BACON INDUSTRIES, INC.

East: 192 Pleasant Street, Waterotown, MA 02472 Phone: 617-926-2550 Fax: 617-926-2022
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EPOXY ADHESIVES

	FLUID					FLEXIBLE			THIXOTROPIC		LOW EXPANSION					THERMALLY CONDUCTIVE		ELECTRICALLY CONDUCTIVE	
Adhesive	FA-8	FA-14	CI-9	FA-48	FA-49	FFA-5	FFA-8	FFA-9	FTA-17	FTA-101	LCA-4	LCA-4LV	LCA-20	LCA-9	LCA-48	LCA-50	LCA-127	LCA-24	CONDUCTING 20/20
Activator	BA-5	BA-45	BA-182	BA-109	BA-9	BA-15	BA-15	BA-11	BA-89	BA-161	BA-5	BA-5	BA-40A	BA-5	BA-105	BA-9	BA-49	BA-9	BA-66B
Parts by weight of activator per 100 parts of adhesive	13.5	24.5	34	13.42	12	150	100	100	50	100	4.5	4.5	27.4	4.5	5.1	5.2	3.83	5.0	5.5
Mixed Viscosity at 77°F, poise	60	2	11	86	100	--	150	50	Paste	Paste	5300	3000	Paste	Paste	--	>4000	Paste	Paste	Paste
Work Life at 77°F, minutes	90	480	1000	180	240	120	120	15	170	360	60	100	--	90	200	120	150	60	60
Recommended Cure, hour/°F	2/200	8/160	4/212	2/212+ 2/375	2/200	2/200	3.5/200	24/77	2/140	2/160	2/200	2/200	2/160 + 4/200	2/200	2/212+ 2/375	2/200	0.5/200	2/200	2/200
TYPICAL CURED PROPERTIES																			
Color	**Blue green**	**Clear amber**	**Water clear**	**Clear amber**	**Opal white**	**Clear amber**	**Clear amber**	**Clear amber**	**Translucent amber**	**Black**	**Light green**	**Light green**	**Blue**	**Tan green**	**Black**	**Black**	**Black**	**Silver**	**Silver**
Specific Gravity	1.20	1.12	1.12	1.18	1.17	1.10	1.10	1.10	1.1	1.1	1.86	1.86	1.99	1.72	1.75	1.93	2.32	2.70	2.70
Hardness, Shore D	83	84	86	89	85	65	82	65	83	73	92	91	90	93	95	90	95	91	87
Bond Strength to aluminum at 77°F, psi	2650	2400	1800	2100	4600	2250	4500	2250	2500	3600	2400	2300	2420	2200	2000	3500	2300	1800	1800
Flexural Strength at 77°F, psi	18,000	10,000	19,000	16,100	11,400	--	10,500	--	14,000	3600	12,000	12,000	13,600	16,000	16,000	--	12,700	--	--
Flexural Modulus at 77°F, 10^6 psi	0.76	0.47	0.3	0.43	0.43	--	0.22	--	0.47	0.08	1.6	1.6	2.0	1.9	1.3	--	1.5	--	--
Water Absorption (24 hour immersion) at 77°F, %	0.12	0.16	0.21	0.17	0.11	--	0.22	0.25	0.83	0.71	-0.01	0.04	--	0.04	0.09	--	0.11	--	--
Glass Transition Temperature by DSC, °F	165	162	240	355	183	--	158	--	126 (TMA)	113	186	176	116	183	380	190	170	196 (HDT)	161 (HDT)
Coeff. of Thermal Expansion from -65°F to 77°F, 10^{-6}/°F	29	37	31	29	38	75	38	75	66	43	15	15	14.6	12	14	26	15	--	--
Volume Resistivity at 77°F, ohm-cm	10^{16}	10^{17}	10^{13}	10^{16}	--	--	10^{16}	--	10^{16}	10^{14}	10^{15}	10^{15}	--	--	10^{14}	--	10^{16}	0.002	0.002
Technical Data Sheet Number	2308	2314	1071	2348	2349	2405	2408	2409	2617	2601	2504	2505	2520	2509	2548	2550	2627	2041	2041

FA-8: Low viscosity fluid for bonding and sealing beryllium, aluminum and other metals. Meets NASA outgassing requirements.

FA-14: Very low viscosity and excellent wetting property for bonding fused beryllium oxide, ceramics and other metals.

CI-9: Low viscosity system with excellent color stability for coating, bonding, impregnating and clear casting applications. Meets NASA outgassing requirements.

FA-48: Clear, low viscosity and high Glass Transition Temperature for high temperature applications.

FA-49: High bond strength, excellent impact and thermal shock resistance for bonding similar and dissimilar substrates.

FFA-5: Low viscosity, flexible general purpose adhesive.
FFA-8: Medium viscosity, flexible general purpose adhesive.

FFA-9: Fast setting room-temperature-curing flexible adhesive.

FTA-17: Non-sag thixotropic adhesive with flexibility and hardness providing good bond strength.

FTA-101: Flexible thixotropic adhesive with excellent bond strength to many substrates.

LCA-4: Instrument grade adhesive. Low coefficient of thermal expansion and meets NASA outgassing requirements.

LCA-4LV: Similar to Adhesive LCA-4 except longer pot life and lower viscosity. Meets NASA outgassing requirements.

LCA-20: Gyro grade adhesive having a low coefficient of thermal expansion. It exhibits excellent adhesion to difficult to bond substrates. Used in Laser applictions. Meets NASA outgassing requirements.

LCA-9: Lowest coefficient of thermal expansion adhesive. Meets NASA outgassing requirements.

LCA-48: Filled version of Adhesive FA-48 for lower thermal expansion for high temperature applications.

LCA-50: Thermally conductive filled adhesive with excellent bond strength.

LCA-127: Thixotropic thermally conductive and electrically insulating adhesive.

LCA-24: Excellent all around electrically conductive system with better strength above 160°F and better long term electrical conductivity stability.

CONDUCTING 20/20: Electrically conductive, silver filled epoxy adhesive with low viscosity at room temperature.

FREEZE-PAKS: Bacon Industries' FREEZE-PAKS assure quality, save expensive production time, increase in-plant safety and eliminates most difficult material handling problems. Bacon Industries' FREEZE-PAKS are supplied in syringes and capsules ranging in size from 1cc upwards. This protective packaging not only is the handy dispenser from a drop to a continuous flow, but protects the user against personal contact from many of the irritating amine curing agents used in epoxy resin formulations. FREEZE-PAKS are manufactured in batch quantities under controlled conditions so that all containers are of identical composition. Each container is marked with a batch number and date of manufacture assuring complete traceability. Therefore, B.I. FREEZE-PAKS assure uniform quality and predictable performance.

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URETHANE ADHESIVES

FLEXOBOND	202	329	430	431	THERMALLY CONDUCTIVE 442
Adhesive	202A	329	430	431	442
Activator	BA-400	BA-329	BA-430	BA-431	**
Parts by weight of activator per 100 parts of adhesive	35	25.6	50	58.3	--
Mixed Viscosity at 77°F, cp	12,000	Heavy Paste	1600	1200	Heavy Paste
Work Life at 77°F, minutes	45	60	100	135	240
Recommended Cure, hour/°F	2/212	2/212	2/200	24/77+ 2/212	2/180
Note: Additional cure increases strength and hardness.					
TYPICAL CURED PROPERTIES					
Color	**Creamy tan**	**Black**	**Clear straw**	**Clear straw**	**Gray black**
Specific Gravity	1.0	1.1	1.1	1.1	2.0
Hardness, Shore A	73	90*	67	84	78
D	23	36*	26	26	--
Bond Strength to aluminum at 77°F, psi	900	1500	450	1300	500
Water Absorption (24 hour immersion) at 77°F, %	0.04	--	<0.2	0.1*	0.14*
Technical Data Sheet Number for complete information	2700	2729	2730	2731	2742

FLEXOBOND series of urethanes usually used in the medical, electronics and aerospace industries.

*7 days at 77°F.

**Available in premixed and frozen only.

FLEXOBOND 202: Rubber modified, fast cure, good adhesion to difficult to bond substrates. Does not contain any TDI, MOCA, lead or mercury.

FLEXOBOND 329: Black thixotropic soft adhesive with high bond strength. Does not contain any TDI, MOCA, lead or mercury.

FLEXOBOND 430: A clear, soft urethane with long work life. Does not contain any TDI, MOCA, lead or mercury.

FLEXOBOND 431: A clear material with low outgassing. Used in the medical industry. Does not contain any TDI, MOCA, lead or mercury. Meets NASA outgassing requirements.

FLEXOBOND 442 BLACK: A thermally conductive flexible urethane resin system for bonding or filleting glass diodes or other stress sensitive components while simultaneously providing a heat flow path. Has excellent electrical properties, flexibility and is low outgassing. It is being used in aerospace applications on circuit boards and is designed for high reliability. Meets NASA outgassing requirements.

ADVANTAGES OF USING FREEZE-PAKS

• AVOID MIXING ERRORS • REDUCE REJECTS • ELIMINATE WASTE • REDUCE PRODUCTION TIME • NO MESSY MIXING AND TIME CONSUMING CLEAN-UP
• PROTECT YOUR WORKERS FROM UNDUE HAZARDS BY SWITCHING TO MODERN SAFER B.I. FREEZE-PAKS

B.I. FREEZE-PAKS are vacuum degassed. This special feature removes entrapped air from the premixed adhesive prior to packaging. Degassed adhesives are stronger and denser. Because there are no discontinuities in the cured film, cracks and failures caused by stress concentrations are eliminated and leak-proof joints are routine. Our experience indicates a properly degassed system will maximize performance. This special high performance feature is available at no extra cost with all B.I. FREEZE-PAKS.

POTTING CASTING ENCAPSULATING COMPOUNDS

	LOW THERMAL EXPANSION				THERMALLY CONDUCTIVE		LIGHT WEIGHT	LOW COST				SILICONE COMPOUNDS	
	P-11	**P-14**	**P-82F**	**P-182**	**P-56A**	**P-178**	**P-175**	**C84/63**	**P-120**	**P-86**	**P-103**	**SC-14A**	**SC-17**
Base Resin	**Epoxy**	**Epoxy**	**Epoxy**	**Epoxy**	**Epoxy**	**Epoxy**	**Epoxy**	**Epoxy**	**Epoxy**	**Epoxy**	**Epoxy**	**Silicone**	**Silicone**
Compound	1119	1420	24F	182	56	178	175	84	120	85	103	SC-14A	SC-17
Activator	BA-1	BA-1	BA-45	BA-182	BA-22A	BA-47	BA-157	BA-63	BA-103	BA-62	BA-99	BA-59A	BA-58
Parts by weight of activator per 100 parts of compound	3.3	3.12	6.0	8.0	71	6.0	16.5	7.3	5.0	27	15	0.3	2.5
Mixed Viscosity, poise/°F	25/212	25/212	9/160	12/160	50/160	14/160	35/160	60/77	26/180	40/75	100/77	500/77	1500/77
Work Life hour/°F	1.5/212	1/212	1/160	1/160	0.7/160	2/160	0.75/160	2/75	30/180	16/75	2/75	3/77	3/77
Recommended Cure, hour/°F	20/212	20/212	3/160+ 16/212	3/160+ 16/212	8/160	16/160	8/160+ 16/250	3/77+ 2/250	4/180	4/180	2/140	24/77	1/212
TYPICAL CURED PROPERTIES													
Color	**Tan**	**Brown**	**Red**	**Black**	**Brown**	**Black**	**Black**	**Black**	**Black**	**Black**	**Black**	**White**	**White**
Specific Gravity	1.85	1.77	1.85	1.82	2.3	2.32	0.75	1.68	1.86	1.72	1.55	1.8	2.23
Hardness, Shore D	88	--	93	-	90	--	75	86	92	90	90	A-60	A-74
Linear Shrinkage, %	0.3	0.3	0.036	0.07	0.5	--	0.25	0.00	0.1	0.16	0.3	--	--
Water Absorption (24 hour immersion) at 77°F, %	--	--	0.03	0.04	--	--	0.02	0.04	0.02	0.02	0.3	--	--
Glass Transition Temperature by DSC, °F	196	209	264(TMA)	276	210 (HDT)	--	277	154 (HDT)	212	165	124	--	--
Coeff. of Thermal Expansion from -65°F to 77°F, 10⁻⁶/°F	14	11	10.4	12	18	17	16	19	14	18	27	65	60
Thermal Conductivity, Btu-in/ft²-hr-°F	3	4	5	5	7	7	1.4	--	--	--	--	5	7
Flexural Strength at 77°F, psi	--	--	22,100	24,500	--	--	5500	10,000	17,000	12,000	17,000	--	--
Flexural Modulus at 77°F, 10^6 psi	1.1	1.6	1.6	1.8	--	--	0.46	1.1	1.8	1.6	0.94	--	--
Dielectric Constant at 77°F and 1 kHz	5.37	4.79	5.14	4.65	5.8	6.32	2.61	4.3	4.37	3.91	5.01	4.9	--
Dissipation Factor at 77°F and 1 kHz	0.002	0.03	0.018	0.014	0.003	0.006	0.013	0.008	0.008	0.003	0.007	0.010	--
Volume Resistivity at 77°F, ohm-cm	10^{16}	10^{14}	10^{14}	10^{14}	10^{16}	10^{15}	10^{14}	10^{16}	10^{15}	10^{16}	10^{15}	10^{15}	10^{15}
Technical Data Sheet Number	1311	1314	1382	1482	1356	1478	1475	1384-63	1420	1386	1403	1514	1517

P-11: Highly filled system with low thermal expansion and excellent machinability.

P-14: Similar to P-11 except lower expansion and better thermal shock resistance.

P-82F: Highly filled high performance system with low thermal expansion, relatively low viscosity, high strength and high modulus of elasticity. Will meet NASA outgassing

P-182: Highly filled high performance system with low thermal expansion and excellent dimensional stability. Will meet NASA outgassing requirements.

P-56A: Mineral filled, thermally conductive compound with excellent electrical properties.

P-178: Filled, thermally conductive compound with good flexibility and thermal shock resistance. Not recommended for high temperature applications.

P-175: Low density syntactic foam epoxy compound with low dielectric constant and good long term stability. Meets NASA outgassing requirements.

C-84/BA-63: General purpose low viscosity potting compound with excellent dielectric properties.

P-120: General purpose compound with good solvent resistance.

P-86: Heat cure system with low exotherm, suitable for large mass, easily pourable with excellent dielectric properties.

P-103: General purpose compound with good resistance to impact and thermal shock. Meets NASA outgassing requirements.

SC-14A: Filled silicone compound with high thermal conductivity, good thermal stability and excellent electrical properties.

SC-17: Filled silicone compound with similar cured properties as SC-14A except has a higher viscosity.

B.I. FREEZE-PAKS are meeting the special needs of the electronics, instruments and other industries requiring the highest quality product. Most of B.I. products are available in FREEZE-PAKS. In addition, Bacon Industries also processes most commercially available 2 part systems so that the advantages and convenience of B.I. FREEZE-PAKS are now available regardless of the product requirement. Each batch is tested and qualified to the appropriate specification.

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