



Wood fuel quality assurance

Heat plant owners converting to using biomass fuel and who traditionally have used coal or gas as fuel are looking for the level of assurance of fuel quality and consistency of supply that is similar to that which they are used to when purchasing coal and gas.

Some types of biomass fuel can be very variable as to their quality and characteristics. As a result heat plant owners are seeking assurance that the potential variability can be managed by their suppliers. Suppliers can provide this assurance by having a quality management system

Quality Management

A Quality Management System (QMS) shows how an organisation operates. The QMS includes the organisation's policies and procedures, and is written with supporting attachments, such as forms, templates, flowcharts and training manuals. The policies and procedures should be complete, applied, understandable and consistent with actual practice. A well-developed QMS describes how policies and procedures are:

- developed
- documented
- approved
- implemented
- regularly re-assessed through self-review.

The QMS should be auditable by an independent external party.

The information in a QMS should not appear onerous or complex. Simple processes may be as effective as complex ones. As an example to effective processes – Is the tyre flat – looking at the tyre to see if it needs air, can be as effective as measuring the pressure. QMS auditor will want to be assured that you have a good process not a complex or costly process.

A QMS auditor needs to see that there is a structured approach to the management and delivery of a product that meets the customer's specification. The QMS is the document that anyone should be able to reference for information on procedures and it must be usable and accessible either electronically or physically. A small organisation might have one copy of the QMS in circulation – it could be amended manually and updated as appropriate. A large organisation may decide to review its full QMS at regular intervals. Some parts may be reviewed more frequently and in more depth. New procedures may have a shorter review cycle initially to ensure any teething problems can be rectified.

Regardless of type or style of QMS it MUST always be up-to-date. [That is the hardest part]

QMS external audit

A strength of a QMS is that it is externally audited by a qualified independent party. The auditor should be fully independent of the business being assessed and have experience in the activity being audited.

Having a QMS in place is a significant step towards operating in a quality focused way. Internal reviews are a first step in managing the effectiveness of the QMS but external audits can be the best way to assess the true effectiveness of the QMS. Quality audits are essential to verify the existence of objective evidence showing conformance to required processes, to assess how successfully processes have been implemented, for judging the effectiveness of achieving any defined target levels, providing evidence concerning reduction and elimination of problem areas and are a hands-on management tool for achieving continual improvement in an organisation.

The criteria for audit should be clearly understood by both the business being audited and the auditor. This criteria should be written and published in open access by the business's customers

The auditor will normally provide written confirmation that the business's QMS meet the criteria. This may be a certificate or simply written notification.

To benefit the organisation, quality auditing should not only report non-conformances and corrective actions but also highlight areas of good practice and provide evidence of conformance. In this way, staff may share information and amend their working practices as a result, also enhancing continual improvement.

The business can obtain significant market benefit from having had an independent audit of the QMS and use the information when bidding for supply contracts. Customers are keen to know that the business has been independently looked at.

In the solid biofuel supply sector there are recognised external auditing schemes

- [Bioenergy Association – Solid Biofuel Supplier Accreditation](#)
Independent assessment and monitoring of suppliers of solid biofuels. Includes coverage by complaints scheme
- DIN plus
Certification of residential and industrial wood pellet manufacture
- [ENplus](#)
Certification of residential and industrial wood pellet manufacture
- Good Chips
Certification of residential and industrial wood pellet manufacture

QMS Documentation

While there is no set format for a QMS, the auditor needs to see evidence of a structured approach to how the business manages their day to day operations. Ideally, their QMS should include the following general features:

- It should be appropriate to the size, nature, complexity of the processes and the organisation.

- It should document all relevant aspects of any required standards and legislation that is being used.
- It should describe in detail the processes used, and how these processes are regularly reviewed, corrected and improved.
- It should explain how quality is monitored and documented.
- All changes made to the processes should be subject to a *management of change* review to ensure that all the effects of the change are addressed.
- All key documents should be controlled documents.
- The QMS should also outline how:
 - staff are trained
 - safety and good manufacturing practice are maintained
 - all details of receipts, fuel processing, deliveries and samples are recorded.
 - nonconforming product is dealt with; and
 - how problems are managed.

Depending on the nature of the business's specific activities, it is expected that their QMS will also cover a number of specific elements:

- **Processes**
 - a) Person accountable for or appointed to manage the quality system
 - b) Product specifications for biomass fuel supplied
 - c) Product Certificate of Quality provided to customers
 - d) Fuel handling and storage including moisture and contaminants exclusion and protection
 - e) Nature and frequency of sampling and testing
 - f) Test methods and equipment
 - i. Maintenance and calibration
 - ii. Participation in correlation schemes
 - iii. Tests performed in house
 - iv. Use of external test laboratories
 - v. Laboratory or test room registration status and QC tester qualifications/experience
 - g) What approach is used for working with customers on quality related issues including for example to customers - the provision of information, advice, and management of complaints etc; to contractors – any contractual agreements for services.
 - h) What processes are there in place to manage non-conforming fuel.
 - i) Labelling and signage
 - j) Transportation – Policy and Practice
 - k) Promotional material and activities
 - l) Contract management
 - m) Handling of information requests and complaints – how is this done?

- **Supporting information**

Information demonstrating product should include:

- a) An outline of the sampling and testing carried out
- b) An outline of how retail samples are selected (e.g. site and season) and sampling frequency.
- c) An outline of your testing facilities; tests you can carry out on your production site and independent laboratories you use for non urgent tests.
- d) Ability to investigate changes to your processes by laboratory trials.
- e) Participation in any QA audits, e.g. ISO 9001 and the areas they cover or other quality assurance activities associated with sampling and testing.
- f) Information on retained samples and records kept.
- g) Any recent examples of product failing to meet specification but detected and able to be rectified before leaving your production facility. Any examples of the need to rectify product and lessons learned.
- h) Information on your ability to quarantine and reprocess or dispose of faulty product.
- i) Any examples of incidents you may have experienced in the last year such as product released to the marketplace which was later found to be outside specification, the reasons for this and the actions you took to identify and rectify the problem.
- j) A representative sample of sets of results for the biomass fuel products you have retailed in the past year. All results should be recorded as part of the QC process. How the results compare against contracted deliverables should be presented with the results submitted for registration.
- k) Details of how and when to calibrate testing equipment and the reporting of actions/corrections taken.
- l) Processes for dealing with customer complaints and claims relating to quality.

QMS Internal review

Having a QMS in place is a significant step towards operating in a quality focused way. This is a key first step but over time it's highly likely that operations change or develop and more effective ways of doing things are identified. It's important therefore that the QMS is kept up to date and address all changes or developments in onsite activities and processes. An internal review is somewhat like a process of checks and balances in order to ensure that the QMS is effective. It's important that the responsibility for managing, reviewing and implementing the QMS is allocated and that it is regularly monitored.

The QMS documentation should show how the QMS is reviewed and as a result of any specific findings leads to the amendment of internal policies, processes and procedures as part of the management of the business in its delivery of a quality product or service.

Staff training

Staff training is a key component of running a quality process. An auditor will seek details of the applicant's commitment to training and details of how training is structured and practiced within the organisation with regard to quality fuel supply.

Documentation should outline the training procedures and initiatives that they have in place noting the frequency of training, training topics and how many staff members are trained.

Critical is the training of relief staff, or staff who can step in when the regular trained staff are not available. Things often go wrong when temporary staff step in and undertake activities they haven't been properly trained for.

Ensuring product quality (quality control procedures)

Ensuring that fuel quality is maintained from the point of production to the point at which it is delivered to the customer is essential. This focus of processes and procedures should be on the maintenance of quality in both practical and contractual. This is achieved by good control of all processes involved and confirmed using an appropriate level of sampling and testing along the whole supply chain.

Information on the expected best practices for product quality verification is set out in the *Bioenergy Association [Technical Guide 5 - Standard Methods for Verifying the Quality of Solid Biofuel](#)*.

The tests and other processes applied at each stage of product manufacture and distribution should be appropriate to the applicant's own circumstances. The recommendations below are advisory only and are not intended to cover all circumstances or actions that may be required. Details as follows:

- Sampling
- Product Testing
- Transportation methods
- Equipment Calibration

Sampling

Sampling must be carried out appropriately and with sufficient frequency as to represent a credible picture of the supplier's activities. Solid Biofuel Suppliers should refer to the Bioenergy Association Technical Guide 5 which sets out recommended sampling procedures and frequencies against which registration will be assessed.

Product testing

It is important that product tests of properties related to biomass fuel type and quality are carried out periodically. For registration the frequency of sample testing is set out in [Bioenergy Association Technical Guide 5 - Standard methods for verifying the quality of solid biofuels](#).

It is important to appreciate that these tests not only give a customer confidence but also signal to potential customers the supplier's commitment to quality and performance. These tests and the performance are what helps to set some suppliers apart from others.

Bioenergy Association approved testing bodies are set out in www.usewoodfuel.org.nz/biomass-fuel-testing .

Fuel transportation methods

Suppliers should be able to demonstrate that their fuel transportation methods are appropriate for maintaining product quality during transport eg are biomass pellets transported in covered trucks.

Equipment calibration

Equipment used to test samples should be calibrated regularly to ensure accuracy and consistency of results. Suppliers should be able to advise an auditor on calibration testing results. An ideal calibration regime is set out in Bioenergy Association Technical Guide 5

Maintain a list of the equipment you hold onsite for the purposes of quality testing. Each item listed should note which fuel types the equipment is relevant to. If you replace the equipment ensure that documentation is updated.

Managing biomass fuel quality contractually

An auditor will be interested to understand how the issue of biomass fuel quality is addressed contractually. Suppliers should be able to indicate to an auditor the typical nature of contractual requirements between parties. Further, it should also be noted what the agreed steps are to remedy any contractual failures.

External certification and accreditation

If a supplier has any external certification or accreditation from an independent external entity this should be recorded within the QMS documentation. The requirements for certification or accreditation may be the basis of the QMS system.