QUALITY MONITORING INSTRUCTION FOR INSPECTION	Issue No : 01 Rev No : Date of Issue / /2021
30P 1105 (LAUNCHER SHAFT)	OFT/MI/MGL/30P 1105

Rev.No	Amendment	Date

MATERIAL SPECIFICATION : IS: 5517-1993, GRADE – 42Cr4Mo2 (or)
BS: 970 PT.3 1991 GR. 709 M40.

ALTERNATE MATERIAL : EN 19 (or) EN 19A

CASTING ROUTE : BS: 3146 PART1, 1974 CLASS-5, GRADE 'A'.

CONDITION OF SUPPLY : Full finished with Firm's material.

END USE : 40mm MGL

INSPECTION CHECK TO BE CARRIED OUT

Table 'A'

SL NO	CHARACTERISTICS	SPECIFICATION / REQUIREMENT	SAMPLE SIZE
1.	Visual	The Component shall be free from defects such as rust, scale, burrs and any other harmful defects. Casting should be free from defects like cracks, hot tears, cold shuts etc., and surface finish must be smooth.	100%
2.	Dimension	100% Dimension check as per store drawing	
3.	Chemical Composition (%)	**IS: 5517-1993, Design 42Cr4 Mo2** C = 0.38 – 0.45 Mn = 0.60 – 0.90 Si = 0.10 – 0.35 S = 0.035 (Max) Cr = 0.90 – 1.20 P = 0.035 (Max) Mo = 0.15 – 0.30 Ni = 0.25 (Max) Cu = 0.35 (Max) V = 0.05 (Max) B = 0.0003 (Max) Tin = 0.05 (Max) %Cu + 10times (%tin)= 0.60% (Max). **BS: 970, PART 3,1991,GRADE-709M40.** C = 0.36 – 0.44 Mn = 0.70 – 1.00 Si = 0.10 – 0.40 Cr = 0.90 – 1.20 Mo = 0.25 – 0.35 S = 0.040 (Max) P = 0.035 (Max) Ni = 0.40(Max) **En19** C = 0.35 – 0.45 Mn = 0.50 – 0.80 Si = 0.10 – 0.35 S = 0.050 (Max) Cr = 0.90 – 1.50 P = 0.050 (Max) Mo = 0.20 – 0.40 Ni = 0.40(Max) V = 0.05(Max) **EN-19A** C = 0.35-0.45 Mo = 0.20-0.35 Si = 0.10-0.35 V = 0.05 (Max) Mn = 0.50-0.80 S = 0.050 (Max) Cr = 0.90-1.20 P = 0.050 (Max) Ni = 0.40 (Max) **FOR CASTING ROUTE:-** **BS:3146 PART-1, 1974 CLASS-5 , GRADE-A.** S = 0.020% (Max) P = 0.025% (Max) (The Chemical composition shall be such as to give the mechanical properties specified after the appropriate heat treatment) (Permissible Variations in value as per specification standard)	One Sample Per Heat

4.	Mechanical Properties	**IS: 5517 - 1993, GRADE.42Cr4Mo2.(LRS 30mm)** Tensile Strength 1000 - 1150 MPa 0.2% Proof Stress 750 MPa (Min.) % Elongation(5.65√A) 10% (Min.) Impact Izod 48 Joules(Min.) **BS: 970, PART 3,1991,GRADE-709M40. ("V" condition)** Tensile Strength 1000– 1150 N/mm² Yield Strength 850 N/mm² (Min) %Elongation(5.65√so) 12% (Min) Impact (Izod) 47 J (Min) **En19 ("W" condition)** Tensile Strength 70 tons/sq.in., (Min) Yield Stress 58 tons/sq.in., (Min) % Elongation 15 % (Min) Impact (IZOD) 30 ft.lb (Min) **EN-19A ('U' Condition)** Tensile Strength 60 Tonns/Sq.In (Min) Yield Strength 48 Tonns/Sq.In (Min) Elongation 17% (Min.) Izod 35 Ft.Lb (Min) **FOR CASTING ROUTE:-** **BS:3146 PART-1, 1974 CLASS-5 , GRADE-A.** Tensile Strength = 1000 N/mm² (Min) 0.2% Proof Stress = 880 N/mm² (Min) Elongation = 9% (Min) Izod Impact strength = 30 Ft.Lbf(Min)	One Sample Per Heat
5.	Other Test	**For Casting Route:** (i) Radiographic test as per ASTME-192 with Acceptance Standard for gas hole & foreign material Level-5, Shrinkage (all types)- Level-3. Radiography using Gamma-ray shall not be permitted at all up to the thickness range of 25mm (Test report to be submitted). ((ii) **Decarburization Test :** One casting per annealing/heat treatment batch shall be subjected to decarburization test at its maximum thickness region. Depth of decarburization shall not exceed 2% of the thickness (Test report to be submitted). (iii) Magnetic Particle Inspection (MPI) Test to be carried out on a sampling basis, inspection level -III at AQL 0.65 as per IS:2500 Pt.1, 1965	
6.	Hardness	32–38 HRC (as per drawing).	Each Consignment
7	Packing	The Packing of the Material shall be done in such a manner to avoid corrosion and damage in handling and transit.	
8	Marking	Each Packing shall be legibly marked with manufacturer's identity , Qty, Heat No, OFT Supply order No etc.,	

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