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- Establishing Engineering Test Certificates -

Document Control Sheet

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Abstract

This guideline is aimed at defining the aim, function and crucial elements to be considered when setting up a test certificate for any product or installation. Products and installations are addressed separately to ensure the clear-cut division in parameters required between the two documents.

Introduction

A test certificate is the document that validates the process of product certification. This certification process is intended to certify that a manufactured product has passed performance and quality assurance tests, while meeting qualifications stipulated in contracts, regulations and/or specifications.

Test certificates carry major liability associations not only to the product design engineer, but also the organization to which he or she is associated. This means that specific information and practices should be applied to ensure good ethics and risk mitigation through maintaining product quality.

Execution

The way in which a test certificate is completed is of utmost importance. Test certificates should never be filled in digitally, as this compromises the reliability of data through the risk of copying and pasting by the tester. It is known that digitally compiled test certificates do not hold up in a court of law, should any queries relating to conformance of the delivered product arise. The following general rules should be followed when considering a test certificate:

- Test certificates should be filled in by hand;
- Ergonomics must be revised to make sure that the test certificate can be successfully completed;

Basic Legal Requirements

When compiling a test certificate, the following points must always be included with relation to product identification:

- Date of Manufacture;
- Certificate Number (all test certificates should have a unique document number for further traceability);
- Company project reference number;
- Client;
- Description of product;
- Manufacturer's serial number;
- Date of test;
- The type of test with relation to the product needs to be clearly identified;
- The test validation should always be identifiable, not just by test type, i.e.:
    - Inspection test certificate acknowledgment/witnessing;
    - Installation pressure test certificate;
    - Manufacture pressure test certificate;

- The limitations of the test must be clearly outlined to mitigate the risk of undue liability by the manufacturer, for example:
    - If an electrician issues a certificate of compliance on an electrical installation, they clearly stipulate what there is, any sub-systems and all-important associations that they are signing off on. If a fault ever occurs, and the electrician's competency comes under question; an additional plug may have been installed by an unqualified person. The original certificate would have noted how many plugs and circuits there were. The electrician can then clearly justify his or her competence by proving that the origin of the fault pertaining to the query, was not covered by them at the time of issuing of the test certificate.

In addition to identification, the vetting procedure required on a test certificate is very important. The following rules should be adhered to:

- The tester should carry out the test and sign accordingly;
- A witness (e.g. immediate supervisor) should also sign the certificate as a quality control measure;
- The responsible engineer/suitably qualified person should sign off the certificate, acknowledging that the results are in-line with safe working tolerances specified;

The client should sign the test certificate, not in the capacity of verifying technical details, but to limit liability by acknowledging that they have viewed the test and are satisfied that it was indeed carried out without any defects ensuing testing. From a technical view point the final liability lies with the qualified/competent person that vetted the certificate.

Factory Tests

Tests carried out in the factory should list the following information:

- Standards that are referenced for the purpose of the test;
- Parameters to be tested;
- Acceptable values and tolerances for each parameter tested;
- The actual reading produced after the test;
- Any specific limitations that were applied to the test, e.g.:
    - The intended system pressure of a product may not be able to reached during factory acceptance testing for several reasons. The required pressure may however be achievable at time of Site Acceptance Testing. The test parameters at the factory would thus need precise defining.
- Comments for any other specialized conditions relating to the test(s) carried out;
- All testing equipment that is used must be listed, namely:
    - Tester Type
    - Make
    - Model
- The latest calibration date should be made available, and where more than one of the same types of testers are used, the serial number to justify any confusion relating to latest calibration(s).

Testing Outside of the Factory

All considerations made up until now are also to be applied to site test certificates. The following additional respects need to however be implemented:

- Site name;
- Site address;
- Site sub-section if applicable (e.g. specific shop location at a mall);

- Limitations of installation testing;
- Special conditions/exclusions;
- Reference to handover acknowledging test execution without problems;
- Any specialized contractual constraints by the owner of the site being worked on.

External Testing of Components

It is very important to manage all equipment that cannot be tested by the manufacturer, e.g. compressors that comprise the product being manufactured.

All key components should always be accompanied by a test certificate. This is usually managed and administered by the organization's procurement team. The administration measure put into place should allow for tracking and document identification that can directly associate the certificate(s) to the product.

All supplier test certificates should always be attached to the test certificates issued by the company. These should be copies. The original should always be filed in the product job file and archived in line with jurisdictional requirements and the organizations quality management system.

It is important to note, that not all components require test certificates. Only key components that carry risk such as mechanical failures and so on, should have this applied. Minor components such as pipes, valves, wire etc. should conform to general validation by the company at time of selection of the supplier.

The company will validate a supplier when adding them to their system. This differs between organizations, and the exact process and structures should always be identified for that company in line with their quality management system.

Supporting Documents

The process of testing is not limited to only test certificates. The following support systems should be in place and managed with great care:

- Safe working procedures (per test);
- Testing method statements (per test);
- Test equipment list;
- Test equipment log books;
- Calibration schedule;
- Database of calibration certificates;
- Test equipment fault logs;
- Test equipment timetables where equipment is shared by multiple users;
- Insurance documentation and policies where expensive equipment is utilized, a policy should be distributed to ensure that all employees are aware of special conditions relating to insurance, when they accept responsibility of the test equipment by means of the log book(s).

Supporting Information

Where pertinent design standard and specification document are regularly reference, a controlled database should be established for referencing by testers and other key personnel.

This system should ensure that copyright risk is not breached, and that information is available at all times to key persons carrying out product certificated related operations.

Conclusion

This document is intended to serve as a basic guideline only. This document is based on common practices and requirements in the engineering, procurement and construction industries within South Africa. This document should be carefully considered during application, specifically when identifying additional jurisdictional requirements that may be required for a product.

Many companies require specific methods and documentation when it comes to validating the conformance and safety of a product. These should always be adhered to by system administrators and never be negated. This could place an organization at high risk in terms of liability across several factors of a project.

This being said, it is very important to realize such requirements when vetting a new prospect that comes into the company, to ensure feasibility and practicability of any such requirements.