FUJITOK
Custom Optical Substrates & Components

Optical Properties of Major Coating Materials (Evaporation)

(Classification)	Refractive index	Product name	Chemical formula	MP (℃)	BP (℃)	Transmittance range(μm)	Density (g/cm³)	Stress	Evaporation source	Granule	Pellet
Low refractive index material	1.34	Natrium fluoride	NaF	993	1695	0.25-10	2.56		E	○	
	1.35	Cryolite	Na_3AlF_6	1000		0.2-10	2.9	T+	M,T,E	○	
	1.36	Lithium fluoride	LiF	848	1676	0.15-7	2.64	T+	M,E	○	
	1.38	Magnesium fluoride	MgF_2	1248	2260	0.2-5	3.18	T+++	W,M,T,E	○	○
	1.40	Aluminium fluoride	AlF_3	1290	(sublimation)	0.2-20	2.88	T+	E	○	
	1.40	Calcium fluoride	CaF_2	1373	2500	0.15-10	3.18		W,T,E	○	○
	1.40	Strontium fluoride	SrF_2	1190	2460		4.2		E	○	
	1.45	Zirconium fluoride	ZrF_4		sublimes at 600℃	4-12	4.43		E	○	
	1.47	Silicon dioxide	SiO_2	1710℃ (softening point)		0.2-10	2.2	C+++	E	○	○
	1.48	Barium fluoride	BaF_2	1354	2260	0.15-13	4.83		E	○	○
	1.49	Yttrium fluoride	YF_3	1152	2230				E	○	

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Medium refractive index material	1.50	Germanium oxide	GeO_2	1116	1250℃ and over		4.2		W,M,T,E	○	
	1.50	OL-B	SiO_2+Al_2O_3			0.4-7		T+	E	○	○
	1.59	Lanthanum fluoride	LaF_3	1493	2327	0.2-12	5.94	T+	E	○	
	1.60	Neodymium fluoride	NdF_3	1374	2327	0.2-2	6.51	T+	E	○	
	1.62	Gadolinium fluoride	GdF_3	1231	2277	0.2-8		T+	E	○	
	1.63	Cerium fluoride	CeF_3	1460	2300	0.3-10	6.16	T++	M,T,E	○	
	1.64	Aluminium oxide	Al_2O_3	2055	2980	0.2-7	4	T++	E	○	
	1.70	Tungsten oxide	WO_3	1473	1750		7.16		W,P,E	○	○
	1.72	Magnesium oxide	MgO	2852	3600	0.2-7	3.58	T+	E	○	
	1.75	Lead fluoride	PbF_2	855	1290	0.3-15	8.24		W,E	○	
	1.80	Silicon monoxide	SiO	1700℃ and over		0.6-10	2.24	T/C	M,T,E	○	○
	1.84	Lanthanum oxide	La_2O_3	2187-2300		0.3-8	6.51		E	○	
	1.88	Yttrium oxide	Y_2O_3	2356-2435		0.3-8	5.01	C+++	E	○	○
	1.89	Scandium oxide	Sc_2O_3	2383-2423		0.3-8	3.86		E	○	
	1.90	Molybdenum oxide	MoO_3	795	1155		4.7		E,M	○	
	1.90	Samarium fluoride	SmF_3	1306	2427		7.1	T+	E	○	
	1.92	Praseodymium oxide	Pr_6O_{11}			0.3-10			W,E	○	

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High refractive index material	2.00	Indium oxide	In_2O_3	decomposes at 700℃		0.4-0.7	7.18		W,T,M.E	○	○
	2.00	Tin oxide	SnO_2	1127	sublimes at approx. 1850℃				W,E	○	○
	2.05	Hafnium oxide	HfO_2	2758		0.25-5	9.68	T++	E	○	
	2.05	Tantalum pentoxide	Ta_2O_5		decomposes at 1470℃	0.3-10	7.3-8.2	T++	E	○	○
	2.05	Zirconium dioxide	ZrO_2	2700	4300	0.3-7	5.49	T+	E		○
	2.10	Antimony trioxide	Sb_2O_3	656	1425	0.3-1	5.2		E	○	
	2.10	Zinc oxide	ZnO		sublimes at 1720℃	0.3-8	5.61		E	○	○
	2.13	Cerium dioxide	CeO_2	2600	(sublimation)	0.4-7	7.13	C+	W,E	○	
	2.13	OS-5	ZrO_2+TiO_2			0.4-7	4.5	T+	E		○
	2.15	OH-40	TiO2+La2O3			0.35-8		T+	E	○	

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High refractive index material	2.15	Neodymium oxide	Nd_2O_3	2192-2310		0.2-2	7.24		E	○	
	2.20	Niobium pentoxide	Nb_2O_5	1520			4.3-5.2	T+	E	○	
	2.24	Chromium oxide	Cr_2O_3	2435	4000	0.6-8	5.21		W,E	○	○
	2.30	Zinc sulfide	ZnS	1800-1900	sublimes at 1180℃	0.4-15	4.09	C++	M,E	○	
	2.35	Dititanium trioxide	Ti_2O_3		decomposes at 2130℃	0.4-10	4.6	T+++	W,E	○	○
	2.35	Trititanium pentoxide	Ti_3O_5			0.4-10	4.2	T+++	W,E	○	○

	2.35	**Titanium monoxide**	**TiO**	1750	3000°C and over	0.4-10	4.93	T+++	W,E	○	
	2.35	**Titanium dioxide**	**TiO_2**	1825	decomposes at 3000°C and over	0.4-10	4.17	T+++	E	○	○
	3.4(2μm)	**Silicon**	**Si**	1414	2642	0.9-10	2.34	T++	W,E	○	
	4.4(2μm)	**Germanium**	**Ge**	959	2691	1.5-4	5.4		W,M,T,E	○	

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		Silver	**Ag**	962	2184		10.5	T+	M,T,E	○	
		Aluminum	**Al**	659	2270		2.7		W,E	○	
		Gold	**Au**	1063	2710		19.3	T+	W,M,E	○	
		Chromium	**Cr**	1890	2212		7.2	T++	W,E	○	
		Copper	**Cu**	1085	2580		8.93	T+	W,M,T,E	○	
		Hafnium	**Hf**	1700			13.3		E	○	
Metal		**Indium**	**In**	156	2100		7.3		W,M,E	○	
		Molybdenum	**Mo**	2610	4800		10.2	T++		○	
		Nickel	**Ni**	1455	2721		8.85	T++	W,E	○	
		Platinum	**Pt**	1773	3800		21.4	T++	W,E	○	
		Tantalum	**Ta**	2996	5300		16.6		E	○	
		Titanium	**Ti**	1675	3262		4.54	C/T+	W,T,E	○	
		Tungsten	**W**	3387	5900		19.1		E	○	
		ITO	**In_2O_3+SnO_2**	Transparent conductive film		0.4-7			E	○	○
Functional material		**MS-DC100**		Water repellent material					W,M,T,E		○
		MS-SY		Super Hydrophobic material					W,M,T,E		○

Stress

C：Compressive stress

T：Tensile stress

+：Weak

++：Medium

+++：Strong

Evaporation source

E：E-gun

W：Tungsten boat

M：Molybdenum boat

T：Tantalum boat