



MINISTRY OF DEFENCE (DGQA)

STANDARD QUALITY ASSURANCE PLAN
FOR GEAR PUMP

STANDARD QAP NO DGQA/DQA (WP)/GEAR PUMP/27/2021
06 MAY 2021

Total Nos. of Pages: 21

ISSUING AUTHORITY

DIRECTORATE OF QUALITY ASSURANCE (WARSHIP PROJECTS)
MINISTRY OF DEFENCE (DGQA)
'H' BLOCK, NIRMAN BHAWAN PO
NEW DELHI - 110 011

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RECORD OF AMENDMENTS

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MINISTRY OF DEFENCE (DGQA)

STANDARD QUALITY ASSURANCE PLAN FOR GEAR PUMP

STANDARD QAP NO
DGQA/DQA (WP)/GEAR PUMP/27/2021
06 MAY 21




(A GEORGE)
Rear Admiral
ADGQA (WP)

Promulgated by: -

DIRECTORATE OF QUALITY ASSURANCE (WARSHIP PROJECTS)
MINISTRY OF DEFENCE (DGQA)
'H' BLOCK, NIRMAN BHAWAN PO
NEW DELHI - 110 011

CONDITION OF RELEASE

1. This standard QAP has been prepared for use of the Indian Navy and of its contractors to follow the specified Quality Assurance procedure during the execution of the contracts. No alteration is to be made to this Standard QAP except by the issue of authorised amendment by DQA (WP).

2. It is to be applied as required in the Quality Assurance procedures covering manufacture of Gear Pumps for IN Ships.

3. The website <http://www.dgqadefence.gov.in> may also be referred for other QA requirements.

4. The Standard QAP has been prepared on the basis of decisions made in Collegiate meeting held at DQA (WP) via VC with leading manufacturers of Gear Pump representatives of professional directorate (DME). Any user of this Standard QAP either within DGQA / Indian Navy or in industry may propose an amendment to it with valid justification. Proposals not applicable to particular contract can be sent directly to DQA (WP), New Delhi, and those directly applicable to a particular contract are to be dealt with using contract procedures.

5. DQA (WP) reserves the right to amend or modify the contents of this Standard QAP without consulting or informing any holder of this document.

6. When this Standard QAP is incorporated into contracts, users are responsible for their correct application and for complying with contractual and other statutory requirements. Compliance with Standard QAP does not of itself confer immunity from legal obligations.

7. Enquiries in connection to these requirements may be made from:

DIRECTORATE OF QUALITY ASSURANCE (WARSHIP PROJECTS)
MINISTRY OF DEFENCE (DGQA)
'H' BLOCK, NIRMAN BHAWAN PO
NEW DELHI - 110 011



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MINISTRY OF DEFENCE (DGQA)

DIRECTORATE OF QUALITY

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STANDARDS INVOKED

Standards as mentioned in the SOTR and approved drawings.

SPECIFIC REQUIREMENTS

1. Testing of physical, chemical properties and specific tests (wherever mentioned) has to be done by NABL accredited lab (including firm's NABL accredited lab).
2. If casting is being poured without integral test bar, then the pouring is to be witnessed by Inspector. No repair of casting whatsoever is to be undertaken without approval by QAE.
3. All castings are to be subjected to RT and / or UT, as applicable, to qualify the same in accordance with the approved class of casting, unless otherwise specified in P.O. & SOTR / TSP. The extent of RT will be as per the approved drawing. The class of casting is to be invariably mentioned in the drawing / DBOM.
4. All forgings are to undergo UT for soundness and integrity checks.
5. Shooting sketch indicating critical test zones and test zones are to be submitted prior to testing.
6. All NDT to be performed in accordance with DQA(WP) policy letter no. 12575/POLICY/DGQA/WP-TC dated 12 Oct 20.
7. Make of item should be as per approved PIL / Detailed Bill of Material (DBOM) or /N approved source.
8. The outsourced components in SQAP are indicative only. OEM is to categorize the outsourced components, specific to their product in the QAP as per the approved DBOM / Drawings and in accordance with Chapter-5 of QAD-01 R01, as amended from time to time.
9. ESS Test (Thermal Cycling, Random Vibration and Burn in / Endurance) is to be in accordance with DQA(N) policy (DQA(N) letter 66301/Policy-07/DQA(N)/QA-07 dated 09 Aug 16).
10. Ingress protection testing will be as per applicable IP rating.
11. Imported items will be inspected i.a.w DQA(N) Policy No. 66301/Policy/DQA(N)/SG dated 14 Nov 17, as amended from time to time. Normally, following documents are inspected: -

- (a) Bill of Lading / Shipping Bill / Airway bill.
- (b) Invoice by OEM or Country of Origin Certificate with Packing List
- (c) Bill of entry to warehousing
- (d) OEM confirmation Certificate
- (e) Firm's Guarantee Certificate as per SOS

12. Type Test, EMI / EMC test and ET will be done at Government/PSU test centers or NABL accredited labs. EMI / EMC Acceptance Test Plan is to be duly vetted by NEC, Mumbai. If TT, EMI / EMC and ET have already been done in earlier projects on identical units, same need not be done again & the reports of earlier tested units will have to be provided for review of inspection agency.

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ABBREVIATIONS

VI	Visual Inspection
DI	Dimensional Inspection
LTC	Lab Test Certificate
MTC/ OEM TC	Manufacturer/OEM Test Certificate
STC	Supplier Test Certificate
CC	Conformance/Compliance Certificate
CHP	Customer Hold Point
IR	Inspection Report
NABL	National Accreditation Board For Testing And Calibration of Laboratories
R	Review
W	Witness
TC	Test Certificate
OEM	Original Equipment Manufacturer
DPT	Dye Penetrant Test
MPT	Magnetic Particle Test
UT	Ultrasonic Test
RT	Radiography test
HT	Heat Treatment
NDE	Non-Destructive Examination
SBN	Structure Borne Noise
ABN	Air Borne Noise
FATs	Factory Acceptance Trials
PQR	Procedure Qualification Record
WPS	Welding Procedure Specification
WPQ	Welder Performance Qualification
ETT	Environmental Type Test
EMI	Electro Magnetic Induction
EMC	Electro Magnetic Conduction
ASNT	American Society of Non destructive Testing
ISNT	Indian Society of Non destructive Testing



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SCOPE

Scope of Quality Assurance: The scope of Quality Assurance includes witness / review at all stages of manufacturing viz. 'Raw Material Stage', 'In-process Stage' and 'Final Stage'. The scope also covers the review and witness of Type test of equipment, wherever applicable.

The SQAP contains comprehensive list of inspections and trials that is to be applicable for quality assurance of the equipment. In addition, quality assurance of equipment will also be governed by specific conditions laid down in SOTRs and 'Approved Drawings'. The inspections/trials must be contemporary to latest technology/ techniques available in the industry at the time of placement of order.

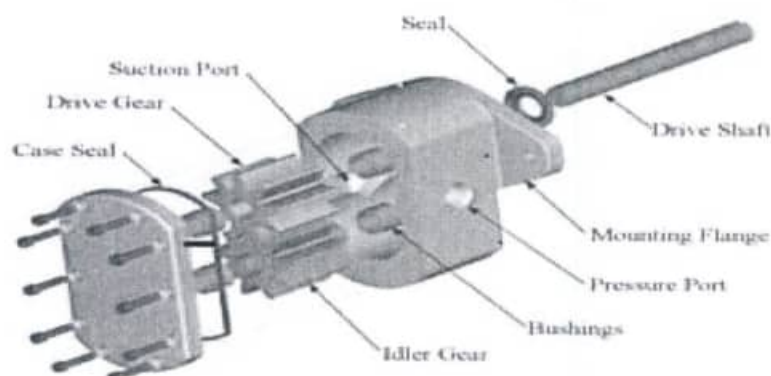
The following quality assurance activities will be carried out during the Quality Assurance of Equipment: -

- Visual Inspection.
- Dimensional Inspection.
- Witness of Pouring in absence of integral test bar.
- Review of LTC/STC/Compliance Certificates/Calibration Certificate/ Import documents.
- Witness of in-house Lab Testing, if applicable.
- Witness of Non-destructive Testing viz. UT, DPT & MPT.
- Witness of Eddy Current Test or review of Eddy Current Test Report, as applicable.
- Review of RT films and reports.
- Review of Heat Treatment Charts.
- Witness of Endurance Trials & Tilt Test, Review of Shock Test and SBN & ABN reports for qualification of Type test, as applicable.
- Review of ETT, EMI/EMC and ESS reports, in addition to Pre and Post ET inspection, as applicable.
- Review of Draft documentation and Witness/Stamping of final documentation, as applicable.
- Issue of CHP clearance.
- Issue of Dispatch Clearance or Issue of Form-IV, as applicable.

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SYSTEM DESCRIPTION

1. Gear pump is a positive displacement pump. it moves a fluid by repeatedly enclosing a fixed volume using interlocking gears and transferring it mechanically using a cyclic pumping action. It delivers a smooth pulse-free flow proportional to the rotational speed of its gears.
2. A gear pump develops flow by carrying fluid between the teeth of two meshed gears. One gear is driven by the drive shaft and turns the other. The pumping chambers formed between the gear teeth are enclosed by the pump's housing and the side plates.
3. A partial vacuum is created at the inlet as the gear teeth unmesh. Fluid flows in to fill the space and is carried around the outside of the gears. As the teeth mesh again at the outlet, the fluid is forced out. High pressure at the pump's outlet imposes an unbalanced load on the gears and their bearing support structure.
4. Gear Pump are used mainly on transfer of the fluid that having some lubricating properties. They can generate high pressures for low flow rates and used extensively for hydrocarbon fluid ranging from diesel to the heaviest fuel oils. Gear pumps are classified as either external or internal gear pumps. In external gear pumps, the teeth of both gears project outward from their centers. External gear pumps may use spur, herringbone, or helical gear sets to move the fluid.





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STANDARD QUALITY ASSURANCE PLAN

Part – I: General Information

1. The following generic information must generally be indicated on each QAP as its identity: -

- (a) Equipment Name
- (b) Equipment Technical Details (as applicable)
- (c) Purchase Order Reference
- (d) Sub/Sub-Orders reference (as applicable)
- (e) Name of Main Indenter/ Ordering Authority
- (f) Name of end user
- (g) Name of Firm/Manufacturer
- (h) SOTRs Reference
- (j) Yard No./ Name of Ship where to be fitted (if available)/End User
- (k) References of relevant Drawings
- (l) QAP No. & Date (as indicated by the firm)
- (m) Contractual Delivery Date
- (n) Inspection Authority
- (p) Inspection Agency
- (q) Quantity (as applicable)

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Part – II:

Technical Inspection & Trials in the form of QAP

PART-II

STANDARD QUALITY ASSURANCE PLAN FOR GEAR PUMP

Sr/ No	Material /components/ As per SOTR/QA Activity	QTY As Per PO	Characteristic/ Type of Check	Quantum of Check	Reference Documents	Acceptance Criteria	Format of Record	Action by QAE	Remarks
1.00	<u>DRAWING/ DOCUMENTS/ TYPE TEST</u>								
1.01	Approved SOTR, PO, Approved GA drawings with DBOM/ BOM, TNC minutes		Verification	100%	PO & SOTR/ TNC Minutes	PO & SOTR/ TNC Minutes	List of documents	CHP For R	
1.02	Type test report		Verification	One per Type	PO, TSP/ SOTR & TNC Minutes	Equipment is Type Tested and reports are held	Type Test reports	R	For Shipyard/ DoI/ DME Orders: If equipment is not Type tested/equipment has undergone changes/ reports are not held, Type test shall be undertaken as per SOTR For DPRO/ CPRO Orders: Type Test shall be applicable, only if indicated in PO
1.03	Manufacturing Drawings		Verification of manufacturing drawings with reference to the approved GA drawings and DBOM for completeness and sufficiency of data to undertake production and process inspections.	100%	SOTR, GA Drawings along with DBOM	Manufacturing drawings bear complete data; The data is sufficient for production and stage inspections	List of approved drawings	R	--

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Srl No	Material /components/ As per SOTR/QA Activity	QTY As Per PO	Characteristic/ Type of Check	Quantum of Check	Reference Documents	Acceptance Criteria	Format of Record	Action by QAE	Remarks
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2.00 SECTION I : RAW MATERIAL INSPECTION

2.01	(a) Housing (b) Housing Bush (c) Bearing Bush		(i) Pouring with integral test bar	100%	SOTR, Approved Drawings and relevant Standards	Compliance to Specification	IR	R	If casting is without integral test bar, pouring to be witnessed by CQAE/ QAE rep
			(ii) Material Identification & Stamping	100%			IR	W	
			(iii) Heat Treatment	100%			HT reports	R	
			(iv) Chemical Composition and Mechanical properties	01 sample per heat / lot			NABL TC	R	
			(v) RT	Critical Regions			NDE Report and film	CHP for R	
2.02	(a) Gears (b) Shaft (c) Connector (d) Connector Nut (e) Front and Back Cover		(i) Material Identification & Stamping	100%	SOTR, Approved Drawings, TNC Minute and relevant Standards	Compliance to specification	IR	W	DQA(WP) policy letter no. 12575/POLICY/ DGQA/WP-TC 12 Oct 20 to be followed
			(ii) Physical Mechanical & Chemical properties	01 sample/ heat / lot			NABL TC	R	

BOUGHT OUT ITEMS

2.03	S & V Mounts		Inspection as per latest SQAP for S&V Mounts/TNC/TSP						
2.04	Motor		Inspection as per latest SQAP for Motor /TNC/TSP						
2.05	Starter/Control Panel		Inspection as per latest SQAP for Starter/ Control Panel/ TNC/TSP						
2.06	Bellows		Inspection as per latest SQAP for Bellows/TNC/TSP						

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Srl No	Material /components/ As per SOTR/QA Activity	QTY As Per PO	Characteristic/ Type of Check	Quantum of Check	Reference Documents	Acceptance Criteria	Format of Record	Action by QAE	Remarks
2.07	Coupling		(i) Product Identification (ii) Physical, Mechanical, Chemical properties (iii) VI & DI	100% 01 sample per heat / lot 100%	SOTR, Approved Drawings and relevant Standards	SOTR, Approved Drawings and relevant Standards	IR NABL TC IR	W R R	
COTS ITEM									
2.08	Grub Screw, Gasket, Plain Washer, Hex. Nut, Washer, Int. Circlip, Stud Dowel Pin		(i) Product identification	100%	SOTR/ Approved drawings/ Supplier's catalogue	SOTR/ Approved drawings/ Supplier's catalogue	STC/ CoC OEM TC	W	
3.00	SECTION II : IN PROCESS INSPECTION								
3.01	Housing		VI & DI Surface Defect MPT/DPT Hydraulic Pressure test (1.5 times of working pressure)	100% 100% 100%	SOTR/ Approved Drawing, TNC minutes, approved ATP and relevant Standards	Approved Drawings Compliance to specification/ Approved Drgs No Leakage	IR NDE Report IR	W W R	 DQA(WP) policy letter no. 12575/POLICY/ DGAAMP-TC 12 Oct 20 to be followed Hydraulic pressure test to be checked @ 1.5 times of working pressure for not less than 30 minutes as per DME Specs 402 unless otherwise specified in the SOTR/Drg/TNC Minutes

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Srl No	Material /components/ As per SOTR/QA Activity	QTY As Per PO	Characteristic/ Type of Check	Quantum of Check	Reference Documents	Acceptance Criteria	Format of Record	Action by QAE	Remarks
3.02	Housing Bush		VI & DI	100%	SOTR/ Approved Drawing, TNC minutes, approved ATP and relevant Standards	Approved Drawings	IR	W	
			DPT	100%		Compliance to specification/ Approved Drgs	NDE Report	W	DQA(WP) policy letter no. 12575/POLICY/ DGQA/WP-TC 12 Oct 20 to be followed
3.03	Gears		VI & DI	100%		Approved Drawings	IR	W	
			(i) Surface Hardness, (ii) Micro & Macro Structure, (iii) Surface Hardness on Teeth, (iv) Core Hardness, (v) Gear Profile	100%		Compliance to specification/ Approved Drgs	NABL TC	R	
			MPT or DPT	100%			NDE Report	W	DQA(WP) policy letter no. 12575/POLICY/ DGQA/WP-TC 12 Oct 20 to be followed
3.04	Shaft		VI & DI	100%	SOTR Approved Drawing, TNC minutes, approved ATP and relevant Standards	Approved Drawings	IR	W	
			(i) Surface Hardness (ii) Core Hardness (iii) Case Depth	100%		Compliance to specification	NABL TC	R	
			MPT or DPT	100%			NDE Report	W	DQA(WP) policy letter no. 12575/POLICY/ DGQA/WP-TC 12 Oct 20 to be followed
			UT	100%		Compliance to specification/ Approved Drgs			

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Srl No	Material /components/ As per SOTR/QA Activity	QTY As Per PO	Characteristic/ Type of Check	Quantum of Check	Reference Documents	Acceptance Criteria	Format of Record	Action by QAE	Remarks
3.05	Front Cover/Back Cover/Cover		VI & DI	100%		Approved Drawings	IR	W	
			DPT	100%		Compliance to specification/ Approved Drgs	NDE Report	W	DQA(WP) policy letter no. 12575/POLICY/ DGQA/WP-TC 12 Oct 20 to be followed
3.06	Bearing Bush		VI & DI	100%		Approved Drawings	IR	W	
			MPT or DPT	100%		Compliance to specification/ Approved Drgs	NDE Report	W	DQA(WP) policy letter no. 12575/POLICY/ DGQA/WP-TC 12 Oct 20 to be followed
3.07	Connector and Connector Nut		VI & DI	100%		Approved Drawings	IR	W	
3.08	Final Pump Assembly		Hydraulic Pressure test (1.5 times of working pressure)	100%	SOTR/ Approved Drawing, TNC minutes, approved ATP and relevant Standards	No Leakage	IR	W	Hydraulic pressure test to be checked @ 1.5 times of working pressure for not less than 30 minutes as per DME 402 unless otherwise specified in the SOTR/Drg/TNC Minutes
4.00	SECTION III : PRE-REQUISITE: FINAL INSPECTION								
	TYPE TESTING OF PUMP (To be carried out on one unit /prototype)								
4.01	Pump Assy		Free rotation of Pump	One Unit	SOTR/ Approved Drawing, TNC minutes, approved ATP and relevant Standards	Free Rotation	IR	W	
4.02	Overall Dimensional Inspection		DI			Approved Drawings	IR	W	
4.03	Over Speed test (20% above specified speed)					Compliance to specification	IR	W	
4.04	Start /Stop test								

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Srl No	Material /components/ As per SOTR/QA Activity	QTY As Per PO	Characteristic/ Type of Check	Quantum of Check	Reference Documents	Acceptance Criteria	Format of Record	Action by QAE	Remarks
4.05	Endurance Test		Flow (Q) v/s Differential Pressure Flow(Q) v/s Speed (N) Vibration Level Air Borne Noise Indication/ Alarm/Shut Down test	One Unit	SOTR/ Approved Drawing, TNC minutes, approved ATP and relevant Standards	Compliance to specification	IR	W	Readings to be recorded by every 02 hrs.
4.06	Strip Open Test		Wearing Parts	One Unit		No wear	IR	W	
4.07	Post-Trial test For 1 hour		Flow(Q) v/s Differential Pressure Flow(Q) v/s Speed (N)			Compliance to specification	IR	W	Reading every 30 Minutes
4.08	Shock Test		Shock & Vibrations Analysis	One Unit	SOTR/NSS-II/ BR 3021 /MIL-Std-167	compliance to specification	NSTL	CHP for R	
4.09	Structure Borne Noise		Structure Borne Noise emitted by Unit	One Unit	SOTR /TNC Minutes /MIL-STD-740-2		LTC	CHP for R	Test to be carried out by NABL approved Lab /Agencies. In case of non -availability of NABL accredited lab, third party / Agency selected for conducting ABN & SBN tests needs to be approved by NHQ
4.10	Air born Noise test (ABN)		Air Borne Noise	One Unit	SOTR /TNC Minutes /BS 3744 & MIL-STD-740-1/Mil Std 111474D		LTC	CHP for R	

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Srl No	Material /components/ As per SOTR/QA Activity	QTY As Per PO	Characteristic/ Type of Check	Quantum of Check	Reference Documents	Acceptance Criteria	Format of Record	Action by QA/E	Remarks
4.11	Tilt test for 8 hours		Flow (Q) v/s Differential Pressure Flow (Q) v/s Speed(N)	One Unit	SOTR/ Approved Drawing, TNC minutes, approved ATP and relevant Standards	compliance to specification	IR	CHP for W	
5.00	MISCELLANEOUS REQUIREMENT								
5.01	Submission of Draft Documents	No of sets	Verification of submission	100%	PO/ SOTR /TNC Minutes/DME 402	PO/ SOTR/TNC Minutes/DME 402	Documentation	R	
5.02	SOTR/TNC Compliance		Compliance	100%	SOTR/TNC Minutes	SOTR/TNC Minutes	Compliance Matrix	R	
5.03	Internal Final Inspection Report		Verification	100%	SOTR/TNC Minutes	SOTR/TNC Minutes	Internal IR	R	
6.00	SECTION IV : FINAL INSPECTOR								
6.01	Final Pump Assembly		Free rotation of Pump	100%	Rotate freely	Free Rotation	IR	W	
6.02	Performance test		Flow (Q) v/s Differential Pressure Flow(Q) v/s Speed (N) Noise & Vibration Bearing Temp Wearing Parts	100%	SOTR, Approved Drawing, TNC minutes, approved ATP and relevant Standards	Compliance to specification	IR	W	
6.03	Strip Open Test			01 unit per lot of 07		No wear	IR	W	
6.04	Post-Trial test For 1 hour		Flow(Q) v/s Differential Pressure Flow(Q) v/s Speed (N)			Compliance to specification	IR	W	Reading every 30 Minutes

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6.05	Overall Dimensional Inspection		DI	100%		Approved Drawings	IR	W	
6.06	Weight		Weight recording		SOTR/ Approved Drawing, TNC minutes, approved ATP	Approved Drawings/ SOTR	Weight certificate IR	W	
6.07	Tally Plate Check		VI	100%			IR	W	
6.08	Lifting arrangement		VI	100%			IR	W	
7.0	SECTION V : PRE REQUISITE ISSUE OF FORM -IV/ I-NOTE								
7.01	OBS Items as per Purchase Order		(i) Product identification and VI	100%	PO, SOTR, Approved Drawings/ PIL / OEM Specification	Compliance to specification	STC/ OEM TC, CC	W	
			(ii) DI				IR	R	
7.02	Submission of as Built Drawings		Verification	100%	Approved Drawings, Concessions & Deviations	Compliance to specification	As built drawings	R	To be stamped by QAO and forwarded to OPA and DQA(WP)
7.03	Submission of approved documents for stamping	sets	Verification and stamping	100%	PO, SOTR, Approved Drawings	Compliance to specification	Documentation	R	
7.04	Liquidation of observation during FATs, if any		Defect rectification	100%	Approved Drawing, SOTR & FAT document	Compliance to specification	IR	R	
7.05	Painting		Visual Inspection & DFT	100%	Approved Drawing, SOTR, Paint Plan	Approved Drawing/ SOTR/ PO	IR	R	
7.06	Preservation & Packing		Visual Inspection	100%	Approved Drawing, SOTR, OEM Preservation Plan	Approved Drawing, Approved Preservation Plan	IR	W	

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7.07	Submission of Form -IV (I&T Certificate)		Correctness	100%	SOTR, PO	SOTR, PO	Form-IV	P	
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Important Notes:-

- (a) Each type of Equipment & accessories to be supplied shall conform to specification acceptable to the TYPE APPROVAL authority.
- (b) Visual and Dimensional inspection (V/DI) to be checked as per Approved drawings for assembly and sub-assembly and as per manufacturer drawings for components.
- (c) HT is not mandatory if not given in material specification and if firm is able to achieve desired physical and mechanical properties.
- (d) All castings will be subjected to RT. Class of casting and extent of RT requirement (shooting sketches) along with critical region to be indicated by the firm in the approved drawing. RT report along with film to be submitted by firm to QAO for review.
- (e) Hydraulic pressure test to be checked @ 1.5 times of working pressure for not less than 30 minutes as per DME 402 unless otherwise specified in the SOTR/Drg/TNC Minutes.
- (f) Balancing for individual components/ items is not required. Balancing to be checked as an assembly with companion part
- (g) Motor/SV Mounts & Control Panel to be procured only from Naval approved vendors.
- (h) EMI/EMC and ETT tests to be done at NABL approved Lab.
- (i) Material Testing to be done at NABL approved Lab.
- (j) **All NDT to be performed in accordance with DQA(WP) policy letter no. 12575/POLICY/DGQA/WP-TC dated 12 Oct 20.** Acceptance criteria for NDT is as per specification laid in approved Drgs/ DBOM or specified by OPA. MPT or DPT to be undertaken to checked on machined surface.
- (k) Imported items to be accepted in accordance with DQA(N) policy letter no. 66301/Policy/DQA(N)/SG dated 14 Nov 17.
- (l) In case the items are of 'Bought Out' nature, the inspections of the store are to be carried out on the basis of STC/OEM TC/CC/QAP as applicable based on criticality.
- (m) The COTS/ 'Bought out' items in the QAP are indicative only. The firm is required to categorically define the 'Bought out'/COTS items specific to their products in the drawings. Items will be categorized as bought out or COTS in the QAP on the basis of approved drawings. Further, only finished products will be accepted as COTS and no raw material for manufacturing will be acceptable as a COTS item.
- (n) The SQAP does not apply to items not in the scope of supply of the firm.
- (o) The column 'Quantity as per P.O' has been left blank which has to be filled by the firm as per P.O while submitting Draft QAP for approval.
- (p) WPS / WPQ certificates to be submitted by the firm for all welding related work. Validity of firm for performing WPS/WPQ to be ascertained if firm not undertaken similar welding so far.
- (q) Assy more than 40 Kgs weight should be provided with lifting arrangement.
- (r) ATP duly approved to be submitted prior FATs.
- (s) Test bed set, internal performance test and compliance SOTR/TNC to be submitted before FATs.

STANDARD QUALITY ASSURANCE PLAN FOR GEAR PUMP

Srl No	Material /components/ As per SOTR/QA Activity	QTY As Per PO	Characteristic/ Type of Check	Quantum of Check	Reference Documents	Acceptance Criteria	Format of Record	Action by QAE	Remarks
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- (t) Each bought out and COTs item should have Make, Model, Type, specification and grade details in approved DBOM.
- (u) Witnessing of inspections can be done in remote mode, wherever, feasible. The modalities of remote inspection are to be worked out jointly by the firm and QAO rep.
- (v) SOP for Remote Inspection wrt Weight measurement, Painting, Preservation and Packing issued vide DQA(WP) letter 29814/MISC/DGQAWP-TC dated 24 Feb 21 as amended from time to time is to be followed, wherever feasible.