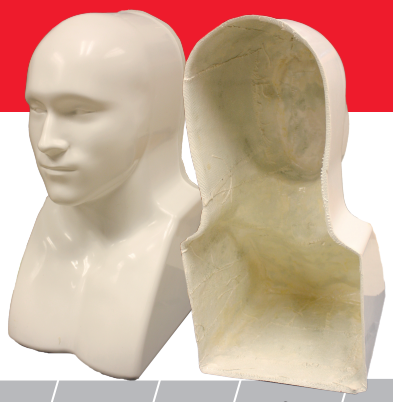
EPOXY LAMINATING RESINS



These room-temperature and high-temperature resins are ideal for general-purpose fiberglass laminated tooling and demanding abrasion-resistant or heat-resistant laminated tools.

Specifications

	Mix Ratio R:H (by wt.)	Mix Ratio R:H (by vol.)	Gel Time (min.) @ 72°F	Demold Time (hr.) @ 72°F	Hardness (Shore D)	Mixed Viscosity (cps)	Density (g/cc)	Volumetric Yield ($in.^3/lb.$)	Compressive Strength (psi)	Flexural Strength (psi)	Flexural Modulus (psi)	Tensile Strength (psi)	Coefficient Thermal Expansion (in./in./°F)	Deflection Temp. (°F)	Tg per DMA (°F)
Room-Temperature Laminating Resins															
Miapoxy 100/95 (Discontinued) See Miapoxy 101/195	100:24	100:25	38	24	90	800	1.13	24.5	26,000	39,000	–	36,000	0.93×10^{-5}	128	–
Miapoxy 101/195	100:23	4:1	35	24	82	800	1.10	25.1	10,600	14,200	320,000	8,800	–	120	–
Miapoxy 100/97 (Discontinued) See Miapoxy 101/197	100:26	100:25	20	24	90	1,120	1.13	24.5	28,000	37,000	–	26,000	1.0×10^{-5}	128	–
Miapoxy 101/197	100:22	4:1	15	24	84	900	1.14	–	11,900	14,700	476,000	8,600	–	140	–
RenLam 1710/Ren 1710 (Discontinued) See Freeman 605 & 621	100:16	100:23	22	24	90	3,500	1.35	20.5	23,000	30,000	1.8×10^{6}	25,000	1.20×10^{-5}	129	164
RenLam 1710/Ren 956 (Discontinued) See Freeman 605 & 621	100:16	100:23	35	24	89	2,000	1.35	20.5	26,900	32,900	1.5×10^{6}	25,000	0.81×10^{-5}	–	–
Freeman 605-15	100:16	100:20	20	24	82	2,850	1.30	21.3	40,000	33,500	1.8×10^{6}	25,300	–	188	–
Freeman 605-45	100:20	100:26	37	24	86	2,800	1.28	21.6	40,000	33,500	1.8×10^{6}	25,300	–	188	–
Freeman 601 (Discontinued) See Freeman 621	100:10	100:14	28	24	88	3,000	1.39	19.9	39,900	9,100	–	25,000	–	128	
RenLam 1720/Ren 956 (Discontinued) See Freeman 621	100:15	100:21	40	24	90	3,200	1.34	20.5	21,000	36,000	1.6×10^{6}	20,000	1.02×10^{-5}	–	164
Freeman 621	100:17	3.5:1	30	24	89	3,000	1.36	20.3	48,000	–	-	24,400	–	135	–
RenLam 1700-1/Ren 1700-1 (Discontinued) See Freeman 690	100:26	100:28	20	24	90	2,000	1.13	24.5	28,000	37,000	1.55×10^{6}	26,000	1.0×10^{-5}	128	–
RenLam 1700-1/Ren 956 (Discontinued) See Freeman 690	100:23	100:25	36	24	89	1,350	1.13	24.5	24,700	40,700	1.7×10^{6}	34,900	0.97×10^{-5}	129	–
RenLam 177-144/Ren 956 (Discontinued) See Freeman 690 & 6700	100:24	–	38	24	90	800	1.15	24.1	26,000	39,000	–	36,000	0.93×10^{-5}	–	273
Freeman 690	100:33	100:37	90	24	86	1,445	1.10	25.0	26,500	39,900	1.3×10^{6}	35,500	–	180	–
RenLam 8100/Ren 8100 (Discontinued) See Freeman 6700	100:25	100:29	35	24	92	2,500	1.15	18.5	23,450	42,180	1.91×10^{6}	32,224	1.2×10^{-5}	128	167
Freeman 6700	100:25	3.5:1	15-20	24	89	3,000	1.36	20.3	48,000	–	–	24,400	–	135	–
High-Temperature Laminating Resins															
Freeman 917 (Discontinued) See Freeman 927	100:10	100:13	52	24	92	4,000	1.46	19.0	24,500	30,574	1.6×10^{6}	23,000	2.56×10^{-5}	–	301
RenLam 4014/Ren 1500 (Discontinued) See Freeman 927	100:11	100:14	55	24	90	4,000	1.34	20.8	28,000	34,000	1.7×10^{6}	24,000	1.41×10^{-5}	–	333
Freeman 927	100:13	100:18	60	24	90	3,600	1.31	21.1	52,800	33,000	–	23,000	2.25×10^{-5}	–	301
RenLam 4005/Ren 1500 (Discontinued) See Freeman 4105	100:14	100:15	50	24	90	1,900	1.19	23.3	28,000	35,000	1.6×10^{6}	26,000	0.85×10^{-5}	289	338
Freeman 4105	100:14	6:1	30	24	88	1,800	1.15	–	21,600	16,600	–	12,400	–	355	–
RenLam 4017/Ren 1510 (Discontinued) No direct alternative	100:15	100:18	90	24	93	8,000	1.42	19.6	44,000	77,000	4.4×10^{6}	80,000	3.40×10^{-5}	–	350
SikaBiresin CH163-1	100:19	–	50-60	–	90	2,500	1.09	25.3	–	90,480	4,642	62,630	–	306	305
SikaBiresin CH163-2	100:25	–	50-75	–	88	3,500	1.18	23.4	–	44,540	2,296	33,690	–	320	331
SikaBiresin CH163-6	100:24	–	180-210	–	90	4,500	1.14	24.2	–	76,200	3,504	56,090	–	389	450
ASTM	–	–	D-2471	–	D-2240	D-2393	D-792	D-792	D-695	D-790	D-790	D-638	D-696	D-648	D-648

Miapoxy 101 (Room Temperature)

- 35 or 15 min. gel time
- 82 or 84 Shore D
- Clear

Miapoxy 101 is a clear, two-component laminating system designed for producing strong and accurate fiberglass laminates or repairs. There are two hardener options: Mia 195, for a longer, 35-minute working time for larger parts, and Mia 197, for smaller parts or repairs with a 15-minute working time.

Freeman 605 (Room Temperature)

- 20 or 37 min. gel time
- 82 or 86 Shore D
- White

This general-purpose epoxy laminating resin features a variable gel time (depending on the hardener used) and is designed to be used with Freeman 705 and Freeman 706 Surface Coats.

Freeman 621 (Room Temperature)

- 20 or 37 min. gel time
- 82 or 86 Shore D
- White

Freeman 621 is a white epoxy laminating resin used for large composite tooling, mold construction and check fixtures. Freeman 621 features low viscosity, for good wet out. Freeman 621 is designed to be used with Freeman 721 Surface Coat.

Freeman 690 (Room Temperature)

- 90 min. gel time
- 86 Shore D
- Translucent

Freeman 690 features a long gel time for construction of large laminated molds and finished parts. This product is clear, making it easy to identify any air entrapment. It is low in viscosity for easy cloth wet out.

Freeman 6700 (Room Temperature)

- 15-20 min. gel time
- 82 Shore D
- Translucent

Freeman 6700 is a general purpose, clear epoxy laminating system designed for producing laminates or for use as an adhesive. It may be used at room temperature without a post cure. A heated post cure is required For applications involving elevated temperatures up to 190°F a heated post cure is required.

Freeman 927 (High Temperature)

- 52 min. gel time
- 92 Shore D
- Gray

Freeman 927 is a low viscosity, aluminum-filled laminating system that offers excellent wet out and good working time for applications requiring service temperature up to 300°F. Freeman 927 pairs well with Freeman 955 Surface Coat. Both require heated post cure to obtain full properties.

Freeman 4105 (High Temperature)

- 30 min. gel time
- 88 Shore D
- Amber

Freeman 4105 is an unfilled, low-viscosity laminating system that offers excellent wet out for tooling applications requiring service temperature up to 350°F. A heated post cure is required to obtain full properties. It is excellent for bonding High-Temperature Tooling Boards.

SikaBiresin CR163 (High Temperature)

- 55, 60, or 195 min. gel time
- 88 or 90 Shore D
- Amber or Black

SikaBiresin® CR163 (formerly known as SIka EL-315) is a very stable, high-temperature epoxy laminating system, offering Tg up to 450°F. This material is available with a choice of three different hardeners (CH163-1, CH163-2, and CH163-6) to allow adequate construction and bagging time on large and small tools.

For part numbers, technical documents, and ordering, visit our website at ***www.FreemanSupply.com.***