



MINISTRY OF DEFENCE (DGQA)

QUALITY ASSURANCE PLAN

STANDARD QUALITY ASSURANCE PLAN
FOR COMPOSITE BLOWERS

STANDARD QAP NO. DGQA/DQA (WP)/COMPOSITE BLOWER/12/2018/REV 0

Total Nos. of Pages: 15

ISSUING AUTHORITY

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MINISTRY OF DEFENCE (DGQA)
STANDARD QUALITY ASSURANCE PLAN
FOR COMPOSITE BLOWERS



STANDARD QAP NO.
DGQA/DQA(WP)/COMPOSITE BLOWER/12/2018/REV 0
2018


(SP Lal)
Rear Admiral
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Promulgated by:-
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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 composite blowers with or without motors for IN Ships.
3. The website <http://www.dggadefence.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) with the leading manufacturer of composite blowers for Indian Navy and representative of professional directorate (DNA). 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 PROJECT)
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STANDARDS INVOKED

<u>S. No.</u>	<u>Specification No.</u>	<u>Description</u>
1	BR 3021, Vol I & II	Shock Manual
2	EED-Q-071-R3 (Rev 4)	Motors and Starters for Naval Ships
3	DEFSTAN 02-636(NES 636)	Requirement for AC & DC starting & Control Gear
4	ASTM D638	Tensile Strength
5	ASTM -D693	Compression Strength
6	ASTM - D256	Izod Impact Strength
7	ASTM-D	Shear Strength
8	ASTM-D792	Specific Gravity
9	MIL-STD-167-2	Vibration Test
10	MIL-STD-740-1 MIL-STD-740-2 BS ISO 3744 MIL-STD-1474D	Noise Tests
11	ISO-1940	Specification and verification of balance tolerances
12	IS:4894	Centrifugal Fan

Note : FRP composite materials as per OEM specifications.

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SPECIFIC REQUIREMENTS

1. Testing of physical and chemical properties 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 only the pouring is to be witnessed by Inspector.
3. Make of the Items should be as per approved PIL/Bill of Material (BoM) or Naval approved sources
4. In case of bought out items, physical verification / function of item may be undertaken during assembly of the equipment to avoid repetition.
5. Imported Equipments/ Items: Inspection will be carried out against the following 05 documents:-
 - (a) Copy of one among Bill of Lading/Shipping Bill/ Airway Bill.
 - (b) Invoice by OEM or Country of Origin certificate of the equipment with packing list.
 - (c) Bill of Entry for Warehousing
 - (d) The certificate of Conformity (CoC) indicating governing specifications and values to which the items are tested along with Original Equipment Manufacturer (OEM) test certificates/ test reports/ Catalogue/ Data sheet.
 - (e) Guarantee/ Warrantee certificate from the supplier/ OEM as per supply order.
6. Ingress protection testing will be as per applicable IP rating,
7. EMI EMC test and ETT will be done at Government/PSU test centers or NABL accredited labs.
8. If Type Testing have already been done in earlier projects on identical units, it will 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
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
P	Perform
R	Review
W	Witness
TC	Test Certificate
OEM	Original Equipment Manufacturer
SBN	Structure Borne Noise
ABN	Air Borne Noise
FATs	Factory Acceptance Trials

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SCOPE

Scope of Quality Assurance: The scope of Quality Assurance will cover witness and review of all manufacturing activities during all stages viz. Raw Material Stage including, bought- out items, In-process Stage and Final Stage. The scope also covers the review and witness of Type test of equipment, wherever applicable.

The Standardised Quality Assurance Plan contains comprehensive list of inspections and/or 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 orders

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

- (a) Visual Inspection
- (b) Dimensional Inspection
- (c) Review of Lab Test Certificates
- (d) Witness of in-house Lab Testing, if applicable.
- (e) Witness of Non-destructive Testing viz. UT, DPT & MPT, , if applicable.
- (j) Review of Type Tests certificates/ reports as applicable
- (k) Review of Draft documentation and witness/Stamping of final documentation, as applicable
- (l) Issue of CHP clearance
- (p) Issue of Dispatch Clearance or Issue of Form-IV, as applicable

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SYSTEM DESCRIPTION

The composite blowers were developed by DMDE for Arihant project due to inherent advantages of these blowers in terms of reduced maintenance and obviate recurrent defects observed in the AL-Mg alloy material blowers.

The function of the blower is to provide a certain flow rate of air rotating at a specified RPM.

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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-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:

Standard QAP

Appendix "A"

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SQAP No: DGQA/DQA (WP)/COMPOSITE BLOWER/12/2018/REV 0 dated 24 Jul 18										
SL. NO	MAT/ COMPONENT/ DRG.NO/ QUALITY ACTIVITY	CHARACTERISTIC/ TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENTS	ACCEPTANCE CRITERIA	FORMAT OF RECORD	AGENCIES			REMARKS
							P	R	W	
DRAWINGS /DOCUMENTS/ TYPE TESTS										
1.00										
1.01	Drawings & Documents	Approved drawings & Documentation	100%	As per purchase order	-	-	1	2	-	Copy of approved drg. to be submitted with PO.
2.00	RAW MATERIALS INSPECTION									
2.01	Hub & Spacer	Chemical, Physical	01 per lot	Approved Drawing & PO	Approved Drawing	TC	3	2	-	CHP Review of TC from NABL Lab.
	Casing	UTS	One test slab per Batch/Lot	-do-	-do-	-do-	3	2	-	CHP
	Motor Plate	Compressive Strength		-do-	-do-	-do-	3	2	-	TC from NABL Lab/ CIPET Tests slabs to be made from the same batch of raw materials which will be used for actual molding of ordered blowers.
	Suction Plate	Izod Impact Strength		-do-	-do-	-do-	3	2	-	
	Impeller	Shear strength Specific Gravity		-do-	-do-	-do-	3	2	-	
2.02	COITS items									
	Bolts, Nuts & Washers	Visual	100%			IR	1	2	-	TC review
	Inserts	Dimensional								
	Drain Plug	Chemical	01/ item/size	-do-	-do-	STC/ TC	3	2	-	
3.00	IN PROCESS INSPECTION									
3.01	Fabrication									
	Casing	Visual inspection	100%	Approved Drawing & PO	Approved drawing	IR	1	2	-	Process report as per manufacturing schedule.
	Motor Plate	Dimensional Inspection								
	Suction Plate									
	Impeller									
	Hub									
4.00	MOTOR	To be inspected in accordance with separately approved SQAP uploaded at DGQA website dgqadefence.gov.in [Home page → Technical Directorates → DQA(WP) → SQAP].								CHP (if complete set is ordered)

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							P	R	W		
5.00 FINAL INSPECTION											
5.01	Complete Assembly	Visual Inspection	100%	Approved Drawing & PO	Approved Drawing	IR	1	-	2	CHP Dynamic Balancing to be repeated on those blowers which have been subjected to flow test & static pressure test with hub other than their own.	
		Dimensional Inspection	100%				IR	1	-		2 (10%)
		Weight Measurement	100%				IR	1	-		2
5.02	Performance	Flow Rate	one per model		Approved drawing/ ISO 1940	IR	3	2	-		
		Static Pressure	100%				IR	3	2		-
5.03	Packing, Preservation and Marking	Visual Inspection	100%		Approved drawing	IR	1	-	2	CHP Packing to be done. Boxes to be kept open for inspector to see randomly.	
6.00 TYPE TESTING											
6.01	Complete Blower	Vibration Test	One per model	-do-	MIL-STD-167-2	IR	3	2	-	Type test to be conducted by NHQ approved agencies only.	
		Noise Test		-do-	MIL-STD-740-2, BS ISO 3744, MIL-STD-1474D, MIL-STD-740-1	IR	3	2	-	Type testing is required (when complete blowers including motor are ordered), if a model is previously not type tested.	
		Shock test			BR 3021/ NSS-II	IR	3	2	-	If a model is already type tested then type test documents to be submitted for review. Inspection agency may witness type tests at their choice	

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						P	R	W	

IMPORTANT NOTE:-

- Motor is to be procured only from IHQ, MoD (N) approved vendors.
- Imported Equipments/ Items:** Inspection will be carried out against the following 05 documents:-
 - Copy of one among Bill of Lading/Shipping Bill/ Airway Bill.
 - Invoice by OEM or Country of Origin certificate of the equipment with packing list.
 - Bill of Entry for Warehousing
 - The certificate of Conformity (CoC) indicating governing specifications and values to which the items are tested alongwith Original Equipment Manufacturer (OEM) test certificates/ test reports/ Catalogue/ Data sheet.
 - Guarantee/ Warrantee certificate from the supplier/ OEM as per supply order.
- COTS:** COTS items to be accepted on the basis of Certificate of Conformity (CoC) with following conditions:-
 - Certificate of Conformity (CoC) must indicate governing specifications and values to which the item has been tested. The certificate must include copies of tests reports.
 - In case of manufacturer's certificate under relevant quality standards (like ISO, OHSAS), the pre published data sheet or company quality policy bringing out the details of test carried out on specific items may be accepted.
- Bought out items:** Bought out items are those which are in the regular production range of the manufacturing firm/ sub vendor and manufactured on placement of specific order by main firm and production is covered by main firm's quality control program.

Legends:

P-Performed, R-Review, V-Verification, W-Witness, 1-Vendor, 2-QAE, 3-NABL Lab, CHP-Customer Hold Point, LTR-Lab Test Report, OEM-Original Equipment Manufacturer, MTC- Material Test Certificate , IR-Inspection Report, PTS- Purchase Technical Specification.