

Polymeric Materials – Filament-wound Tubing, Industrial Laminates,
Vulcanized Fiber, and Materials for Use in Fabricating Recognized Printed
Wiring Boards – Component

COMPANY											E212661
Jinbao Electronics (Tongling) Co Ltd											
Tonglin Economic & Technology Dev Zone											
Tongling, Anhui 244000 China											

Industrial laminates:

Mtl Dsg	ANSI Type	Color	Build up	Flame Class	R.T.I.		H				Meets 746E Non-HAL	Meets 746E DSR
			Min Thk (mm)		Elec (°C)	Mech (°C)	H W I	H A I	V T R	C T I		
PTFE Industrial laminates furnished as sheets, rods or tubes												
HR-6000	No ANSI	NC	0.12	V-0	-	-	-	-	-	-	-	-
			0.38	V-0	-	-	-	-	-	-	-	-
			0.80	V-0	-	-	-	-	-	-	-	-
			1.60	V-0	-	-	-	-	-	-	-	-
Industrial laminates furnished as sheets												
HR-1130, CEPCP-22F												
	No ANSI	NC	0.63	V-0	90	90	-	-	-	-	-	-
			1.40	V-0	90	90	-	-	-	-	-	-
HRFR-4, HR-4130	FR-4.0	NC	0.38	V-0	130	130	0	4	0	-	-	-
			0.63	V-0	130	140	0	3	0	-	-	Yes
			1.40	V-0	130	140	0	2	0	4	-	Yes
HRFR-4UV, HR-4140												
	FR-4.0	YL	0.38	V-0	130	130	0	1	-	-	-	Yes
			0.63	V-0	130	140	0	1	-	-	-	Yes
			1.40	V-0	130	140	0	1	-	3	-	Yes
HRG-4150CTI, HRG-4170CTI												
	FR-4.1	NC	0.10	V-0	130	130	0	0	-	-	Yes	Yes
			0.20	V-0	130	130	0	0	-	-	-	Yes
			0.38	V-0	130	130	0	0	-	-	-	Yes
			0.63	V-0	130	140	0	0	-	-	-	Yes
			1.40	V-0	130	140	0	0	-	0	-	Yes
HRG-4170HC	FR-15.1	NC	0.10	V-0	140	130	0	0	-	-	Yes	Yes
			0.20	V-0	150	140	0	0	-	-	-	Yes
			0.38	V-0	150	140	0	0	-	-	-	Yes
			0.63	V-0	150	150	0	0	-	-	-	Yes
			1.40	V-0	150	150	0	0	-	0	-	Yes
HRG-4180, HRG-4150, HRG-4180L, HRG-4150H, HRG-4180A												
	FR-4.1	NC	0.05	-	-	-	-	-	-	-	Yes	-
			0.10	V-0	130	130	4	0	-	-	-	Yes
			0.20	V-0	130	130	4	0	-	-	-	Yes
			0.38	V-0	130	130	4	0	-	-	-	Yes
			0.63	V-0	130	140	0	0	-	-	-	Yes
			1.40	V-0	130	140	0	0	-	2	-	Yes
HRH-4170, HRM-4150, HRM-4150A, HRH-4170A												
	FR-4.0	NC	0.05	-	-	-	-	-	-	-	-	-
			0.10	V-0	120	90	0	0	-	-	-	Yes
			0.20	V-0	120	90	0	0	-	-	-	Yes

			0.38	V-0	130	130	0	0	-	-	-	Yes
			0.63	V-0	130	140	0	0	-	-	-	Yes
			1.40	V-0	130	140	0	0	-	3	-	Yes
ZD-8400, HRG-4180M												
	FR-15.1	NC	0.05	-	-	-	-	-	-	-	Yes	-
			0.10	V-0	150	130	4	0	-	-	-	Yes
			0.20	V-0	150	150	4	0	-	-	-	Yes
			0.38	V-0	150	150	4	0	-	-	-	Yes
			0.63	V-0	150	150	0	0	-	-	-	Yes
			1.40	V-0	150	150	0	0	-	2	-	Yes
Industrial laminates furnished as sheets, rods or tubes												
HR-4600, HRE-4600												
	FR-4.0	NC	1.40	V-0	130	140	0	2	-	0	-	Yes
			0.63	V-0	130	140	0	3	-	-	-	Yes
			0.38	V-0	130	130	0	3	-	-	-	Yes
			0.20	V-0	120	90	0	3	-	-	-	Yes
			0.10	V-0	120	90	0	3	-	-	-	Yes
HRE-4151, HRE-4130												
	FR-4.0	NC	0.63	V-0	130	140	0	3	-	-	-	Yes
			1.40	V-0	130	140	0	2	-	3	-	Yes
Industrial laminates												
HR-3130, HRE-3130, HR-3132, HRE-3150												
	CEM-3.0	NC	0.63	V-0	130	140	0	2	-	-	-	Yes
			1.40	V-0	130	140	0	2	-	3	-	Yes
HRE-4150	No ANSI	NC	0.80	V-0	-	-	-	-	-	-	-	-
			1.60	V-0	-	-	-	-	-	-	-	-

Metal base industrial laminates:

Mtl Dsg	Color	Metal		Dielectric		Flame Class	R.T.I.		H				Meets 746E Non-HAL	Meets 746E DSR
		Min Thk (mm)	Max Thk (mm)	Min Thk (mic)	Max Thk (mic)		Elec (°C)	Mech (°C)	H W I	H A I	V T R	C T I		
Aluminum base with Epoxy (EP) dielectric, industrial laminates furnished as sheets														
<i>HRA-5, HRA-520A</i>	NC	0.50	-	70	200	V-0	130	130	4	0	-	0	-	Yes
<i>HRA-510, HRA-515, HRA-520, HRA-530</i>														
	NC	0.5	-	100	200	V-0	130	130	3	3	-	3	-	Yes
<i>HRA-5100, HRA-5105, HRA-5110</i>														
	NC	0.80	-	80	80	V-0	-	-	-	-	-	-	-	-

Ultrathin build ups:

Build Up					Laminate				Prepreg				
Mtl Dsg	ANSI Type	Min Thk (mm)	TI Elec	TI Mech	Mtl Dsg	Thk (mic)	TI Elec		Mtl Dsg	Thk (mic)	TI Elec		
HR-4600, HRE-4600													
	FR-4.0	0.63	130	140	HR-4600, HRE-4600	80	90		HRP-4600, HREP-4600	80	90		
		0.38	130	130	HR-4600, HRE-4600	80	90		HRP-4600, HREP-4600	80	90		
HRFR-4, HR-4130	FR-4.0	0.38	130	130	HRFR-4, HR-4130	50	90		HRPFR-4, HRP-4130	50	90		
HRFR-4UV, HR-4140													
	FR-4.0	0.38	130	130	HRFR-4UV, HR-4140	50	90		HRPFR-4UV, HRP-4140	50	90		
HRG-4150CTI, HRG-4170CTI													
	FR-4.1	0.10	130	130	HRG-4150CTI, HRG-4170CTI	50	90		HRGP-4150CTI, HRGP-4170CTI	50	90		
		0.63	130	140	HRG-4150CTI, HRG-4170CTI	50	90		HRGP-4150CTI, HRGP-4170CTI	50	90		
HRG-4170HC	FR-15.1	0.10	140	130	HRG-4170HC	50	90		HRGP-4170HC	50	90		

		0.20	150	140	HRG-4170HC	50	90	HRGP-4170HC	50	90
		0.63	150	150	HRG-4170HC	50	90	HRGP-4170HC	50	90
HRG-4180, HRG-4150, HRG-4180L, HRG-4150H, HRG-4180A										
	FR-4.1	0.20	130	130	HRG-4180,HRG-4150, HRG-4180L, HRG-4150H, HRG-4180A	50	90	HRGP-4180, HRGP-4150, HRGP-4180L, HRGP-4150H, HRGP-4180A	50	90
		0.63	130	140	HRG-4180,HRG-4150, HRG-4180L, HRG-4150H, HRG-4180A	50	90	HRGP-4180, HRGP-4150, HRGP-4180L, HRGP-4150H, HRGP-4180A	50	90
HRH-4170, HRM-4150, HRM-4150A, HRH-4170A										
	FR-4.0	0.38	130	130	HRH-4170, HRM-4150, HRM-4150A, HRH-4170A	50	90	HRHP-4170, HRMP-4150, HRMP-4150A, HRHP-4170A	50	90
		0.63	130	140	HRH-4170, HRM-4150, HRM-4150A, HRH-4170A	50	90	HRHP-4170, HRMP-4150, HRMP-4150A, HRHP-4170A	50	90
ZD-8400, HRG-4180M										
	FR-15.1	0.20	150	150	ZD-8400	50	90	ZDP-8400	50	90

Metal clad industrial laminates:

Metal Clad Dsg	Lam- inate Dsg	Pre- preg Dsg	ANSI Type	Bld up	Clad Cond Thk				Max	Max	Assembly Solder		Solder Lts		
				Min Thk (mm)	Min Ext (mic)	Max Ext (mic)	Max Int (mic)	Area Dia (mm)	Flame Class	Oper Temp (°C)	Process Temp(°C)	Process Cycles	Temp (°C)	Time (sec)	
Metal clad industrial laminates for use in multilayer printed wiring boards with copper on one or both sides, furnished as sheets															
HRFR-4, HR-4130	HRFR-4, HR-4130	HRPFR-4, HRP-4130	FR-4.0	0.38	17	102	102	50.8	V-0	130	-	-	288	20	
HRFR-4UV, HR-4140															
	HRFR-4UV, HR-4140	HRPFR-4UV, HRP-4140	FR-4.0	0.38	17	103	103	50.8	V-0	130	-	-	288	20	
HRG-4150CTI, HRG-4170CTI/HRGP-4150CTI, HRGP-4170CTI (ASP 1)															
	HRG-4150CTI, HRG-4170CTI	HRGP-4150CTI, HRGP-4170CTI	FR-4.1	0.38	17	102	68	50.8	V-0	130	260	6	288	20	
HRG-4170HC/HRGP-4170HC (ASP 1)															
	HRG-4170HC	HRGP-4170HC	FR-15.1	0.38	17	102	68	50.8	V-0	130	260	6	288	20	
HRG-4180, HRG-4150, HRG-4180L, HRG-4150H, HRG-4180A															
	HRG-4180, HRG-4150, HRG-4180L, HRG-4150H, HRG-4180A	HRGP-4180, HRGP-4150, HRGP-4180L, HRGP-4150H, HRGP-4180A	FR-4.1	0.38	17	102	68	50.8	V-0	130	-	-	288	20	
ZD-8400, HRG-4180M															
	ZD-8400, HRG-4180M	ZDP-8400, HRGP-4180M	FR-15.1	0.38	17	102	68	50.8	V-0	130	-	-	288	20	
Metal clad industrial laminates for use in multilayer printed wiring boards with copper on one or both sides, furnished as sheets or rolls															
HRH-4170, HRM-4150, HRM-4150A, HRH-4170A															
	HRH-4170, HRM-4150, HRM-4150A, HRH-4170A	HRHP-4170, HRMP-4150, HRMP-4150A, HRHP-4170A	FR-4.0	0.38	17	102	68	50.8	V-0	130	-	-	288	20	
Metal clad industrial laminates for use in single layer printed wiring boards with copper on one or both sides, furnished as sheets															
HR-1130, CEPCP-22F															
	HR-1130, CEPCP-22F	-	No ANSI	0.63	17	102	-	13	V-0	90	-	-	260	20	
HR-4600, HRE-4600															
	HR-4600, HRE-4600	-	FR-4.0	0.63	34	102	-	50.8	V-0	130	-	-	288	20	
				0.10	17	102	-	50.8	V-0	90	-	-	288	20	
HRE-4151, HRE-4130															
	HRE-4151, HRE-4130	-	FR-4.0	0.63	34	102	-	50.8	V-0	130	-	-	288	20	
HRFR-4, HR-4130	HRFR-4, HR-4130	-	FR-4.0	0.38	17	103	-	50.8	V-0	130	-	-	288	20	
HRFR-4UV, HR-4140															
	HRFR-4UV, HR-4140	-	FR-4.0	0.38	17	103	-	50.8	V-0	130	-	-	300	30	
HRG-4150CTI, HRG-4170CTI (ASP 1)															
	HRG-4150CTI, HRG-4170CTI	-	FR-4.1	0.1	17	102	-	50.8	V-0	130	260	6	288	20	
HRG-4170HC (ASP 1)															
	HRG-4170HC	-	FR-15.1	0.1	17	102	-	50.8	V-0	130	260	6	288	20	

<i>HRG-4180, HRG-4150, HRG-4180L, HRG-4150H, HRG-4180A</i>															
	HRG-4180, HRG-4150, HRG-4180L, HRG-4150H, HRG-4180A	-	FR-4.1	0.1	17	102	-	50.8	V-0	130	-	-	288	20	
<i>HRH-4170, HRM-4150, HRM-4150A, HRH-4170A</i>															
	HRH-4170, HRM-4150, HRM-4150A, HRH-4170A	-	FR-4.0	0.38	17	102	-	50.8	V-0	130	-	-	288	20	
				0.10	17	102	-	50.8	V-0	90	-	-	288	20	
<i>ZD-8400, HRG-4180M</i>															
	ZD-8400, HRG-4180M	-	FR-15.1	0.1	17	102	-	50.8	V-0	130	-	-	288	20	
Metal clad industrial laminates for use in single layer printed wiring boards with copper on one or both sides,															
<i>HR-3130, HRE-3130, HR-3132, HRE-3150</i>															
	HR-3130, HRE-3130, HR- 3132, HRE-3150	-	CEM- 3.0	0.63	17	102	-	50.8	V-0	130	-	-	260	20	

Metal clad metal base industrial laminates:

Metal Clad Dsg	Lam- inate Dsg	Pre- preg Dsg	Metal		Dielectric		Clad Cond Thk			Max		Max		Assembly Solder		Solder Lts	
			Min Thk (mm)	Max Thk (mm)	Min Thk (mic)	Max Thk (mic)	Min Ext (mic)	Max Ext (mic)	Max Int (mic)	Area Dia (mm)	Flame Class	Oper Temp (°C)	Process Temp(°C)	Process Cycles	Temp (°C)	Time (sec)	
			Aluminum base with Epoxy (EP) dielectric, Metal clad industrial laminates with copper on one side only, furnished as sheets														
<i>HRA-5, HRA-520A</i>	-	-	0.5		70	200	18	102	-	50.8	V-0	130	-	-	300	30	
<i>HRA-510, HRA-515, HRA-520, HRA-530</i>																	
	HRA-510, HRA-515, HRA-520, HRA-530	-	0.5		100	200	17	102	-	50.8	V-0	130	-	-	288	20	

Metal clad industrial laminates (Flammability Only Recognition):

Metal Clad Dsg	Lam- inate Dsg	Pre- preg Dsg	ANSI Type	Bld up		Clad Cond Thk		Max		Max		Assembly Solder		Solder Lts	
				Min Thk (mm)	Min Ext (mic)	Max Ext (mic)	Max Int (mic)	Area Dia (mm)	Flame Class	Oper Temp (°C)	Process Temp(°C)	Process Cycles	Temp (°C)	Time (sec)	
PTFE Metal clad industrial laminates for use in single layer printed wiring boards with copper on one or both sides, furnished as sheets															
HR-6000	HR-6000	-	No ANSI	0.12	-	-	-	-	V-0	-	-	-	-	288	30
Metal clad industrial laminates for use in single layer printed wiring boards with copper on one or both sides,															
HRE-4150	-	-	No ANSI	0.80	-	-	-	-	V-0	-	-	-	-	260	20

Metal clad metal base industrial laminates (Flammability Only Recognition):

			Metal		Dielectric		Clad Cond Thk			Max		Max		Assembly Solder		Solder Lts	
Metal Clad Dsg	Lam-inate Dsg	Pre-preg Dsg	Min Thk (mm)	Max Thk (mm)	Min Thk (mic)	Max Thk (mic)	Min Ext (mic)	Max Ext (mic)	Max Int (mic)	Area Dia (mm)	Flame Class	Oper Temp (°C)	Process Temp(°C)	Process Cycles	Temp (°C)	Time (sec)	
Aluminum base with Epoxy (EP) dielectric, Metal clad industrial laminates with copper on one side only, furnished as sheets																	
HRA-5100, HRA-5105, HRA-5110																	
	-	-	0.80		80	80	-	-	-	-	V-0	-	-	-	260	20	

ASP 1 – Assembly solder process evaluated to IPC-TM-650, 2.6.27 Thermal Stress Assembly Simulation.

Marking: Company name, material designation on container or wrapper.

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