



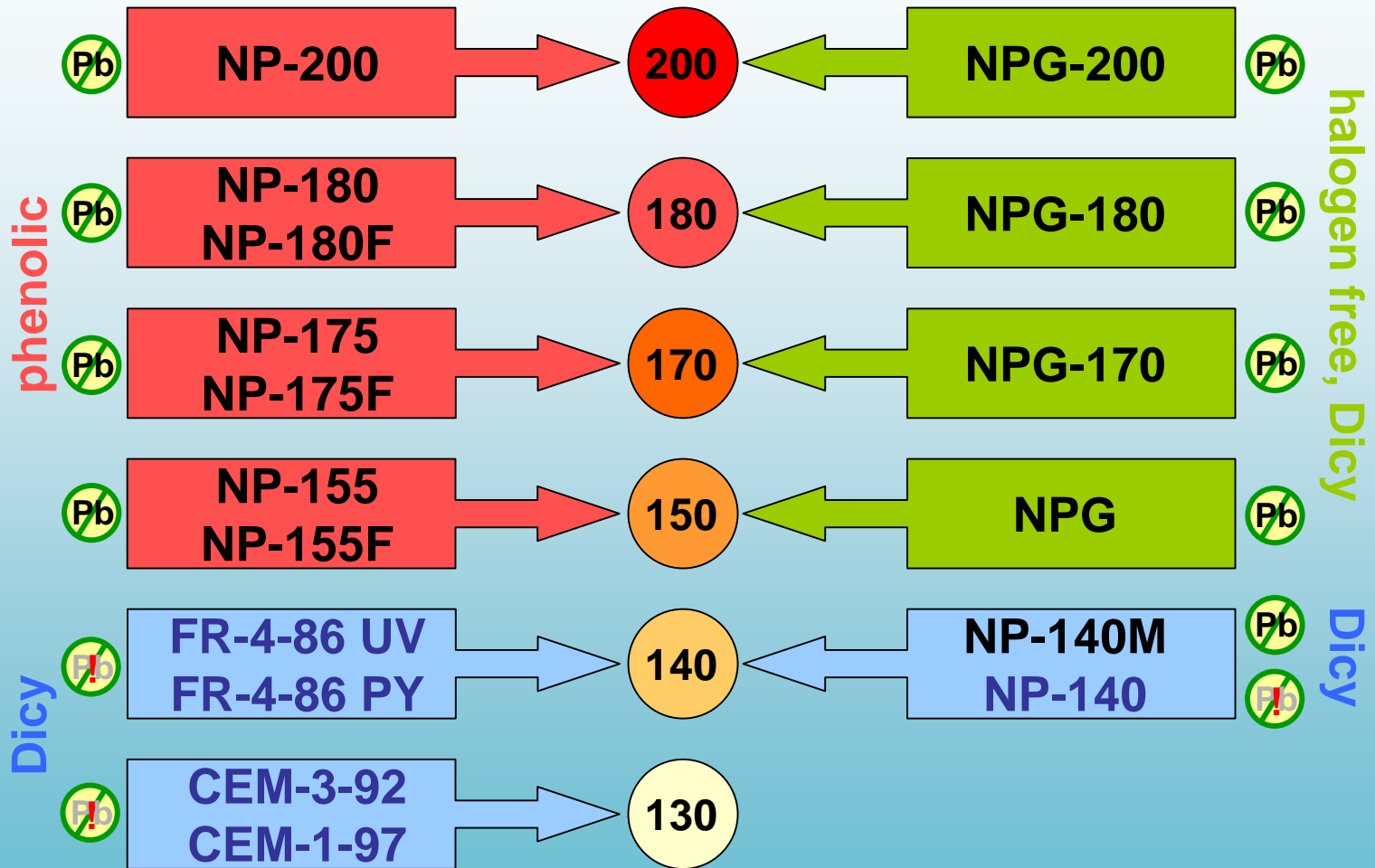
		Standard			Halogen free		Phenolic cured	
		FR-4-86	FR-4-86 PY	NP-140	NPG	NPG-170	NP-155F	NP-175F
thermic	Tg (DSC) *	140 °C	140 °C	140 °C	150 °C	170 °C	150 °C	170 °C
	Td 5 % (TGA) **	310 °C	310 °C	310 °C	345 °C	351 °C	357 °C	359 °C
	T 260 [min]	15~25	15~25	15~25	> 60	> 60	> 60	> 60
	T 288 [min]	2	2	2	> 20	> 20	> 30	> 30
	Enhanced safty Pb-free process	-	-	-	yes	yes	yes	yes
mechanical	CTE x [ppm/K]	15~18	15~18	15~18	11~15	11~15	13~16	13~16
	CTE y [ppm/K]	15~18	15~18	15~18	11~15	11~15	13~16	13~16
	CTE z pre Tg [ppm/K]	55~70	55~70	55~70	30~50	30~50	45~55	45~55
	CTE z post Tg [ppm/K]	270~300	270~300	270~300	200~230	200~230	245~270	245~270
	TE z % (50 °C ~ 260 °C)	3,9~4,3	3,9~4,3	3,9~4,3	2,6~3,0	2,4~2,8	3,4~3,8	3,0~3,3
	Tested -40/+125 °C / 500 x	yes	yes	yes	yes	yes	yes	yes
	Tested -40/+140 °C / 1000 x	-	-	-	yes	yes	-	-
elektric	Permittivity 1 MHz	4,5~4,7	4,5~4,7	4,2~4,4	4,2~4,4	4,3~4,5	4,3~4,5	4,3~4,5
	Permittivity 1 GHz	4,0~4,2	4,0~4,2	3,8~4,0	3,8~4,0	3,9~4,1	3,8~4,0	3,8~4,0
	Loss Tangent 1 MHz	0,015~0,020	0,010~0,016	0,015~0,020	0,014~0,016	0,014~0,016	0,016~0,020	0,016~0,020
	Loss Tangent 1 GHz	0,012~0,014	0,010~0,016	0,012~0,014	0,012~0,014	0,012~0,014	0,012~0,014	0,012~0,014
	CTI (PLC / range [V])	3 / 175~249	0 / > 600	3 / 175~249	2 / 250~399	2 / 250~399	3 / 175~249	3 / 175~249
RoHS conform		yes	yes	yes	yes	yes	yes	yes
Anti CAF		yes	yes	yes	yes	yes	yes	yes
IPC 4101 B data sheet #		21	-	21	92, 94, 127	94, 127, 128	24, 99, 101	26, 99, 126

* 20 °C/min, ** 10 °C/min

The data contained herein is believed to be accurate based on our current knowledge, even though they are without liability and guarantee



Tg [°C] DSC



suitable for lead free soldering
 optional for lead free soldering