whole document.	20-25
A	US 6387990 B1 (YEAGER; GARY W.) 14 May 2002 See the whole document.	1-31

☒ 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

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search

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Authorized officer

CHO Han Sol

Telephone No. 82-42-481-5580



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/037246**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

See the Extra Sheet

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 and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/037246

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003-0118835 A1 (SAIKUMAR JAYARAMAN et al.) 26 June 2003 See the whole document.	1-31
A	US 2002-0086239 A1 (MAN-LIN CHEN et al.) 04 July 2002 See the whole document.	1-31
A	WO 2007-075769 A1 (DOW GLOBAL TECHNOLOGIES INC. et al.) 05 July 2007 See the whole document.	1-31

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/037246

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 2007-0282081 A1	06.12.2007	CN 101085905 C0 JP 2007-321130 A KR 10-2007-0116552 A	12.12.2007 13.12.2007 10.12.2007
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/037246

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		JP 2009-521566 A	04.06.2009
		KR 10-2008-0077639 A	25.08.2008

Continuation of Box No. III

Claims 1 - 19 and 31 directed to an adhesive and assembly.

The composition itself and that of the assembly comprise a curable resin, a curing agent and a block copolymer additive comprising hydrophobic segments and hydrophilic segments wherein the glass transition temperature of the block copolymer additive is at least about 40°C.

Claims 20 - 25 directed to a methods of preparing chip die assembly and of forming assembly.

The composition used for the assembly comprises a curable resin, a curing agent and a block copolymer additive comprising hydrophobic segments and hydrophilic segments

Claim 26 and 27 directed to a composition comprises an epoxy component, a silane-modified epoxy component, a thermoplastic urethane, and diaminodiphenyl sulfone.

Claims 28 - 30 directed to composition of matter comprises a reaction product of the specific epoxy component and epoxy-functionalized alkoxy silane.

Since the above mentioned groups of claims do not share any of the technical features identified, a technically special relationship between the inventions does not exist.

Accordingly, the claims do not relate to one invention or to a single inventive concept, a priori.