

Quality Requirement

Mechanical Completion & Testing General Requirements

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CHANGE DESCRIPTION

Revision	Change description
1	Updated section 1 – Added Inspection check-list Changed Section 2 - Updated reference to engineering specifications Changed Section 2.2 - Supplier Responsibility Changed Section 4 – Updated details for product release Changed Section 5 - Weight control
0	Initial release

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1 MECHANICAL COMPLETION (MC)

Mechanical completion is executed to verify that the equipment is manufactured and installed in accordance with drawings, specifications and standards.

Note: MC completion list or equivalent final inspection check-list is a document provided by NOV with the PO documentation package.

NOV will normally perform a verification activity before accepting the products from the Supplier.

The Supplier shall present a Mechanical Completion check prior to FAT. Hydraulic and Mechanical interfaces shall be checked and measured, results to be documented and available. All check points and noted issues on the punch document shall be clarified with NOV prior to packing and shipment.

NOV QC representative will sign the final acceptance of the MC record.

1.1 MC Traceability List

Based on the Product model List of Parts, a MC Traceability List will be defined by NOV as a part of each Equipment Delivery's MC documentation (procedure/dossier etc.). The MC traceability list is limited to specific components (Commodity parts) with certificate requirements.

The Supplier shall verify and record the actual serial/Certificate number for each component listed in the MC traceability list. The list shall be presented to the NOV Surveyor for verification and signature before FAT and then it is to be enrolled into the final documentation.

2 TESTING

All test activities shall be performed according to established engineering specifications and as described in engineering procedure. In addition, it shall follow national regulations and satisfy NOV's terms & conditions. Safety precautions and necessary personal protective equipment shall be used.

The Supplier shall provide hydraulic, water, pneumatic and electric supply for performance of the tests.

The hydraulic power unit capacity shall be min:

$$\text{Test pressure} = \text{Design pressure} \times 1.5.$$

Capacity (flow rate in l/min) shall be sufficient for operating the equipment in question. The Power Unit/Pressure test unit shall meet the cleanliness ISO 4406:2017 class 17/15/12. The power unit shall have a mineral oil hydraulic medium, unless specified otherwise.

2.1 Load Test

All Safe Work Load (SWL) marked lifting points shall be overload tested and re- examined by MT after load test.

Load test shall be carried out using the overloads stated in the regulations. Dead weights (Test Loads) shall be supplied by the Supplier. The Dead Weights to be of controlled mass, alternatively the Supplier shall supply NOV with adequate load cell(s).

Necessary, certified, lifting gear (slings, chains, shackles, etc.) shall be provided by the Supplier.

2.2 Internal Test (Supplier Shop test)

The supplier is responsible to assure that the product shall be completed and prepared for internally test/inspection prior to delivery and/or factory acceptance test. NOV reserves the right to require inspection points (Hold/Witness/Review/Monitor) at this stage if specified in the ITP.

The supplier is responsible to check and record the test activity according to NOV MC/ Shop test procedure; check record or similar procedure or setup implemented by the Supplier.

Operation of machinery (hydraulic, electric and pneumatic) shall only be done in the presence of an NOV representative or as agreed with buyer.

Internal test/inspection is also applicable for steel constructions and products produced for assembly and finalizing by other Suppliers or sites.

3 FACTORY ACCEPTANCE TEST (FAT)

After NOV`s internal test has been performed, all outstanding items shall primarily be closed before FAT.

AS BUILT hose list and drawing shall be presented for approval to NOV QC Surveyor prior to FAT.

The FAT shall be performed according to approved FAT procedure issued by NOV.

The test program shall be managed by a NOV assigned representative.
Third party representatives and/or Clients may attend the FAT.

NOV representative will finally accept and sign out the FAT.

4 FINAL PRODUCT RELEASE / ACCEPTANCE RELEASE PROTOCOL (ARP)

The product can be considered as accepted when it shows satisfactory results according to the testing procedure; MC completion and when FAT documents are signed by the involved parties.

NOV QC representative will sign the ARP or the equivalent Product release approval documentation. The documents shall be signed no later than when the product is packed and ready for shipment.

5 WEIGHT CONTROL

The Supplier shall perform weighing of all equipment in accordance with ISO 19901-5 (or equivalent standard), and shall notify the Company in writing, 5 days in advance of the weighing operation.

The Supplier shall stamp the weight onto the equipment tag plate.
Documentation to be delivered according to final documentation requirements.

If delivery consists of several components/assemblies, each component shall have a separate weight certificate showing net weights, excluding lifting gear and transport frames.

The weight certificates shall include the engineering specified weights and highlight any deviations.

1-10 tons: +/- 2%, above 10 tons: +/- 1%.

5.1 Calibration of weighing equipment

The weighing equipment shall have a valid calibration certificate, max. 12 months old. If older, equipment must be re-calibrated before use.

Certified wire slings, shackles, chains etc. as required for lifting the component / product shall be used.

5.2 Procedure for weight control

The weighing shall be repeated three times and the weight recorded for each weighing on the certificate.

After weighing the average weight shall be calculated and recorded on the weight certificate, this and copies if the valid calibration certificate shall be attached to the Test Record Book and Final Documentation.