

ELVACITE® 4055 PIGMENT DISPERSION RESIN

Elvacite® 4055 is a solid acrylic bead resin, which can be used for the preparation of universal pigment pastes. The resin is compatible with a wide range of inorganic and organic pigments, as well as different types of resins.

Physical properties

Appearance - solid, white, free flowing spherical beads

Glass transition temperature (T_g) - 76°C (onset, 20°C / min)

Molecular Weight (Mw) - 5,500

Viscosity of 60% w/w solution in methoxy propyl acetate (MPA) - 11,700cP using Brookfield LVTDVII viscometer with spindle 4 @ 12rpm @ 26°C

Acid number - 3 mgKOH/g

Observations:

60% ^w/_w solution in MPA – dissolves to give colourless lacquer.

Pigment Dispersion Evaluation

Pigment dispersion evaluation was carried out using formulations recommended by EFKA Chemicals BV. Each resin was initially dissolved in methoxy propyl acetate (MPA) at 60% ^w/_w solids before being transferred to a 250cm³ paint can and the rest of the ingredients added. To the total formulation amount of 100g was then added 100g of Ballotinni (2mm). The contents were milled on a Red-Devil shaker for 30 minutes and then evaluated for appearance, Hegman and gloss.

Table 1 : Pigment Base Formulations

<u>Formulation</u>	PIGMENT TYPE			
	<u>Tioxide TR81</u>	<u>Bayferrox 3920</u>	<u>Sico Yellow 1252HD</u>	<u>Novoperm Red F3RK70</u>
Elvacite® 4055 (60% ^w / _w in MPA)	9.3	12.8	23.5	20.8
EFKA-4047	4.0	5.5	10.1	11.9
Ircogel 905	2.0	2.0	—	0.5
Methoxy propyl acetate (MPA)	9.4	12.4	23.2	15.9
Solvesso 100	9.3	12.3	23.2	15.9
Pigment	66.0	55.0	20.0	35.0

Pigment Dispersions

Table 2 : Pigment Dispersion Comparison

Pigment Type	Elvacite® 4055		
	Appearance	Hegman	Gloss* 20/60/85°
Tioxide TR81	viscous	7.0	5.7/54.4/86.8
Bayferrox 3920	just mobile	6.0	1.0/2.3/49.4
Sico Yellow 1252 HD	very mobile	8+	3.9/40.7/86.6
Novoperm Red F3RK70	mobile	8+	1.0/26.6/69.6

* The gloss measurement was carried out after the dispersions had been coated and dried on most charts using a 100 micron meyer bar.

Resin Compatibility Evaluation:

The compatibility of Elvacite[®] 4055 with a range of other resins, i.e. typical acrylic, alkyd and epoxy resins, was assessed as follows:

10% ^w/_w Elvacite[®] 4055 was solution blended with 90% ^w/_w of each test resin. Details of the solvents employed are shown in table 3. The blend solutions were rolled overnight at room temperature and then observed for clarity and colour. Coatings of each blend were also made by casting onto PET sheets using a 100 micron meyer bar and allowing to dry for 24 hours.

Table 3 : Resin Compatibility Study - Solution Blends

Resin / Solvent	Type	Elvacite [®] 4055
Elvacite [®] 2021/Acetone	acrylic, methyl methacrylate	(A) Clear
Elvacite [®] 2041/Acetone	acrylic, methyl methacrylate	(B) very slight haze
Elvacite [®] 2014/Acetone	acrylic, methyl methacrylate	(C) cloudy, some insolubles
Elvacite [®] 2016/Acetone	acrylic, methyl methacrylate/n-butyl methacrylate co-polymer	(A) clear
Elvacite [®] 2042/Acetone	acrylic, ethyl methacrylate	(B) very slight haze
Elvacite [®] 2044/Acetone	acrylic, n-butyl methacrylate	(B) very slight haze
Elvacite [®] 2045/Acetone	acrylic, isobutyl methacrylate	(A) clear
Epikote 1001/ Acetone	epoxy	(E) very cloudy, yellow
Wresinol VAS 9160/ White spirit	alkyd, short oil/linseed	(A) clear, pale yellow
Wresinol AS 483/ White spirit	alkyd, medium oil/linoleic	(C) cloudy, yellow
Wresinol AS 621/White spirit	alkyd, long oil/linoleic	(E) very cloudy, yellow
Blagden 930-50 / White spirit	alkyd, short oil/soya & benzoic	(A) clear, yellow

Table 4 : Resin Compatibility Study - Dried Film Blends

Resin	Type	Elvacite® 4055
Elvacite® 2021	acrylic, methyl methacrylate	(A) clear
Elvacite® 2041	acrylic, methyl methacrylate	(A) clear
Elvacite® 2014	acrylic, methyl methacrylate	(A) clear
Elvacite® 2016	acrylic, methyl methacrylate n-butyl/methacrylate co-polymer	(A) clear
Elvacite® 2042	acrylic, ethyl methacrylate	(A) clear
Elvacite® 2044	acrylic, n-butyl methacrylate	(A) clear
Elvacite® 2045	acrylic, isobutyl methacrylate	(A) clear
Epikote 1001	epoxy	(B) very slight haze
Wresinol VAS 9160	alkyd, short oil/linseed	(A) clear
Wresinol AS 483	alkyd, medium oil/linoleic	(B) very slight haze
Wresinol AS 621	alkyd, long oil/linoleic	(C) very slight haze
Blagden 930-50	alkyd, short oil/soya & benzoic	(B) very slight haze

Code for Evaluation:

- A = Clear solutions
- B = Very slight haze
- C = Cloudy
- D = Cloudy, some insolubles
- E = Very cloudy

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