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Technical Requirements Specification

Technical specification for outgassing sample

The scope of this document is to define the requirements pertaining to preparation, cleaning, packaging, labeling, handling and delivery of samples prior to outgassing rate measurement by the IO.

Approval Process			
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<i>Change Log</i>			
Technical specification for outgassing sample (QUCYDA)			
<i>Version</i>	<i>Latest Status</i>	<i>Issue Date</i>	<i>Description of Change</i>
v1.0	Revision Required	10 Mar 2015	
v1.1	Approved	11 Mar 2015	Typing, spelling and small grammatical changes
v1.2	Approved	07 Sep 2017	Modification of the minimum surface of the sample. Add a table that sum up the needed information for the sample that shall be filled in by the submitter of the sample.

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1 Bibliography

[1] ITER_D_2EZ9UM - ITER Vacuum Handbook.

[2] ITER_D_27Y4QC - Appendix 3 Materials.

[3] ITER_D_2ELN8N - Appendix 4 Accepted Fluids.

[4] Appendix 17 Guide to Outgassing Rates and their Measurement (ITER_D_2EXDST).

[5] ITER_D_2MGWR4 - Material Approval Request.

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2 Background

The ITER Vacuum Handbook [1] contains in appendices 3 [2] and 4 [3] lists of materials which are approved for use on components that will be exposed to ITER vacuums. Restrictions, such as total amount and post manufacturing processes are also detailed in the referenced appendices. In order for a material or process to be approved the effect on the ITER vacuum of that material or process must be sufficiently well characterized in order to assess its performance. One such characterization is that of thermal outgassing [4].

3 Scope

The scope of this document is to define the requirements pertaining to preparation, cleaning, packaging, labeling, handling and delivery of samples prior to outgassing rate measurement by the IO.

4 Definition of sample

In the context of an outgassing measurement, a sample could be:

- A component or a part of a component (feedthrough connections, a sensor...),
- Base material (Epoxy, resin, metal, alloy, quartz...),
- Cable (connection for instrumentation...),
- A process (performed on a sample).

In case of a process that needs to be qualified, the sample can be a part of a component or a coupon of material that has been the subject of a specific process (for e.g. cleaning, cutting, grinding, coating, welding, etc.)

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5 Preparation

5.1 Sample Size

5.1.1 Maximum

Sample size shall not exceed the following (in mm):

- Length: 100
- Width: 40
- Height: 120

5.1.2 Minimum

Samples for testing shall have a surface area (which will be exposed to vacuum) of at least 3000 mm².

5.2 Cable

Samples of cable shall have ends terminated.

5.3 Cleaning

Handling of the samples shall be done with powder free, latex or nitrile gloves to avoid any contamination.

Samples shall be cleaned with non-lint clothes slightly soaked in isopropyl alcohol.

The sample shall be provided in his final state, i.e. in the state it is going to be installed in the machine. This implies that the sample should not undergo additional cleaning upon arrival at the ITER vacuum laboratory.

5.4 Preparation of a sample in order to qualify a process

In the case of qualification of a process outgassing tests will normally be performed on components, parts of the component or “coupons” which have been subjected to the complete manufacturing process.

The sample shall be prepared from a clean coupon or a clean piece of equipment. Once the coupon is cleaned, it shall undergo the process that has to be qualified.

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6 Labeling and background data

Sample shall only be marked for identification purpose. Marking of the sample shall be done only by using a clean sharp point or by a laser scribing method.

The sample shall be sent with the corresponding Material Approval Request [5].

7 Packing

In order to preserve the sample from external contamination during transport, packaging shall be done carefully. Sample shall be wrapped in halogen-free plastic bag and then place within a clean rigid container.

7.1 Packing list

- Material acceptance request [5]
- Outgassing test request form filled in (form in annex)
- Sample,
- Senders address

7.2 Delivery Address

Sample shall be sent to:

Mr. Liam Worth
Building 72/ office 3028 / PSE / Vacuum Section
Route de Vinon-sur-Verdon
CS 90 046
13067 St. Paul-lez-Durance France

8 Annex: Outgassing test request form

The outgassing request form sum-up the information of the sample to test, it shall be filled each time an outgassing test is required as part of the acceptance process of new material.

Technical specification for preparation of samples for outgassing rate measurement (ITER bench)

Outgassing test request			
Requestor			
Name			
Affiliation	<input type="checkbox"/> DA	Name of DA	
	<input type="checkbox"/> ITER	Name of section	
Definition of sample			
Vacuum Quality Class (VQC)		<input type="checkbox"/> VQC 1	<input type="checkbox"/> VQC 2
		<input type="checkbox"/> VQC 3	<input type="checkbox"/> VQC 4
<input type="checkbox"/>	Base material (metal, resin, etc)		
<input type="checkbox"/>	Cable		
<input type="checkbox"/>	A process (application of fluids, coatings, grinding)		
<input type="checkbox"/>	A component or part of component (sensors, etc)		
Specify chosen type (e.g. 316L s/s)			
Location/function in machine			
Sample size			
Sample size, mm (100x120x40 max)			
Area exposed to the vacuum (At least 3000 mm ²)			
Cleaning process			
(The sample shall be provided in his final state, i.e. in the state it is going to be installed in the machine)			
The sample (components, part of components) has been subjected to complete manufacturing process*			
*- if outgassing test is a part of a qualification process			
<input type="checkbox"/> Yes		<input type="checkbox"/> No	
Labeling technique			
<input type="checkbox"/>	Clean sharp point		
<input type="checkbox"/>	Laser scribing		
<input type="checkbox"/>	Other (specify)		
Packing			
<ul style="list-style-type: none"> Sample shall be wrapped in halogen free plastic bag and placed within clean rigid container 			
<input type="checkbox"/> Yes		<input type="checkbox"/> No	
<ul style="list-style-type: none"> Filled and signed Material Approval Request should be enclosed in the package 			
Comments			
Delivery address		Sender info	
Sample shall be sent to:			
Mr. Liam Worth			
Building 72/ office 3028 / PSE / Vacuum Section			