ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

Nan Ya, the leading global Epoxy Resin manufacturer,started to manufacture high quality epoxy resins since 1988.During the past two decades, the annual capacity has expanded to more than 300,000 MT in 2008.

Nan Ya Epoxy keeps focus on R&D and technology improvements,and are able to provide high quality and environmental-friendly products to meet nearly any application. Nan Ya Epoxy passed ISO-9002 , ISO-14001 and Sony Green partner Certificate.

As a member of Formosa Plastic Group,Nan Ya Epoxy also takes advantage of internal sourcing channels within Formosa Plastic Group to ensure high quality, sufficient and on-time BPA and ECH supplies.

Nan Ya Epoxy offers the following categories of epoxy resins:

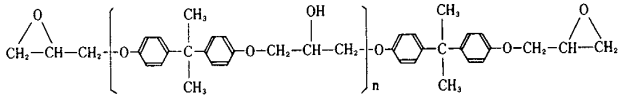
A. NPEL SERIES：BPA based liquid Epoxy Resins
B. NPEF SERIES：BPF based, BPA /BPF blended epoxy resins
C. NPEK SERIES：Epoxy reactive diluent diluted liquid epoxy resins
D. NPES SERIES：BPA based medium or high M.W solid epoxy resins
E. NPSN SERIES：Liquid or solid epoxy resin solutions in organic solvent
F. NPPN SERIES：Phenol novolac solid epoxy resins and epoxy resin solutions in organic solvent
G. NPCN SERIES：Cresol novolac epoxy resins
H. NPEB SERIES：Brominated Epoxy Resins with different bromine content.
I. NPER SERIES：Dimer acid/Elastormer modified flexible epoxy resins.
J. NPEC SERIES：Epoxy resins for castings
K. NPEW SERIES：Waterborne epoxy resins
L. NPEP SERIES：Phosphorous epoxy resins for halogen free flame retardancy.
M. NPEH SERIES：Phenol or BPA based novolac resins.

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

A. NPEL SERIES : BPA based liquid epoxy resins

The most common low M.W epoxy resins produced by Biphenol A and epichlorohydrin in different ratios. Primarily used in low VOC,high solid and solvent-free indusrial coatings,flooring, adhesives,casting and tooling ,potting and encapsulation, ,electric laminates,composites, and civil engineering etc.,



TRADE NAME	EEW (g/eq)	Viscosity (cps@25 ℃)[1]	Color (Gardner)	Comments
NPEL-127	176~184	8000~11000	1.0 MAX.	Standard BPA type resin, low viscosity
NPEL-127E	176~184	8000~11000	1.0 MAX	Standard BPA type resin for electronic grade, low viscosity
NPEL-127H	182~188	10000~12000	1.0 MAX.	Standard BPA type resin, low viscosity
NPEL-128	184~190	12000~15000	1.0 MAX	Standard BPA type resin
NPEL-128E	184~190	12000~15000	1.0 MAX.	Standard BPA type for electronic grade
NPEL-128R	184~194	12000~16000	1.0 MAX.	Less-crystallizable, suitable for flooring and adhesives
NPEL-128S	205~225	19000~24000	1.0 MAX.	Non-crystallizable resin
NPEL-134	230~270	O~U*	1.0MAX.	Semi-solid, suitable for adhesives and laminates
NPEL-136	300~330	X~Z2*	1.0 MAX.	Similar to NPEL-134, higher Mw and viscosity
NPEL-231	184~194	---	1.0 MAX	Precatalyzed, standard BPA type resin

(1) Gardner-Holdt method (70%NV of butyl carbital solution)

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

B. NPEF SERIES: BPF type and BPA/BPF blend type

NPEF and **BPA/BPF** series are lower viscosity, enhanced crystallization resistance liquid epoxies over that BPA based epoxies. They provide better workability and storage stability in formulation and reduce the handling costs.Primarily suitable for use in adhesives, laminates, composites, civil engineering and low VOC protective paints.

TRADE NAME	EEW (g/eq)	Viscosity (cps@25 ℃)	Color (Gardner)	Comments
NPEF-164X	185~205	700~1100	3.0 MAX.	BPA/BPF/Reactive Diluent blended type
NPEF-170	160~180	2000~5000	3.0 MAX.	Standard BPF type resin
NPEF-175	160~180	2000~5000	3.0 MAX.	BPA/BPF blended type
NPEF-176	170~190	3000~5000	3.0 MAX.	BPA/BPF blended type
NPEF-185	170~190	6000~8000	3.0 MAX.	BPA/BPF blended type
NPEF-187	175~185	7500~9500	3.0 MAX.	BPA/BPF blended type
NPEF-198	180~186	10000~14000	1.0 MAX.	BPA/BPF blended type
NPEF-500	164~170	400~600	2.0 MAX.	BPA/BPF/Diluent blended type

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

C. NPEK SERIES: Epoxy reactine diluent diluted liquid epoxy resins

BPA base or BPA/ BPF blend epoxy resins modified by gylcidyl ether reactive diluents ,lower resin viscosity ,crystallization resistant, good flow and leveling ,high filler loading and good wetting of reinforcements and substrstes , NPEK series are designed primarily for solvent-free industrial coatings,flooring, casting, potting and encapsulation ,civil engineering and some specialy for infusion and injection processes for fiber reinforced plastic moldings.

TRADE NAME	EEW (g/eq)	Viscosity (cps@25 ℃)	Color (Gardner)	Comments
NPEK-110	176~186	1400~2400	1.0 MAX.	Butyl Glycidyl Ether diluted type
NPEK-114	190~210	600~1200	1.0 MAX.	C12~C14 Aliphatic Glycidyl Ether diluted type
NPEK-114L	195~205	550~750	1.0 MAX.	C12~C14 Aliphatic Glycidyl Ether diluted type
NPEK-114M	188~199	2100~2500	1.0 MAX.	C12~C14 Aliphatic Glycidyl Ether diluted type
NPEK-114H	184~194	5100~5700	1.0 MAX.	C12~C14 Aliphatic Glycidyl Ether diluted type
NPEK-114T	185~205	1500~2100	1.0 MAX.	C12~C14 Aliphatic Glycidyl Ether diluted type
NPEK-115	175~195	600~1200	1.0 MAX.	Butyl Glycidyl Ether diluted type
NPEK-116	180~200	600~1200	1.0 MAX.	C12~C14 Aliphatic Glycidyl Ether/ Neopentyl Diglycidyl ether diluted type
NPEK-117	180~190	1500~3500	1.0 MAX.	Butyl Glycidyl Ether diluted type
NPEK-139	180~220	1500~2100	3.0 MAX.	C10 Glycidyl Ester diluted type
NPEK-257	182~192	400~600	3.0 MAX.	Cresly Glycidyl Ether diluted type
NPEK-279	195~208	1000~1700	2.0 MAX.	2-ethyl Hexyl Glycidyl Ether diluted type

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

D. NPES SERIES : BPA based medium or high M.W solid epoxy resins

(a) Medium Molecular Weight Epoxy Resin

NPES-900 series are manufactured by advanced method with BPA and "standard" liquid BPA type epoxy resin in different ratios and are mainly used for vinyl ester synthesis ,powder coatings, laminates, epoxy ester synthesis, marine and protective coatings,

(1) HIGH PURITY SOLID EPOXY

TRADE NAME	EEW (g/eq)	Solution Viscosity (@25℃)[1]	Melt Viscosity (cps@150℃)[2]	Soft Point (℃)	Color (Gardner)	Comments
NPES-901	450~500	D~F	---	64~74	1.0 MAX.	For vinyl ester, CFRP, paints
NPES-901H	580~610	I~L	---	80~85	1.0 MAX.	For vinyl ester, CFRP, paints
NPES-902	600~650	I~M	---	82~92	1.0 MAX.	For coatings
NPES-902H	680~710	K~P	2000~4500	90~95	1.0 MAX.	For coatings
NPES-903	700~750	N~R	3000~5000	90~98	1.0 MAX.	For powder coatings
NPES-903H	740~780	P~S	3500~6000	92~100	1.0 MAX.	For powder coatings
NPES-903K	670~700	K~P	2000~4000	88~95	1.0 MAX.	For powder coatings
NPES-904	780~850	S~W	4500~8000	96~107	1.0 MAX	For powder coatings and epoxy ester
NPES-904H	840~900	V~X	6000~9000	100~112	1.0 MAX.	For powder coatings and epoxy ester
NPES-905L	900~930	---	---	95~110	1.0 MAX.	For powder coatings
NPES-904F	810~860	P~U	6500~9500	96~107	1.0 MAX.	Precatalyzed for epoxy ester synthesis

(1.) N.V 40%. butyl carbitol solution. (2) Viscosity measured by cone & plate viscometer at 150℃

(2). MASTER BATCH TYPE SILICONE FREE FLOW CONTROL AGENT MODIFIED EPOXY RESINS

Designed for used in pure epoxy and epoxy/polyester hybrid powder coatings to improve surface flow and levelling for decorative applications.It facilitates homogeneous mixing in formulation and gives better consistency in final product.

TRADE NAME	EEW (g/eq)	Melt Viscosity (cps@ 150℃)[1]	Soft Point (℃)	Comments
NPES-902P	700~750	1800~2800	85~95	For powder coating, with 2.5% flow agent, ,
NPES-903P	750~800	2000~3000	85~97	For powder coating, with 2.5% flow agent, ,
NPES-903L	830~930	750~1400	90~95	High flow for powder coating, with 2.5% flow agent,
NPES-904HP	910~950	8500~13000	98~107	For powder coating, with 0.5% flow agent
NPES-924	720~770	2000~3500	85~97	For powder coating, with 10% flow agent,Master batch

(1). Viscosity measured by cone & plate viscometer at 150℃

(3) HIGH FLOW EPOXY RESIN

Low melt viscosity, mainly used for solvent paints and decorative powder coatings with excellent flow and coating properties.

TRADE NAME	EEW (g/eq)	Solution Viscosity (25℃)[1]	Melt Viscosity (cps@ 150℃)[2]	Soft Point (℃)	Comments
NPES-601	510~570	G~I	----	74~82	For paints
NPES-602	610~660	---	600~1800	75~86	For powder coatings
NPES-602L	640~680	---	1200~1600	79~85	For powder coatings
NPES-602H	660~720	---	1700~2500	85~95	For powder coatings
NPES-603	720~770	---	1500~3500	85~95	For powder coatings
NPES-604	800~850	---	2500~6000	90~100	For powder coatings
NPES-605	900~950	---	4000~8000	95~108	For powder coatings

(1). N.V 40%. butyl carbitol solution (2). Viscosity measured by cone & plate viscometer at 150℃

(4) SPECIAL MODIFIED MEDIUM MOLECULAR WEIGHT EPOXY RESIN

Solid epoxy resins modified by multifunction phenol novalac epoxy resin. They provide excellent coating properties such as adhesion, mechanical strengh,thermal resistance,corrosion resistance and chemical resistance when properly formulated and are suitable for used in pure epoxy powder coatings,epoxy/ polyester powder coatings and pipe coatings.

TRADE NAME	EEW (g/eq)	Melt Viscosity (cps@ 150℃)[1]	Soft Point (℃)	Color (Gardner)	Comments
NPES-660U	500~560	4000~8000	90~98	2.0 MAX.	Multifunction resin modified
NPES-661H	710~740	----	98~108	3.0 MAX.	Multifunction resin modified
NPES-662H	750~850	----	110~120	2.0 MAX	Multifunction resin modified for pipe coating

(1).Viscosity measured by cone & plate viscometer at 150℃

(b) High Molecular Weight Solid Type Epoxy Resin

Primarily for use in one pack stoving enamels in combination with heat-reactive cross-linking agents such as amino resin or phenol formaldehyde resin, and are suitable for metal decoration, can coatings,PCM, tube and drum linings, coil coating primers,or some as flow modifier in epoxy powder coatings.

(1). GENERAL SOLID EPOXY RESIN

TRADE NAME	EEW (g/eq)	Solution Viscosity (25℃)[1]	Soft Point (℃)	Color (Gardner)	Comments
NPES-907	1500~1800	X~Z2	120~130	1.0 MAX.	For can coatings
NPES-909	1800~2400	Z3~Z5	130~150	1.0 MAX.	For can coatings and coil coatings
NPES-909H	2100~2500	Z3~Z5	135~150	1.0 MAX.	For can coatings and coil coatings

1. 40% N.V, butyl carbitol solution

(2). HIGH FLOW EPOXY RESIN

Modified solid epoxy resins with higher flowability than NPES-900 series, suitable for used in formulating high solid type paints.

TRADE NAME	EEW (g/eq)	Solution Viscosity (@25℃)[1]	Soft Point (℃)	Dilution Viscosity (sec)[2]	Comments
NPES-607	1650~1900	Y~Z1	120~135	---	For can coatings
NPES-627	1650~1900	Y~Z1	120~135	---	For can coatings
NPES-628	2000~2500	---	130~140	26~36	Mw higher than NPES-627, for can coatings
NPES-629	2400~3000	---	135~150	28~46	Flexible type, for can coating, more narrow MW distribution
NPES-619A	2400~3000	---	135~150	28~36	Flexible type, for can coating, more narrow MW distribution
NPES-619B	2400~3000	---	135~150	31~37	Flexible type, for can coating, more narrow MW distribution
NPES-619C	2400~3000	---	135~150	33~43	Flexible type, for can coating,more narrow MW distribution
NPES-619D	2400~3000	---	135~150	39~46	Flexible type, for can coating,more narrow M.W distribution
NPES-619E	2600~3300	---	135~150	45~52	Flexible type, for can coating,more narrow MW distribution
NPES-669	2900~3300	---	135~150	39~46	Flexible type, for can coating,more narrow MW distribution

(1).40% N.V, in butyl carbitol solution. .(2). Ford #4 cup: 25%N.V in PMA solution.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

(c). Solid Epoxy Resin By Taffy Process.

NPES-300 series are solid epoxy resins suitable for used in tank lining ,marine,protective coatings, coal tar base coating,flooring , powder coatings and adhesives.

TRADE NAME	EEW (g/eq)	Solution Viscosity (cps@25℃)[1]	Soft Point (℃)	Color (Grdner)	Comments
NPES-301	450~500	D~G	60~70	1.0 MAX	Type 1 taffy process for paints
NPES-303	800~900	O~S	90~105	1.0 MAX	Type 3-taffy process for powder coatings
NPES-303L	720~760	M~R	85~94	1.0 MAX	Type 3-taffy process for powder coatings
NPES-304	900~1000	Q~U	95~115	1.0 MAX	Type 4-taffy process for powder coatings
NPES-307	1600~2000	---	105~130	1.0 MAX	Type 7- for can coatings

(1) 40%N.V,in butyl carbitol solution

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

E. NPSN SERIES：Liquid or solid epoxy resin solutions in organic solvent

1.Semi-solid Epoxy resin Solvent type

Semi-solid epoxy resin solutions dissolved in organic solvents for ease of handling and processing in applications such as coatings, civil engineerings and adhesives,etc..

TRADE NAME	EEW (g/eq)[1]	Viscosity (cps@25 ℃)[2]	N.V (%)	Color (Gardner)	Comments
NPSN-134X80	230~270	800~1400	79± 1	1.0 MAX.	20% Xylene Varnish
NPSN-134X85	230~270	2000~5000	85± 1	1.0 MAX.	15% Xylene Varnish
NPSN-134X90	230~270	10000~30000	90± 1	1.0 MAX.	10% Xylene Varnish
NPSN-136X80	300~330	3000~7000	80± 1	1.0 MAX.	20% Xylene Varnish
NPSN-136X66	300~330	200~400	66± 1	1.0 MAX.	34% Xylene Varnish

[1].based on solid. [2].Brookfield viscosity.

2. Solid Epoxy resin Solvent type

Solid epoxy resin solutions dissolved in various organic solvents to provide low viscosities and better workability ,primarily for use in marine and protective coatings.

TRADE NAME	EEW (g/eq)[1]	Viscosity (25℃)[2]	Non volatility (%)	Color (Gardner)	Comments
NPSN-901X65	450~500	1000~1800	64~66	1.0 MAX.	35% Xylene Varnish
NPSN-901X75	450~500	8000~15000	74~76	1.0 MAX.	25% Xylene Varnish
NPSN-901S75	450~500	13000~25000	74~76	1.0 MAX.	25% BCS Varnish
NPSN-901K80	450~500	4000~13000	79~81	1.0 MAX.	20% MEK Varnish
NPSN-900X75	450~500	2500~4500	74~76	2.0 MAX.	25% Xylene Varnish
NPSN-902X70	600~650	8000~18000	69~71	1.0 MAX.	30% Xylene Varnish
NPSN-902X75	600~650	20000~50000	74~76	1.0 MAX.	25% Xylene Varnish
NPSN-901H75	450~500	8000~15000	74~76	1.0 MAX	25% Xylene Varnish. good wetting for high filler

(1) based on solid. (2).Brookfield viscosity.

3. HIGH PURITY SOLVENT EPOXY RESIN

Solid epoxy resin solutions in organic solvents to providing low viscosities and better workability in formulating and processing ,primarily used in protective coatings, marine paints and varnishes.

TRADE NAME	EEW (g/eq)[1]	Viscosity (25℃)[2]	Non volatility (%)	Color (Gardner)	Comments
NPSN-907BM50	1500~ 1800	2000~ 8000	49~51	1.0 MAX.	In BCS/XYL. Varnish

(1).based on solid. (2).Brookfield viscosity.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

4. HIGH MOLECULAR WEIGHT HIGH FLOW EPOXY RESIN SOLUTION

TRADE NAME	EEW (g/eq)[1]	Viscosity (cps@25℃)[2]	Non volatility (%)	Color (Grdner)	Comments
NPSN-608BM50	2000~ 2500	3000~6500	49~51	1.0 MAX.	BCS/XYL varnish
NPSN-609BM50	2400~3000	4000~11000	49~51	1.0 MAX.	BCS/XYL varnish
NPSN-609BM51	2400~3000	4000~12000	50~51	1.0 MAX.	BCS/XYL varnish
NPSN-610BM50	2400~ 3000	3000~7000 (@30℃)	48~50	1.0 MAX.	BCS/XYL varnish

(1).based on solid. (2).Brookfield viscosmeter

5. Solid Epoxy Resin Solvent Type

TRADE NAME	EEW (g/eq)[1]	Solution Viscosity (cps@25℃)[2]	Non volatility (%)	Color (Gardner)	Comments
NPSN-301X65	450~500	800~1700	64~66	1.0 MAX	35% Xylene Varnish
NPSN-301X75	450~500	6000~14000	74~76	1.0 MAX	25% Xylene Varnish

(1).based on solid. (2).Brookfield viscosity

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

F. NPPN SERIES：Phenol Novolac Epoxy Resin

NPPN epoxy resins are mainly used in marine and protective coatings for rebar and pipe ,laminates, composites and civil engineering, where higher corrosion/chemical and heat resistance is of prime importance.

1. GENERAL TYPE

TRADE NAME	EEW (g/eq)	Solution Viscosity (25℃)[2]	Color (Gardner)	Comments
NPPN-631	168~178	1100~1700[1]	2.0 MAX.	Low viscosity phenol novolac type
NPPN-638	170~190	H~K[2]	3.0 MAX.	Standard phenol novolac type
NPPN-638S	170~190	H~J[2]	3.0 MAX.	Standard phenol novolac type

(1) Brookfield viscometer method cps/52℃ (2) 60% N.V,butyl carbitol solution

2.TETRA-FUNCTION NOVOLAC TYPE

A tetrafunctional glycidyl ether of tetraphenylol ethane epoxy resin. It is mainly used in electrical laminates, high performance composites, and adhesive,in which higher heat distortion temperature,chemical resistance and UV-block are desired.

TRADE NAME	EEW (g/eq)	SOFT POINT(℃)	Color (Gardner)	Comments
NPPN- 431	200~240	82~92	9~13	Tetrafunction resin, excellent for heat resistance and UV block, used in CFRP, CCL

3. BISPHENOL-A NOVOLAC TYPE

TRADE NAME	EEW (g/eq)	SOFT POINT(℃)	Color (Gardner)	Comments
NPPN- 438	190~210	60~68	2.0MAX.	BPA-Novolac type epoxy used in CFRP, CCL

4. NOVOLAC SOLVENT TYPE

TRADE NAME	EEW (g/eq)	NON VOLATILITY (%)	Color (Gardner)	Comments
NPPN-431A70	200~240	69~71	9~13	Tetrafunction resin, excellent for heat resistance and UV block. Acetone varnish
NPPN-638K80	170~190	79~81	3.0 MAX	MEK varnish
NPPN-638S90	170~190	89~91	5.0 MAX	BCS varnish
NPPN-638X80	170~190	89~91	3.0 MAX	XYL varnish
NPCN-704K80	200~230	79~81	5.0 MAX	MEK varnish
NPPN-438A70	185~210	69~71	4.0 MAX	BPA-Novolac type epoxy. Acetone varnish
NPPN-438A80	185~210	79~81	5.0 MAX	BPA-Novolac type epoxy. Acetone varnish
NPPN-438K80	185~210	79~81	5.0 MAX	BPA-Novolac type epoxy. MEK varnish

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

G. NPCN SERIES：Cresol novolac epoxy resins

NPCN SERIES exhibit better thermal stability and lower moisture adsorption than EPPNs, widely used in applications including as base components of molding compounds for electronics,chemical resistance coatings,high temperature adhesives, heat resistant composites and laminates, and resist ink, etc.

.

TRADE NAME	EEW (g/eq)	SOFT POINT (℃)	Color (Gardner)	Comments
NPCN -701	190~215	60~64	3.0 MAX	Adhesive
NPCN-702	190~215	65~74	3.0 MAX	Adhesive & Powder coating
NPCN-703	195~225	75~85	3.0 MAX	Transfer molding compound, for CFRP,CCL,Ink
NPCN-704	195~220	85~95	3.0 MAX	Transfer molding compound, for CFRP,CCL,Ink
NPCN-704H	200~220	95~100	3.0 MAX	Transfer molding compound, for CFRP,CCL,Ink

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

H. NPEB series: Brominated Type Epoxy Resins With Different Bromine Content.

NPEB series are manufactured through the reaction of tetrabromobisphenol-A and epichlorohydrin in diffent ratios, and are suitable for use in applications where fire resistance are desired.

1. HIGH BROMINATED TYPE

Provide excellent flame retardancy because of high bromine content. Suitable for use in electrical moulding, laminates and some as flame-retardant additive for engineering plastics applications.

TRADE NAME	EEW (g/eq)	SOFT POINT (℃)	Bromine Content (%)	Comments
NPEB-340	330~380	46~64	46~50	Pure DGE-TBBA
NPEB-400	380~420	64~74	46~50	For paper laminates
NPEB-408	700~850	100~130	48~52	Flame-retardant for engineering plastics
NPEB-428	270~290	5000~6500[1]	48~52	Flame-retardant for engineering plastics

(1) Viscosity in cps @ 65℃.

2. HIGH BROMINATED SOLVENT TYPE

TRADE NAME	EEW (g/eq)[1]	Viscosity (cps@25℃)[2]	Non volatility (%)	Bromine Content (%)	Comments
NPEB-400T60	380~420	5~30	59~61	46~50	Toluene varnish, suitable as flame retardant for phenolic paper laminates
NPEB-400T80	380~420	---	79~81	46~50	Toluene varnish, suitable as flame retardant for phenolic paper laminates
NPEB-400A60	380~420	5~20	59~61	46~50	Acetone varnish, suitable as flame retardant for copper clad laminates

3. END CAPPING HIGH BROMINATED TYPE

Medium molecular weight end-capped brominated resins. Exhibite excellent heat stability and workability,suitable for use as flame-retardant additives in engineering plastics.

TRADE NAME	SOFT POINT (℃)	Bromine Content (%)	Comments
NPEB- 462	115~125	57~60	Medium molecular weight, flame-retardant .For engineering plastics, like ABS, nylon....etc.

4. LOW BROMINATED SOLVENT TYPE (DICY CURED SYSTEM)

Designed for combining with dicyanodiamide/ Imidazoles curing system, Mainly used in the manufacture of FR-4 and multilayer laminates for PCB, and may also be used in molding compounds, and surface coatings, etc..

TRADE NAME	EEW (g/eq)	Viscosity (cps @25℃)	Non volatility (%)	Bromine Content (%)	Comments
NPEB-450A80	410~440	800~1800	79~81	18~21	Standard brominated epoxy resin in acetone, suitable for CCL
NPEB-454A80	425~455	1000~2600	79~81	18~21	Modified brominated epoxy resin in acetone, suitable for UV-block property
NPEB-454HA80	425~455	1000~2600	79~81	18~21	Modified brominated epoxy resin in acetone, suitable for UV-block property
NPEB-485A80	385~405	800~2000	79~81	18~21	Modified brominated epoxy resin in acetone, suitable forTg150℃,UV-block ,CCL application
NPEB-487A80	355~375	1000~2500	79~81	14~17	Modified brominated epoxy resin in acetone, suitable for Tg170℃, UV-block ,CCL application

5. LOW BROMINATED SOLVENT TYPE (PHENOL NOVOLAC CURED SYSTEM)

Designed to cure with phenol novolac curing system and offer higher Tg and excellent performance properties after proper cured,primarily used in laminates,

TRADE NAME	EEW (g/eq)[1]	Viscosity (cps) (25℃)	Non volatility (%)	Bromine Content (%)	Comments
NPEB-454XA80	385~405	800~1600	79~81	18~21	Higher Tg (140℃) and better copper foil peeling strength.NPEB-454XA80:NPEB-454XB35=100:35
NPEB-485XA80	365~385	1000~3000	79~81	16~18	Higher Tg (150℃) and better copper foil peeling strength.NPEB-485XA80:NPEB-485XB45=100:43
NPEB-475A70	295~335	100~700	69~71	14~16	Higher Tg (150℃) and good thermal, moisture resistance,combined with BPA novolac,TBBA..etc NPEB-475A70:NPEB-475B60=100:60
NPEB-476A70	300~350	50~180	69~71	21~23	Higher Tg (150℃) and good process window NPEB-476A70:NPEB-476B70=100:31.5
NPEB-476NA70	295~325	30~150	69~71	20~22	Higher Tg (150℃) and good thermal, moisture resistance.NPEB-476NA70:NPEB-476NB70=100:35 IR spectrum same as FR-4 STD
NPEB-477A70	280~350	50~250	69~71	24~26	Higher Tg (170℃) and good process window NPEB-477A70:NPEB-477B70=100:35
NPEB-477NA70	250~270	1500~3000	69~71	22~24	Higher Tg (170℃) and good thermal,moisture resistance.NPEB-477NA70:NPEB-477NB70=100:41 IR spectrum same as FR-4 STD

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

I. NPER SERIES：Dimer Acid/Elastormer modified flexible epoxy resins.

NPER series are flexible epoxies modified by elastomers or dimeric acid,and provide improved toughness, adhesion properties, impact resistance and low temperature flexibility over unmodified epoxies when formulated in adhesives, laminates, composites and coatings.

1. POLYURTHANE MODIFY TYPE

Polyurethane modified liquid epoxy resins mainly used in adhesives applications

TRADE NAME	EEW (g/eq)	Viscosity (cps@25℃)	Color (Gardner)	Comments
NPER-133	195~240	20000~30000	1.0 MAX	Flexible EPU modified, for use in adhesive
NPER-133L	195~240	10000~16000	1.0 MAX.	Flexible EPU modified, for use in adhesive

2. DIMER ACID MODIFY TYPE

Manufactured through the reaction of liquid BPA epoxy and long chain dimer acid at high temperature to increase the miscibility of dimer acid and epoxy resin.Mainly act as a modifier for the other epoxy resins used in adhesives, laminates ,coatings,etc..

TRADE NAME	EEW (g/eq)	NON VOLATILITY (%)	Color (Gardner)	Comments
NPER-172	600~700	100%	6.0 MAX.	Dimer acid modified DEGBA. Semi solid
NPER-172X75	600~700	74~76	3.0 MAX.	Dimer acid modified DEGBA. Xylene varnish
NPER-174X90	250~265	89~91	3.0 MAX.	Dimer acid modified DEGBA,Xylene varnish

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

3. RUBBER MODIFY TYPE

Manufactured through the reaction of liquid BPA epoxy and CTBN rubber at high temperature to increase the miscibility of CTBN and epoxy resin.Mainly act as a modifier for the other epoxy resins used in in adhesives, laminates ,composites, coatings, etc.

TRADE NAME	EEW (g/eq)	Viscosity (cps@25℃)	Color (Gardner)	Comments
NPER-450	450~500	250000~400000	12 MAX.	CTBN rubber modified DEGBA

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

J. NPEC SERIES：Epoxy resins for castings

Primarily used in casting of electrical equipments/components such as transformers, switch gear,bushings and ignition coils.

1. CASTING RESIN

TRADE NAME	EEW (g/eq)	Viscosity (cps@25℃)	Color (Gardner)	Comments
NPEC-195	370~420	50~60℃ (Soft point)	1.0 MAX.	Solid resin for big size machine's casting, NPEC-195：NPEC-195H＝100：30
NPEC-205	210~250	900~1500	1.0 MAX.	Low viscosity and good flexibility. R.T cured NPEC-205 : NPEC-205H=100:20
NPEC-220	180~195	10000~15000	1.0 MAX.	For small size machine's casting
NPEC-225	185~200	10000~15000	1.0 MAX.	For small size machine's casting . NPEC-225: NPEC-225H=100:80

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

2. COMPOUNDING FORMULA

TRADE NAME	Viscosity (cps@25℃)	Color (Gardner)	Comments
NPEC-882	1400~1800	BROWN	Distribution transformer, coil by filament winding process. NPEC-882 : NPED-442=100: 87
NPEC-838	220000~320000	BROWN	Prefilled resin and hardner for CT, PT or high voltage busway vacuum casting. NPEC-838 : NPED-441 = 1: 1
NPEC-845H	5000~15000	BROWN	Busway joint casting NPEC-845H : NPED-445H =100:65
NPEC-838U	50000~80000	BROWN	Prefilled resin and hardner for CT, PT or high voltage busway vacuum casting .NPEC-838U : NPED-441U = 1: 1
NPEC-846U	90000~130000	BROWN	Prefilled resin and hardner for APG casting process. NPEC-846U : NPED-446U =1: 1

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

K. NPEW SERIES：Waterborne epoxy resins

NPEW series are waterborne epoxy solutions with features including lower VOC,easily dilutable with water,fast drying time,very good substrate wetting and performance properties,primarily used in flooring,civil engineering,marine and industrial coatings,fiber sizing, can and coil coatings.

TRADE NAME	EEW (g/eq)	Viscosity (cps@25℃)	Non volatility (%)	Volatile	Comments
NPEW-254W60	190~250	3000~13000	60±2	WATER	Emulsion type, 60% NPEK-114 dispersed in water, suitable for flooring application
NPEW-258W60	190~240	6000~20000	60±2	WATER	Emulsion type, 60% NPEL-128 dispersed in water, suitable for flooring application
NPEW-261W55	480~560	800~5000	55±2	WATER[1]	Curing at ambient temperature, suitabl for coating
NPEW-276W25	---	11"~15"[2]	23±1	WATER[1]	Suitable for fiber saturation, can and coil coating

(1) Containing water miscible cosolvent (2) Ford＃4 cup in sec @ 25℃

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

L. NPEP SERIES：Phosphorous type Epoxy Resin for Halogen Free Flame Retardancy.

Special halogen-free multi-functional epoxy resin solutions suitable for high performance prepreg,electric laminates and varnish.When properly formulated, it provides properties of good flame retadancy,high Tg,high thermal resistance,low moisture absorption and UV block resistance.

TRADE NAME	EEW (g/eq)	Viscosity (cps@25℃)	Non volatility (%)	Comments
NPEP-200LA70	390~410	500~1500	69~71	Acetone solution suitable for halogen free copper clad laminates, P cont. = 2.5%
NPEP-204A70	440~480	2000~4000	69~71	Acetone solution suitable for halogen free copper clad laminates, P cont. = 4%

ANWIN ENTERPRISES (TAIWAN) CO., LTD.

Tel: 886-2-2717-3068 Fax: 886-2-2717-3998 E-mail: Marketing@awint.com

M. NPEH SERIES：Phenol or BPA based novolac Type Epoxy Curing Agent.

1. TPN1 is a multifunctional epoxy curing agents. It is used primarily in epoxy resin formulations for electrical laminates, molding compounds, and adhesives in those increased HDTand improved heat and chemical resistance are desired.

TRADE NAME	Color (Gardner)	Soft Point (℃)	Comments
TPN1	9~11	120~150	Glyoxal-phenol type novolac

2.NPEH series are novolac resin solutions consist of phenol formaldehyde novolac or Bisphenol A novolac dissolved in acetone. They can act as multifunctional curing agents,,imparting higher cross-link density, higher *T*g, and better thermal and chemical resistance when formulated with proper epoxy resin ,and are widely used in composites, electrical laminates, and adhesive applications.

TRADE NAME	OH Equivalent (g/eq)	Viscosity (cps@25℃)	Non volatility (%)	Comments
NPEH-710A65	95~105	300~1500	64~66	Phenol Type Novolac. 35% Acetone Varnish
NPEH-720HA65	95~105	300~1500	64~66	Phenol Type Novolac, higher Mw than NPEH-710 35% Acetone Varnish
NPEH-720HA65	115~125	300~1500	64~66	BPA Type Novolac. 35% Acetone Varnish
NPEH-720XA65	115~125	300~1500	64~66	BPA Type Novolac, higher Mw than NPEH-720H. 35% Acetone Varnish