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KUKDO EPOXY

EPOKUKDO

DOMIDE

DOCURE

KUKDO CHEMICAL CO., LTD.

PRESIDENT'S GREETING

Since established in 1972, we, Kukdo Chemical Co., Ltd. have initiated the production of epoxy resin, one of thermosetting resin used as important raw material for various industries, and through producing hardeners, inorganic chemicals, polyols, polyureas and other related products under customers' continuous support and patronage, now we have become one of world-leading fine chemical specialized company.

Having four manufacturing factories in Korea and one in Kunshan, China, we are always devoted to be co-developing technical partner with customers through producing and supplying epoxy resin and various others for electric / electronic, coating, architecture, adhesives, sports and aerospace composite related industry and through developing new products and new application fields.

We are ready to render detail specified full services for products development and application technology having integrated R&D center equipped with various high-tech instruments and facilities for epoxy resins, urethane resins & others.

Since 1983 we have developed world market and now exporting our products more than 60 different overseas countries.
Being certified by ISO-9001 and ISO-14001, we are preparing most appropriate manufacturing, sales and management policy in order to furnish to clients in relation with new environment system like REACH, RoHS & GHS.
In addition, as pollutant discharge control policy, we are exerting more on developing quality and environment friendly products and application technology to cope with market demand.

Appreciating your continuous interests and patronage, every Kukdo staffs will do our utmost to be a partner for creating bright future prosperity together with our valuable clients. Thank you,

Faithfully yours,

Chong-Soo, Park / President

Head Office

China Factory

KUKDO EPOXY

CONTENTS

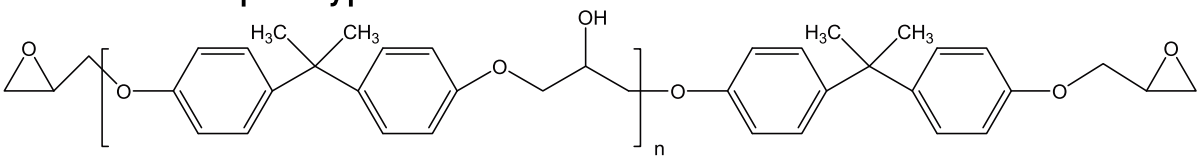
Pusan Factory

Iksan Factory

Sihwa Factory

Bisphenol-A Type Epoxy Resin

1. Standard Liquid Type



1) Low Viscosity Type

Grade	EEW (g/eq)	Viscosity (cps@25℃)	Hy-Cl (wt. %)	Specific Gravity*1 (20℃)	Color (G,max.)	Characteristics/Use
YD-112	170-185	500-700	0.1max.	1.14	1	PGE modified type
YD-113	170-190	500-700	0.2max.	1.14	1	CGE modified type
YD-114	190-210	500-700	0.05max.	1.14	0.7	C_{12}-C_{14} modified type
YD-114E	190-210	700-1,100	0.05max.	1.14	0.7	C_{12}-C_{14} modified type
YD-114F	185-205	450-750	0.05max.	1.14	1	C_{12}-C_{14} modified type
YD-114EF	180-200	700-1,200	0.05max.	1.14	1	C_{12}-C_{14} modified type
YD-115J	175-194	150-500	0.6-0.9	1.14	0.7	BGE Modified type, Low viscosity type
YD-115	180-190	700-1,100	0.1max.	1.14	1	BGE modified type
YD-115G	180-190	700-1,100	0.2-0.3	1.15	1	Non-crystal type
YD-115E	185-205	1,100-2,800	0.05max.	1.14	0.7	C_{12}-C_{14} modified type
YD-115CA	195-215	800-1,600	1.75-1.95	1.15	1	BGE modified type, Non-crystal type
YD-119	180-220	200-600	0.1max.	1.14	1	Neo-E modified type
YD-2209	193-203	3,000-6,000	0.05max.	1.16	0.5	catalyst dispersion type

*1 Reference data

2) Medium Viscosity Type

Grade	EEW (g/eq)	Viscosity (cps@25℃)	Hy-Cl (wt. %)	Specific Gravity*1 (20℃)	Color (G,max.)	Characteristics/Use
YD-127	180-190	8,000-11,000	0.05max.	1.17	0.5	Standard type
YD-128	184-190	11,500-13,500	0.05max.	1.17	0.5	Standard type
YD-128A	184-194	12,000-15,000	0.1max.	1.17	0.8	Standard type
YD-128M	184-196	12,000-14,000	0.06-0.07	1.17	0.8	Stable reaction type
YD-128H	187-205	12,000-18,000	0.6-1.0	1.17	0.5	Stable reaction type
YD-128S	205-225	19,000-24,000	1.85-2.20	1.17	1	Non-crystal type
YD-128SM	188-198	18,000-22,000	0.05max.	1.17	0.5	Non-crystal type
YD-128SH	190-205	16,000-20,000	0.5-1.5	1.15	1	Non-crystal type

*1 Reference data

3) High Viscosity Type

Grade	EEW (g/eq)	Solution Viscosity*1 (25° C)	Hy-Cl (wt. %)	Specific Gravity*2 (20° C)	Color (G,max.)	Characteristics/Use
YD-134	230-270	P-U	0.1max.	1.18	1	Semisolid, High adhesion
YD-134L	213-244	N-R	0.05max.	1.18	1	Semisolid, High adhesion
YD-136	290-335	A-C*3	0.1max.	1.18	1	High adhesion

*1 Gardner Holdt Method, Butyl Carbitol NV 70% Solution
*2 Reference data
*3 Gardner Holdt Method, Butyl Carbitol NV 40% Solution

2. Standard Solid Type

Grade	EEW (g/eq)	Solution Viscosity*1 (25°C)	Softening Point*2 (°C)	Specific Gravity*3 (20°C)	Color (G,max.)	Characteristics/Use
YD-011*4	450-500	D-F	60-70	1.16-1.20	1	General, Laminate
YD-011S	455-495	D-F	60-70	1.16-1.20	0.7	General
YD-011H	530-570	F-J	70-80	1.16-1.20	0.3	General
YD-012	600-700	G-K	75-85	1.16-1.20	1	General
YD-013K	780-840	M-Q	88-95	1.16-1.20	1	General, Non-blocking
YD-014ER	800-950	P-S	88-102	1.16-1.20	1	High purity, Ester coating
YD-014*4	900-1,000	Q-U	91-102	1.16-1.20	1	General
YD-017*4	1,750-2,100	Y-Z_1	115-125	1.16-1.20	1	Can coating
YD-017R	1,750-2,100	Y-Z_1	117-127	1.16-1.20	1	High purity, Ester coating
YD-017H	2,100-2,400	Z_1-Z_4	120-135	1.16-1.20	1	High purity, Can coating
YD-019*4	2,500-3,100	Z_3-Z_5	125-140	1.16-1.20	1	Can coating, PCM
YD-019K	2,500-3,800	Z_3-Z_7	120-150	1.16-1.20	1	Can coating, PCM
YD-020L	3,500-4,300	Z_3-Z_5	135-145	1.16-1.20	1	Can coating, PCM
YD-020	4,000-6,000	Z_4-Z_6	140-155	1.16-1.20	1	High purity, Can coating

*1 Gardner Holdt Method, Butyl Carbitol NV 40% Solution
*2 Ball & Ring Method
*3 Reference data
*4 Approved by F.D.A

3. Solution of Solvent Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25°C)	Non-Volatile Content (wt.%)	Color (G,max.)	Characteristics/Use
YD-011MTB50	450-500	A-B*1	50±1	0.5	MIBK/Toluene/Butyl Cellosolve
YD-011MTB50X	450-500	A-B*1	50±1	0.5	MIBK/Toluene/Butyl Cellosolve
YD-011MS65S	450-500	400-800	65±1	0.5	n-Butanol/Xylene/MIBK
YD-011BC70	450-500	-	70±1	0.5	Butyl Cellosolve
YD-011X70	450-500	2,500-4,000	70±1	0.5	Xylene
YD-011AM70	450-500	K-P*1	70±1	0.7	Acetone/Methyl Cellosolve
YD-011X75	450-500	Z_3-Z_6*1	75±1	1	Xylene
YD-011T75	450-500	Z-Z_5*1	75±1	1	Toluene
YD-011BC75	450-500	Z_3-Z_6*1	75±1	0.5	Butyl Cellosolve
YD-011EC75	450-500	Z_1-Z_6*1	75±1	0.5	Ethyl Cellosolve
YD-011M75	450-500	Z-Z_4*1	75±1	0.7	MIBK
YD-011MX75	450-500	-	75±1	0.5	MIBK/Xylene
YD-011A80	450-500	X-Z_4*1	80±1	1	Acetone
YD-012A80	600-700	Z_3-Z_6*1	80±1	0.5	Acetone
YD-014AM70	900-1,000	Y-Z_3*1	70±1	1	Acetone/Methly Cellosolve
YD-014M75	900-1,000	-	75±1	0.5	MIBK
YD-017EC55	1,750-2,100	Z_1-Z_5*1	55±1	1	Ethyl Cellosolve
YD-017KT55	1,750-2,100	Z-Z_4*1	55±1	1	MIBK/Toluene
YD-128MX75	184-190	A-D*1	75±1	0.5	Xylene/Methanol
YD-128X80	184-194	100-200	80±1	1	Xylene
YD-128X90	184-190	T-Y*1	90±1	0.5	Xylene
YD-128MC90	184-194	400-800	90±1	1	Methly Cellosolve
YD-134X80	230-270	-	80±1	1	Xylene
YD-134X90	230-270	10,000-20,000	90±1	1	Xylene
YD-136C75	290-335	P-U*1	75±1	0.5	MIBK
KD-211EX75	450-500	Z_2-Z_7*1	75±1	1	Xylene
KD-211GX75	500-550	Z_3-Z_7*1	75±1	0.7	Xylene

*1 Gardner Holdt Method

4. Powder Coating Epoxy Resin

1) General Grade

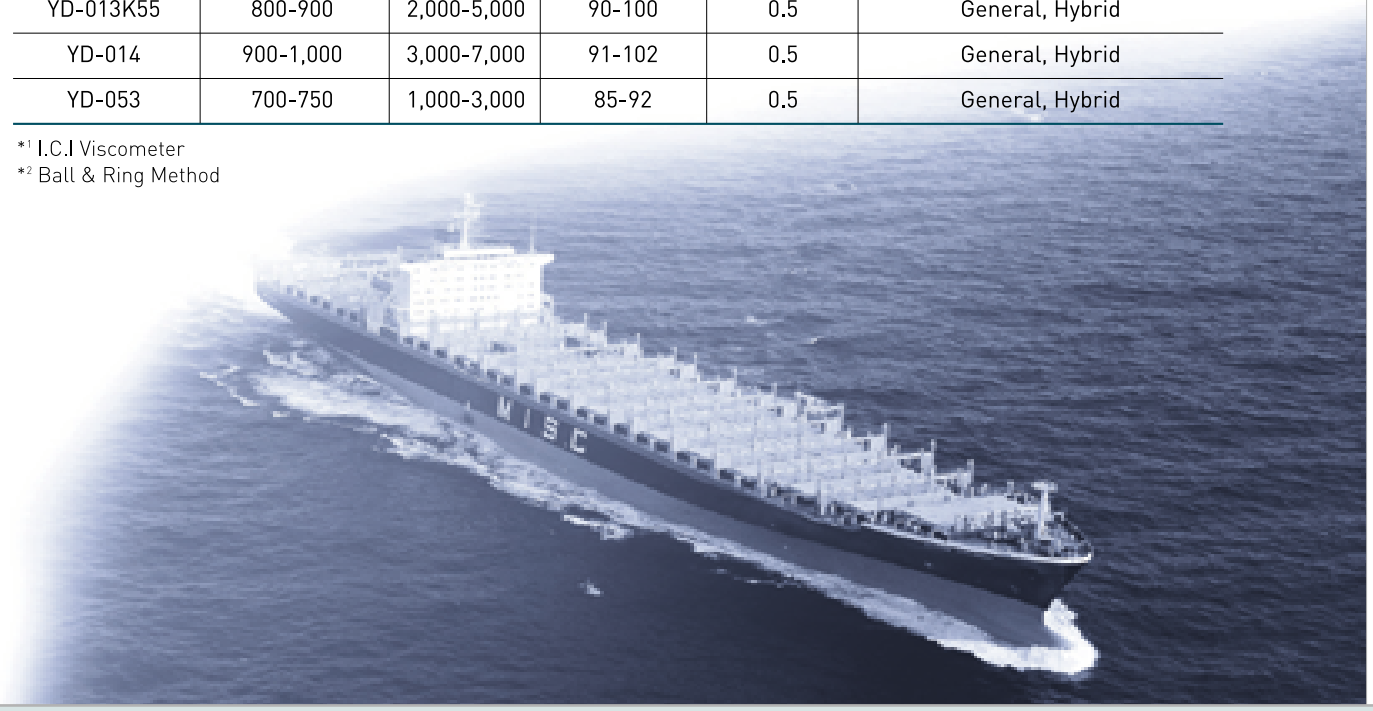
Grade	EEW (g/eq)	Melt Viscosity*1 (cps@150°C)	Softening Point*2 (°C)	Color (G,max.)	Characteristics/Use
KD-211E	455-485	300-700	65-75	0.5	General
KD-211G	500-550	500-1,500	70-80	0.7	General
KD-213	730-840	3,000-7,000	88-98	0.5	General, Hybrid
KD-214C	875-975	2,000-4,000*3	95-105	0.5	PCM, Hybrid, General
KD-242C	640-700	1,500-3,500	84-90	0.7	General
KD-242G	650-725	2,000-3,500	85-95	0.7	General
KD-242GHF	625-675	1,500-3,500	83-93	0.7	Good flow, High gloss
KD-243C	715-835	3,000-8,000	88-98	0.7	General, Hybrid

*1 I.C.I Viscometer
*2 Ball & Ring Method
*3 Melt Viscosity at 175°C

2) Low Viscosity, High Flow Grade

Grade	EEW (g/eq)	Melt Viscosity*1 (cps@150°C)	Softening Point*2 (°C)	Color (G,max.)	Characteristics/Use
YD-012	600-700	800-1,600	75-85	0.5	General, Hybrid
YD-013K	780-840	1,500-4,000	88-95	0.5	General, Hybrid
YD-013K55	800-900	2,000-5,000	90-100	0.5	General, Hybrid
YD-014	900-1,000	3,000-7,000	91-102	0.5	General, Hybrid
YD-053	700-750	1,000-3,000	85-92	0.5	General, Hybrid

*1 I.C.I Viscometer
*2 Ball & Ring Method



3) High Molecular Weight Grade

Grade	EEW (g/eq)	Melt Viscosity*1 (cps@175°C)	Softening Point*2 (°C)	Color (G,max.)	Characteristics/Use
KD-214L	1,050-1,150	4,000-8,000	100-110	1	Pipe coating
KD-214M	1,150-1,300	5,000-10,000	107-117	1	Pipe coating
KDF-214M	1,150-1,300	1,000-4,000*3	-	1	Pipe coating
YD-017	1,750-2,100	20,000-90,000*3	115-125	1	General
YD-017H	2,100-2,400	50,000-100,000*3	120-135	1	General
YD-019	2,500-3,100	80,000-200,000*3	125-140	1	General
YD-020	4,000-6,000	250,000-400,000*3	140-155	1	Can coating, PCM

*1 I.C.I Viscometer
*2 Ball & Ring Method
*3 Melt Viscosity at 200°C(Reference data)

4) Special Grade

Grade	EEW (g/eq)	Melt Viscosity*1 (cps@150°C)	Softening Point*2 (°C)	Color (G,max.)	Characteristics/Use
KD-211D	500-575	1,000-3,500	82-92	0.7	Novolac modified type
KD-211H	500-575	2,000-4,000	88-98	0.7	Novolac modified type
KD-213C	750-850	3,000-8,000*3	105-118	0.7	Novolac modified type
KD-213H	750-850	20,000-50,000	110-120*4	0.7	Novolac modified type
KD-242S	600-700	500-2,000	77-87	0.7	Good flow
KD-242H	660-720	2,200-2,800	85-95	0.7	Good flow
KD-293	700-780	1,000-4,000	85-95	0.7	Good flow

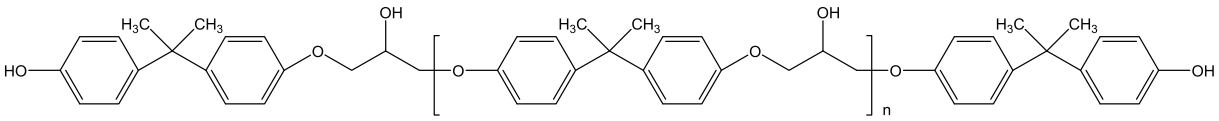
*1 I.C.I Viscometer
*2 Ball & Ring Method
*3 Melt Viscosity at 175°C
*4 Mettler Method

5) Master Batch Grade

Grade	EEW (g/eq)	Melt Viscosity*1 (cps@150°C)	Softening Point*2 (°C)	Color (G,max.)	Characteristics/Use
YD-012F15	730-830	1,000-3,000	77-87	Milky White	High flow
YD-014DLM	730-870	3,000-7,000	93-97	Milky White	High flow
YD-0153F	820-930	4,000-9,000	92-102	Milky White	High flow
KD-213F2	750-850	3,000-8,000	90-100	Milky White	High flow
KD-214CR	900-1,050	5,000-10,000	95-105	Milky White	High flow
KD-242GR	760-875	3,000-7,000	85-95	Milky White	High flow
KD-264	830-940	4,000-8,000	88-98	Milky White	Dimer acid modified type, High flow
KD-292U	660-720	1,000-4,000	85-95	Milky White	High flow
KD-293U	700-780	1,000-4,000	85-95	Milky White	High flow

*1 I.C.I Viscometer *2 Ball & Ring Method

6) Phenol Excess Type Curing Agent



Grade	Ph-OH E.W. (g/eq)	Softening Point*1 (°C)	Gel time*2 (sec)	Color (G,max.)	Characteristics/Use
KD-404	230-260	73-85	40-80	1	Fast cure
KD-405	230-260	73-85	100-160	0.5	High adhesion
KD-410	230-260	73-85	40-80	Milky White	Fast cure
KD-410J	230-260	73-85	30-70	Milky White	Fast cure
KD-420	230-260	73-85	25-50	Milky White	Fast cure
KD-426	360-440	90-100	25-55*3	Milky White	Fast cure, High flexibility
KD-407	230-260	73-85	-	1	Non-catalyst
KD-438	500-580	90-110	-	1	Non-catalyst, High flexibility
KD-448	660-760	95-120	-	1	Non-catalyst, High flexibility
KD-448J	660-760	95-120	30-60*4	1	Fast cure
KD-448H	660-760	95-120	20-50*4	1	Fast cure
KDF-407	200-260	500-2,500*5	-	1	Non-catalyst

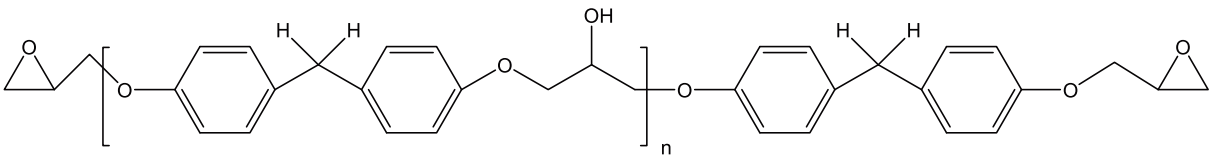
*1 Ball & Ring Method *2 43phr on KD-211D, at 180°C *3 73phr on KD-211D, at 180°C
*4 130phr on KD-211D, at 180°C *5 Melt Viscosity : I.C.I Viscometer at 125°C

5. n=0 free, BPA free, Non Toxic System

Grade	EEW (g/eq)	Melt Viscosity*1 (cps@150°C)	Softening Point*2 (°C)	Color (G,max)	BPA Content (ppm,max.)	BADGE (ppm,max.)
KD-6712	600-700	750-1,750	80-90	1	1	500
KD-6714	900-1,000	3,000-7,000	90-105	1	1	400
KD-6717	1,700-1,900	2,000-3,500*3	115-130	1	1	100
KD-6719	2,500-2,900	5,000-11,000*3	130-145	1	1	50
KD-452	490-570*4	2,000-4,000	95-105	2	500	-

*1 I.C.I Viscometer
*2 Ball & Ring Method
*3 Solution Viscosity, Butyl Carbitol NV 40% at 25° C
*4 Ph-OH E.W.

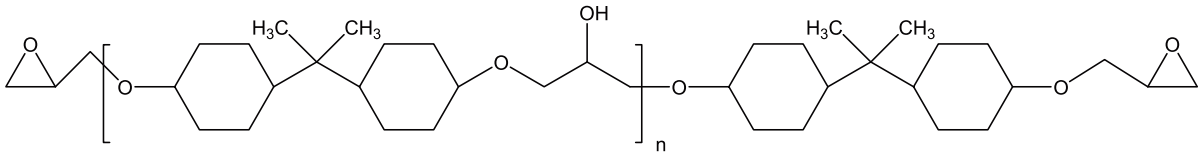
Bisphenol-F Type Epoxy Resin



Grade	EEW (g/eq)	Viscosity (cps@25°C)	Softening Point (°C)	Color (G,max)	Characteristics/Use
YDF-161	170-180	5,000-7,000	-	2	General coating
YDF-161H	175-185	6,000-8,000	-	2	General coating
YDF-162	175-185	7,000-10,000	-	2	General coating
YDF-165	160-180	700-1,100	-	3	Low Viscosity
YDF-170	160-180	2,000-5,000	-	3	Standard BPF type
YDF-175	160-180	2,000-5,000	-	3	Less-crystal type
YDF-175S	160-180	2,000-5,000	-	3	Non-crystal type
YDF-2001	450-500	B-D*2	50-60	1	Low Viscosity, Flexible type
YDF-2004	900-1,000	K-N*2	78-88	1	High flow, Flexible type

*1 Ball & Ring Method
*2 Gardner Holdt Method, Butyl Carbitol NV 40% Solution

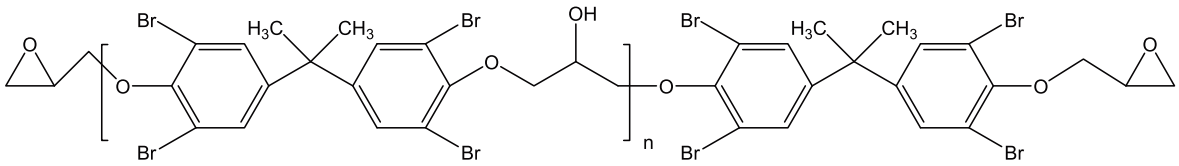
Hydrogenated BPA Type Epoxy Resin



Grade	EEW (g/eq)	Melt Viscosity (cps@25°C)	Softening Point*1 (°C)	Color (G,max)	Characteristics/Use
ST-3000	220-240	2,500-4,000	-	2	Good compatibility with acrylic and polyester resin
ST-4000D	600-750	-	85-100	3	Good exterior durability, Powder coating
ST-4100D	900-1,100	-	95-110	3	Good exterior durability, Powder coating
ST-5080	550-650	-	78-88	1	Good exterior durability, Powder coating
ST-5100	900-1,100	-	95-105	1	Good exterior durability, Powder coating

*1 Ball & Ring Method

Brominated Epoxy Resin



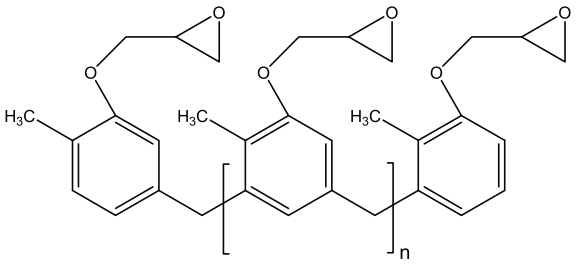
Grade	EEW (g/eq)	Softening Point*1 (°C)	Br.Content (wt.%)	Volatile Content (wt.%)	Characteristics/Use
YDB-228	210-240	10,000-20,000*2	16-18	-	Flame retardant type
YDB-400	380-420	64-74	46-50	-	High purity
YDB-400T60	380-420	-	46-50	40±1	Toluene solution type
YDB-400T70	380-420	-	46-50	30±1	Toluene solution type
YDB-400TE70	380-420	-	48-50	30±1	Toluene, MEK solution type
YDB-400H	430-460	70-80	48-51	-	High purity
YDB-406	620-680	90-110	50-52	-	ENPLA, Flame retardant type
YDB-408	690-750	102-112	50-52	-	ENPLA, Flame retardant type
YDB-410P	900-1,000	120-130	50-52	-	ENPLA, Flame retardant type
YDB-412	1,200-1,300	125-140	51-53	-	ENPLA, Flame retardant type
YDB-423A80	420-480	-	18-21	20±0.5	Laminate, Flame retardant type
YDB-424A80	430-460	-	18-21	20±0.5	Multi-layer Laminate
KDB-600A80	430-460	-	18±0.5	20±1	Laminate, UV blocking type
KDB-610A80	480-500	-	18±0.5	20±1	Laminate, UV blocking type
KCB-300PMA75	280-300	-	28-30	25±1	High Tg type
YDB-500A80	440-550	-	19-22	20±0.5	Acetone solution type
KB-560	800-1,500*3	95-105	58-60	-	ENPLA, End capped type
YDB-416	1,500-1,700	105-115	54-56	-	ENPLA, Half capped type
KB-562P	1,700-2,300*3	113-120	57-59	-	ENPLA, End capped type
KB-563P	3,000-4,000*3	135-145	55-57	-	ENPLA, End capped type
YDB-419	5,200-6,200	125-135*4	52-55	-	ENPLA, Half capped type

*1 Ball & Ring Method
*2 Viscosity at 40°C
*3 Mw(Reference data)
*4 T_m(DSC)

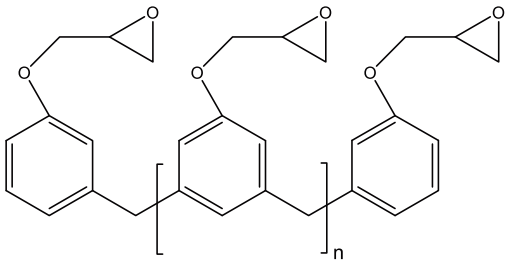
Non-Halogen Flame Retardant Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25°C)	Volatile Content (wt.%)	Characteristics/Use
KDP-550MC65	560-620	2,000-3,000	35±1	Laminate, Non-halogen flame retardant type
KDP-555MC80	250-280	15,000-20,000	20±1	Laminate, Non-halogen high Tg type
KDP-540MC75	270-300	2,000-3,000	25±1	Laminate, Non halogen flame retardant type

Novolac Epoxy Resin



[o-Cresol Novolac]



[Phenol Novolac]

1. o-Cresol Novolac Type

Grade	EEW (g/eq)	Softening Point*1 (°C)	Hy-Cl (ppm,max.)	Color (G,max.)	Characteristics/Use
YDCN-500-1P	190-210	50-54	350	2	EMC, Laminate, Coating
YDCN-500-4P	200-212	60-63	350	2	EMC, Laminate, Coating
YDCN-500-5P	200-212	63-66	350	2	EMC, Laminate, Coating
YDCN-500-7P	200-212	66-70	350	2	EMC, Laminate, Coating
YDCN-500-8P	200-212	68-72	350	2	EMC, Laminate, Coating
YDCN-500-10P	200-212	70-74	350	2	EMC, Laminate, Coating
YDCN-500-80P	190-220	75-85	350	2	EMC, Laminate, Coating
YDCN-500-90P	190-220	85-95	350	2	EMC, Laminate, Coating
YDCN-500-90PA75	190-220	Q-W*2	75±1*3	3	Acetone solution type
YDCN-500-80PBC60	190-220	-	60±1*3	8	Butyl carbitol solution type
YDCN-500-80PCA60	190-220	-	60±1*3	8	Cellosolve acetate solution type

*1 Ball & Ring Method
*2 Gardner Holdt Method
*3 Non-Volatile Content(wt.%)

2. Phenol Novolac Type

Grade	EEW (g/eq)	Viscosity (cps)	Color (G,max.)	Characteristics/Use
YDPN-631	165-185	A-D*1	3	High heat resistance, Molding, Low viscosity
YDPN-636	170-180	2,000-8,000*2	3	High heat resistance, Low viscosity
YDPN-637	180-190	3,000-6,000*2	3	Low viscosity
YDPN-638	170-190	H-K*1	3	High heat resistance, Molding
YDPN-641	170-190	800-1,100*3	3	High heat resistance
YDPN-644	195-235	32,000-52,000*4	3	High Performance
YDPN-638A80	170-190	80±1*5	3	Acetone solution type

*1 Gardner Holdt Method, Butyl Carbitol NV 60% Solution
*2 Brookfield Viscometer at 50°C
*3 I.C.I Viscometer at 150°C
*4 Brookfield Viscometer at 60°C
*5 Non-Volatile Content(wt.%)

3. BPA-Novolac Type

Grade	EEW (g/eq)	Softening Point*1 (°C)	Color (G,max.)	Characteristics/Use
KBPN-110	200-220	60-70	3	BPA-novolac type, High heat resistance, High performance
KBPN-115	205-225	70-80	3	BPA-novolac type, High heat resistance, High performance
KBPN-120	210-230	80-90	3	BPA-novolac type, High heat resistance, High performance

*1 Ball & Ring Method

4. DCPD Type Epoxy Resin

Grade	EEW (g/eq)	Softening Point*1 (°C)	Characteristics/Use
KDCP-100	250-270	55-65	Low melt viscosity, Low moisture absorption, EMC, PCB, etc.
KDCP-150	265-290	75-85	Low melt viscosity, Low moisture absorption, EMC, PCB, etc.
KDCP-200	270-295	85-95	Low melt viscosity, Low moisture absorption, EMC, PCB, etc.

*1 Ball & Ring Method

Flexibile Epoxy Resin

1. Dimer Acid Modified Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25℃)	Color (G,max.)	Characteristics/Use
YD-171	390-470	400-900	12	Dimer acid modified epoxy resin
YD-172	600-700	Simisolid	6	Dimer acid modified epoxy resin
YD-172X75	600-700	X-Z*1	6	Xylene solution type

*1 Gardner Holdt Method

2. Rubber Modified Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25℃)	Color (G,max.)	Characteristics/Use
KR-100	530-630	D-G*1	5	CTBN modified epoxy resin
KR-101	700-800	2,000-10,000*4	3	CTBN modified epoxy resin
KR-102	1,100-1,300	T-W*1	5	CTBN modified epoxy resin
KR-104	1,150-1,300	T-X*1	5	CTBN modified epoxy resin
KR-104L	1,100-1,300	95-105*2	5	CTBN modified epoxy resin
KR-170	200-235	30,000-60,000	8	CTBN modified epoxy resin
KR-202C	350-400	600-1,000	9	NBR modified epoxy resin. Mixed solvent
KR-207	175-205	2,000-3,000	10	CTBN modified epoxy resin
KR-208	270-330	8,000-12,000	10	NBR modified epoxy resin
KR-309	280-320	25,000-40,000	11	NBR modified epoxy resin
KR-415	375-425	50,000-1,000,000*5	10	NBR modified epoxy resin
KR-450	400-500	Semisolid	12	CTBN modified epoxy resin
KR-818	370-430	Semisolid	8	CTBN modified epoxy resin
KR-909	350-400	15,000-40,000	11	NBR modified epoxy resin
KR-628	220-240	40,000-60,000	Milky white	Acrylic rubber modified epoxy resin
KR-692	675-775	82-98*2	Milky white	Acrylic rubber modified epoxy resin
KR-693	800-900	90-105*2	Milky white	Acrylic rubber modified epoxy resin
KSR-1000	1,100-1,300	1,000-5,000*3	Milky white	Silicone modified epoxy resin

*1 Gardner Holdt Method, Butyl Carbitol NV 40% Solution
*2 Softening Point(℃), Ball & Ring Method
*3 I.C.I Viscometer at 175℃
*4 I.C.I Viscometer at 150℃
*5 Brookfield Viscometer at 50℃

3. Urethane Modified Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25°C)	Color (G,max.)	Characteristics/Use
UME-305	230-270	5,000-12,000	3	High flexibility, Molding
UME-315	210-230	30,000-80,000	1	Flexible coating Adhesive
UME-330	265-280	10,000-50,000*1	5	Elasticity, Molding

*1 Brookfield Viscometer at 40°C

UV Curing Type Epoxy Resin

Grade	Acid Value (mgKOH/g)	Viscosity (25°C)	Volatile Content (wt.%)	Color (G,max.)	Characteristics/Use
KDU-651	3max.	Semisoild	-	1	NV 100%
KDU-651T70	1max.	Z_5-Z_7*1	30±1	1	TMPTA
KDU-652S75	5max.	O-S*1	25±1	3	Styrene monomer
KDU-651M90	6max.	Z_2-Z_6*1	10±1	1	MEK
KDU-653	3max.	Semisoild	-	5	NV 100%
KDU-653M90	5max.	Z_4-Z_8*1	10±1	5	MEK
KDU-657TH70	3max.	Z_4-Z_6*1	30±1	5	2-HEMA/TMPTA
KDU-651TP75	1max.	Z_3-Z_5*1	25±1	1	TPGDA

*1 Gardner Holt Method

Low Temperature Curing Type Epoxy Resin

Grade	EEW (g/eq)	Solution Viscosity*1 (25°C)	Non-Volatile Content (wt.%)	Color (G,max.)	Characteristics/Use
KDN-253	300-340	W-Z	70±1	1	Low temp. Curing coating, Adhesive
KDN-255	400-500	S-W	60±1	1	Low temp. Curing coating, Adhesive

*1 Gardner Holdt Method, Butyl Carbitol NV 40% solution

Phenoxy Resin

Grade	Solution Viscosity*1 (25°C)	Non-Volatile Content (wt.%)	Color (G,max.)	Characteristics/Use
YP-50	Z_1-Z_5	100	3	Magnetic tape, Polymer blend
YP-50EK35	W-Z_2*2	35±1.5	-	Paint, Can coating
YP-55	50,000-60,000*3	84*4	-	BPA type
YP-70	50,000-60,000*3	74*4	-	BPA/BPF type

*1 Gardner Holdt Method, Butyl Carbitol NV 40% solution *2 Gardner Holdt Method *3 Mw *4 T_g(°C), DSC

Epoxy Resin for P.C.M

Grade	Mw	Viscosity (cps@25°C)	Non-Volatile Content (wt.%)	Characteristics/Use
KU-400T40	20,000-30,000	3,000-7,000	40±1	Mixed solvent
KU-420K40	15,000-30,000	X-Z*1	40.5±1	Mixed solvent
YD-017KC40	2,000-2,200*2	I-(K~L)	41.5±1	Mixed solvent
YD-017CW50	2,000-2,200*2	700-1,300	51±1	Mixed solvent

*1 Gardner Holdt Method
*2 EEW(g/eq)

Epoxy Modified Polyol(Isocyanate Curing Type)

Grade	OH Value (mgKOH/g)	Solution Viscosity (25°C)	Non-Volatile Content (wt.%)	Characteristics/Use
YU-300	100-130	$Z\text{-}Z_4$	60±1	Tar-urethane coating, MIBK/Toluene=1/1

Filament Winding, Laminating Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25°C)	Color (G,max.)	Characteristics/Use
KBR-1722	190-200	3,000-7,000	2	F/W, Laminate
KBR-1726	187-197	4,500-6,500	1	F/W, Paint
KBR-1728	175-190	6,500-9,500	1	F/W, Non-crystal type
KBR-1729	170-190	3,000-7,000	1	F/W, Laminate
KBR-1753	190-205	800-1,000	1	F/W, Laminate, Paint

Molding Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25°C)	Color (G,max.)	Characteristics/Use
YC-195	360-400	500-700*1	1	Large scale electrical molding, Hardener YC-195H
YC-195B	370-420	380-550*1	1	Large scale electrical molding, Hardener YC-195H
YC-230	185-200	10,000-15,000	1	Electrical parts, Hardener YC-230H
KC-305	183-192	9,500-13,000	1	Large scale electrical casting, Transformer, Hardener KC-305H
KC-335	188-196	8,500-15,000	-	Electrical casting, Molding, Hardener KC-335H

*1 Brookfield Viscometer at 120°C

Reactive Diluent

Grade	EEW (g/eq)	Viscosity (cps@25°C)	Color (G,max.)	Characteristics/Use
PG-202	135-165	15-30	1	NPGDGE type
PP-101	220-240	10-20	5	SBPMGE type
PG-207P	300-330	40-100	1	PPGDGE type
Neokukdo-E	240-265	5-20	2	Coating, Carboxylic acid glycidyl ester
Neokukdo-P	240-260	5-15	1	Coating, Low toxicity type
LGE	275-300	5-20	30*1	Aliphatic glycidyl ether
BGE	145-155	1-5	30*1	Butyl glycidyl ether
1,6HDGE	135-165	10-30	50*1	1,6 Hexanediol diglycidyl ether
1,4BDGE	120-140	15-30	50*1	1,4 Butanediol diglycidyl ether

*1 APHA Color

Tri-Functional Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25°C)	Hy-Cl (wt.%)	Specific Gravity*1 (20°C)	Color (G,max.)	Characteristics/Use
YH-300	135-150	100-300	0.1max.	1.14	1	TMPTGE type
YH-325	175-190	4,000-6,000	0.1max.	1.16	1	High adhesion

*1 Reference data

Tetra-Functional Epoxy Resin

Grade	EEW (g/eq)	Softening Point* (°C)	Non-Volatile Content (wt.%)	Viscosity (cps@25°C)	Hy-Cl (ppm)	Characteristics/Use
KDT-4400	210-240	80-90	-	-	3,000max.	High heat resistance, UV-Blocking
KDT-4400A70	210-240	-	70±1	100-200	1,400±100	High heat resistance, UV-Blocking, Acetone solution type
KDT-4400M70	210-240	-	70±1	150-350	1,500±100	High heat resistance, UV-Blocking, MEK solution type

* Ball & Ring Method

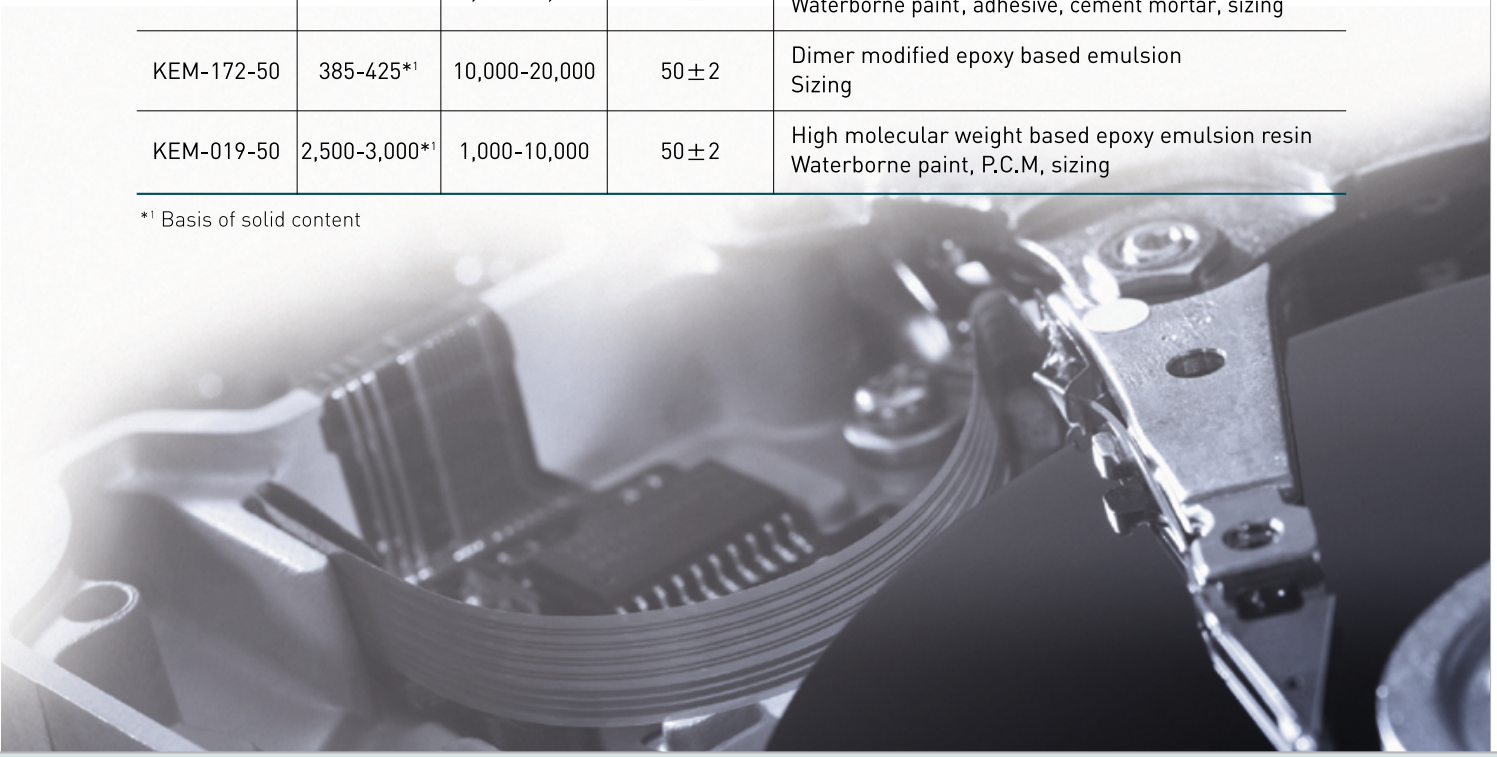
Special Type Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25°C)	Characteristics/Use
KD-175X90	240-275	2,000-4,000	High solid epoxy resin
KD-176X80	290-330	1,000-2,000	High solid epoxy resin
KSR-177	190-220	9,000-15,000	Excellent adhesion for non-ferrous metals and glass
KSR-176X90	240-270	2,000-5,000	Excellent adhesion for non-ferrous metals and glass

Waterborne Epoxy Resin

Grade	EEW (g/eq)	Viscosity (cps@25°C)	Non-Volatile Content (wt.%)	Characteristics/Use
KEM-128R	195-215	2,000-8,000	100	YD-128 based self-emulsifiable epoxy resin
KEM-128M	200-220	7,000-15,000	100	YD-128 based self-emulsifiable epoxy resin
KEM-128-70	190-210*1	1,000-10,000	70±2	Liquid based epoxy emulsion resin Waterborne paint, adhesive, cement mortar, sizing
KEM-134-60	260-300*1	1,000-10,000	60±2	Semisolid based epoxy emulsion resin Waterborne paint, adhesive, cement mortar, sizing
KEM-101-50	450-550*1	1,000-10,000	47±2	Solid based epoxy emulsion resin Waterborne paint, adhesive, cement mortar, sizing
KEM-172-50	385-425*1	10,000-20,000	50±2	Dimer modified epoxy based emulsion Sizing
KEM-019-50	2,500-3,000*1	1,000-10,000	50±2	High molecular weight based epoxy emulsion resin Waterborne paint, P.C.M, sizing

*1 Basis of solid content



KUKDO

Curing agents are
composed of five main products.

DOMIDE

1. Polyamide Resin	G-series,	GX-series
2. Amidoamine Resin	G-A series,	GX-series

DOCURE

1. Aliphatic Amine Modified	KH-5 series
2. Cycloaliphatic Amine Modified	KH-8 series
3. Aromatic Amine Modified	TH-series
4. Waterborne Curing Agents	KH-7 series

DOMIDE G-series show slow reactivity compared with polyamide stuffs.

And they are widely used in the big scale fields of civil works, construction and coating because of their powerful adhesion and effective applicability.

Aliphatic Amine modified DOCURE KH-5 series include Epoxy-adduct, Mannich base.

Epoxy-adduct type has elimination of amine blush and good chemical resistance and good compatibility with Epoxy resin.

Mannich base has good water spot resistance and good reactivity at low temperature.

Cycloaliphatic Amine modified DOCURE KH-8 series offer good weatherability, high gloss and chemical resistance.

Aromatic Amine modified DOCURE TH-series offer good electrical resistance and good chemical resistance.

Waterborne curing agent DOCURE KH-7 series provide good compatibility with Epoxy-Dispersion. These are Zero-VOC systems, so there is no effect on environment.

KUKDO Curing agents help to achieve the end result which you desire field or any application.

PRODUCT GROUP PROPERTY SUMMARY

PRODUCT GROUP	PRODUCT GROUP PROPERTY SUMMARY	PRODUCT TYPE
POLYAMIDES	Ambient cure, low toxicity, good flexibility and toughness, high viscosity, long pot-life and good water resistance. Polyamide-Adducts provide good compatibility and faster dry under severe conditions than standard polyamides.	G-series
AMIDOAMINES	Low viscosity. Exhibit very good adhesion, particularly to concrete. Modified Amidoamine can offer faster cure speed, lower viscosity and good chemical resistance.	G-A series
ALIPHATIC AMINES	Wide range of products has a different properties. High reactivity and fast cure at room or low temperature. Relatively moisture sensitivity. Good chemical resistance, particularly to solvents. For heat-cure applications, very good chemical resistance and electrical and mechanical properties.	KH-5 series
CYCLOALIPHATIC AMINES	Good film properties such as excellent gloss. Resistance to amine blush and water-spotting. For heat-cure applications, good elevated-temperature performance and very good chemical resistance.	KH-8 series
AROMATIC AMINES	For heat-cure applications, low viscosity. Lower exothermic and higher heat resistance. Very good chemical resistance and electrical properties.	TH-series
WATERBORNE CURING AGENTS	Water is a diluent, instead of solvents in waterborne-epoxy system. This system with Zero-VOC may not affect on environmental conditions.	KH-7 series
ACCELERATOR & CATALYST	This includes tertiary amines, imidazoles substituted urea (e.g., thiourea.). Tertiary amines and imidazoles are excellent accelerators for other curing agents such as dicyandiamide and anhydrides.	KH-30

Polyamide & Amidoamine Type

Grade	TAV*[1] (mgKOH/g)	Viscosity (cps@25°C)	Color (Gardner)	A.H.E.W. (g/eq)	Description
G-700	90-100	Semi-Solid	12max.	450-500	High M.W Type. Coatings, Adhesives.
G-5022	200-240	50,000-70,000*[2]	12max.	165-185	Standard high-viscosity polyamide. Flexibility, long pot-life and good properties with solid epoxy resin.
G-0930	280-320	8,000-12,000*[2]	12max.	120-140	Standard medium-viscosity polyamide. 1:1 volume ratio with standard liquid epoxy resin.
G-640	370-400*[3]	8,000-12,000	12max.	100-120	Standard high-imidazoline content polyamide. High solid coatings, adhesives, sealer and putties.
G-0331	280-340	2,500-4,500	12max.	100-120	Medium-viscosity polyamide. Adhesives, civil works.
G-0240	370-430	1,500-3,000	12max.	60-80	Standard type polyamide for adhesives, coatings.
G-A0533	310-350	500-1,000	14max.	95-115	Grouts, mortar and floorings, low-viscosity adhesives.
G-A0432	320-380	200-600	14max.	70-80	High-imidazoline content amidoamine. Grouts, mortar and adhesives.
G-5022X70	140-170	T-W*[4]	12max.	235-265*[5]	DOMIDE G-5022X70 is a 70% solid solution of DOMIDE G-5022 cut in xylene. Solventborne primer coating. Long pot-life.

*[1] TAV : Total Amine Value(0.1N-HCl Method)
*[2] Viscosity : cps at 40°C
*[3] TAV : 0.1N-$HClO_4$Method
*[4] Viscosity : Gardner Holdt Method
*[5] A.H.E.W. : Solution base

Polyamide Adduct Type

Grade	TAV*[1] (mgKOH/g)	Viscosity (cps@25°C)	NV*[2] (wt.%)	Solvents	A.H.E.W.*[5] (g/eq)	Description
GX-328B75	230-260*[3]	4,000-8,000	74-76	n-Butanol	160-180	Polyamide adduct. High solid, anti-corrosive coatings for marine & industrial use.
GX-328K	210-250	1,500-4,500	75-77	Xylene	110-130	Polyamide adduct. High solid, anti-corrosive coatings for marine & industrial use.
GX-422	110-150	Z-Z_3*[4]	58-62	Xylene/ n-Butanol	350-390	Polyamide adduct. Solventborne coatings. Fast dry.
GX-430	170-220*[3]	2,000-6,000	73-77	n-Butanol	180-190	Polyamide adduct. High solid, anti-corrosive coatings for marine & industrial use.
GX-450TI60	120-140	800-1,500	58.5-61.5	Toluene/ iso-propanol	316	Polyamide adduct. Coal tar Epoxy curing agent.
GX-450XB70	145-165*[3]	4,500-8,500	68.5-71.5	Xylene/ n-Butanol	330	Polyamide adduct. Fast dry and fast cure. Anti-corrosive coatings for marine & industrial use.
GX-460	230-270*[3]	3,000-6,000	90	Ethanol	190	Polyamidoamine adduct. High solid, anti-corrosive coatings for marine & industrial use.
GX-483	180-219*[3]	2,700-6,400	100	-	133	Polyamidoamine adduct. High solid coatings for marine & industrial use.
GX-533	260-320	800-2,000	100	-	100	Polyamidoamine adduct.

*[1] TAV : Total Amine Value(0.1N-HCl Method)
*[2] N.V : non-volatile content(wt.%)
*[3] TAV : 0.1N-$HClO_4$Method
*[4] Viscosity : Gardner Holdt Method
*[5] A.H.E.W. : Solution base

Aliphatic Amine Modified Type

Grade	TAV (mgKOH/g)	Viscosity (cps@25°C)	Color (Gardner)	Use Level (phr)	Description
KH-240	280-360	2,000-4,000	15max.	40-50	Adhesives, sealants and putties. Concrete repair.
KH-252	420-480	50-800	-	40	Fast cure. Accelerator for other curing agent.
KH-500	450-500	500-4,000	10max.	35-40	Mannich product Curable at low temperature and damp conditions.
KH-500F	450-500	500-4,000	10max.	35-40	Mannich product curable at low temperature and damp conditions. Reduced free amine and phenol comparing with KH-500.
KH-505	300-370	500-2,500	10max.	45-60	Curable under damp condition.
KH-506	340-400	500-2,000	10max.	35-40	Fast curing under cold and damp conditions. Good water-spot resistance.
KH-530S	450-500	20-50	6max.	45-55	Laminating, floorings, grouts.
KH-531	290-350	30-150	3max.	40-50	Self-leveling, flooings, grouts, mortar.
KH-550	360-420	100-200	8max.	45-55	Fast cure. Accelerator for other curing agent.
KH-602	670-730	50-250	5max.	25	Good flexibility and mechanical properties. Resin mortar, grouts.
KH-620	570-630	3,000-5,000	6max.	20	Fast cure. Good resistance to alcohol, solvents, acids.

Cycloaliphatic Amine Modified Type

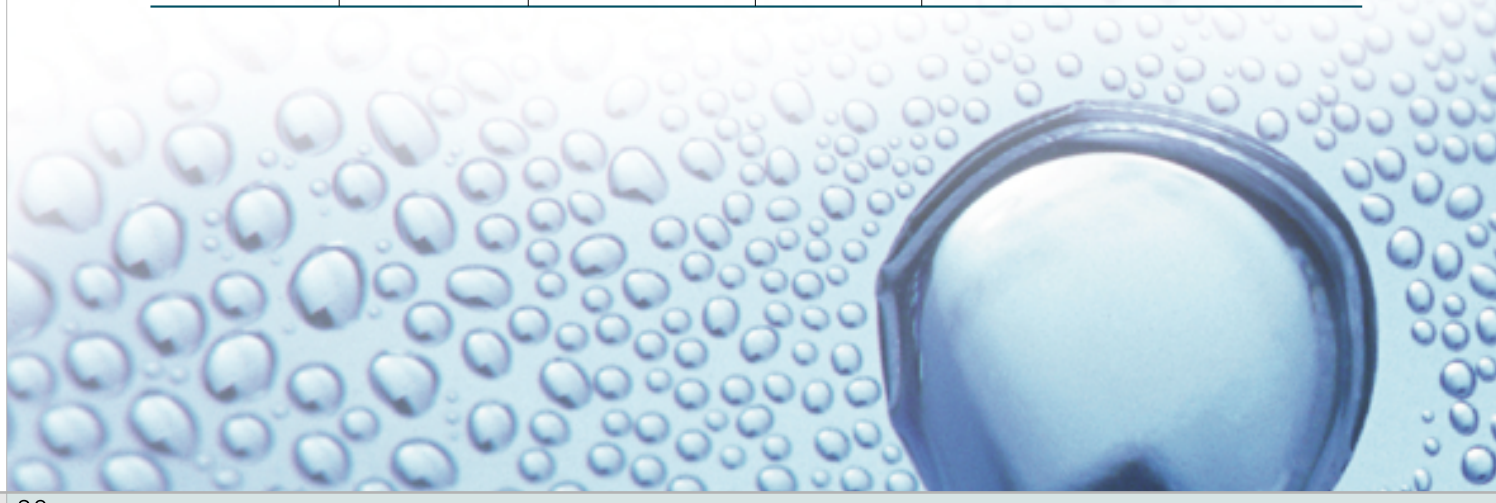
Grade	TAV (mgKOH/g)	Viscosity (cps@25°C)	Color (Gardner)	Use Level (phr)	Description
KH-811	370-430	2,000-6,000	3max.	35	Good chemical resistance. Floorings, high gloss coatings.
KH-812	290-350	30-150	3max.	45	Low viscosity. High solid, solvent-free floorings.
KH-813	300-350	80-200	8max.	45-50	Low viscosity. Solvent-free and high solid coatings. Tank linings.
KH-814	300-360	30-100	3max.	50	Low viscosity. Good color retention, high gloss. Solvent-free and high solid coatings.
KH-815	245-305	100-1,000	3max.	55-60	Resin mortar. Solvent-free and high solid coatings.
KH-816	220-320	300-500	3max.	60	Good color retention, high gloss. Solvent-free and high solid coatings.
KH-818B	250-320	100-300	3max.	60	Low viscosity. Good color retention, high gloss. Solvent-free and high solid coatings.
KH-819	340-390	50-150	2max.	45	Low viscosity. Solvent-free and high solid coatings.
KH-825	270-300	80-350	5max.	50-55	Low viscosity, high gloss. Resin mortar, floorings.
KH-831	330-400	400-1,000	3max.	45	Self-leveling floorings. Solvent-free and high solid coatings.

Aromatic Amine Modified Type

Grade	Viscosity (cps@25°C)	Appearance	Use Level (phr)	Description
TH-430	3,000-6,000	Dark brown liquid	60	Good chemical resistance.
TH-431	3,200-6,300	Dark brown liquid	60	Good chemical resistance.
TH-432	300-1,000	Dark brown liquid	60	Good chemical resistance.
TH-437	600-2,000	Dark brown liquid	40	Good chemical resistance.
TH-438	14,000-23,000	Dark brown liquid	60	Good chemical resistance.
TH-451	14,000-23,000	Dark brown liquid	60	Good chemical resistance.
TH-452	1,500-2,500	Dark brown liquid	60	Good chemical resistance.

Waterborne Curing Agent

Grade	TAV (mgKOH/g)	Viscosity (cps@25°C)	Use Level (phr)	Description
KH-700	190-250	3,000-10,000	80-100	Polyamine base. Waterborne coatings and primers.
KH-701	350-420	14,000-22,000	30-40	Polyamide base. Primer/sealer for concrete. Adhesives for wood and steel. Waterborne coatings and primers.
KH-721	190-240	10,000-20,000	80-100	Polyamine base. Waterborne coatings and primers.
KH-723	260-300	20,000-45,000	70	Polyamide base. Waterborne coatings and primers.
KH-748	190-250	5,000-15,000	80-100	Polyamine base. Waterborne coatings and primers.



Amine & Anhydride Hardener

Grade		Use Level (phr)	H,D,T (°C)	Description
Aliphatic Amines	DETA TETA	8-10 9-12	90-120 90-120	Civil works, Construction.
Tertiary Amines	KH-30 BDMA	5-10 5-10	90 100	Accelerator for anhydride, polyamide and other amines.
Araliphatic Amine	MXDA	17-20	130-150	Heat and chemical resistance.
Cycloaliphatic Amine	IPDA	20-24	100-120	Good weatherability. Civil works, Construction.
Aromatic Amine	DDM	27-30	140	Heat and chemical resistance.
Anhydrides	Me-THPA MNA	80-90 80-90	130 135	Electrical fields, Laminating, Filament winding, FRP.
Jeffamine	D-230 D-400	25-35 40-60	60 50	Coating, Molding.
	A-399	5-15	60	Accelerator for Jeffamine.

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