



COURSE MANUAL: *STAINLESS STEEL TIG-WELDING*
MODULE 9

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MODULE 9

Objective:

To have knowledge about the topic "quality control"

To have knowledge about quality of product delivery and documentation

Extent:

- The key function for inspection and quality control
- The welders role in insuring the quality of the weld
- Control and understand NDT's role in identifying possible welding errors
- Introduction to ISO 3834; quality demands for welding
- Introduction to documentation of quality and the delivered product

Expected achievements:

- Being able to make decisions
- Being able to explain the necessity of quality control in welding
- Being able to identify the different parts of ISO 3834 in relations to the standards for welding personnel and welding procedures
- Ability to consider defects of welding (ISO 6520-1)
- Ability to evaluate if own work has the required quality to be transferred to the client according to the required specifications.

Quality documents

The quality documents may be divided into two groups:

- 1) Documents regarding the company's operation, for instance organization, responsibilities, the company's procedures and work instructions. These are documents included in the company's quality manual.
- 2) Documents covering quality control and quality reports. This may be control reports, and checklists which often are transferred to customers with the product.

Identification and traceability

The contract will define the demands for documentation. The requirements are often in general, but in order to document performed quality, it has been experienced that at least it has to be a minimum of traceability and documentation according to the requirements and specifications in the contract.

We will have to consider that a system built up with main control plans and detailed control plans will to a large extent be able to cover the needs of documentation. Where welding is an important process, additional requirements for welding procedures and documented competence in the form of welders certificates. As long as NDE is not specified it will neither be necessary to make weld drawings with weld numberings, nor will it be necessary to have traceability about where the specific welder has worked. It will be sufficient to document which welding procedures that has been used.

If NDE is required, a weld drawing must be provided with specification of controlled welds and the result of the control itself.

The extent of identification and traceability will often be defined in requirements in the contract or in the company's internal requirements.

Such requirements will for that reason be stated in contract procedures or in company procedures.

When these requirements are stated, the specified documents, reports, etc. shall follow the product delivery.

The documentation will usually include:

- Production plans
- Work instructions
- Information on where the welds are positioned in the design
- Methods of identifying the welds, positions of the identification, stamping, labelling, etc.
- Tracing of welds being done mechanically or automatically.
- Tracing of welders and operators according to product specifications
- Approval of welders and WPS according to manufacturing requirements
- Filler materials, for instance type and fabrication number, batch number, etc.
- Basic material, charge number, etc.
- Repaired products and locations

The quality documentation forms an essential part of the company's system for quality assurance. Based on this, the company's quality policy, quality targeting, fabrication methods are built, and they assure that the company's quality level can be achieved and maintained. The level of the quality documentation may

already at the first contact between the parties stimulate the interest in the company's ability to manufacture the desired product.

The welder's responsibility and authority

The welder's tasks are usually consisting of:

- Preparation of own work
- Verification of own work
- Reporting own work
- Working in a multi-cultural environment
- Building networks to achieve a good working environment

Such a responsibility also requires that the welder has the correct authority, for instance terminating welding if this involves errors or risks to health, environment, or safety, or if the welder means that continuing the work is unsafe.

Both responsibility and authority should be defined in an instruction or in a work procedure.

Non conformances and corrective actions

The company's routines for non conformances and corrective actions are to ensure that:

- A defective product is not passed on to the next step in production, used, or passed on to customer
- corrective actions are implemented to assure that the error is not repeated
- it is defined what to do with a non conformance
- non conformances are identified, and that corrective actions are performed
- it is defined responsibility and authority relations regarding non conformance
- non conformances are defined regarding repairs and that relevant measures are defined
- it is established a system for non conformance documentation and corrective actions
- there are established routines for renewed controls after non conformances and repairs

This should result in a non conformance report that may consist of the following paragraphs:

- non conformance description
- plans for corrective actions