

# TABLE OF PHYSICAL CONSTANTS OF SCINTILLATORS

Scintillator	Type	Density	Refractive Index	Melting Softening or Boiling Point °C	Light Output (% Anthracene)	Decay Constant, Main Component ns	Wave-length of Maximum Emission nm	Content of Loading Element (% by wt.)	H/C No. H Atoms/ No. of C Atoms	Principal Applications	
<b>PLASTIC</b>	NE 102A	Plastic	1.032	1.581	75°	65	2.4	423	....	1-104	γ, α, β, fast n
	NE 104	Plastic	1.032	1.581	75°	68	1.9	406	....	1-100	ultra-fast counting
	NE 108	Plastic	1.032	1.58	75°	65	1.5	545	....	1-103	with photodiodes
	NE 110	Plastic	1.032	1.58	75°	60	3.3	434	....	1-104	γ, α, β, fast n, etc.
	NE 111A	Plastic	1.032	1.58	75°	55	1.6	370	....	1-103	ultra-fast timing
	NE 114	Plastic	1.032	1.58	75°	50	4.0	434	....	1-109	as for NE 110
	NE 115	Plastic	1.032	1.582	75°	35	3.20	395	....	1-108	phoswiches
	NE 118	Plastic	1.020	1.580	99°	60	3.3	434	....	1-104	high temperatures
	NE 125	Plastic	1.14	1.594	80°	55	2.7	425	D 13.8%	0.957	(D/C) n
	Pilot F	Plastic	1.032	1.581	75°	65	2.1	425	....	1-103	γ, α, β, fast n
	Pilot U	Plastic	1.032	1.58	75°	67	1.36	391	....	1-100	ultra fast timing
	Pilot 425	Plastic	1.19	1.49	100°	....	....	425	....	1.6	Cherenkov detector
<b>LIQUID</b>	NE 213	Liquid	0.874	1.508	141°	78	3.7	425	....	1-213	fast n (P.S.D.)
	NE 224	Liquid	0.877	1.505	169°	80	2.6	425	....	1-330	γ, fast n
	NE 226	Liquid	1.61	1.38	80°	20	3.3	430	....	0	γ, insensitive to n
	NE 230	Deuterated liquid	0.945	1.50	81°	60	3.0	425	D 14.2%	0.984	(D/C) special applications
	NE 232	Deuterated liquid	0.89	1.43	81°	60	4	430	D 24.5%	1.96	(D/C) special applications
	NE 235	Liquid	0.858	1.47	350°	40	4	420	....	2.0	large tanks
	NE 236	Liquid	0.796	1.444	192°	48	3.5	425	....	1.92	low temperatures
	NE 237	Liquid	0.813	1.459	192°	61	3.15	425	....	1.82	high flash point, general
	<b>LOADED LIQUID</b>	NE 311 & 311A	B loaded liquid	0.91	1.411	85°	65	3.8	425	B 5%	1-701
NE 314A		Pb loaded liquid	0.96	1.53	141°	25	2.0	425	Pb 7.5%	1-261	γ, X-rays
NE 316		Sn loaded liquid	0.93	1.496	148.5°	35	4.0	425	Sn 10%	1-411	γ, X-rays
NE 320		<sup>6</sup> Li loaded liquid	0.906	1.497	160°	34	2.19	425	<sup>6</sup> Li 0.15%	1-428	n
NE 343		Gd loaded liquid	0.884	1.502	168°	65	3.0	425	Gd 0.5%	1-360	n
<b>NEUTRON (ZnS-type) and GLASS</b>	NE 422 & 426	<sup>6</sup> Li-ZnS(Ag)	2.36	....	110°	300	200	450	Li 5%	....	slow n
	NE 451	ZnS(Ag)-plastic	1.443	....	110°	300	200	450	....	....	fast n
	NE 901, 902, 903	Glass	2.64	1.58	c.1200°	28	20 & 60	395	Li 2.3%	....	n, β
	NE 904, 905, 906	Glass	2.5	1.55	c.1200°	25	20 & 58	395	Li 6.6%	....	n
	NE 907, 908	Glass	2.42	1.566	c.1200°	20	18 & 62	399	Li 7.5%	....	n
	NE 912, 913	Glass	2.42	1.55	c.1200°	25	18 & 55	397	Li 7.7%	....	n, β (low background)
<b>CRYSTAL</b>	Anthracene	Crystal	1.25	1.62	217°	100	30	447	....	0.715	γ, α, β, fast n
	NaI(Tl)	Crystal	3.67	1.775	650°	230	230	413	....	....	γ, X-rays
	NaI(pure)	Crystal	3.67	1.775	651°	440†	60†	303†	....	....	γ, X-rays (fast counting)
	BaF <sub>2</sub>	Crystal	4.89	1.474	1627°	23	0.6 & 620	220/310	....	....	γ, H.E.P.
	Bi <sub>4</sub> Ge <sub>3</sub> O <sub>12</sub>	Crystal	7.13	2.15	1355°	21	350	480	....	....	γ, H.E.P.
	CsI(Tl)	Crystal	4.51	1.788	620°	95	1100	580	....	....	heavy particles, γ(P.S.D)
	CsI(Na)	Crystal	4.51	1.787	621°	150-190	650	420	....	....	heavy particles, γ(P.S.D)
	CaF <sub>2</sub> (Eu)	Crystal	3.17	1.434	1418°	110	1000	435	....	....	β, X-rays etc.
	ZnS(Ag)	Multi-crystal	4.09	2.356	1850°	300	70	450	....	....	α
	ZnO(Ga)	Multi-crystal	5.61	2.02	1975°	90	1.48	385	....	....	α