

UV/EB Curable Resin Denacol Acrylate

Introduction

Recently the studies in the field of UV or EB curable resins (systems) have been made, especially in the applications for inks, coatings and adhesives.

The advantages of UV or EB curing system are bellow.

- (1) Can eliminate the pollution in the working area with solvent because of solvent –free system
- (2) Can save energy because of its ambient curable properties as compared with thermosetting system
- (3) Short curing time
- (4) Can obtain better surface properties and gloss than thermosetting system

Epoxy Acrylate is the reaction product of epoxy compound and (meth)acrylic acid, and is used as the potential ingredient in UV curable systems. And these epoxy (meth)acrylate has excellent features compared with conventional (meth)acrylic esters which made by the reaction of alcohol and (meth)acrylic acid.

- (1) **Epoxy acrylate** have low vapor pressure and do not have much objectionable odor.
- (2) **Epoxy acrylate** has hydroxy group in its structure, therefore they have very good compatibility with polyamide, polyvinyl alcohol and polyester.
- (3) Epoxy acrylate can give excellent adhesive properties to the plastics and metals , due to interaction between the adherend and hydroxy group.

We, *Nagase ChemteX Corporation*, have developed many kinds of unique epoxy compound under the trade name of “**DENACOL**”. Based on this technology, we have started to produce and introduce many types of epoxy acrylate whose trade name is “**DENACOL ACRYLATE**” made by the reaction of **DENACOL** with acrylic acid.

The potential application of **DENACOL ACRYLATE** is following.

- (1) As raw materials for UV curable resins for inks, paints and photo-sensitive formulation
- (2) As cross-linking agent to improve the water resistance and the adhesive strength of resins used in the textile and paper industries

And **DENACOL ACRYLATE** can be designed for water soluble agents easily with NCX-Technology. Through the employment of “**DENACOL**” that has many grades of water soluble type.

Meanwhile, there are many grades for Water-insoluble “**DENACOL ACRYLATE**” .

We can produce many kind of **Epoxy Acrylate** in various applications with the Epoxides “**DENACOL**”.

Products line up [1]

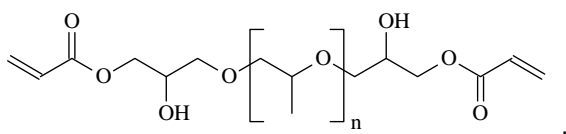
Grade	Chemical Name	Color (G)	Viscosity (mPa·s/25°C)	Acid Value (mgKOH/g)	Stage
DA-111	EPOXY ACRYLATE FROM ALLYLALCOHOL	3	15	5	L
DA-212	EPOXY ACRYLATE FROM 1,6-HEXANEDIOL	2	1,000	5	L
DA-314	EPOXY ACRYLATE FROM GLYCEROL	2	12,000	10	P
DA-911M	EPOXY ACRYLATE FROM (POLY) PROPYLENE GLYCOL	3	1,100	5	P
DA-920	EPOXY ACRYLATE FROM (POLY) PROPYLENE GLYCOL	3	500	5	P
DA-931	EPOXY ACRYLATE FROM (POLY) PROPYLENE GLYCOL	1	550	10	P
DM-811	EPOXY METHACRYLATE FROM (POLY) ETHYLENE GLYCOL	3	800	5	L
DM-832	EPOXY METHACRYLATE FROM (POLY) ETHYLENE GLYCOL	1	550	5	L
DM-851	EPOXY METHACRYLATE FROM (POLY) ETHYLENE GLYCOL	2	600	10	L
DA-212L*	EPOXY ACRYLATE FROM 1,6-HEXANEDIOL	1	1,000	5	L
DA-214L*	EPOXY ACRYLATE FROM 1,4-BUTANEDIOL	2	5,000	5	L
DA-321L*	EPOXY ACRYLATE FROM TRIMETHYLOLPROPANE	1	7,000	5	L

Stage information: Commercial=C / Pilot=P / Lab.=L

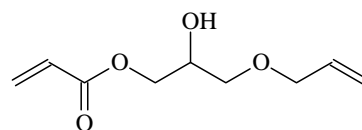
*Remark: Low chlorine grades

【 Chemical structure (Typical grades) 】*****

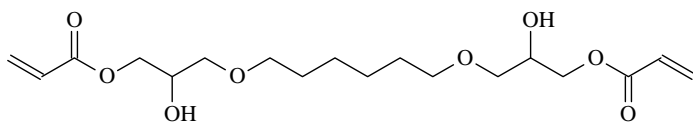
DA-911M , 920 , 931 (n=1,n≠3,11)



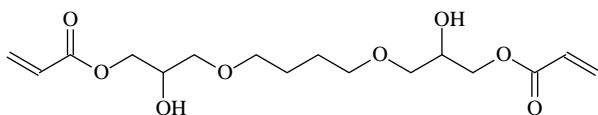
DA-111



DA-212 / DA-212L



DA-214L



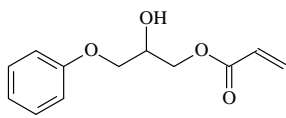
Products line up [2]

Grade	Chemical Name	Color (G)	Viscosity (mPa·s/25°C)	Acid Value (mgKOH/g)	Stage
DA-141	EPOXY ACRYLATE FROM PHENOL	1	220	5	C
DA-250	EPOXY ACRYLATE FROM BISPHENOL A (PO)2	2	60,000	5	P
DA-721	EPOXY ACRYLATE FROM PHTHALIC ACID	2	100,000	5	P
DA-722	EPOXY ACRYLATE FROM HEXAHYDRO PHTHALIC ACID	1	80,000	5	P
DM-201	EPOXY METHACRYLATE FROM RESORCINOL	1	60,000	5	P

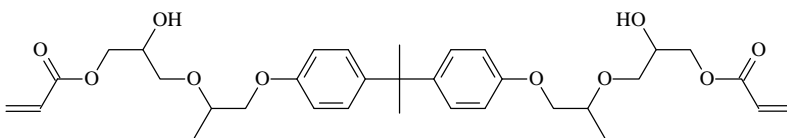
Stage information: Commercial=C / Pilot=P / Lab.=L

【 Chemical structure (Typical grades) 】*****

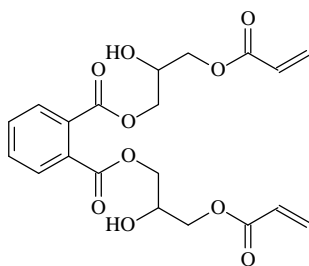
DA-141



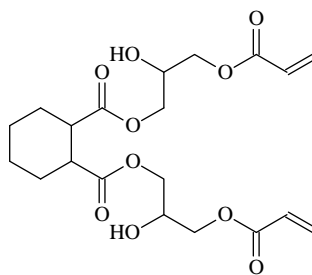
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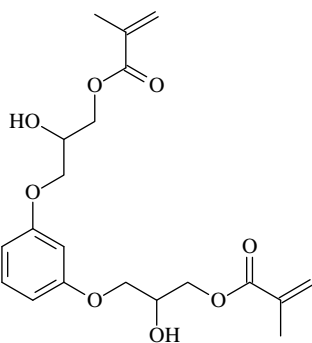
DA-721



DA-722



DM-201



Products line up 【 3 】

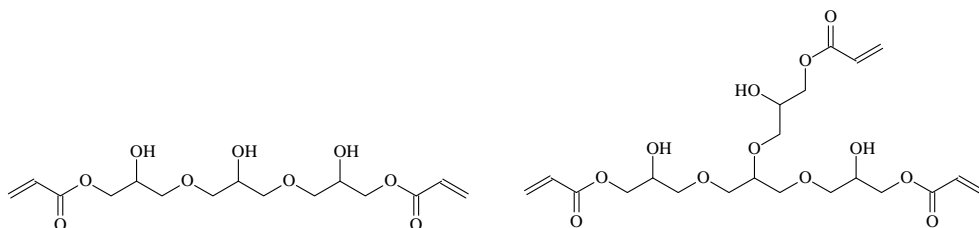
Grade	Chemical Name	Color (G)	Viscosity (mPa·s/25°C)	Acid Value (mgKOH/g)	Stage
DA-314-90M	EPOXY ACRYLATE FROM GLYCEROL	1	500	5	C
DA-310-PG80	EPOXY ACRYLATE FROM GLYCEROL	1	3,000	4	L

Stage information: Commercial=C / Pilot=P / Lab.=L

Grade	Solvent	N.V.M. (%)
DA-314-90M	METHANOL	90
DA-310-PG80	PROPYLENE GLYCOL METHYL ETHER ACETATE	80

【 Chemical structure (Typical) 】*****

DA-314 / 314-90M / 310-PG80



Other information

DENACOL ACRYLATE should be stored in a cool place, preferably below 25°C. Once the container has been opened, it is advisable to use the product as quickly as possible.

Attention

“ DENACOL ACRYLATE “ serve as a special development article grade. About each introduced physical properties and data, it is a representation value in a developmental stage. Beforehand, please understand. And chemical structure of each products is typical formation in those molecules, usually they include some components.

Sample package : 100 grs/500 grs



Nagase ChemteX Corporation

Functional Chemicals Department

1-17 SHINMACHI 1-CHOME , NISHI-KU OSAKA JAPAN 550-8668
TEL : +81-6-6535-2542 FAX : +81-6-6535-2544

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