

**Guideline (not under Configuration Control)**

## Appendix 19 Documentation and QA

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Appendix 19**

Guide to Documentation and QA for Vacuum  
components for use on the ITER Project

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## 19 Documentation and Vacuum Quality Assurance

### 19.1 Scope of this Appendix

This Appendix describes typical documentation which should normally be produced to assure adherence to the Quality Assessment (QA) system for vacuum items for use in the ITER Project.

*Suppliers* who follow the guidelines contained in this Appendix will provide suitable documentation which will meet the requirements of the ITER Vacuum Handbook. Other forms of documentation which satisfy these requirements may be *accepted*.

This Appendix does not specify a Quality *Control* System for vacuum items for the ITER Project. This will be specified elsewhere to conform to the necessary international standards.

This document does not specify the technical requirements for, or specifications of, any individual vacuum item. Such information will be found in general form elsewhere in the ITER Vacuum Handbook and in detail in the specification and/or drawings issued by ITER for any particular tender or contract.

In any dispute over QA related to vacuum procedures applied to or vacuum performance of any item, the decision of the ITER Vacuum Responsible Officer (RO) will normally be taken as authoritative.

### 19.2 Areas to which Vacuum QA Applies

- Materials
- Satisfactory procedures for cleaning and processing
- Assessment of cleanliness
- Leak tightness
- Outgassing performance
- Baking

### 19.3 *Supplier's* QA System

It is to be expected that the *supplier* will have experience in operating a quality assurance system to the relevant national or international standards, e.g. ISO 9001 or equivalent. Evidence of this would normally be supplied with the tender or quotation process.

### 19.4 Certificates

Except where the ITER Project has issued a specific pro-forma certificate pertaining to any requirement, the *supplier* should use a suitable certificate of the *supplier's* devising. Draft versions of such certificates should be submitted as part of the tender or quotation process to be *accepted* before use. Certification should conform to EN 10204 2.2, 3.1 or 3.2

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## 19.5 Materials Used

### 19.5.1 Information Normally Required Prior to Manufacture

- The *supplier* should supply typical certificates of chemical analysis for each batch of material called in the specifications and/or drawings, based on the *supplier's* previous experience of such materials. If the *supplier* has no previous experience of using such materials, a statement of this fact should be supplied.
- The *supplier* should normally supply certificates and/or samples of capability of carrying out welding or other jointing techniques called in the specifications and/or drawings for the materials to be used.

### 19.5.2 Normal Post Manufacture Certification

- The *supplier* should issue a certificate that all materials used conform to the specification and/or drawings, drawing attention to any discrepancies.
- Unless otherwise specified, certificates of chemical analysis of each batch of material used (e.g. ladle or ingot samples) are normally required.
- Forged stainless steels for use on VQC 1A components should be supplied with certificates of inclusion counts conforming to ASTM E-45 method D or equivalent.

## 19.6 Cleaning and Processing

### 19.6.1 Information Normally Required Prior to Manufacture

- The *supplier* should provide details of the cleaning processes to be used in the form of a job flow check sheet or diagram, together with a list of the chemicals used.
- The *supplier* should provide details of all equipment to be used for cleaning or processing, including sizes, *supplier* and approximate date of manufacture. Details of all vacuum pumps and gauges which may be used in any process are to be included. Where any equipment cannot meet the requirements of the specification this must be clearly indicated.
- The *supplier* should provide details of any subcontractor to be used for cleaning and/or processing.

### 19.6.2 Normal Post Manufacture Certification:

- The *supplier* should deliver a certificate for each item supplied showing compliance with the appropriate specification. This will clearly identify the item and record all significant parameters (e.g. time and temperature) of the major stages of the processes applied and all equipment used.
- A non-conformance report should be provided for each item where any deviation from the *accepted* procedures has occurred.

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## 19.7 Assessment of Cleanliness

### 19.7.1 Information Normally Required Prior to Manufacture

- The *supplier* should provide details of the method or methods to be used to assess cleanliness of the items.
- The *supplier* should provide full details of all equipment to be used for assessing cleanliness including specification, supplier and approximate date of manufacture. Details of all vacuum pumps and gauges to be used in any testing are to be included. Where any equipment cannot meet the requirements of the specification this must be clearly indicated.
- The *supplier* should provide details of any subcontractor to be used for assessing cleanliness.

### 19.7.2 Normal Post Manufacture Certification

- The *supplier* should deliver a certificate for each item supplied showing compliance with the appropriate specification. This will clearly identify the item and all equipment used. Included will be a record of all significant parameters of the major stages of the procedures used to carry out these tests and calibration certificates for vacuum gauges and gas analysers used. Results of any chemical analyses or residual gas spectra will be supplied in full.
- A non-conformance report should be provided for each item where any deviation from the performance specification has occurred.

## 19.8 Leak Tightness

### 19.8.1 Information Normally Required Prior to Manufacture

- The *supplier* should provide details of the method or methods to be used to leak test the items in accordance with the ITER Vacuum Handbook.
- The *supplier* should provide full details of all equipment to be used for leak testing including specification, supplier and approximate date of manufacture. Details of all vacuum pumps and gauges, including dates of calibration, to be used are to be included. Where any equipment cannot meet the requirements of the specification this must be clearly indicated.
- The *supplier* should provide details of any subcontractor to be used for leak testing

### 19.8.2 Normal Post Manufacture Certification

- The *supplier* should deliver a certificate for each item supplied showing compliance with the appropriate specification. This will clearly identify the item and all equipment used in these tests. Included will be a record of all significant parameters of the major stages of the procedures used and calibration certificates for leak detection equipment and standard leaks used.
- A non-conformance report should be provided for each item where any deviation from the performance specification has occurred.

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- The *supplier* should report details of all leaks found during the manufacturing phase and details of remedial action taken to minimise the size of any identified leaks.

## 19.9 Outgassing Performance

### 19.9.1 Information Normally Required Prior to Manufacture

- The *supplier* should provide details of the method or methods to be used for measuring outgassing in accordance with the ITER Vacuum handbook Appendix 17, where this is called for in the specification and/or drawings
- The *supplier* should provide full details of all equipment to be used for measuring outgassing including specification, supplier and approximate date of manufacture. Details of all vacuum pumps and gauges, including dates of calibration, to be used are to be included. Where any equipment cannot meet the requirements of the specification this must be clearly indicated.
- The *supplier* should provide details of any subcontractor to be used for measuring outgassing.

### 19.9.2 Normal Post Manufacture Certification

- The *supplier* should deliver a certificate for each item supplied showing compliance with the appropriate specification. This will clearly identify the item and all equipment used for these measurements. Included will be a record of all significant parameters of the major stages of the procedures used and calibration certificates for vacuum gauges and gas analysers used.
- A non-conformance report should be provided for each item where any deviation from the performance specification has occurred.

## 19.10 Baking

### 19.10.1 Information Normally Required Prior to Manufacture

- The *supplier* should provide details of the method or methods to be used for Baking in accordance with the ITER Vacuum Handbook where this is called for in the specification and/or drawings
- The *supplier* should provide full details of all equipment to be used for baking including specification, supplier and approximate date of manufacture. Details of all vacuum pumps and gauges, including dates of calibration, to be used are to be included. Where any equipment cannot meet the requirements of the specification this must be clearly indicated.
- The *supplier* should provide details of any subcontractor to be used for baking.

### 19.10.2 Normal Post Manufacture Certification

- The *supplier* should deliver a certificate for each item supplied showing compliance with the appropriate specification. This will clearly identify the item and all equipment used for these measurements. Included will be a record of all significant parameters of the major stages of the procedures used and calibration certificates for vacuum gauges and gas analysers used.



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- A non-conformance report should be provided for each item where any deviation from the performance specification has occurred.