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(54) Title: POWDER COMPOSITIONS

(57) Abstract: There is described a thermosetting and/or radiation curable powder with a binder prepared from a polyester (PE) obtained from a polyol with lower amounts of neopentyl glycol (NPG). The powder forms smooth defect free coats and is resistant to contamination from conventional NPG-rich PE. The powder comprises a binder of a co-reactable blend of (i) 40 - 98 % by weight (w/w) at least one OH, COOH or ethylenically functional (fn) PE having acid or OH number 10 - 100 mg KOH/g, $T_g > 40^\circ\text{C}$, where the PE is obtained from reacting a polyacid comprising 70 - 100 % weight of terephthalic acid (TPA) and/or isophthalic acid (IPA) and 0 - 30 % w/w another polyacid; with a polyol comprising 0 - 85 % w/w NPG and 15 - 100 % w/w another polyhydric polyol; (ii) 2 - 60 % w/w at least one glycidyl or isocyanate fn polyphenoxy resin; polyepoxy and/or β -hydroxyalkylamide crosslinker or ethylenically functional oligomer; and (iii) 0.2 - 5 % w/w of at least one COOH or OH fn acrylic copolymer with a value of 10 - 100 mg KOH/g; $T_g > 400^\circ\text{C}$ and a number average molecular weight (M_n) 1000 - 15000 and/or at least one glycidyl or isocyanate fn acrylic copolymer having an fn equivalent weight of from 150 to 1000 g of acrylic copolymer per equivalent of fn group, $T_g > 40^\circ\text{C}$ and M_n 1000 to 15000 and/or a non functional acrylic copolymer having $T_g > 400^\circ\text{C}$ and M_n 1000 to 15000.



INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2009/051045

A. CLASSIFICATION OF SUBJECT MATTER

INV. C09D167/02 C09D167/06
ADD. C08L33/06

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)
C09D

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, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/171300 A1 (MOENS LUC [BE] ET AL) 4 August 2005 (2005-08-04) paragraphs [0064], [0095]; claims; table 3	1-15, 20-23
X	US 5 397 641 A (MOENS LUC [BE] ET AL) 14 March 1995 (1995-03-14) claims; examples 11,12; tables II,III	1-15, 20-23
X	DATABASE CA [Online] CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; 24 August 1999 (1999-08-24), KAMIKI, YUMI ET AL: "Polyester resin-based composition for powder coating" XP002528909 retrieved from STN Database accession no. 131:171606 abstract	1-15, 20-23

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☒ 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 document 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 another 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.

Z document member of the same patent family

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	-& JP 11 228676 A (NIPPON ESTER CO., LTD., JAPAN) 24 August 1999 (1999-08-24) -----	
X	US 4 824 909 A (TOGO MASAHIKO [JP]; ABE KAZUTOSHI [JP]) 25 April 1989 (1989-04-25) claim 1; examples 1,2,4-7; tables 1,2 -----	1-12, 16-17, 20-23
X	WO 92/01756 A1 (EASTMAN KODAK CO [US]) 6 February 1992 (1992-02-06) claims 5,8,11 -----	1-12, 16-17, 20-23
X	EP 0 636 669 A2 (DSM NV [NL]) 1 February 1995 (1995-02-01) example I -----	1-12, 18-23
X	EP 0 980 901 A2 (MORTON INT INC [US]) 23 February 2000 (2000-02-23) tables -----	1-12, 18-23
X	US 2007/225396 A1 (MOENS LUC [BE]; KNOOPS NELE [BE]; MAETENS DANIEL [BE]) 27 September 2007 (2007-09-27) claims 1, 3, 8, 15, 16 -----	1-12, 18-23

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2009/051045

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 additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search reportcovers 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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-15, 20-23

claims 1-15 and 20-23 with respect to thermosetting powder coating compositions based on carboxy functional polyesters

2. claims: 1-12, 16-17, 20-23

claims 1-12, 16, 17 and 20-23 with respect to thermosetting powder coating compositions based on hydroxy functional polyesters.

3. claims: 1-12, 18-23

claims 1-12 and 18-23 with respect to radiation-curable powder coating compositions based on polyesters comprising ethylenically unsaturated groups.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2009/051045

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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