

**About
EQC
India**

Équipe Qualité Consultants (EQC India) comprises of a team of quality professionals engaged in providing quality management and welding services for the infrastructure sector and manufacturing units.

EQC's areas of Operation of are:

- Supplier assessment, audits and development
- Review and approval of Quality Plans and Field Quality Plans
- Field Quality Audits
- Consultancy for PED certification/ CE Marking
- Welding Qualifications as per ASME and EN/ISO
- ISO 9001, ISO 14001-2015 and ISO 45001-2018
- Quality Improvement Studies
- Documentation & Implementation of ISO: 3834 Series for Quality requirements for fusion welding of metallic materials, EN: 15085-2/ BS EN 1090
- **Responsible Welding Coordinator (RWC Services)**
- Technical Support and Training on Codes and standards on Steels including Chinese, Russian, Indian, EN and ASME codes.
- Technical Support, Consultancy & Training on Welding Technology, NDT, Industrial Painting, Dynamic Balancing & Engineering Materials.

EQC India was started in 2009 to provide value added to Industry.



Inspiring Quality Since 2009

In the present issue, we cover in brief key steps to be taken for improving quality of welds consistently.

High-quality welding is built on a foundation of skilled/qualified welders, cleanliness, preparation, correct storage of consumables and materials, the type of welding and the type of gas used, as well as the integration of automation into job planning

Producing consistent quality welds requires the use of professional grade tools and equipment. Proper PPE and necessary protective clothing are also mandatory to insure the safe and quality performance of welders. Quality welding relies on concentration, performing consistent repetitive procedures and techniques, which can be dramatically impaired when a welder is uncomfortable regarding equipment, clothing, or the working conditions surrounding them. However, many managers overlook the necessity of quality tools, equipment, and working conditions, as a way of reducing costs.

Happy Reading!

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Editor, 1st October 2019

NEW CLIENTS/ CONTRACTS/ PARTNERS DURING THE LAST QUARTER



Ten Simple Steps to Improve Welding Quality

Superior quality welding processes deliver two distinct competitive advantages: weld integrity and welding repeatability. With the right processes in place, you should be able to consistently deliver strong, durable welds that are free from cracking, distortion, spatter, undercut, porosity and erratic beads.

To drill down on these key factors a little more, we've compiled ten (10) steps on how to improve the quality of your welding processes.

It is assumed that the welding machines are in good condition & calibrated, work environment is suitable for welding, welding parameters of WPS are adhered to and that there is adequate supervision of the welding process

1. Skilled and Qualified Welders

The skill level of the welder is an important factor in the delivery of high-quality welds. Not just anyone can pick up a welding torch and perform a strong, durable weld that is free from cracking, spatter, undercut, porosity and erratic beads. - perfecting one's welding technique to deliver repeatable high-quality welds requires time, practice in-depth technical knowledge and finally conduct of welder qualification tests to confirm welder's skill. Tack welding also has to be performed by qualified welders. Qualifications tests can be conducted based on standards such as ASME, AWS, API, BIS, EN/ISO.

2. Automation

Automating welding processes has the potential to provide enormous gains, in terms of productivity, profitability and quality. The automation of travel speed, current and other welding parameters reduces the likelihood of human error in the welding process, delivering consistent, repeatable weld profiles. In fact, a well programmed automated welding system will provide highly consistent weld quality almost indefinitely. In comparison, manual welding requires a high degree of concentration over sustained periods, inevitably resulting in welder fatigue and increasing the likelihood of defects.

3. Cleanliness

Cleanliness plays a key role in welding quality. If a welder does not properly clean the components being welded, the results can be disastrous. Contaminants such as rust, mill scale, paint, dirt, dust, grease introduced during a weld can cause incomplete fusion, porosity, cracking and poor bead appearance. These issues compromise the weld's performance, longevity, and its ability to resist corrosion.

As such, your welding process should always include cleaning the components to be welded so that all surfaces are spotless and smooth, and ensuring your work area and consumables are clean and contaminant-free.

4. Type of Welding

The type of welding you choose to use in your welding process greatly influences the quality of the weld. Each type of welding offer both advantages and disadvantages in terms of weld quality.

For instance, welding with the GMAW process could be subject to lack of fusion. Additional potential issues include spatter and inter-pass cleaning.

In comparison, Gas Tungsten Arc Welding (GTAW) is typically the cleanest type of welding. Where high quality welding is non-negotiable, workshops tend to use GTAW because of the high-quality results it delivers. Eliminating slag, flux and spatter results in a much higher quality weld.

5. Multiple Passes

When the welding of thicker materials requires multiple passes, the likelihood of porosity, inclusions at the toes of the passes, and lack of fusion all significantly increase. In addition, cleaning and grinding is required between each pass, increasing the likelihood of inclusions.

Reducing the number of passes can be key to improving overall weld quality.

6. Storage & conditioning of Welding Consumables

An often-overlooked tip for improving the quality of your welding processes is properly storing your consumables to ensure they remain free from contaminants. This will help prevent quality issues such as excessive slag fluidity, porosity, rough welding surfaces, difficult slag removal and, perhaps most importantly of all, increased diffusible hydrogen that often leads to cracking. As such, filler wires and coated electrodes, your grinding wheel and even the gloves with which you handle your materials should be stored in a dry location. In particular, ensure that the manufacturer's storage instructions for your electrodes and wires are adhered to.



7. Materials and Workpiece Storage

The way in which you store your base materials and workpieces is just as important as how you store your welding consumables. So, be sure to store all the workpieces that you plan to weld in a dry area that is out of the elements and free from contaminants.

8. Gas Selection

It is imperative that you select the right gas for the welding process to be applied. The right gas offers a range of benefits: it protects the weld pool from exposure to

the atmosphere, promotes a stable arc, and significantly impacts the quality of the weld deposit.

For instance, when using GTAW to weld stainless steel, a mixture of argon and hydrogen delivers impressive results. This is because of increasing heat of the arc and thus increasing penetration.

When choosing the right gas, you need to consider: the type of material being welded; whether deep penetration is a must (as opposed to reducing burn-through in the joint); and whether weld appearance (and therefore spatter) are important.

9. Preparation

To deliver the best possible quality welds consistently, preparation is essential. Consistent input affords consistent output. Quality fit-up gives quality results.

During the welding preparation process, fabricators and welders should always check for external contaminants before presenting a component for welding. All dust, grease and grime must be removed, leaving the area to be welded as clean as possible. You will also need to prepare the edges of the material being welded for the joint required. For instance, if the material requires a butt weld, you will need to ensure both the root face and root gap are properly prepared and aligned prior to start of welding.

10. Job Planning

Proper job planning can greatly improve your welding process, particularly for large-scale projects that feature repeatable components. For instance, when planning for a job, you should consider what is both the easiest welding position, and the welding position which is likely to provide the highest quality results. You should also consider whether the job can be performed with automation. If it can, incorporating automation as much as possible into your job plan has the potential to significantly improve output, consistency and repeatability.

EQC India provides training and certification services for welders based on codes such as: ASME Section IX, EN ISO:9606, AWS, API 1104, BIS & IBR.

Équipe Qualité Consultants also provides consultancy and customized training for QA, QC/ Inspection/ Welding/ Engineering / Power Professionals/ Fabricators in the following areas:

<i>1. Welding Coordination Personnel (IWE)</i>	<i>2. Welding Qualifications as per ASME IX</i>
<i>3. Welding Qualifications as per EN/ISO</i>	<i>4. Engineering Materials - Steels</i>
<i>5. Welding Certification as per ISO: 3834</i>	<i>6. Railway Certification as per EN: 15085-2</i>
<i>7. ISO:9001, ISO: 14001 & ISO: 45001</i>	<i>8. Factory Production Control (FPC) for CE</i>
<i>9. QA/QC for Chinese Power Equipment</i>	<i>10. Industrial Painting Systems</i>

For further details, please contact:

Équipe Qualité Consultants,

Project Quality & Welding Consultants

304, V4 Mayur Plaza IV, Mayur Vihar Phase One, Delhi 110091

www.eqcindia.co.in, info@eqcindia.co.in, 011-40195119, 09350258683

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