

Procedure: Measurement Equipment

Purpose

To identify all measurement and monitoring equipment used to maintain product quality and ensure it is periodically checked for suitable use.

References

1. CDQ2020 - Measurement Equipment Report
2. CDQ2020 - Measurement Equipment Register

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1. Measurement Equipment Report

Each key piece of measurement equipment has a sticker with a unique no. which relates to its Measurement Equipment Report ([ref 1](#)), these reports are a record of the history of each piece of equipment. They list:

Item and ID number	Inspection frequency
Where the equipment is located	Any work/maintenance carried out on the equipment
Inspection/service history	Who carried out the inspection/service

2. Measurement Equipment Register

The Measurement Equipment Register ([ref 2](#)) lists details about each piece of equipment and when the next inspection/service is due.

3. Service by Contractor

For all services carried out by an external contractor, the contractor's reports must be included with the Measurement Equipment Report.

4. Protection of Measurement Equipment

When in storage and during routine maintenance and use, where possible each piece of measurement equipment is protected against damage and deterioration.

5. Non-Conforming Equipment

If equipment is outside of specified tolerances, a risk assessment is carried out on the goods produced since the previous measurement. Appropriate action is taken depending on the outcome of the risk assessment. If equipment is found to be outside of specified tolerances, the equipment is adjusted, repaired or replaced.

6. Measurement Equipment – Assessment Method and Acceptable Tolerances

6.1 Scales

Assessment Method

All scales are assessed on site by an approved contractor. Our assessment of whether the scales are suitable for use is based on the recommendations in the approved contractor's reports. If a set of scales sustains damage, it is quarantined until they are given the OK by the approved contractor.

All reports shall be filed on 2020 with the Scales Measurement Equipment Report ([ref 1](#)).

6.2 Spectrometer

The Spectrometer undergoes a day to day program. For more info refer to "Spectrometer" procedures.

6.3 Silver/Silver Chloride Reference Electrodes

Assessment Method

The Master Silver/Silver Chloride reference electrode shall only be used for checking and verifying Rust Seeker Reference Electrodes. This includes:

1. Electrodes that have been in stock for an excessive length of time. Note that we sell the oldest stock first, so the likelihood of having very old stock is reduced.
2. If a Rust Seeker becomes damaged or is suspected of being damaged during assembly.
3. If a customer posts back their Rust Seeker to verify its accuracy.

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The Master Silver/Silver Chloride shall not be used for day to day operations and it shall be replaced at least every 4 years. If the reference electrode is within +/- 10mV it is within the limits of acceptable use. If the reference electrode falls outside of this range, it is to be replaced.

6.4 Multimeters

Assessment Method

All Multimeters are calibrated against the Master Multimeter. It shall only be used for calibration of other multimeters; it is not to be used for day to day tasks. It shall be verified at least every 48 months via comparison with 2 other multimeters that are registered as part of the Measurement Equipment system.

Calibration of all standard use multimeters is carried out by using the variable power supply and comparing voltage readings at 12 volts and 2.77V (lowest possible reading using variable power supply). The results and deviation are then recorded on the appropriate measurement equipment report ([ref 1](#)). Voltage readings must be within +/-0.6V (5%) deviation from the master multimeter to pass.

ID No.		Brand		Model		Serial No.		Location		Test Frequency					
21 - Master		Risharb		Rish 15S		090891		Ops Manager Office		48 Months					
Voltage Test (12V)						Voltage Test (2.77V)									
Master		This Meter		Dev.		Pass		Master		This Meter		Dev.		Pass	

ID No.		Brand	Model		Serial No.	Location		Test Frequency	
22		Dick Smith	Q1419		180557275	Laboratory		12 Months	
Voltage Test (12V)					Voltage Test (2.77V)				
Master	This Meter	Dev.	Pass		Master	This Meter	Dev.	Pass	

ID No.		Brand	Model		Serial No.	Location		Test Frequency
23		Digitech	QM1535		795773	Laboratory		12 Months
Voltage Test (12V)					Voltage Test (2.77V)			
Master	This Meter	Dev.	Pass	Master	This Meter	Dev.	Pass	

Tested by:

Date:

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6.5 Digital Thermometer/Pyrometer Handsets

Assessment Method

All Digital Thermometer/Pyrometer Handsets are calibrated against the Master Digital Thermometer Handset. The Master Digital Thermometer Handset shall only be used for calibration of other handsets and auditing laboratory thermometers; it is not to be used for day to day operations. The Master Digital Thermometer Handset is verified annually via comparison with at least 2 other digital handsets that are registered as part of the Measurement Equipment system.

Three thermometer test probes are submerged in molten Aluminium or Zinc, each in turn is plugged into the Master Digital Thermometer Handset. If the readings are within $\pm 5^{\circ}\text{C}$ of each other, one of the probes is selected for testing the Digital Thermometer Handsets. If the readings are outside of this range, the probes or connecting wiring are repaired or replaced.

The temperature reading is then recorded on the Thermometer Measurement Equipment Report ([ref 1](#)). All other Digital Handsets are then plugged into the same thermometer probe and the reading is recorded.

Interim cross calibration can be used between 12 monthly calibrations as a secondary check. If digital handsets display differently, then check the digital handsets against the master unit.

Tolerances

If the temperature readings are within $\pm 20^{\circ}\text{C}$, the digital thermometer is within the acceptable limits. If the readings are outside of these limits, the Digital Thermometer Handset is sent for repair or replaced.

Master	Brand/Model	Frequency	Location
I.D No: 52	TFC-305P	36 Monthly	Op's Manager
Date:	Dip 1	Dip 2	Dip 3

General Use	Brand/Model	Frequency	Location
I.D No: 27	TFC-305P	12 Monthly	Foundry
Date:	Dip 1	Dip 2	Dip 3

General Use	Brand/Model	Frequency	Location
I.D No: 28	TFC-305P	12 Monthly	Foundry
Date:	Dip 1	Dip 2	Dip 3

General Use	Brand/Model	Frequency	Location
I.D No: 29	TFC-305P	12 Monthly	Foundry
Date:	Dip 1	Dip 2	Dip 3

Tested by:

Date:

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