

# Royal Scientific Society

## Laboratory Management & Quality Assurance

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## What is QA?



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A set of documented procedures and practices that, when effectively applied, insure a product with a specified level of quality and consistency.



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## Why ?



To obtain test results that are:

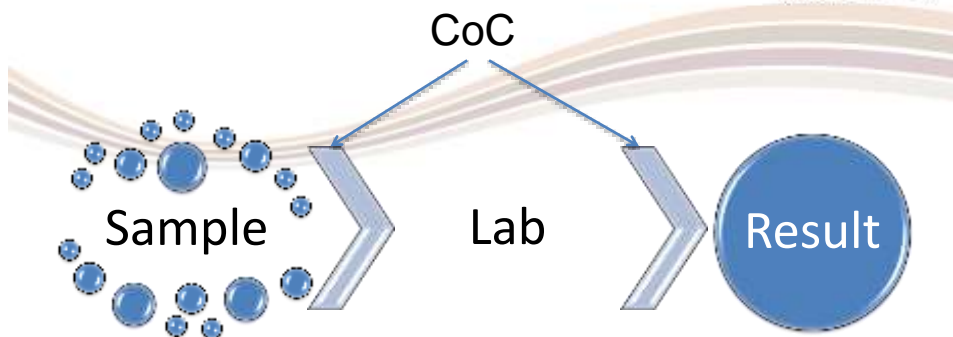
- Accurate
- Reproducible
- With acceptable uncertainty
- Timely
- Defendable (when challenged)



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## Testing Process



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## Sample



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- Sample Info
- Sampling Tools
- Sampling Procedure
- Cross Contamination Prevention
- Sample Seals & Tamper Prevention
- Sample Handling During Transport
- Records



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## Sample Info.



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### Sample info.

- \* Sample ID Code
- \* Sampling Location
- \* Sampling Date & Time
- \* Sample Collector
- \* Custodian of Sample during Transport
- \* Sample – Lab Delivery Info.

Lab ID Code, Recipient at Lab, Time & Date, Sample Condition, Analyst



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## Lab



- Test Methods/Procedures (Incl. Sample Prep.)
- Testing Equipment (Incl. Auxiliaries)
- Lab Personnel
- Lab Environment
- Uncertainty Budget
- Documentation



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## Lab – Test Methods/Procedures



- Standard Methods (ISO, ASTM, EN,.....)
- Non- Standard Methods (Published and Peer-Reviewed)
- In-House Methods



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## Standard Test Methods



- Well Established
- Already Tested & Validated
- Given Estimate of Uncertainty
- Periodically Reviewed
- Only need verification of lab capability to perform
- Documentation of Verification Data is Required



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## Non-Standard Test Methods



- Published
- Peer Reviewed
- May Need Further Validation and test for Fitness for Purpose
- May Need Estimation of the Associated Uncertainty
- Need verification of lab capability to perform
- Documentation of Validation/Verification Data is Required



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## In-House Test Methods



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- Need Validation, Including Repeatability and Reproducibility, and test for Fitness for Purpose
- Need Establishment of Uncertainty Budget and Uncertainty Estimation
- Need verification of lab capability to perform
- Need Analysis and Documentation of Validation Data



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## In-House Test Methods-Validation A couple of methods



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- Comparison with test results obtained using a validated method
- Use of Certified Reference Material(s)



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## Lab



- Testing Procedures (Incl. Sample Prep.)
- Testing Equipment (Incl. Auxiliaries)
- Lab Personnel
- Lab Environment



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## Lab – Testing Equipment



- Fitness for Purpose
- Equipment Calibration (Measurement Traceability)
- Equipment Intermediary Checks
- Preventive Maintenance
- Documentation and Records



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## Lab – Personnel (Analysts)



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- Theoretical knowledge (Measurands, Measurement and Equipment Operation)
- Training on Test Equipment
- Training on Applying Test Method(s)
- Personal Proficiency (PT, use of CRM, Sample Duplicates, Inter-Lab Comparisons,...)
- Training/Proficiency Documentation and Records



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## Lab Environment



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- Temperature
- Humidity
- Power requirements and stability
- Others
- Documentation and Records



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## Results and Reporting



- Sample ID
- Other Sample Info
- Test Method and Deviations (if existed)
- Sample Preparation Method (if needed)
- Result Evaluation Reference
- Test Results
- Expanded Combined Uncertainty of Results (when requested – ISO 17025:2005), Coverage Factor or Level of Confidence.



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## Chain of Custody



CoC is the Cement Holding the  
Entire Testing Process Together



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Thank you



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