
	Manufacturing, testing and supply of vacuum vessels for HNB3 (Beam Line Vessel and Beam Source Vessel) and DNB <i>Annexure 6D: Welding_Technical qualification of production workshops</i>	INDUS Ref No II-UG7F2UA- v1.1
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1. Scope

This document specifies the requirement pertaining to the technical qualification of production workshop for the prime contractor and sub-contractor for the DNB Vessel and HNB3 Vessel.

The purpose of the technical qualification of a production workshop is to evaluate the capacity and technical resources of this workshop for carrying out welding operations.

2. Reference documents

RCC-MR 2007: Section 4: RS 6000 Technical qualification of production workshops

3. Qualification conditions

The technical qualification of a workshop for the execution of welding work is subject to the following requirements:

3.1 Installation

The workshop must possess suitable facilities for carrying out satisfactory welding work. These facilities comprise:

- (i) Welding equipment suitable for the welding procedures used and in good working order, properly equipped places of work (including handling equipment) of the necessary cleanliness according to the materials used and the classes of components, and premises storage facilities suitable for the proper preservation and drying of the filler materials heat.
- (ii) heat treatment facilities in good condition and of suitable capacity according to the work to be done.
- (iii) destructive and non-destructive examination facilities suitable for the inspections to be performed.


3.1.2 If the workshop does not possess the necessary heat treatment or test facilities, hiring the services of another sub-contractor is allowed. However, in such a case, the prime contractor has to guarantee that the corresponding facilities are satisfactory. These must be indicated in the qualification report.

3.2 Personnel and supervision

The welding and test personnel (and their supervisors) must possess the necessary skill and competence. They must in general belong to the workshop; temporary outside assistance, duly qualified according to specification requirements, will nevertheless be allowed.

3.3 Experience

3.3.1 General case:

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The workshop must normally have experience in carrying out jobs involving comparable welding procedures, with regard to:

- The nature of the material (low alloy steels, austenitic stainless steels, etc.),
- The shape (plates, pipes, etc.) and dimensions (range of thickness, etc.),
- The welding processes, the types of equipment for automatic processes,
- The use of heat treatments,
- The conduct of non-destructive examinations.

In the absence of such experience, the performance of welding procedure qualification tests may fulfil this function.

3.3.2 Demonstration that the level of skill has been maintained

For vacuum boundary welds, the qualification report (**Clause 4** below) shall also define sets of welding procedures comprising:

- The same process and operating system (manual, partially mechanized, automatic),
- Base metal belonging to the same family of Austenitic stainless steels
- Deposited metal belonging to the same family of austenitic stainless steels

For these welds, the qualification report shall only allow application of welding procedures belonging to a group for which the last application does not exceed 3 years. However, a welding procedure belonging to a set that does not involve preheating can be performed by reference to a set performed with preheating for which the last application does not exceed 3 year.

4. Qualification report


4.1 General case:

Before the start of the welding operations, a qualification report shall be issued by the manufacturer attesting that the conditions of **clause 3** are satisfied.

This report must indicate:

- the name of the workshop
- the name of the person responsible for the qualification
- the welding equipments
- the heat treatment facilities
- the non-destructive examination and destructive testing facilities and equipment
- the technical staff (as per **clause 3.2**)
- the welding procedures used and constituting the experience of the workshop

4.2 Demonstration that the level of skill has been maintained

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Where the level of skill has to be verified, as stipulated in **clause 4.2**, the qualification report shall either contain a list or make reference to a document specifying the various sets of welding procedures for which the last application does not exceed 3 years.

This check on the level of skill can be performed once a year by revision of the document and by ensuring that the last mentioned performance does not date back more than 2 years. For this check, all occasions on which the procedure was performed can be listed not just those stipulated in the contractual requirements or the applicable manufacturing documents.

However, these applications of the procedure shall have been performed under the Quality Assurance regulations and have been the subject of comparable non-destructive testing procedures (extent, volumetric or surface examinations).

Where it cannot be demonstrated that the level of skill has been maintained for a given set of welding procedures because the previous application dates back further than 3 years, it is forbidden to use this set of welding procedures. However, this set can be reintroduced after a new qualification has been performed or in anticipation of a test coupon (prior to manufacture) where required.

5. Workshop qualification period

5.1 Qualification period


The qualification of a workshop remains valid as long as no major modification is made to the existing arrangements. Otherwise, the corresponding qualification report must be amended accordingly.

5.2 Invalidation of the qualification

The qualification of a workshop shall be invalidated if a doubt arises regarding the validity of such qualification because of a serious fault discovered in its production welds.

6. Transfer of welding procedure qualification

- 6.1 For a welding procedure qualification test conducted at a workshop or site to be extended to another workshop or site belonging to the same manufacturer, this new workshop or site must satisfy the conditions required in **clause 3 above**. Additionally, the manufacturer shall indicate in a report the arrangements made (technical precautions and supervision) to ensure the continuity of the skill and experience following the transfer. In no case may such transfer be made from one manufacturer to another.

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- 6.2 The welding procedure qualifications performed at a workshop or site must correspond to production welds normally executed respectively at such workshop or site.