

Materials thermal properties :

Material	Transverse sound velocity (1) [m/s]	Longitudinal sound velocity (1) [m/s]	Density (2) [kg/m³]	Molar mass (2) [g/mol]	Debye temperature (3,4) [K]
Ag	3640	1690	10500	108	221
Al	6360	3130	2700	27	390
Au	3280	1190	19300	197	178
Cu	4760	2300	8960	63	310
Cr	6850	3980	7150	52	424
Ir	5380	3050	22500	192	228
Mo	6250	3350	10200	96	377
Ni	5810	3080	8900	58	345
Pd	4540	1900	12000	106	275
Pt	4080	1690	21500	195	225
Ta	4100	2900	16400	181	225
W	5180	2870	19300	184	312
Silicon	8433	5845	2329	28	650
Sapphire	11400	6170	3980	102	1000
Diamond	18200	12300	3513	12	2200

Experimental TBC and predictions

Material	TBC Si [MW/m ² K]	TBC Al ₂ O ₃ [MW/m ² K]	TBC O:C [MW/m ² K]	TBC Si Litt [MW/m ² K]	TBC Al ₂ O ₃ Litt [MW/m ² K]	TBC Diam Litt [MW/m ² K]	Irradiance [MW/m ² K]	DMM - Si (Debye) [MW/m ² K]	DMM - Si (Sine type) [MW/m ² K]	DMM - Al ₂ O ₃ (Debye) [MW/m ² K]	DMM - Al ₂ O ₃ (Sine type) [MW/m ² K]	DMM - Diam (Debye) [MW/m ² K]	DMM - Diam (Sine type) [MW/m ² K]
Ag	158	77	43			47 (5)	125	91	49	77	33	22	10
Al	363	160		360 (6), 217** (7)	180* (8), 180 (9), 300 (7)	46 (8), 220 (10), 232(5)	219	389	297	340	215	108	56
Au	116	57	76	119 (11), 45** (7)	45 (8), 60 - 70 (12)	40 (8), 75 (5)	102	50	31	42	19	12	6.5
Cu	269	175	104		197 (13),	110 (5)	234	227	173	195	120	58	34
Cr	397	349				474 (5)	340	438	753	387	708	132	115
Ir	226	147	*				236	84	248	73	190	23	49
Mo	376	216		160** (7)		221(5)	238	345	332	301	253	97	63
Ni	348	283	290	199** (7)		310 (5)	312	279	407	242	306	76	72
Pd	230	152	*	153** (7)	167 (13), 125 (7)		169	166	104	142	68	41	21
Pt	165	106		149** (7)	116 (9), 80 (7)	153 (10), 145 (5)	149	95	73	81	47	23	15
Ta	163	141	*				162	85	115	72	94	22	24
W	332	131	206				203	216	188	187	141	58	38

* Value taken from the graphe. It is different from the value given in Table II.

** Values not included in Fig. .. because Si samples were treated using O-plasma cleaning, which is likely to produce and SiO₂ layer that creates interfacial conditions different from the one studied within this work.

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