

Table 16 — Chemical composition: alloy direct hardening steels

Steel	C	Si	Mn	P	S	Cr	Mo	Ni
	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)
530M40	0.36 to 0.44	0.10 to 0.40	0.60 to 0.90	0.035 max.	0.040 max.	0.90 to 1.20	—	—
605M36	0.32 to 0.40	0.10 to 0.40	1.30 to 1.70	0.035 max.	0.040 max.	—	0.22 to 0.32	—
606M36	0.32 to 0.40	0.10 to 0.40	1.30 to 1.70	0.035 max.	0.15 to 0.25	—	0.22 to 0.32	—
708M40	0.36 to 0.44	0.10 to 0.40	0.70 to 1.00	0.035 max.	0.040 max.	0.90 to 1.20	0.15 to 0.25	—
709M40	0.36 to 0.44	0.10 to 0.40	0.70 to 1.00	0.035 max.	0.040 max.	0.90 to 1.20	0.25 to 0.35	—
722M24	0.20 to 0.28	0.10 to 0.40	0.45 to 0.70	0.035 max.	0.040 max.	3.00 to 3.50	0.45 to 0.65	—
817M40	0.36 to 0.44	0.10 to 0.40	0.45 to 0.70	0.035 max.	0.040 max.	1.00 to 1.40	0.20 to 0.35	1.30 to 1.70
826M31	0.27 to 0.35	0.10 to 0.40	0.45 to 0.70	0.035 max.	0.040 max.	0.50 to 0.80	0.45 to 0.65	2.30 to 2.80
826M40	0.36 to 0.44	0.10 to 0.40	0.45 to 0.70	0.035 max.	0.040 max.	0.50 to 0.80	0.45 to 0.65	2.30 to 2.80
945M38	0.34 to 0.42	0.10 to 0.40	1.20 to 1.60	0.035 max.	0.040 max.	0.40 to 0.60	0.15 to 0.25	0.60 to 0.90

NOTE See also 3.3 c), 3.3 i) and options A.2 and A.5.

Table 17 — Chemical composition: ferritic and martensitic stainless and heat resisting steels

Chemical composition (maximum unless range stated)								
Steel	C	Si	Mn	P	S	Cr	Mo	Ni
	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)
<i>Ferritic steels</i>								
403S17	0.08	1.0	1.0	0.040	0.030	12.0 to 14.0	—	0.50
430S17	0.08	1.0	1.0	0.040	0.030	16.0 to 18.0	—	0.50
<i>Martensitic steels</i>								
410S21	0.09 to 0.15	1.0	1.0	0.040	0.030	11.5 to 13.5	—	1.00
416S21	0.09 to 0.15	1.0	1.5	0.060	0.15 to 0.35	11.5 to 13.5	0.60	1.00
416S29	0.14 to 0.20	1.0	1.5	0.060	0.15 to 0.35	11.5 to 13.5	0.60	1.00
416S37	0.20 to 0.28	1.0	1.5	0.060	0.15 to 0.35	12.0 to 14.0	0.60	1.00
416S41	0.09 to 0.15	1.0	1.5	0.060	0.060	11.5 to 13.5	0.60	1.00
420S29	0.14 to 0.20	1.0	1.0	0.040	0.030	11.5 to 13.5	—	0.15 to 0.35
420S37	0.20 to 0.28	1.0	1.0	0.040	0.030	12.0 to 14.0	—	1.00
431S29	0.12 to 0.20	1.0	1.0	0.040	0.030	15.0 to 18.0	—	2.0 to 3.0

Table 21 — Mechanical properties for alloy steels (18)

Steel	Condition (2)	Size (1) (diameter across flats, or thickness) mm	R _m N/mm ²	R _e min. N/mm ²	A min. on 5.65 √S ₀ %	Impact ^a		R _{p0.2} (3) min. N/mm ²	HB (13)
						Izod min.	KCV min.		
722M24	Hardened and tempered + turned or ground	T > 150 ≤ 250	850 to 1 000	650	13	40	35	635	248 to 302
		T ≥ 6 ≤ 150	850 to 1 000	680	13	54	50	665	248 to 302
		U ≥ 6 ≤ 150	925 to 1 075	755	12	47	42	740	269 to 331
		T ≥ 6 ≤ 150 U ≥ 6 ≤ 150	850 to 1 000 925 to 1 075	700 770	9 9	54 47	— —	680 755	248 to 302 269 to 331
817M40	Turned, ground or cold drawn and finally softened	T > 150 ≤ 250	850 to 1 000	650	13	40	35	635	248 to 302
		T > 63 ≤ 150	850 to 1 000	680	13	54	50	665	248 to 302
		U > 29 ≤ 100	925 to 1 075	755	12	47	42	740	269 to 331
		V > 13 ≤ 63 W ≥ 6 ≤ 29 (1)(6) X ≥ 6 ≤ 29 (1)(6) Z ≥ 6 ≤ 29 (1)(6)	1 000 to 1 150 1 075 to 1 225 1 150 to 1 300 1 550 min.	850 940 1 020 1 235	12 11 10 5	47 40 34 10	42 35 28 9	835 925 1 005 1 125	293 to 352 311 to 375 341 to 401 444 min.
	Hardened and tempered + cold drawn or hardened and tempered + cold drawn + ground (4)(6)(7) (4)(6)(7) (4)(6)(7)	T > 63 ≤ 150	850 to 1 000	700	9	54	—	680	248 to 302
		U > 29 ≤ 100	925 to 1 075	770	9	47	—	755	269 to 331
		V > 13 ≤ 63	1 000 to 1 150	865	9	47	—	850	293 to 352
		W ≥ 6 ≤ 29 (4)(6)(7) X ≥ 6 ≤ 29 (4)(6)(7) Z ≥ 6 ≤ 29 (4)(6)(7)	1 075 to 1 225 1 150 to 1 300 1 550 min.	955 1 035 1 250	8 7 3	40 34 11	— — —	940 1 020 1 235	311 to 375 341 to 401 444 min.
	Turned, ground or cold drawn and finally softened							277 max.	

^a See also option A.3.

QUALITY ASSURANCE PLAN FOR A/S ROCKET RGB 60 (EMPTY) MOD 1

Item Description		CHAMBER FORE MOTOR MOD 1		Type of check		Quantum of samples	Acceptance norms	Inspection by
Ref. Document	NASK 1134/1/2(P)	Class	Semi critical	Visual	100%	BS 970 (Pt 3)-91 Gde 817 M40(EN 24)	BS 970 (Pt 3)-91 Gde 817 M40(EN 24) Hardened & Tempered 'X' condition	
Material	Steel to spec BS 970 (Pt 3)-91 Gde 817M40 (EN 24)	Characteristics	Critical	Chemical lab analysis	Three samples per lot or as per the discretion of inspection authority	IS:8791/98 class 'A' for ferritic steel forging or ASTM E213 for seamless tube cold finished condition & Annealed condition		
Heat Treatment	Hardened & Tempered 'X' condition	General finish, appearance	Critical	Mechanical lab analysis	Three samples per lot or as per the discretion of inspection authority			
Component name/operations		Chemical properties	Critical	Visual	100%			
		Mechanical properties	Critical					
Chamber fore motor (Raw material)		Ultra Sonic test	Critical					
In process - Pipe cutting, rough turning, hardening & tempering, finish machining, coating, painting, drilling and tapping		Dimensions	Critical	Dimensional measurement	As per sampling plan IS 2500 level II		Tolerance as specified in Drg.NASK 1134/1/2(P)	NAI
Testing	Hydraulic pressure testing of 330kgf/cm ² for 1 minute		Critical	Visual & Dimensional for deformity in motor post pressure test	100%		No leakage	
	Dye Penetration Test		Critical	Visual			No Defects	
Final finish	Phosphating		Semi critical	Visual & Test Sample	100%		IS 3618 Class B	
	Zirconium silicate or APC 216 JSS 8010-51:2009		Critical	Visual & as specified in specification.	100%		Appendix 'C' of ARDE/spec/334/1985 or JSS 8010-51:09	
	PU painting		Critical	Visual & as specified in specification.	100%		PU Paint Dove grey (JSC No.694 to IS 5)	As specified in specification.

VERIFIED

(Sahmir Kumar Samal)

Note: One motor from lot size ≤100 Nos. to be proof pressure tested at 420±5 kgf/sq.cm for 10 sec followed by burst test at 520±10 kgf/sq.cm

R. DAS TURE! JURY

(Sahmir Kumar Samal)
Foreman (Misch)

