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14 BASIC LIQUID EPOXY SYSTEMS

TDS 820108 rev050912

From 4 resins: **ABOCAST 50-3, 50-6, 50-11, 50-16**
With 3 hardeners: **ABOCURE 50-1, 50-12, 50-17**
And 2 ONE-COMPONENT SYSTEM: **ABOCAST 8103-11** and **8103-16**

The here described ABATRON Epoxy Systems are available as such or modified with reactants, thickeners, fillers, flexibilizers, accelerators, pigments and other ingredients resulting in hundreds of specialized compounds for industrial, structural, electric, construction, marine and almost any conceivable application for epoxies.
All 14 Systems are at the same time **adhesives, castings resins, solventless coatings, dielectrics, binders for laminates or aggregates** etc., with the versatility and performance typical of high-grade Epoxy compounds.

ABOCAST 50-3: General-purpose resin. Light straw color. Viscosity: 11,000-14,000 cps @ 25º C (like thicker honey)
ABOCAST 50-6: Higher purity resin. Almost colorless. Lower viscosity: 4,000-6,000 cps (like a medium motor oil)
ABOCAST 50-11: Low viscosity resin: 500-800 cps (like light motor oil). Light straw color.
ABOCAST 50-16: The lowest-viscosity resin: 150-220 cps. Light straw color.
ABOCAST 50-1: For room temperature curing. Variable ratios: from 33 to 200 pbw (parts by weight) can be mixed with 100 pbw ABOCAST to obtain wide range of results. Lowest ratios (33-40 pbw) offer maximum rigidity, chemical and heat resistance. Higher ratios (up to 200 pbw) yield increasing flexibility and impact resistance. Amber color. Medium viscosity: 14,000-20,000 cps. Preferred where versatility and ease of application count most.
ABOCURE 50-12: Water-like viscosity and color. Faster room-temp. curing. It develops higher rigidity, heat and chemical resistance than ABOCURE 50-1, but requires precise proportioning.
ABOCURE 50-17: For high temperature curing. Dark. Highest rigidity, chemical and heat resistance. Long pot life at 25º C: 6-8 hr. Best for larger casting and high physical and chemical requirements.
ABOCAST 8103-11: One-component system. Liquid for 6-8 month @ 25º C. It hardens by simple heating. 12,000 cps.
ABOCAST 8103-16: One-component system, like 8103-11. Same shelf life and hardening, but thinner and more flexible. 1,500 cps.

ABOCAST (A)	**50-3**	**50-6**	**50-3**	**50-6**	**50-3**	**50-6**	**8103-11**
ABOCURE (B)	**50-1**	**50-1**	**50-12**	**50-12**	**50-17**	**50-17**	----------
Blend: pbw (A)/(B)	100/35	100/35	100/13	100/14	100/26	100/28	----------
Blend viscosity: cps/ 25 ºC	16000	6500	2250	900	110 @ 70º C	70 @70º C	12000
Pot life, 500 gms, min	140	160	30	43	68 @70º C	94 @ 70º C	190 @100º C
Exotherm, º C (peak)	152º	153º	255º	283º	238º	240º	170º
Deflection Temperature, ºC	105º	92º	111º	107º	160º	157º	160º
Flexural Strength, psi	9700	12170	13900	15590	13500	15270	140000
Flexural Modulus, $x10^5$	3.50	3.27	4.4	4.04	3.9	3.52	4.5
Compressive Strength, psi	12400	12290	16300	15840	16800	17150	16500
Compressive Modulus, $x10^5$	3.7	2.39	4.4	2.63	3.75	2.17	3.3
Tensile Strength, psi	8300	6810	11400	9620	9550	10000	5700
Ultimate Elongation	3.9%	2.0%	4.4%	4.4%	4.4%	3.0%	1.6%
Izod Impact, notched	0.5	0.44	0.5	0.5	0.58	0.44	0.26
Hardness, Shore D	85	84	86	85	85	85	86
Thermal Degradation, weight loss after:							
100 hrs @ 160 ºC	0.94%	0.5%	1.06%	0.92%	0.55%	0.58%	0.036%
500 hrs @ 160 ºC	1.73%	1.07%	1.45%	1.42%	0.73%	0.70%	0.86%
200 hrs @ 210 ºC	3.34%	2.44%	3.89%	3.51%	1.55%	1.42%	3.5%
100 hrs @ 260 ºC	Failure	Failure	Failure	Failure	25.9%	23.9%	19.6%
Weight Change after 120 days:							
In 30% Sulfuric Acid	4.02%	3.35%	3.11%	3.18%	2.60%	1.96%	1.11%
In Acetone	16.2%	14.2%	5.97%	4.68%	11.80%	17.20%	3.2%
In 50% Sodium Hydroxide	0.12%	0.07%	-0.08%	-0.07%	0.05%	-0.12%	0.02%
In JP 4 Fuel	0.29%	0.23%	0.09%	0.08%	0.27%	0.11%	0.23%
In Distilled Water	2.43%	2.24%	1.68%	1.69%	2.08%	1.64%	1.70%
Dielectric Constant:							
Cond. A, cps 60	3.23	3.24	4.02	3.98	4.10	4.07	3.36
Cond. A, cps 1,000	3.19	3.20	3.90	3.86	4.06	4.01	3.35
Cond. A, cps 1,000,000	2.99	2.95	3.42	3.27	3.56	3.60	3.15
Cond. D 48/50, 60 cps	3.48	3.44	4.27	4.23	4.43	4.45	3.63
Cond. D 48/50, 1,000	3.44	3.39	4.17	4.07	4.37	4.37	3.59
Cond. D 48/50, 1,000,000	3.10	3.07	3.55	3.42	3.75	3.77	3.31
Dissipation Factor:							
Cond. A, cps 60	.0036	.0097	.0074	.010	.0054	.0057	.0035
Cond. A, cps 1,000	.0070	.0097	.020	.027	.015	.015	.0055
Cond. A, cps 1,000,000	.019	.021	.032	.031	.036	.034	.023
Cond. D 48/50, 60 cps	.0059	.0078	.010	.013	.0068	.0065	.0049
Cond. D 48/50, 1,000	.011	.011	.023	.030	.017	.017	.0068
Cond. D 48/50, 1,000,000	.026	.026	.036	.035	.041	.039	.028
Volume Resistivity, Cdn. A	$1.22x10^{16}$	$4.86 x10^{15}$	$6.1x10^{15}$	$1.29x10^{16}$	$1.22x10^{16}$	$1.21x10^{16}$	$9.63x10^{15}$
Volume Cond. C 96/23/96	$1.22x10^{16}$	$2.91x10^{14}$	$1.7x10^{15}$	$1.1x10^{15}$	$1.22x10^{16}$	$9.05x10^{15}$	$4.09x10^{14}$
Surf. Resisitivity, Cdn. A	$5.5x10^{15}$	$7.85x10^{15}$	$7.85x10^{15}$	$7.85x10^{15}$	$>7.85x10^{15}$	$>7.85x10^{15}$	$>7.85x10^{15}$
Surf. Cond. C 96/23/96	$7.85x10^{15}$	$2.04x10^{14}$	$6.3x10^{15}$	$9.42x10^{14}$	$>7.85x10^{15}$	$>7.85x10^{15}$	$6.12x10^{13}$

ABOCAST (A)	**50-11**	**50-16**	**50-11**	**50-16**	**50-11**	**50-16**	**8103-16**
ABOCURE (B)	**50-1**	**50-1**	**50-12**	**50-12**	**50-17**	**50-17**	- - -
Blend : pbw (A)/(B)	100/35	100/35	100/13.5	100/14	100/27	100/28	- - -
" Viscosity : cps/25° C	2300	700	400	100	100 @ 70°C	60 @ 70°C	1500
Pot life , 500 gms, min	240	380	36	38	29 @ 70°C	29 @ 70°C	360 @100° C
Exotherm, ° C (peak)	190 °	154°	265°	280°	270°	242°	130°
Deflection Temperature, ℃	80°	58°	84°	64°	123°	102°	62°
Flexural Strength, psi	11430	9400	11830	13620	16350	19000	10590
Flexural Modulus, x 10^5	2.29	2.84	4.04	4.12	3.60	5.00	3.07
Compressive Strength, psi	10300	9190	14250	12690	15610	1440	10000
Compressive Modulus, x 10^5	2.40	2.39	3.05	2.86	2.71	2.70	3.20
Tensile Strength, psi	7880	6830	10710	9470	11380	11490	6930
Ultimate Elongation	14.4%	9.1%	7.5%	8.1%	8.5%	18.2%	14.4%
Izod Impact, notched	0.44	0.64	0.25	0.41	0.45	0.68	0.69
Hardness, Shore D	75	75	85	85	86	82	60
Thermal Degradation, Weight loss after:							
100 hrs @ 160 ℃	0.82%	Failure	1.03%	Failure	0.85%	Failure	4.44%
500 hrs @ 160 ℃	1.73%	Failure	1.80%	Failure	1.52%	Failure	7.84%
200 hrs @ 210 ℃	3.43%	Failure	4.29%	Failure	3.18%	Failure	15.2%
100 hrs @ 260 ℃	Failure	Failure	Failure	Failure	26.50%	Failure	44.1%
Weight Change after 120 days:							
in 30% Sulfuric Acid	7.2%	9.4%	4.9%	7.3%	3.5%	5.7%	1.3%
in Acetone	Failure	Failure	Failure	Failure	26.4%	>50%	Failure
in 50% Sodium Hydroxide	0.29%	0.13%	-0.13%	-0.14%	-0.07%	-0.02%	0.03%
in JP 4 Fuel	0.56%	0.40%	0.98%	0.05%	0.14%	0.18%	0.27%
in Distilled Water	3.00%	2.78%	2.05%	2.73%	1.76%	1.70%	2.66%
Dielectric Constant:							
Cond. A, cps 60	3.09	3.17	3.84	3.67	4.06	3.78	3.46
Cond. A, cps 1,000	3.06	3.12	3.77	3.62	4.01	3.75	3.40
Cond. A, cps 1,000,000	2.90	2.92	3.31	3.24	3.55	3.41	3.13
Cond. D 48/50, 60 cps	3.33	3.40	4.15	4.15	4.35	4.10	4.34
Cond. D 48/50, 1,000 cps	3.29	3.35	4.04	4.02	4.39	4.04	4.08
Cond. D 48/50, 1,000,000 cps	3.02	3.05	3.47	3.50	3.74	3.62	3.50
Dissipation Factor:							
Cond. A, cps 60	.0089	.0100	.0079	.0098	.0047	.0052	.0044
Cond. A, cps 1,000	.0078	.0089	.017	.013	.012	.0092	.012
Cond. A, cps 1,000,000	.017	.018	.028	.025	.037	.031	.024
Cond. D 48/50, 60 cps	.0100	.0120	.012	.021	.0061	.0096	.052
Cond. D 48/50, 1,000 cps	.010	.013	.021	.020	.014	.011	.031
Cond. D 48/50, 1,000,000 cps	.024	.027	.037	.037	.041	.037	.047
Volume Resistivity, Cond. A	$2.42x10^{15}$	$3.43x10^{15}$	$1.19x10^{16}$	$>1.19x10^{16}$	$>1.24x10^{16}$	$>1.22x10^{16}$	$7.52x10^{14}$
Volume Cond. C 96/23/96	$6.3x10^{14}$	$1.49x10^{14}$	$7.16x10^{14}$	$8.89x10^{14}$	$5.57x10^{15}$	$>1.22x10^{16}$	$1.10x10^{14}$
Surface Resistivity, Cond. A	$7.85x10^{15}$	$4.71x10^{15}$	$>1.19x10^{16}$	$7.85x10^{15}$	$3.53x10^{15}$	$>7.85x10^{15}$	$4.71x10^{14}$
Surface Cond. C 96/23/96	$1.1x10^{14}$	$1.57x10^{15}$	$8.89x10^{14}$	$6.67x10^{14}$	$5.1x10^{14}$	$>7.85x10^{15}$	$6.28x10^{13}$

CURE CYCLES:

ABOCAST 50-3, 50-6, 50-11 and **50-16** harden with **ABOCURE 50-1** or **50-12** in 2-24 hrs. or longer, at room temperature, or faster with heating. Full cure: 2-5 weeks at room temperature or 1-4 hrs at 80°-120°C. ABOCURE 50-1 requires at least twice as long as 50-12 to harden. Results are optimized by heat curing.

Curing the same ABOCAST resins with **ABOCURE 50-17** requires heat: 1-2 hrs. @ 80-100°C + 1-3 hrs. @ 120-150°C For larger castings and critical applications: 8-24 hrs. at room temperature, or until hard. Then: 1-2 hrs. @ 80°C + 1-2 hrs @ 100° + 1-2 hrs. @ 120° + (optional) 1-2 hrs @ 150-160°. Do not demold before 100° C cure cycle. At room temperature, the pot life of blends with ABOCURE 50-17 is 6-8 hrs. with a negligible exotherm. This offers obvious advantages where needed, and the possibility to make very large castings in single pourings.

ABOCAST 8103-11 and **ABOCAST 8103-16** are typical 'ONE-COMPONENT EPOXIES". They contain latent catalysts, and are cured by simple heating, without addition of hardeners. At room temperature, these epoxy systems remain liquid for 6 months or longer (whereas the ABOCAST/ABOCURE 2-component systems have a shelf life of at least one year). Gelling occurs within 3-4 hrs @ 100°C. Total cure: 4-6 hrs @ 100°. At 110-120°, gelling is reduced to 0.5-1.0 hour and cure to 1-2 hrs.

SUGUESTED USES: Bonding most structural materials, metals, concrete, masonry, wood, fiberglass, rigid plastics, glass, ceramics to themselves or to each other. Coating and resurfacing the same materials (structures, flours, walls, stairs, tanks, decks, runways, driveways, porches, patios, halls...). Potting and encapsulating electronic components, embedding samples or specimens for preservation or analysis, casting patterns and molds; pouring decorative or protective layers. Injection, filling, patching, repair, maintenance. Blending with all kinds of fillers (powders, fibers, sand, aggregates, etc.) for functional or decorative purposes. All are available as described above (liquid and clear), or in several colors, thixotropic (like vase line or peanut butter), or in other variations, without significant changes in other properties.