METALCRAFTS

DESIGN · FABRICATION · SINCE 1967

Quality Policy & Quality Assurance Manual

How we plan, build, inspect and improve every job, from the first drawing to the final despatch.

COMPANY	Metalcrafts Technologies Pvt. Ltd.
WORKS	Plot No. M3, Industrial Estate, Udyambag, Belgaum 590 008
DOCUMENT	Quality Policy & QA Manual
APPROVED BY	Chief Executive

QUALITY POLICY

Quality, consistency and performance, measured by what our customers expect of us.

01	**Quality**	Our products show high, consistent quality and performance, judged by the customer's expectations.
02	**Delivery & cost**	We deliver products and services on time and at an optimal cost.
03	**Customers**	Exceptional service and total customer satisfaction are our top priorities.
04	**People**	Customers, suppliers and employees are vital to our success. We treat every one of them fairly and with respect.
05	**Safety**	Our manufacturing processes and the products we buy are safe in every respect.
06	**Documentation**	We provide accurate and complete documentation with every job.
07	**Workplace**	We provide an environment that motivates our people and gives high job satisfaction.

Chief Executive
Metalcrafts

QA Quality at a glance

Seven principles that run through every section of this manual.

01

Customer-defined quality

Every product is built to meet the customer's expectations and delivered on time.

02

Formal design and drawing control

Every drawing is checked and approved. All changes are formally recorded and only current revisions reach the shop floor.

03

Inspection at every stage

Hold points run from raw material receipt through machining, welding, heat treatment and painting to final despatch. Critical machined parts get 100% checks.

04

Qualified people and procedures

All welding is done by qualified welders using approved procedures, and only trained staff operate our machines.

05

Controlled suppliers and materials

Subcontractors are vetted and audited, incoming material is inspected, and every part is traceable to its job and lot.

06

Calibrated testing

Measuring instruments and test equipment are calibrated on a fixed schedule, with records kept.

07

Continuous improvement

Defects are isolated, and their root causes are analysed and corrected at source. Quality data is fed back to design, purchasing and production.

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01 Purpose & organisation

Our Quality Control Programme makes sure every quality-related step of every product is inspected and controlled at each phase of production.

How the programme works

- Every phase is covered by written QC procedures with clear instructions.
- Applying them carefully finds flaws early, while they are cheap to fix.
- Corrective action follows quickly, before work moves on.

Who owns quality

- An independent QA department leads the programme and reports to the Chief Executive.
- Quality itself is the responsibility of every operating section.
- QA can stop production whenever requirements are not met.

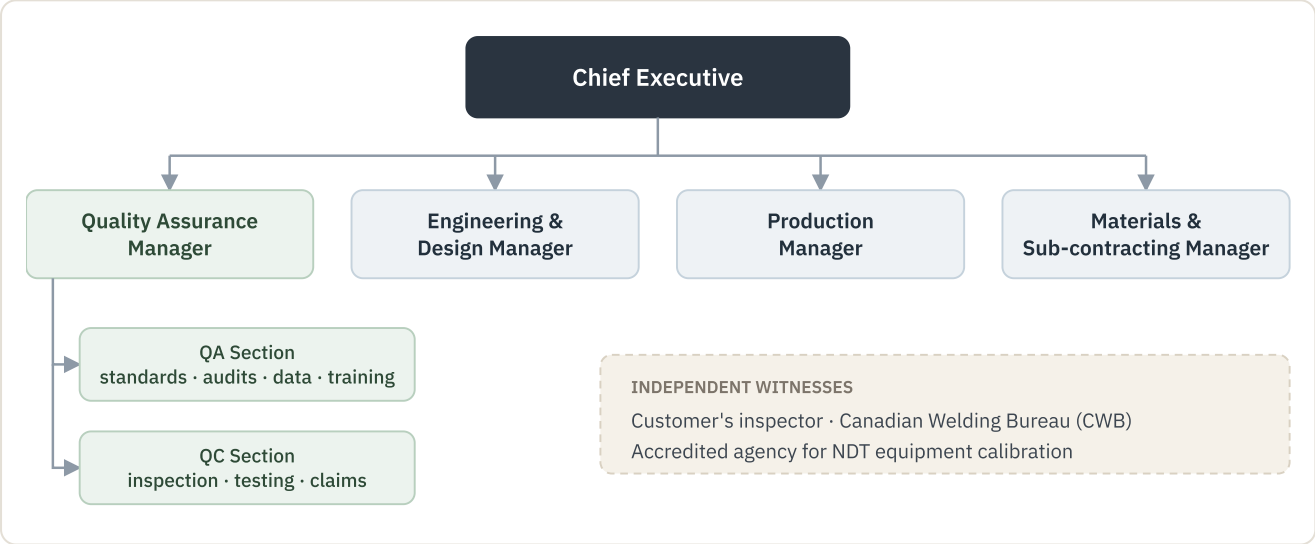

FIG. 1 · QUALITY ORGANISATION

QUALITY ASSURANCE LINE MANAGEMENT

QA SECTION

- Sets and maintains in-plant standards.
- Compares actual practice with those standards.
- Collects and statistically analyses quality data.
- Trains people in quality control.
- Reviews design errors and advises on subcontractor selection.

QC SECTION

- Inspects and tests raw materials, fabricated members, shop assemblies, welding, corrosion protection, bought-out parts, painting and packing.
- Prepares for inspection by the customer's inspectors and issues reports.
- Investigates and reports on any defect claimed by a customer.

02 Responsibilities

Each manager reports to the Chief Executive and has clear quality duties.

ROLE	KEY QUALITY RESPONSIBILITIES
Chief Executive	Holds overall responsibility for the QA system. Guides and controls staff so the policy is carried out, and directs management audits.
Quality Assurance Manager	■ Establishes the QA system and issues and reviews this manual. ■ Audits all QA activities and documents QA/QC procedures. ■ Controls receiving inspection, fabrication inspection and non-conforming items at every stage. ■ Stops production when a requirement is not met. ■ Issues test and inspection reports and certificates. ■ Reviews specifications and bids, approves vendors and liaises with the customer's inspector.
Engineering & Design Manager	■ Reviews customer specifications and drawings. ■ Prepares and approves design documents, shop drawings, material lists, procurement specifications and erection drawings. ■ Standardises products and parts, and controls design changes.
Production Manager	■ Plans and controls all fabrication, fabrication lines, shop-floor staff and in-process material. ■ Issues operation planning cards, fabrication flow charts and work instructions. ■ Distributes drawings and withdraws superseded ones. ■ Controls welding electrodes, assigns qualified welders and maintains production facilities.
Materials & Sub-contracting Manager	■ Raises enquiries and purchase orders for materials, consumables, equipment and outside fabrication. ■ Controls and releases material from the warehouse. ■ Keeps up-to-date records and the approved vendor list.
Welding Supervisor	Selects welders for qualification tests, arranges CWB witnessing, keeps the qualified welders list and monitors welding parameters on the shop floor.

03 Fabrication & QC flow

Every fabricated component follows the same route. Work does not pass an inspection hold point until it is accepted.

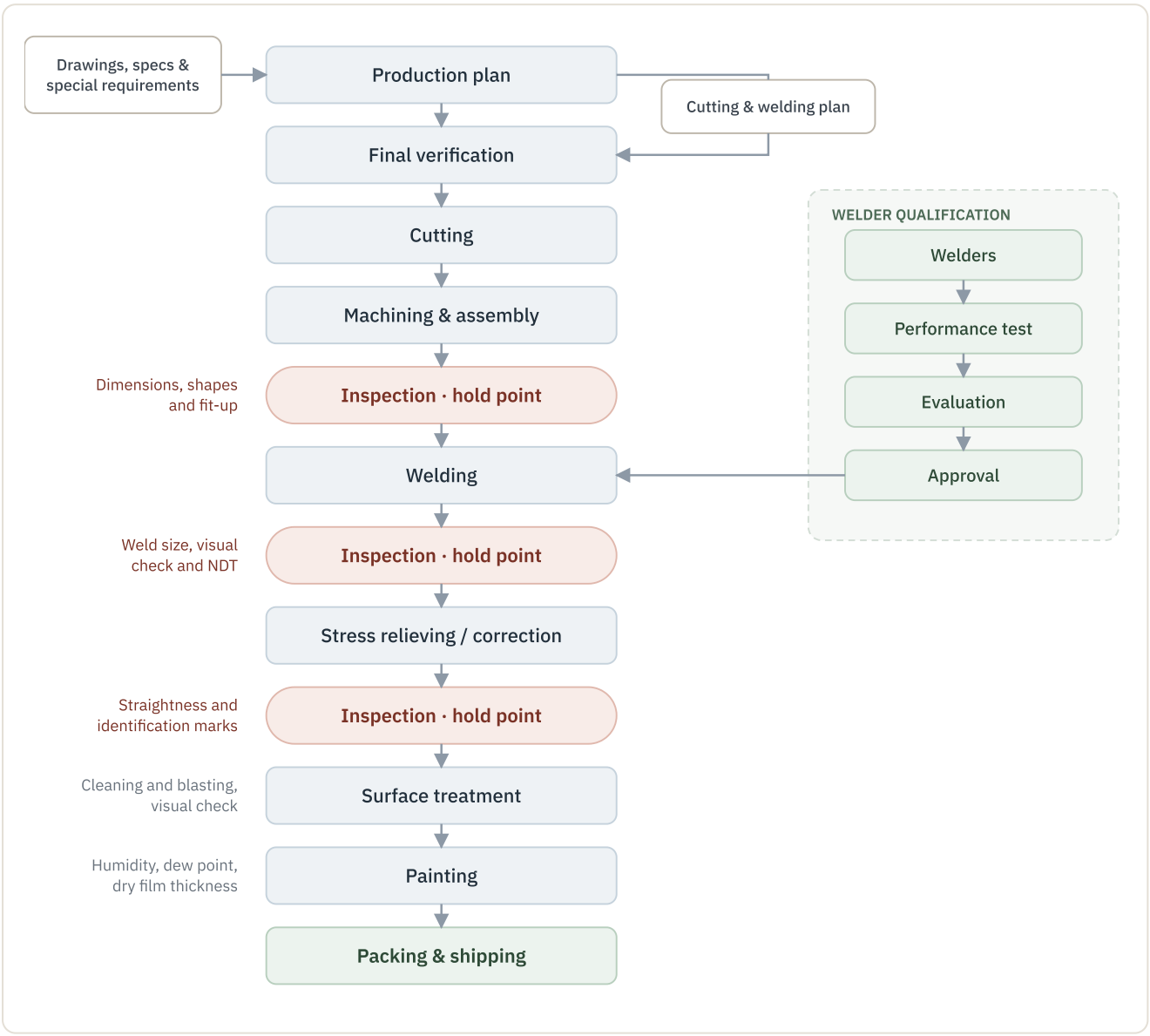

FIG. 2 · STANDARD FABRICATION ROUTE — PROCESS · HOLD POINT · QUALIFIED / RELEASED

Before work

Drawings and specifications are turned into a production plan, plus a cutting and welding plan, and verified.

During work

Three hold points check dimensions, welds and straightness. Rejected items are marked and segregated.

Welders

Only welders who have passed a performance test and been approved may weld.

04 Machined components

Shafts, gears and other machined parts carry the tightest checks. Every critical stage is inspected 100%.

100%
inspection of rough and finish machining

100%
run-out check after assembly

100%
check of the packing list before despatch

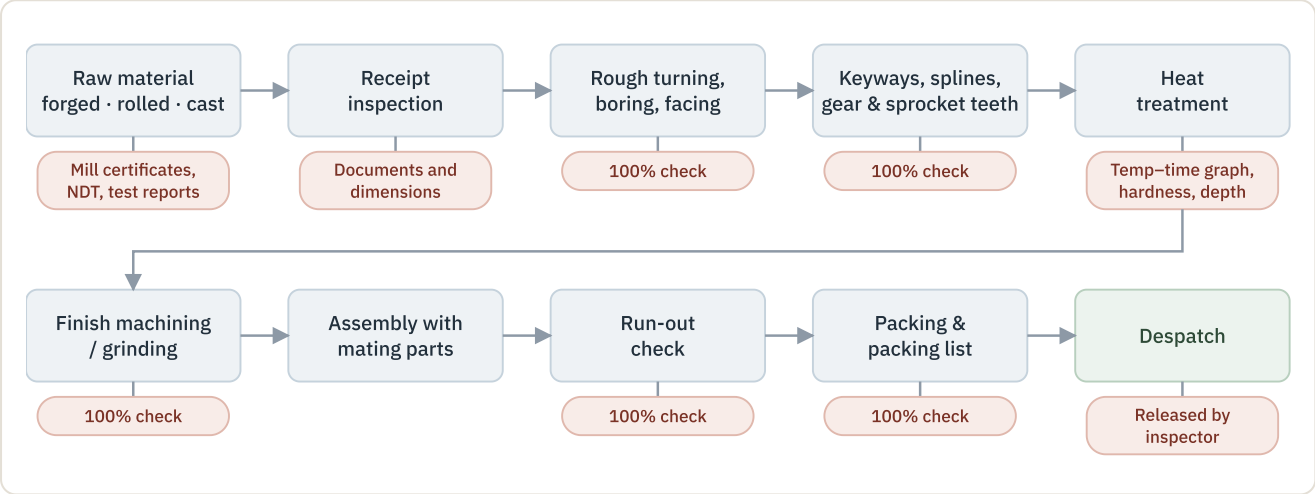

FIG. 3 · MACHINED & ASSEMBLED COMPONENTS

Incoming forgings and castings

- Arrive with NDT results, chemical and mechanical test results, heat-treatment and dimensional reports.
- Are checked at receipt inspection before any machining starts.

Heat treatment

- A temperature–time graph is recorded for every cycle.
- Hardness and hardened depth are checked before finish machining.

Before despatch

Every assembly gets a 100% run-out check after fitting its mating parts. The packing list is checked 100% against the order, and nothing leaves the works until the inspector releases it.

05 Design & drawing control

Specifications and drawings are the most important information in production. They are reviewed before use, and every change is controlled.

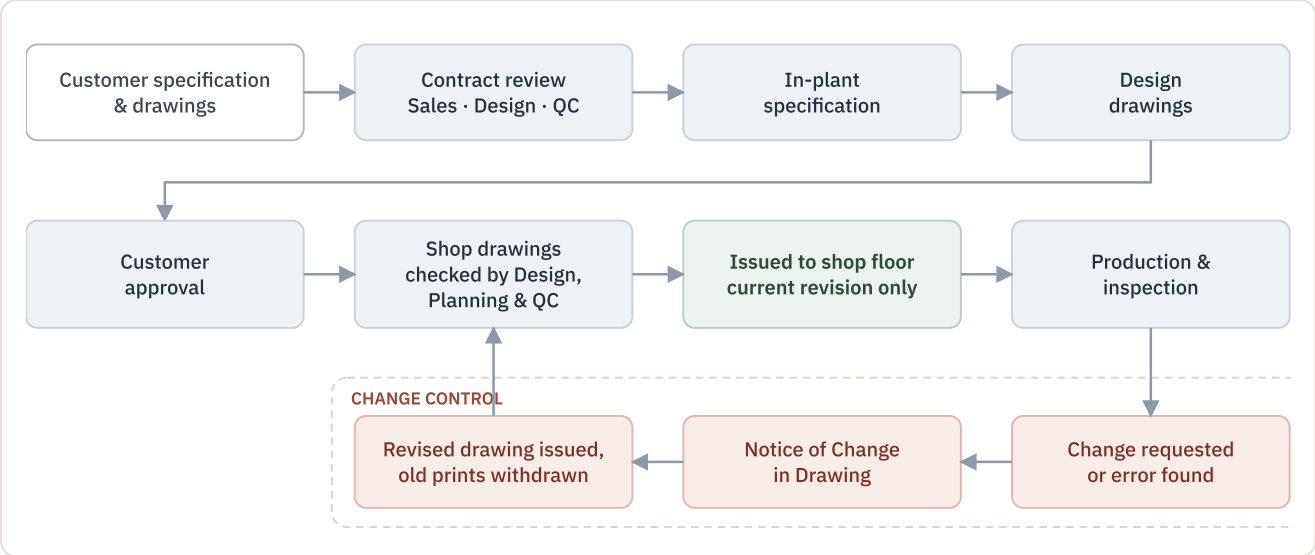

FIG. 4 · FROM CONTRACT TO SHOP FLOOR

REVIEW & DESIGN CHANGE RELEASED

Contract review

- Sales passes every contract, specification and drawing to Planning, Engineering and QA.
- Design and QA check them for adequacy. A review meeting is held when needed.
- Where the customer's needs differ from our in-plant standards, the contract-specific requirements are added for that job.

What every drawing defines

- The design criteria for buying, making, inspecting and testing.
- Tolerances for every dimension and process variable.
- Identification that links each part to its purchase, fabrication and inspection.

Revision control

- Revision numbers are verified before any drawing is issued.
- Changes go out on a *Notice of Change in Drawing*, reviewed by Planning and QC.
- Old prints are returned and withdrawn, so only current revisions are in use.

Customer drawings

- Design evaluates every customer-supplied drawing and reports to QC, Planning and Sales.
- If an error is found during assembly, the customer is told and agrees the correction.

06 Purchasing & suppliers

We buy only from suppliers whose own quality systems we have checked, and inspect what they send before we accept it.

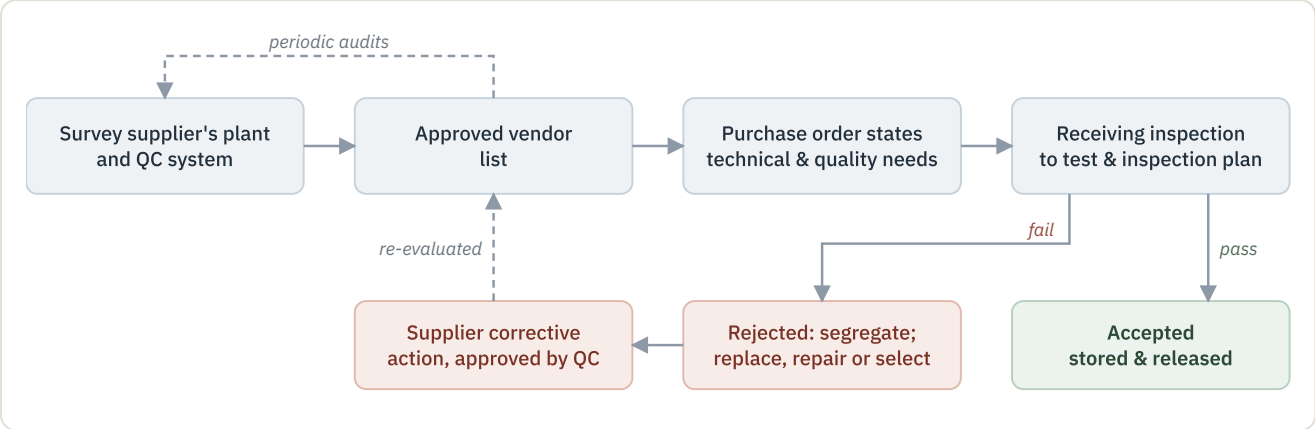

FIG. 5 · SUPPLIER AND MATERIAL CONTROL

CONTROL STEP REJECTION ACCEPTED

Supplier approval

- QC surveys the supplier's plant and quality system before an order is placed.
- QC can refuse any supplier without an adequate quality system.
- Approved suppliers are revisited periodically and given technical help when needed.

Receiving inspection

- All raw, semi-finished and finished goods are inspected before acceptance.
- Sampling, document review and checks follow a written test and inspection plan.
- Compliance documents are filed with the receiving note and purchase order.

Every procurement specification states

- Material identification to the applicable code or standard: shape, weight and grade.
- Inspections and tests the vendor must carry out.
- Mill certificate requirements.
- Documents the vendor must supply.
- Drawing and specification references, with revisions.
- Reviewed and accepted by QA before the order is raised.

07 Production control

All work is done under controlled conditions, to written instructions that state how acceptable work must look.

Work instructions

- Cutting, machining, punching, drilling, heat treatment, pre- and post-heating, assembly and welding all follow documented instructions at the workstation.
- Instruction sheets carry the contract and drawing number. They are approved by Production and Engineering and confirmed by QA.
- Work moves through the shop on a job card. The fabrication sequence, including inspections, is set out on the Operation Planning Card.
- Special processes are done only by certified workers.

Planning

- Production Planning controls all schedules from status reports by every section.
- A weekly planning conference with every manager confirms production and shipment dates.
- Long and mid-term projects get a production plan every two weeks.
- Any deviation is reported to the responsible person straight away.

THREE LEVELS OF FABRICATION INSPECTION

1 · In-process

Each section inspects its work before passing it on. Results go in the Internal Inspection Report.

2 · Shop assembly

Trial assembly confirms fit against the shop drawings and proper field erection.

3 · Final

All welded parts are checked for straightness, completeness and identification marks before packing.

Facilities & tooling

- Machines are run only by skilled, authorised operators, who check them daily.
- The Maintenance Section carries out preventive and routine maintenance and keeps a history of every major machine.
- Facilities are inspected monthly against a checklist. Only Maintenance may modify them.
- Jigs and fixtures are inspected and renewed regularly.

Stop when in doubt

- Any defect that affects quality or safety stops the operation immediately, and the machine is tagged out of use.
- Handling rules are issued with the drawings, so parts are not damaged between stages.
- Finished items are protected from rust and damage by painting, labelling, bagging or proper stocking.

08 Welding control

Only qualified welders, using qualified procedures and properly dried consumables, weld on our products.

IS:817 / IS:7813
qualification of welders and welding operators

IS:1024
standard for all welding (latest editions)

230–260 °C
drying of low-hydrogen electrodes, at least 2 hours

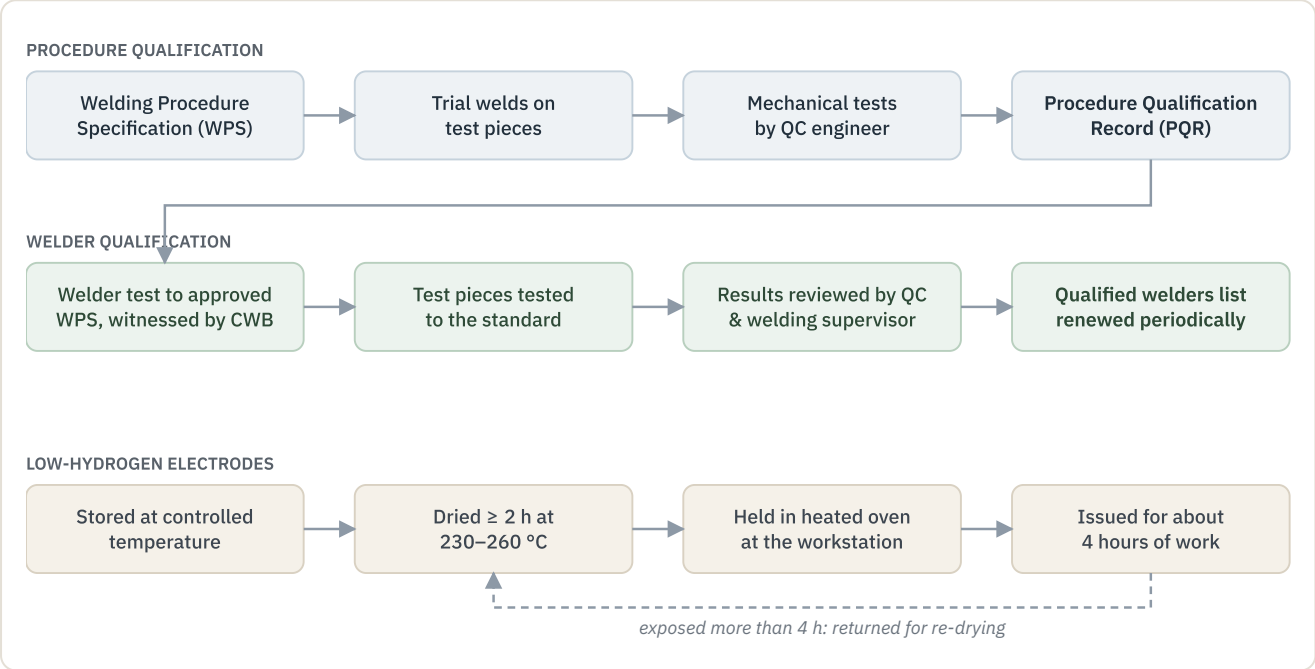

FIG. 6 · QUALIFICATION AND ELECTRODE HANDLING — PROCEDURE WELDER

During welding

- Work follows the approved WPS and the welding engineer's instructions.
- The inspector checks fit-up immediately before the first run.
- The supervisor monitors the parameters and records them on the Welding Process Record.
- Back-gouging or grinding is inspected before the second side is welded.

After welding

- Weld dimensions, visual quality and NDT are checked.
- The inspector signs, stamps and dates the Welding Inspection Report.
- The report is approved by the QA or QC engineer.
- Welding equipment is maintained on a scheduled programme.

If a parameter is violated

Welding stops. A non-conformity tag and notice are raised and handled under the non-conformance procedure (section 11).

09 Inspection & testing

Every inspection confirms the product matches the contract specification, the drawings and our quality requirements.

STAGE	WHAT IS CHECKED
Receiving	Incoming material against the test and inspection plan, with documents and mill certificates.
Assembly fit-up	Dimensions and tack welds against the drawing. Work is set up on a flat, level surface, and tack welders are qualified. Reports are made daily.
Welding	Weld preparation and fit-up, shrinkage allowance on heavy welds, preheat, run-off pieces, every run, back-gouging and post-heat.
Non-destructive testing `PT · MT · UT · RT`	Liquid penetrant, magnetic particle, ultrasonic and radiography as the quality plan requires. Repairs are raised on a Material Rectification Note and re-tested by NDT.
Pre-final	A full dimensional check of the complete fabrication against the drawing.
Surface preparation	Cleaning, pickling and shot or sand blasting. The surface must be free of mill scale, oil, spatter, salts and chemicals.
Painting	Surface temperature, relative humidity and dew point (whirling hygrometer) are recorded before painting starts. Paint type and mix ratio are checked, the coat is inspected visually, and dry film thickness is measured with a DFT gauge.
Final	Straightness, completeness and identification marks before packing.

Customer inspection and witnessing

- For customer-witnessed jobs, Sales and Inspection draw up an inspection and test plan. QC reviews it and the customer approves it.
- The plan covers every stage from receiving to shipment, including subcontracted items. Any difference from our in-plant standards is agreed in writing.
- QC sends the customer the inspection and test reports with supporting data.

10 Calibration & traceability

Measurements can only be trusted if the instruments are accurate, and parts can only be trusted if we know where they came from.

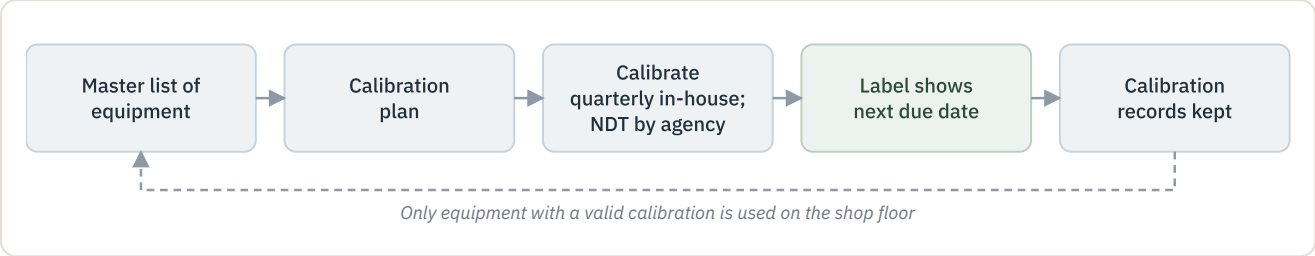

FIG. 7 · CALIBRATION CYCLE

STEP RELEASE FOR USE

Measuring equipment

- Steel tapes, vernier calipers, micrometers, straight and angle rules are calibrated every quarter by the Inspection Section.
- A master steel tape with an accuracy certificate is the factory standard.
- Only equipment on the calibrated equipment list is used in the shop.

Test & NDT equipment

- Calibrated by a qualified public inspection organisation within set periods.
- Each instrument carries a label with its next calibration date.
- The QA Manager is responsible overall. The QC Engineer keeps the reference standards.

IDENTIFICATION & TRACEABILITY

Job Order Number

Every contract has its own number, used on every document and part.

Lot number

Each manufacturing lot number is stamped or marked on the material.

Colour coding

Identifies steel grades and component groups at a glance.

11 Packing, shipment & non-conformance

Nothing leaves the works until it is released by an inspector, and nothing defective is allowed to move on.

Packing checks

- Component and shipping marks
- Packing list
- Quantity per package
- Packing material, size and quality
- Rigidity of each package

Storage & shipment

- Packing is to our in-plant standard unless the customer specifies otherwise.
- Storage and handling, by sling or forklift, protect the final coating. Any damage is repaired.
- Items ship only after release by QC and, where required, by the customer.

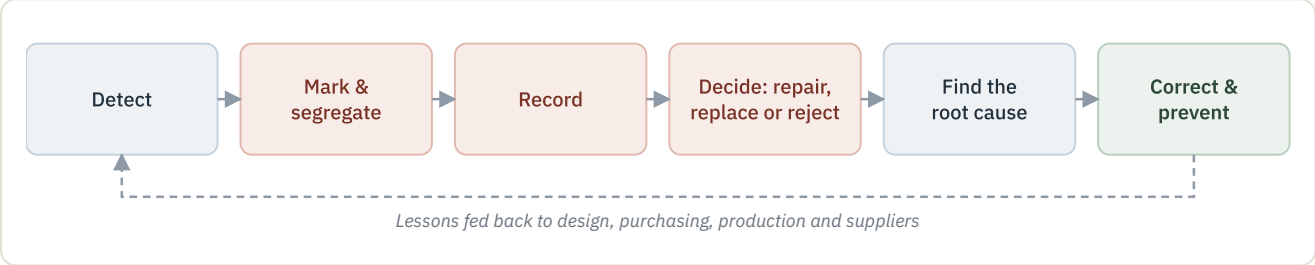

FIG. 8 · HANDLING A NON-CONFORMANCE

CONTAINMENT PREVENTION

WHERE FOUND	ACTION	PREVENTION
Incoming material	Supplier replaces, repairs or selects good material, as QC advises. Rejects are segregated and discarded.	Supplier proposes corrective action. QC approves it and checks the supplier's performance.
In the plant	Marked with white paint or a label, segregated, then repaired or replaced to the standard or customer specification.	Training, better processes and procedures, or an amended in-plant standard.
After shipment	Repaired or replaced as decided by the customer and the Inspection Section.	Improve the supplier's QC, the inspection and test plan, or the in-plant standard.

12 Records & feedback

Quality data is collected, analysed and fed back, so that every job is better than the last.

What we record

- Inspection and test data for every contract
- General in-plant inspection and test records
- Defective material and corrective actions
- Calibration records
- Quality cost data
- Welder qualifications and procedure records

How we use it

- QC analyses the data statistically and with other quality tools.
- Results are fed back to design, purchasing, production and subcontractors.
- Failure costs are totalled periodically and shared with all production staff, to raise quality awareness.

Quality is not a final inspection. It is a habit at every stage, from first sketch to final test.

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