

Appendix

Principal features of a selection of modern submarines

Class type	Hull		Sail		Fwd planes		ACS	Propulsor	Sub-merged power (kW)	V (kn)	Comments			
	L(m) D(m)	L/D	Disp (t)	Conf	I/L H/L	Loc/L						Conf	Loc/L	
Akula I SSN	110.3 13.6	8.1	12,770	Short PMB	Blended	0.23 0.03	0.10	High midline All moving	0.38	Cruciform Vertical stab with rudder Stern plane with tab	Propeller	32,000	33	Akula II & III: L = 113.3m
Alpha SSN	81.4 9.5	8.6	3200	Short PMB No casing	Blended	0.20 0.04	0.16	High midline All moving	0.44	Cruciform Vertical stab with rudder Stern plane with tab	Propeller	30,000	41	
Arihant SSBN	112.0 11.0	10.2	6000	Large casing	Foil	0.11 0.03	0.21	Sail	0.25	Cruciform Vertical stab with rudder Stern plane with tab	Propeller	83,000	24	Details scarce
Astute SSN	97.0 11.3	8.6	7600	PMB Casing	Large foil	0.17 0.06	0.13	Eyebrow All moving	0.35	Cruciform All moving rudder Stern plane with tab	Pump-jet	20,500	30	

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Class type	Hull		L/D	Disp (t)	Conf	Sail		Loc/L	Fwd planes		ACS	Propulsor	Sub-merged power (kW)	V (kn)	Comments
	L(m) D(m)	I/L H/L				Conf	Loc/L		Conf	Loc/L					
Barracuda SSN	99.4 8.8		11.3	5300	PMB Very small casing	Foil	0.12 0.07	0.09	Midline All moving Retractable	0.39	X-form Fixed and movable surfaces with gap	Pump-jet	50,000	25+	
Borei SSBN	170 13.5		12.6	24,000	PMB Large casing	Foil	0.14 0.03	0.19	Midline	0.41	Cruciform Vertical stab with tab Stern plane with tab	Pump-jet	≈37,000	30	Improved Borei has all moving rudders and end plates on the stern plane
Collins SSK	77.4 7.8		9.9	3400	PMB Casing	Foil	0.17 0.08	0.12	Sail All moving	0.16	X-form All moving	Propeller	5400	20	
Columbia SSBN	171.0 13.0		13.2	20,810	PMB Casing	Foil	0.06 0.04	0.33	Sail	0.35	X-form Fixed and movable tab	Pump-jet	n/a	n/a	
Dread-nought SSBN	153.6 13.7		11.2	17,500	PMB Small casing	Foil	0.11 0.04	0.23	Midline	X	X-form	Pump-jet	n/a	n/a	
Gotland A19 SSK	60.4 6.2		9.7	1600	PMB Casing	Foil	0.14 0.08	0.18	Sail	0.20	X-form All moving	Propeller	1300	20	
Jim SSBN	135 12.5		10.8	11,000	PMB Large casing	Foil	0.11 0.05	0.29	Sail	0.32	Cruciform Vertical stab with rudder Stern plane with tab	Propeller	n/a	25	Type 094

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Class type	Hull		Sail		Fwd planes		ACS	Propulsor	Sub-merged power (kW)	V (kn)	Comments					
	L(m)	D(m)	L/D	Disp (t)	Conf	I/L						H/L	Loc/L	Conf	Loc/L	
Kaitvari SSK	67.5	6.2	10.9	1775	PMB Small casing	Foil	0.14	0.14	0.08	0.18	Sail	Cruciform Vertical stab with rudder Stern plane with tab	Propeller	2900	20	Based on Scorpene
Kilo SSK	72.6	9.9	7.3	3950	PMB Casing	Foil	0.11	0.19	0.07	0.25	Eyebrow All moving Retractable	Cruciform but no upper rudder Rudder fixed with tab Stern plane fixed with tab	Propeller	5500	20	A number of varieties exist with slightly different lengths One fitted with PJ
Lata SSK	72.0	7.1	10.1	2700	PMB Casing	Foil	0.12	0.17	0.07	0.16	Sail All moving	Cruciform Rudder with tab Stern plane with tab	Propeller	5576	21	

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Class type	Hull		Sail		Fwd planes		ACS	Propulsor	Sub-merged power (kW)	V (kn)	Comments			
	L(m) D(m)	L/D	Disp (t)	Conf	I/L H/L	Loc/L						Conf	Loc/L	
Los Angeles SSN	110.3 10	11	6000	PMB	Foil	0.07 0.05	0.20	Sail All moving	0.22	Cruciform All moving rudder Stern plane with tab	Propeller	26,000	30+	Some had end plates on the stern planes. Later, improved, class had midline planes, plus two additional fixed aft planes
Ohio SSBN/SSGN	170 13.0	13.1	18,750	PMB Casing	Foil	0.06 0.03	0.29	Sail All moving	0.29	Cruciform with end plates on stern plane All moving rudder	Propeller	45,000	25	
Rubis SSN	73.6 7.6	9.7	2600	Short PMB No casing	Foil	0.14 0.08	0.22	Sail All moving	0.25	Cruciform Vertical stab with rudder Stern plane with tab Gaps between fixed parts and movable parts	Propeller	48,000	25+	

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Class type	Hull		Sail		Fwd planes		ACS	Propulsor	Sub-merged power (kW)	V (kn)	Comments			
	L(m) D(m)	L/D	Disp (t)	Conf	I/L H/L	Loc/L						Conf	Loc/L	
Scorpène (CM) SSK	61.7 6.2	10.0	1565	PMB Small casing	Foil	0.14 0.08	0.17	Sail All moving	0.22	Cruciform Vertical stab with rudder Stern plane with tab	Propeller	2900	20	A number of varieties exist with slightly different lengths
Seawolf SSN	108 12	9.0	9200	PMB No casing	Foil	0.09 0.05	0.25	High midline. All moving	0.35	Cruciform All moving rudder Stern plane with tab Plus two fixed angled surfaces	Pump-jet	34,000	35	
Shang SSN	110.0 1.0	10.0	7000	PMB	Foil	0.12 0.06	0.23	Sail All moving	0.27	Cruciform Vertical stab with rudder Stern plane with tab	Propeller	n/a	30	Also known as Type 093A/093G Type 093 is shorter than the Type 093G Info is approx., and based on 093G

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Class type	Hull		Sail		Fwd planes		ACS	Propulsor	Sub-merged power (kW)	V (kn)	Comments			
	L(m) D(m)	L/D	Disp (t)	Conf	I/L H/L	Loc/L						Conf	Loc/L	
Shishumar SSK	67.5 6.2	10.9	1775	PMB Casing	Foil	0.15 0.07	0	Very low midline	0.40	Cruciform Upper rudder all moveable Lower rudder and stern planes fixed with tabs	Propeller	4500	22.5	Indian variation on Type 209 1500
Sind-ughosh SSK	72.6 9.9	7.3	3950	PMB Casing	Foil	0.19 0.07	0.11	Eyebrow All moving Retractable	0.25	Cruciform but no upper rudder Rudder fixed with tab Stern plane fixed with tab	Propeller	4400	17	Indian variant of Kilo class
Song SSK	74.9 8.4	8.9	2250	PMB	Foil	0.14 0.09	0.22	Sail	0.26	Cruciform Vertical stab with rudder Stern plane with tab	Propeller	n/a	22	
Soryu SSK	84.0 9.1	9.2	4200	PMB Casing	Foil	0.12 0.07	0.14	Sail All moving	0.18	X-form All moving	Propeller	6000	20	

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Class type	Hull		Sail		Fwd planes		ACS	Propulsor	Sub-merged power (kW)	V (kn)	Comments			
	L(m) D(m)	L/D	Disp (t)	Conf	I/L H/L	Loc/L						Conf	Loc/L	
Trafalgar SSN	85.4 9.8	8.7	5300	PMB Casing	Foil	0.10 0.06	0.14	Midline All moving Retractable	0.39	Cruciform All moving rudder Stern plane with tab	Pump-jet for all but first of class	11,000	30+	
Triomphant SSBN	138 12.5	11.0	14,335	PMB Casing	Foil	0.10 0.05	0.22	Sail	0.24	Cruciform with large end plates on stern plane All moving rudder	Pump-jet	15,000	25	
Type 209 SSK	64.4 6.5	9.9	1810	PMB Large casing	Foil	0.15 0.07	0	Very low midline	0.40	Cruciform Upper rudder all moveable Lower rudder and stern plane fixed with tabs	Propeller	4500	22	Variations: 1100; 1200; 1300; 1400; 1500. Info is for 1500
Type 212 SSK	56.0 6.8	8.2	1830	PMB Large casing	Large foil/blended	0.17 0.07	0.09	Sail All moving	0.10	X-form All moving	Propeller	1700	20	

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Class type	Hull		L/D	Disp (t)	Conf	Sail		Loc/L	Fwd planes		ACS	Propulsor	Sub-merged power (kW)	V (kn)	Comments
	L(m) D(m)	I/L H/L				Conf	Loc/L		Conf	Loc/L					
Type 214 SSK	65.0 6.3	0.20 0.07	10.3	1860	PMB Large upper casing and smaller lower casing	Large foil/blended	0.03	Eyebrow All moving	0.28	Cruciform All moving upper rudder. Lower rudder fix stab plus rudder. Stern plane with tab	Propeller	2850	20	All the control surfaces are within the boundaries of the hull	
Type 216 SSK	90.0 8.1	0.16 0.05	11.1	4000	PMB with casing	Large foil	0.10	Sail All moving	0.14	X-form All moving	Propeller	n/a	20+	Concept only?	
Type 218SG SSK	70.0 6.3	0.15 0.06	11.1	≈2000	PMB Large upper casing and smaller lower casing	Foil	0.13	Eyebrow All moving	0.33	X-form All moving With additional fixed vertical and horizontal planes	Propeller	n/a	n/a		

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Class type	Hull			Sail			Fwd planes		ACS	Propulsor	Submerged power (kW)	V (kn)	Comments		
	L(m)	D(m)	L/D	Disp (t)	Conf	I/L	H/L	Loc/L						Conf	Loc/L
Typhoon SSBN	17.5	23/12 ^a	-	48,000	Non circular	0.17	0.05	-ve 0.05	Very high midline All moving	0.42	Cruciform Vertical stab with tab Stern plane with small tabs in way of propellers	Two propellers in shrouds (7)	74,000	27	^a Non circular Sail aft of midships, with missiles forward Double hull configuration
Vanguard SSBN	149.9	12.8	11.7	15,900	PMB Casing	0.07	0.04	0.27	Eyebrow All moving	0.37	Cruciform All moving rudder Stern plane with tab	Pump-jet	20,500	25+	
Victoria SSK	70.3	7.2	9.8	2455	PMB Small casing External keel	0.16	0.08	0.08	Midline All moving	0.36	Cruciform All moving rudder Stern plane with tab	Propeller	5000	20	

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Class type	Hull		Sail		Fwd planes		ACS	Propulsor	Sub-merged power (kW)	V (kn)	Comments			
	L(m) D(m)	L/D	Disp (t)	Conf	I/L H/L	Loc/L						Conf	Loc/L	
Virginia SSN	115.0 10.0	11.5	7900	PMB No casing	Foil	0.08 0.05	0.29	High midline. All moving	0.38	Cruciform All moving rudder Stern plane with tab Plus two fixed angled surfaces Lower rudder extends below the keel line	Pump-jet	30,000	25+	
Walrus SSK	67.7 8.4	8.1	2650	Teardrop Small casing	Foil	0.18 0.09	0.17	Sail All moving At leading edge of sail	0.25	X-form All moving with headbox	Propeller	4000	20	
Xia SSBN	120 10	12	8000	PMB Large casing	Foil	0.15 0.05	0.26	Sail	0.30	Cruciform Vertical stab with tab Stern plane with tabs	Propeller	58,000	22	Type 092

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Class type	Hull		Sail		I/L H/L	Loc/L	Fwd planes		ACS	Propulsor	Submerged power (kW)	V (kn)	Comments
	L(m) D(m)	L/D	Disp (t)	Conf			Conf	Loc/L					
Yasen SSN	139.5 ≈13	≈10.7	13,800	PMB	0.16 0.03	0.24	Very high midline (almost eyebrow) Retractable	0.35	Cruciform Rudder and stern plane fixed with tabs	Propeller	n/a	35	Also known as the Graney class Speed of 28 knots "silent"
Zwaardvis SSK	66.9 8.4	8.0	2640	Teardrop Small casing	0.15 0.09	0.17	Sail All moving At leading edge of sail	0.22	Cruciform All moving rudder Stern plane with tab Lower rudder extends below keel	Propeller	3800	20	

All information from public domain sources and may not be accurate
n/a indicates that the information is not available

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