



Fokker Aerostructures B.V.
Quality Procurement department

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Exhibit B;Quality
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The latest issue to this document is the version that is available on the Fokker Aerostructures website:

<http://www.fokker.com/Supplier-Q-requirements>

Revision	Date	Changes
01	11 April 2011	New document, additional P&W requirements on Fokker Aerostructures Purchase Orders
02	20 March 2012	Par. 4. Quality Management System ; "4 years for off-the-shelf / industry standard parts (e.g., AN, AS, MS, JAN, etc.)" has changed to "5 years for off-the-shelf / industry standard parts (e.g., AN, AS, MS, JAN, etc.)".

Document: ExhB- B2enP&W JSF Supplier Quality Assurance Requirements Standard

Introduction 1

Introduction

Suppliers who receive a purchase order from a Fokker Aerostructures shall be certified / registered to the Quality Management Systems - Aerospace - Requirements of AS/EN/JISQ 9100.

In addition to the Fokker Aerostructures B.V. Exhibit B (standard) Supplier Quality Assurance Requirements and ExhB-BUWen 2008 general Requirements Subcontracting (see; "<http://www.fokkeraerostructures.com/Supplier-Q-requirements>"), this Exhibit-B defines Fokker Aerostructures B.V. specific Customer's requirements with respect to quality and forms an integral part of the Purchase Order concluded between Supplier and Fokker Aerostructures B.V.

All terms defined in the Purchase Order shall be applicable to this Exhibit-B, unless explicitly defined otherwise in this Exhibit-B.

Deviating from above mentioned requirements is only allowed with Buyer's written permission.

Introduction 1.1

Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material

Access

Buyer, there Customer (representatives), and their customer's government/regulatory agencies shall have the right of entry into a supplier's facility or that of their subcontractors. Entry shall provide for access to quality system documentation and quality records as well as the ability to conduct audits and verify product and processes.

Par. 1

Quality System Requirements in addition to EN9100

Scope

- Suppliers shall be certified / registered to the Quality Management Systems - Aerospace - Requirements of AS/EN/JISQ 9100.
- Stockist Distributors or organizations carrying out the purchase, storage, splitting and sale of products without affecting product conformance shall be certified / registered to AS/EN/JIS Q 9100 or Quality Management Systems - Aerospace Requirements for Stocklist Distributors AS/EN/JISQ 9120.
- Suppliers and all members of their supply chain that only provide special processes (not part manufacturing suppliers) that receive a purchase order from a UTC member may be accredited to Nadcap AC7004 in lieu of AS/EN/JISQ 9100.
- Required Documents
Supplier has to process, manufacture and deliver all parts i.a.w. AS/EN9100 and PWA-300 (including P&W LCS/MCL) requirements. In addition to par. 3.1 of the Fokker Aerostructures B.V. standard Supplier Quality Assurance Requirements all Reports/Certificates covering materials or parts produced to the requirement of P&W LCS/MCL shall contain the following statement:

"Parts/material have been controlled to P&W requirements for LCS/MCL per P&W-MCL manual section F17".

Remark: The PWA-300 requirement is not applicable for Subcontractor Machining activities (COC is sufficient)

Par. 2

Normative Reference

Suppliers must comply with all applicable specifications and revisions current at order placement (P&W/Fokker Aerostructures B.V. Purchase order date). Fokker Aerostructures B.V. will refer to this date in the P.O. for the Supplier.

Par. 4

Quality Management System

- a. Control of Documents
 - Corrections to work instructions or documents must be recorded, dated and signed in ink or other permanent marking method with the original data being legible and retrievable after the change.
 - All quality records (non-electronic) shall be documented in ink or other permanent marking.
- b. Control of records and record retention

Retain Quality Management System (QMS) records (incl. Radiographs) as identified per AS9100. The following identified quality records shall be maintained for the minimum retention periods specified below:

- 40 years from time of manufacture for:
Flight safety, critical / major rotor parts, serialized major engine (cast / fabricated) cases and main shaft bearing supports, which are not integral to a major case.
- 10 years for all other parts except off-the-shelf industry standard parts.
- 5 years for off-the-shelf / industry standard parts (e.g., AN, AS, MS, JAN, etc.).

Radiographs: The Supplier shall retain radiographs.

- 40 years for:
Flight safety, Critical / major rotor parts (i.e., turbine and compressor disks, hubs, shafts, free turbine couplings and turbine disk side plates), Space Shuttle fuel cells as well as serialized major engine (cast / fabricated) cases, (i.e., inlet fan, compressor, intermediate, diffuser, combustion, turbine and exhaust cases), and main shaft bearing supports which are not integral to a major case and engine components traceable by Engineering Drawing / Quality Assurance Data required serial numbers.
- 10 years for:
Castings or parts where the purchase order, engineering drawing or specifications require serial number traceability.
Castings or parts where the purchase order, engineering drawing or specifications do not require serial number traceability, shall be retained only if no other inspection record is retained that documents completion and final acceptance of radiographic inspection.
- 5 years for:
Military hardware - turbine airfoil (blades) casting radiographs for initial casting quality.
Military hardware - Radiographs of airfoils for the presence of foreign material need not be retained provided an inspection record is retained that documents completion and final acceptance of radiographic inspection.

Par. 6

Resource Management

- a. Requirements for individuals performing visual inspection
Unless otherwise specified, procedures shall be implemented to ensure that eye examinations, including visual acuity and color vision, as applicable, are administered by a medically qualified/trained person to all individuals performing visual inspection.
 - Intervals shall not exceed one year.
 - Individuals shall be tested in at least one eye, either corrected or uncorrected.
 - Color Perception testing is required one time only. Individuals shall be capable of adequately distinguishing and differentiating colors used in the method for which certification is required, the process being performed or inspection activity. Documentation shall be retained.
 - Records shall be retained for each individual.
 - Individuals performing visual inspection (i.e. calibration, non-weld, in-process, layout, dimensional) shall be compliant with near vision requirements of Snellen 14/18, (20/25), Jaegar 2 at 14 inches, or Ortho-Rater 8.
 - Individuals performing visual inspections on welds shall be compliant with the American Welding Society Standard (AWS) D17.1.
 - Individuals performing nondestructive testing (NDT) shall be compliant with Aerospace Industries Association National Aerospace Standard (AIA/NAS) 410

Note: Vision tests may be substituted for the options listed above providing the equivalence is verified and documented by a licensed optometrist.

Par. 7
Par. 7.2

Product Realization
Customer-Related Processes

- a. Review of Requirements Related to the Product:
Verbal agreements or instructions shall under no circumstances be construed as approval or authorization to proceed.
- b. Customer Communication:
 - Changes that may affect quality must be documented and communicated to Fokker Aerostructures B.V. Quality Assurance and/or Purchasing Representative prior to effectivity of the change.
 - All reports, correspondence, drawings, notices, marking and other communications between the supplier and the customer must be written in the English language.

Par. 7.4

Purchasing

Suppliers must use only P&W approved sources to perform special processes (each special process supplier must obtain initial P&W approval.

- a. If PWA-300 is indicated in the P.O. the control of materials and parts shall be i.a.w. this specification.
Supplier has to be approved by P&W and must be called out in the P&W Materials Control Laboratory Manual appendix 36.
This specification defines the requirements for test, testing standards, test reports and other controls of materials, processes and parts supplied to P&W and the procedures required for Engineering Source Approval, process Approval and Source Qualification. Laboratory control of shop material, parts and processes within P&W is defined in the applicable "A" sections of P&W Materials Control Laboratory Manual.
Supplier shall deliver materials, parts and processes i.a.w. PWA-300, Reports/Certificates covering materials or parts produced to this PWA-300 requirements shall contain the following statement "**Parts/material have been controlled to P&W requirements for LCS per P&W-MCL manual section F17**".
- b. Suppliers must provide raw materials test reports / certification results / laboratory analysis requirements (e.g., tensile strength, stress rupture, hardness, chemical composition, etc.), as defined by the product definition and/or the purchase order.

Par. 7.5.1
Par. 7.5.1.3

Product and Service Provision
Control of production Equipment, Tools and NC Machine Programs

With respect to Non-deliverable software the supplier shall have procedure(s) that address the following minimum requirements:

- a. Organizational responsibility and authority including product and process integrity.
- b. Identification of requirements:
 - Define the purpose or function of the software
 - Define the requirements and how the software requirements are initiated, documented and approved.
- c. Define Coding standards:
 - Naming conventions including developmental version production file names.
 - Software Version
 - Header information
 - Comments

Note: The preferred method is to segregate the production software from the test and development programs.

Note: In cases where the library contains production, test and developmental software programs, there shall be a unique identifier assigned to distinguish the three types {e.g., CMM_V1_dev, CMM_V1_test, and CMM_V1_Prod etc.}.
- d. Verification and Validation:
 - Define the Verification and Validation process.
 - Test procedure or test description and results shall be documented, reviewed and retained.

- Provide objective evidence that the software performs its required function.
- Trace software to requirements.
- Inspection review and approval of software must be performed by someone acting in an acknowledged product integrity role. Software used to verify quantitative values (e.g., CMM, etc.) requires an independent method of validation (i.e., layout inspection, fixture check or comparison with another CMM program previously verified by an independent method) and correlation of the two sets of results.
 - Acceptable correlation requires the difference to be within 10% of the tolerance for each characteristic. Differences greater than 10% but not exceeding 25% may be acceptable with documented justification.
 - Differences greater than 25% are not acceptable.
 - Variable data shall be recorded and retained.

e. Target Environment:

- Identify interfaces to other software and to target computer hardware.
- Identify the target computer hardware and software environment.

f. Version Control:

- Uniquely identify each version of the software.
- Identify each item that makes up a software product.

g. Change Control:

Define the software change process. This includes, but is not limited to:

- Identifying problems
- Analysis for problem cause
- Implementation and verification of corrective action
- Revivification and revalidation of software shall be employed to ensure that the modified software meets the changed requirements.

h. Access Control:

- Limited access control shall be defined and implemented. Examples of such controls include:

- Read and write access of the master and copies.
- Edit Key restrictions (e.g. NC, CNC Machine, etc.).

i. Archiving, Backup and Recovery:

- Define the process used to prevent the use of obsolete software programs. Software that is no longer required for production shall be restricted and/or removed from all systems so it is no longer available for use.
- Master copies, duplicates, and user copies shall be restricted and/or removed from all areas except the archive.
- Obsolete software in the archive shall have restricted access to prevent unauthorized use.
- Master copies shall be stored in a secure location.
- Software programs shall be archived in a manner that allows retrieval of all released versions of software programs for traceability purposes.

j. Identification, Storage, Handling and Release:

Define the method for identification, storage, handling and release of software to the user. The end user shall only access the latest software program version.

Note: Multiple software programs may be stored in machine memory (e.g., NC, CNC, etc.) however, it is not recommended since the wrong software production program may be used. It is strongly recommended that only the production software program, in use, be stored in machine memory.

k. Define training and maintenance requirements.

l. Documentation:

- Define required documentation for software development.
- Define approval requirements for software being released to production.

- m. Define the process of supplier oversight (i.e., audit and product acceptance).
- n. Define the process used to accept Purchased or Vendor Supplied software (COTS) prior to initial use.
- o. Analysis of Risks and Criticality as applicable.
- p. Software Support Tool Development Process:
 - Define the software requirements and document them in the program folder or equivalent.
 - Design and code the software and document the activity in the program folder or equivalent.
 - Execute a functional test of the software and document the activity in the program folder or equivalent.
 - Control the Software and documentation using internal configuration management procedures.
- q. Define the internal audit or review processes for software to ensure compliance to established software development, procurement and control procedures.

Par. 7.5.2

a. Validation of Processes for Production and Service Provision:

Suppliers and all members of their supply chain shall use P&W approved suppliers when a specific material or manufacturing special process is identified.

Suppliers and all members of their supply chain that only provide special processes (not part manufacturing suppliers) must be Nadcap accredited for the following special processes where applicable;

- Brazing
- Chemical Processing
- Coatings
- Heat Treating
- Materials Testing
- Nonconventional Machining
- Nondestructive Testing
- Shot Peening
- Welding

Note 1: Nadcap accreditation is not required for materials testing laboratories with American Association for Laboratory Accreditation (A2LA).

Note 2: In spite of the fact that P&W qualified Materials and Processes are listed in the SQL, for delivery of materials, parts and processes the supplier has to be also a MCL/LCS approved i.a.w. P&W Materials Control Laboratory Manual appendix 36.

b. PWA-300 Control of materials, Processes and Parts (LCS/MCL).

If PWA-300 is indicated in the P.O. the control of materials and parts shall be i.a.w. this specification.

Supplier has to be approved by P&W and must be called out in the P&W Materials Control Laboratory Manual appendix 36.

This specification defines the requirements for test, testing standards, test reports and other controls of materials, processes and parts supplied to P&W and the procedures required for Engineering Source Approval, process Approval and Source Qualification. Laboratory control of shop material, parts and processes within P&W is defined in the applicable "A" sections of P&W Materials Control Laboratory Manual.

Supplier shall deliver materials, parts and processes i.a.w. PWA-300, Reports/Certificates covering materials or parts produced to this PWA-300 requirements shall contain the following statement "**Parts/material have been controlled to P&W requirements for LCS per P&W-MCL manual section F17**".

Par. 7.6

Control of Monitoring and Measuring Devices

Calibration Systems shall meet the applicable requirements of ISO 10012, ISO 17025 or ANSI/NCSL Z540-1.

If ANSI/NCSL Z540 is applicable, the Handbook shall be used as the interpretive guide.

In accordance with the industry standards and guidance referenced above, stated reliability goals, accuracy ratios and Significant-Of-Tolerance condition criteria must be established.

- a. The Calibration interval analysis methodology used to maintain the reliability of Measuring and Test Equipment (M&TE) shall have a stated reliability goal to meet a minimum 95% reliability target for M&TE in-tolerance at the end of their interval schedule.
- b. Significant-Out-Of-Tolerance conditions are defined as any M&TE out-of-tolerance condition exceeding 25% of the product tolerance. These conditions require documented review of impact on quality and notification to the Fokker Aerostructures B.V., if product received by Fokker Aerostructures B.V. has been affected.

Par. 8

Par. 8.2.2

Measurement, Analysis and Improvement

Note not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material

Internal audit

Audits of the entire Quality Management System must be conducted annually. Alternate plans may be accepted by Fokker Aerostructures B.V.

Par. 8.2.4

Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material

Monitoring and Measurement of Product

- a. Unless otherwise specified products shall be inspected 100%.
Drawing indicated Key Characteristics will be monitored i.a.w. AS/EN 9103.
After Customer approval Statistical Techniques may be used i.a.w. ASQR-20.1 or equivalent procedures.
- b. The use of an operator certification program or other special manufacturing methodologies (e.g. manufacturing controlling features, die/mold control, method of manufacturing, etc.) must be approved prior to implementation by the Customer.
- c. The supplier shall generally select M&TE with an accuracy ratio of 10 to 1 (product tolerance to M&TE tolerance) however, accuracy ratios as low as 4 to 1 are acceptable, unless otherwise specified. Use of M&TE with accuracy ratios less than 4 to 1 are not permitted unless a detailed measurement uncertainty analysis in accordance with ANSI/NCSS Z540-2 indicates an uncertainty ratio of 1.5 to 1, or better, and the measurement process is maintained under statistical quality control.

Par. 8.2.4.1

Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material

First Article Inspection (FAI)

First Article Inspections i.a.w. AS/EN 9102 are applicable for castings, forgings and finished parts/assemblies.

Before delivery of the parts Fokker Aerostructures B.V. shall accept the FAI.

In addition to requirements of AS/EN 9102 the following requirements are applicable:

- A replication of product part marking (via photograph or sample) that represents production marking must be included within the FAI Report
- The Supplier holding the Fokker Aerostructures B.V. purchase order is responsible for assuring completion of the FAI Report for all finished part characteristics generated by Sub-tier Suppliers.
- At any time, Fokker Aerostructures B.V. may request a complete FAI to be performed in lieu of a partial (delta) FAI.
- Additional requirements for AS 9102 FAI Form 1:
 - Field 11, Supplier Code:
 - Record Fokker Aerostructures B.V. assigned Supplier Code.
 - Field 12, P.O. Number:
 - Record UTC Member Purchase Order Number. (see header of P.O)
- Additional requirements for AS 9102 FAI Form 3:
 - Field 14, For each characteristic:
 - Record FAI Inspection Measuring Equipment used as a media of inspection. Record FAI inspector identification (e.g., signature, stamp, electronic authorization, etc.) used to signify the person that accomplished the inspection.
- Use of automated, risk-based AS9102 First Article Inspection form 0 and form

3 (see form risk-based AS9102 FAI P&W on the Fokker Aerostructures Supplier portal <http://www.fokker.com/Supplier-Q-requirements>)

- Blank entries that are not applicable shall be noted "N/A".
- For CMM measurements results it is not acceptable to make a statement "see CMM report" in FAI form 3
- FAI parts must be identified up to and including delivery

Par. 8.3

Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material

Control of Nonconforming Product

Articles deemed scrap must be clearly identified and rendered unusable within 30 days of final disposition unless otherwise instructed.

Customer must be informed immediately (not to exceed 24 hours or the next business day) of suspect nonconforming product shipped regardless of destination.

Ensure that related characteristics which may be affected by rework or repair operations are identified and re-inspected after these operations are performed.

Par. 8.5.2

Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material

Corrective Action

- a. When requested to provide corrective action, prepare a report documenting the occurrence, findings, and assessment of the affected product and submit to the Customer.
Provide objective evidence of relentless root cause analysis and implementation of corrective action that eliminates risk of reoccurrence.
- b. To ensure effectiveness of the corrective action, suppliers shall perform 100% inspection of the deviated characteristics for the next (3) three consecutive manufactured lots.

c.

Other General Requirements

Others 1

Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material

(Digital) Product Definition

a. Drawing aspects

P&W will provide the product definitions as "blue print" drawings and the products must be i.a.w. with the requirements of this drawings including:

- Applicable notes

Remark: Digital models are not leading for inspection

- Applicable specifications

If PWA-79360 or PWA-360 is applicable specified material must be verified for an additional P&W supplement.

Where a spec supplement has been issued but does not appear on the engineering drawing, interpret the drawing as invoking the supplement:(for example; the other requirement AMS 4928 TI ALLOY" shall be interpreted as equivalent to AMS 4928 & PWA-S-4928 TI ALLOY" . A listing of issued PWA Specification Supplements is available in the PWA Specifications Revisions List.

(see http://www2.pratt-whitney.com/procurement/specrev/current/srl_current.pdf)

- Applicable Quality Assurance Data (QAD) sheet

- QAD's are Requirements for inspections and part of the drawing
- QAD revision numbers are defined on the Requirements Control Cards (RCC's).
RCC's are part of the P&W Purchase order

- Applicable Requirements Control Cards (RCC)

- (Additional) requirements are defined in the applicable RCC's which are defined in the P&W Purchase order

b. Purchase order Requirements

The P&W Purchase order embraced all deliverable assemblies/parts (part

numbers) including the Requirements Control Card (RCC's) and QAD revisions. The RCC defines the (additional) requirements for the deliverable items including all regarding individual parts with all applicable P&W specifications. All parts must be produced i.a.w. these requirements. For all subcontracting activities a copy of the RCC will be provided to the sub-contractor (including applicable specifications)

c.

Others 2

PW-QA-6078

Quality Control Requirements for Barstock, Castings, Forgings, Extrusions, Rolled or Welded rings and Sonic Configurations Parts produced by Supplier is applicable.

Others 3

Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material

SUBCONTRACTING

Unless otherwise specified the Supplier shall not sub-contract, the Purchase Order or part thereof without written authorization of the Buyer. Where applicable, Supplier shall flow down to sub-tier suppliers all applicable requirements in Buyers purchasing documents. Such permission shall not affect Supplier's responsibility.

Others 4

REQUIRED DOCUMENTS

Measuring report(s) and Certificate of Conformity, based on objective evidence (a.o. measuring and/or test reports), demonstrating and stating full compliance with Purchase Order requirements;

- Original COC to be packed with the goods

As a minimum the following information must be on the COC

1. Original manufacturer's and/or distributor's name and address
2. Buyer's Purchase Order number
3. Buyer's Part number, revision if applicable, product name and quantity
4. Drawing or specification number and revision
5. Serial number(s) or date code(s) or lot/batch/heat number(s) (as applicable)
6. If applicable Shelf life / life time data (date of manufacturing)
7. Authorized signature, Name, title and date (legible)
8. Statement, declaring that the delivered products are in compliance with the requirements of the purchase order. (if applicable including statement **"Parts/material have been controlled to P&W requirements for LCS per P&W-MCL manual section F17"**).
9. Release date of certificate
10. Deviation of the product related to requirements on the purchase order, if applicable and authorized by Buyer.

Shipment documentation:

Each shipment by the Supplier shall be accompanied with the documents in accordance with the above.

Others 5

Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material

GOVERNMENT SOURCE SURVEILLANCE:

During performance on this contract, manufacturing and associated processes, products and inspection and /or test data are subject to review, verification, examination, test and/or analysis by authorized Government representatives. Government inspection or release of product prior to shipment is not required unless you are otherwise notified.

Others 6

RATED ORDER

This is a "Rated Order" certified for National Defense use under the system regulation (DPAS).

A DPAS rating of DOA1 applies. You are required to follow all provisions of the Defense Priorities and Allocations System regulation (15 CFR 700).

This P.O. is part of the Government Contract number: N00019-09-C-0015

It is Suppliers own responsibility to take cognizance of the above mentioned regulation.

Others 7	<p>Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material</p> <p>ITAR/EAR ITAR and Manufacturing License Agreements regulations are applicable in this program. The NDA-SP-Spa-MA371-00B form will be used for this. Fokker Aerostructures B.V. shall have a Non-Disclosure agreement with all subcontractors/suppliers which prohibits unauthorized use of the proprietary/technical data provided under the applicable technical data export license.</p>
Others 8	<p>MATERIAL SAFETY DATA SHEET (MSDS) Whenever the material supplied in fulfillment of this Purchase Order is supplied to Buyer for the first time, a current, detailed Material Safety Data Sheet (MSDS) shall accompany the shipment, given that the material is either toxic or hazardous or both as defined by any applicable law, code statute or regulation. Whenever an MSDS is revised, a post revision copy shall be furnished with the next shipment</p> <p><u>Shipment documentation:</u> Whenever an MSDS needs to accompany a material shipment to Buyer, an additional copy of the MSDS shall be sent, under separate cover, to the cognizant Buyer.</p>
Others 9	<p>SHELF LIFE MATERIALS Used shelf life materials shall be “factory new” unless Buyer’s written permission.</p>
Others 10	<p>Note: not applicable for Standard Hardware, Commercial-Off-the Shelf parts (COTS) and Raw Material</p> <p>RETURN OF SUBMITTED INFORMATION AND MATERIAL All information submitted by Buyer, like drawings, production orders shall be returned to Buyer with delivered goods. Where Buyer submitted material to Supplier, the remaining material shall be returned to Buyer with goods to be delivered.</p>
Others 11	<p>RESPONSIBILITIES OF SUPPLIER Supplier shall report to Buyer all cases where products, parts or appliances have been released and subsequently identified to have deviations from the applicable design data.</p>

Approved:

Eelco Houkes,
Manager Quality Procurement