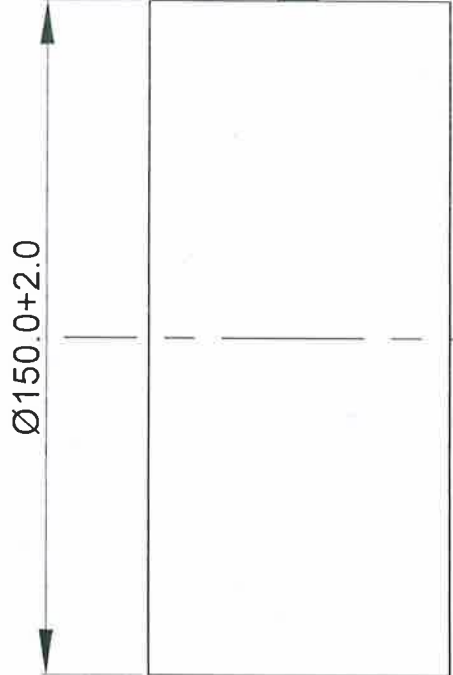


DRG.No.
0 RGB 060 1 182 0

REV
0

TRADE ACTION

A



ISSUED BY
STANDARD CELL

DATE: SIGNATURE:

67.0+0.5

⊥ 0.5 A

- Note:
1. Material to be supplied in hardened & tempered to 'U' condition.
 2. Ultrasonically tested as per IS 8791-98 Class 'A' in longitudinal & transverse direction.
 3. Surface should be smooth and free from burrs, cavities, cracks, scratches, foreign inclusion & dent marks.
 4. Suitable rust prevention medium to be applied to avoid rusting of material.

ALL DIMENSIONS IN mm
REMOVE ALL SHARP EDGES

MATERIAL				LATEST REF./DC NO.:	
BS 970 Pt -3:91 817M40(En24)					
HARDNESS				DRAWN	
269 to 331 HB				Sharat	
PROTECTIVE FINISH		ALTERATIONS		CHECKED	
---		TITLE :		USER SEC.	
ROUGHNESS		BLANK FOR NOZZLE PLATE (RGB-60)		Senthil	
---		HIGH ENERGY PROJECTILE FACTORY TRICHY		OIC/QAP	
EST.MASS	PRO/FINAL			Doss	
---	---			SHEET	
				1 of 1	
				APPRD.	
				Bodala	
				DATE	
				20.08.22	
				SCALE	
				NTS	
				DRG. NO:	
				REV	
				0 RGB 060 1 182 0	

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

NOZZLE PLATE MOD 1										
Item Description	NOZZLE PLATE MOD 1									
Ref. Document	NASK 1134/1/7/1(P)									
Material	Steel to spec BS 970(Pt-3)-91 Gde 81.7 M40 (EN 24)									
Heat Treatment	Hardened and tempered 'U' Condition									
Component name/ operations	Characteristics	Class	Type of check	Quantum of check	Reference document	Acceptance norms	Format of record	Inspection Activity Categorisation	Inspection by	
Nozzle plate (Raw material)	General finish, appearance	Semi critical	Visual	100%	BS 970(Pt 3)-91 Gde 81.7 M40 (EN 24) Hardened and tempered 'U' Condition	BS 970(Pt 3)-91 Gde 81.7 M40 (EN 24) Hardened and tempered 'U' Condition	Visual Inspection report	Critical	NAI	
	Chemical properties	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	C2 R1 S1 Plate 1 & Nil for Plate 2	Test Certificate from NABL Lab / Govt Lab			
	Mechanical properties	Critical	Mechanical lab analysis	Three samples per lot or as per the discretion of inspection authority			Test Certificate by Level II/ III inspector			
	UT Testing	Critical	NDT	100%	ASTM E 381-1984	ASTM E 112	Tempered amrtensite with grain size greater than 5			Test Certificate from NABL Lab / Govt Lab
	Macro structure examination	Critical				ASTM E 45-2018	ABCD 1.5 thin & AD 0.5 thick			
	Micro structure examination	Critical	Lab analysis	Three samples per lot or as per the discretion of inspection authority			Tolerance as specified in Drg.NASK 1134/1/7/1(P)			Inspection report of Nozzle plate
	NMR	Critical					IS 1573, Service Grade II			Test Certificate from NABL Lab / Govt Lab
In process - Normalising, rod cutting,turning and milling	Dimensions	Critical	Dimensional measurement	As per sampling plan IS 2500 Level III						
	Zinc plated & Chrome passivation	Semi Critical	Visual & Test Sample	100%						
Final finish	PU painting	Critical	Visual & as specified in specification.	100%	ISC no 694 to IS 5 as specified in the relevant drawing.	ISC no 694 to IS 5 as specified in the relevant drawing.	Inspection report	Non-Critical	QC HEFP	

Table 16 — Chemical composition: alloy direct hardening steels

Steel	C	Si	Mn	P	S	Cr	Mo	Mo	Ni
	%(m/m)	%(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	—	0.22 to 0.32	—
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	—	—
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	1.30 to 1.70	—
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	2.30 to 2.80	0.60 to 0.90

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

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

Steel	C	Si	Mn	P	S	Cr	Mo	Ni	Se
	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)	%(m/m)
Ferritic steels									
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	—
Martensitic steels									
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	0.15 to 0.35
420S29	0.14 to 0.20	1.0	1.0	0.040	0.030	11.5 to 13.5	—	1.00	—
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
817M40	Hardened and tempered + turned or ground	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
	Turned, ground or cold drawn and finally softened	V > 15 ≤ 63	1 000 to 1 150	850	12	47	42	835	293 to 352
		W ≥ 6 ≤ 29	1 075 to 1 225	940	11	40	35	925	311 to 375
		X ≥ 6 ≤ 29	1 150 to 1 300	1 020	10	34	28	1 005	341 to 401
	Hardened and tempered + cold drawn or hardened and tempered + cold drawn + ground	Z ≥ 6 ≤ 29	1 550 min.	1 235	5	10	9	1 125	444 min.
		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
	Turned, ground or cold drawn and finally softened	V > 13 ≤ 63	1 000 to 1 150	865	9	47	—	850	293 to 352
		W ≥ 6 ≤ 29	1 075 to 1 225	955	8	40	—	940	311 to 375
		X ≥ 6 ≤ 29	1 150 to 1 300	1 035	7	34	—	1 020	341 to 401
	Turned, ground or cold drawn and finally softened	Z ≥ 6 ≤ 29	1 550 min.	1 250	3	11	—	1 235	444 min.
									277 max.

^a See also option A.3.