

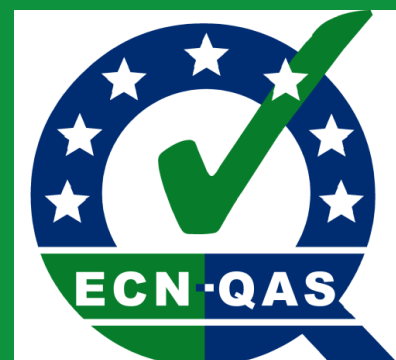
## Summary


# ECN-QAS

## European Quality Assurance Scheme for Compost and Digestate

European Compost Network ECN e.V.

[www.compostnetwork.info](http://www.compostnetwork.info)



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## Summary


Quality assurance schemes for compost and digestate products have been established in a number of Member States over the past 20 years. They form the backbone of sustainable biodegradable waste recycling, ensuring that quality products (meeting minimum quality criteria) are manufactured consistently.

The Commission started already to work on product standards for biowaste under the Waste Framework Directive [1] [2]. The development of End-of-Waste Standards for compost and digestate by the European Commission [3] and the revision of the European Fertiliser Regulation led to a demand for a European uniform quality standard for composting and anaerobic digestion plants and composted/digested products. The European Compost Network ECN met this challenge and developed a concept for a European quality assurance scheme within its working groups 'Quality Assurance' and 'Anaerobic Digestion'. It includes proposals for quality standards of compost and digestate required by the Commission for a free cross-border movement of goods in the EU.

## Background

As the Landfill Directive (99/31/EC) sets targets to limit the quantities of biodegradable waste landfilled, it is important that those biodegradable wastes that are recycled through composting or anaerobic digestion are of a sufficiently high quality to ensure that the soils to which they are applied are not only protected, but enhanced.

The Waste Framework Directive (2008/98/EC) sets the provision for defining end-of-waste (EoW) criteria, which are a set of standards that a given waste stream has to fulfil in order to cease to be waste. Work on determining EoW criteria for compost and digestate has been undertaken by the EC's JRC-IPTS, a process in which ECN has been actively involved since its inception in 2007. The final report, published by the JRC-IPTS in January 2014, proposed that: *"Compost/digestate producers are required to operate a quality management system in compliance with quality assurance standards that are recognised as suitable for compost/digestate production by Member States or the Community."* This ethos is also underpinned in the 2010 EC Communication on Bio-waste (COM(2010)235), which notes: *"Standards for compost and digestate should be established to enable their free circulation on the internal market and to allow using them without further monitoring and control of the soils on which they are used."*

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Standards, implemented through an independent quality assurance scheme, therefore provide the basis for market development and investment. In addition to facilitating the implementation of waste legislation, a quality assurance scheme for compost and digestate is also an important pre-requisite in the revision of the EU Fertilisers Regulation by DG Enterprise (EC No. 2003/2003), the JRC/IPTS revision of the EU Eco-Label for Soil Improvers (COM(2006)799) and Growing Media (COM(2007)64), the revision of the EU Organic Farming Regulation (COM(2014)354) by DG Agriculture and Rural Development, and the EC's Soil Thematic Strategy (COM(2006)231).

### **Targets of the European concept**


The target of setting up an EU-wide quality assurance scheme for organic resources is mainly to define this Europe-wide standard for quality management and quality organic products like compost and digestate. The pre-condition for a consistent compost and digestate quality is to harmonise the parameters of the treatment process and to check them regularly by an independent control. In addition this ECN-QAS project should show a common basis for the existing quality schemes in Europe and should support Member States to define their own quality standards and to develop a quality assurance scheme for composts and digestate.

The targets of ECN-QAS and of this initiative by ECN e.V. are:

- Specification of marketable compost and digestate products with a standardised and guaranteed homogenous quality
- Establishment of a harmonised control tool for compost/digestate quality
- Enhancement of the compost/digestate quality and operation quality
- Safeguarding of a successful use of compost/digestate products
- Deregulation and recognition of certified compost/digestate products by legal authorities, in agricultural production systems and by food processing industry
- Promotion of recycling of organic waste 'From Waste to Product'

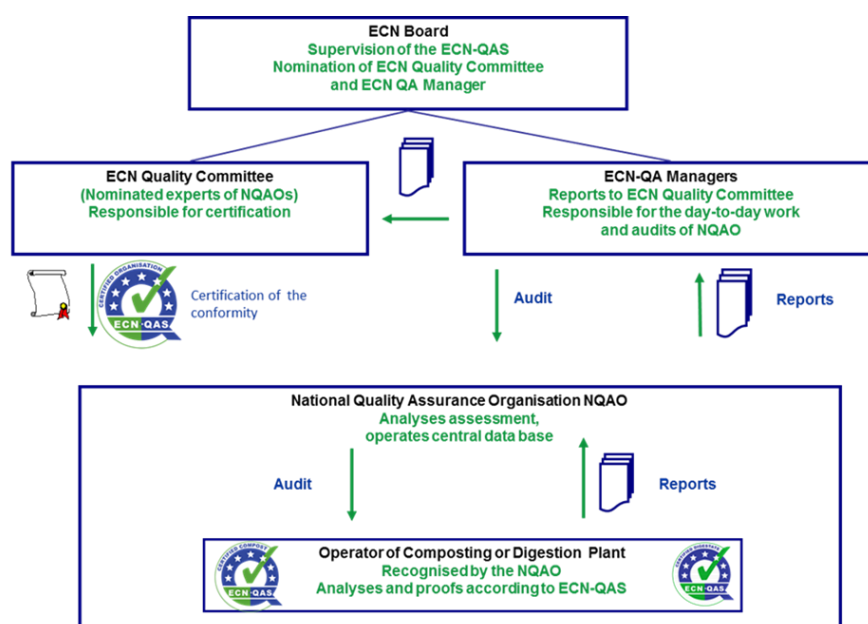
### **Concept of the ECN-QAS**

In order to support the manufacture of quality compost and digestate across Europe, ECN developed a concept for a pan-European quality assurance scheme (ECN-QAS) within its working groups 'Quality Assurance' and 'Anaerobic Digestion'. This includes the characterisation of quality standards for recycled organic resources (compost and digestate)


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with the aim of facilitating the free cross-border movement of goods within the EU. It is based on existing national quality assurance systems and knowledge within member organisations. The ECN-QAS provides a European-wide independent quality assurance scheme for national quality assurance organisations (NQAO). It operates in accordance with the European standard “General criteria for certification bodies operating product certification” (EN 45011) and has been based on knowledge of, and experience in, existing quality assurance organisations. The ECN-QAS requires:

- A conformity assessment of the NQAO quality assurance scheme by ECN.
- Regular assessment of compost and digestate production in the plants by the national quality assurance organisation.
- Regular sample taking and analysis of the final product for relevant quality parameters from independent, acknowledged laboratories, coupled with evaluation of the results by the NQAO.
- Documentation by the NQAO with information about the quality properties of the product, legal requirements, the necessary compost and digestate declaration and information about use and application rates according to good practice.
- Awarding of the ECN-QAS Quality Label to composting or digestion plants by the NQAO.



**Figure 1: Organisational Structure and Course of Certification by ECN-QAS**

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### **ECN-QAS Quality Manual**

The specific aim of this ECN-QAS Quality Manual is to provide the necessary background information and standardised documentation to build up a European Quality Assurance Scheme (ECN-QAS) for composts and digestate. The Quality Manual includes the requirements for the conformity assessment of national quality assurance organisations and for composting and digestion plants.

The Quality Manual is divided in three main parts:


- Part A describes the general target and structure of the European Quality Assurance Scheme (ECN-QAS).
- Part B of the ECN-QAS Quality Manual specifies the ECN requirements to be met by a national quality assurance organisation (NQAO) for composting/digestion plants, which are preconditions for the described recognition procedure of an organisation performing quality assurance according to the European Quality Assurance Scheme of ECN.
- Part C of the ECN-QAS Quality Manual is divided into two sections:
  - CI ECN-QAS for compost
  - CII ECN-QAS for digestate.

These sections specify requirements for the operational process management of composting and digestion, the selection of input materials and the compost and digestate quality. They include specifications for sampling and testing. They also specify requirements for product certification and declaration to ensure that the compost and digestate products are consistently fit for their intended uses. These essential elements have to be implemented into the quality assurance scheme of the national quality assurance organisation (NQAO).

### **Quality requirements for composting and digestion**

Process requirements for the production of composts and digestate are laid down in the ECN-QAS. These include the use of input materials defined in a positive list. The waste numbers and denominations of the European Waste Catalogue have been adopted and if necessary supplemented by explanations and specific requirements. As a basic principle only separately collected organic wastes are accepted.

Requirements on the process management and its documentation are defined too. This includes minimum guidelines about the adherence of process parameters to guarantee a sufficient sanitisation of the product. By means of a check list the operation quality of the

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plant is controlled and assessed through the NQAO at the plant inspection visit every two years.


### **Compost and digestate quality**

Quality composts and digestate have a widely homogenous composition based on defined input materials and are highly qualified humus products which are placed on the market as soil improvers and organic fertilisers. They are used to preserve the content of organic matter in the soil and thus influence bio-diversity and soil fertility in a positive way. The fertilising efficiency of compost and digestate can be characterised via their nutrient content, whereby longer time periods must be calculated (crop rotations) compared to mineral fertilisers for compost. Further criteria relevant for various compost and digestate applications, especially with the use as mixing components in growing media, are among others the plant compatibility and electrical conductivity of the material.

<b>Table 1: Quality criteria of the European Quality Assurance Scheme for the characterising of quality compost</b>		
	<b>Parameter</b>	<b>Assessment</b>
<b>Soil improvement</b>	Organic matter	≥ 15 %, declaration
	Alcaline effective materials (CaO)	Declaration
<b>Fertilisation</b>	Nutrients (N; P, K, Mg, S)	Declaration
<b>Material properties</b>	Plant compatibility	Benchmark accord. to the test on germinable plants, declaration
	Water content	Benchmark for peak content, declaration
	Bulk density/volume weight	Declaration
	Grain size	Declaration
	pH-value	Declaration
	Electric conductivity	Declaration

### **Aspects the protection of the environment and consumers**

Important parameters for the market of recycling products are the not desired ingredients which in quality assured composts and digestates can be reduced to a minimum through separate collection of biowastes together with an optimised process management which are harmless and environmentally safe for the individual application. Hereby to be named is the content of heavy metals and impurities like plastics, metals and glass and weed seeds.


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In order to achieve the quality label limit values must be kept for these parameters. They are based on a research [4] which has been contracted by the Commission's DG Environment in the framework of the development of the European Soil Protection Strategy. The formation of these limit values was the result on the comparing assessment of the present compost qualities in Europe with the pre-condition that separate collection of biowaste is established in the countries. In order to comply with the precautionary requirements of the environment and consumer protection the long-term accumulation of harmful matter in the soil has been considered when identifying the limit value levels.

Table 2: Precautionary requirements on the protection of environment and consumers		
	Parameter	Assessment
<b>Hygienic aspects</b>	Salmonellae	0 in 25 g DM
<b>Undesired ingredients</b>	Impurities (glass, metals, plastics)	≤ 0.5 % DM
	Weed seeds	≤ 2 per litre
<b>Harmful matter Precautional limit values<sup>1)</sup></b>	<b>Heavy metals</b>	<b>mg / kg DM</b>
	Lead (Pb)	130
	Cadmium (Cd)	1.3
	Chromium (Cr)	60
	Copper (Cu) <sup>2)</sup>	300 <sup>3)</sup>
	Nickel (Ni)	40
	Mercury (Hg)	0.45
	Zinc (Zn) <sup>2)</sup>	600 <sup>3)</sup>
<sup>1)</sup> Amlinger, F. et al. 2004: Heavy metals and organic compounds in waste used as organic fertilisers. <sup>2)</sup> Copper and zinc are classified as essential nutrients. Values over 110 mg Cu kg <sup>-1</sup> DM and over 400 mg Zn kg <sup>-1</sup> DM must be declared. <sup>3)</sup> These values are classified as benchmarks.		

## Quality Monitoring

Quality monitoring of composts and digestate is realised through regular sample taking and analysing by independent labs which are recognised by the national quality assurance organisation. A pre-condition for such approval is a regular participation in ring tests.

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The basis for the analysis of soil improvers and growing media are European Standards (EN). The analysing methods will be actualised correspondingly to the development in the European Standardisation of analysing methods. However, national analysing methods are also accepted in the ECN-QAS, in so far as they are legally requested.

### Certification

The national quality assurance organisation approved by the ECN-QAS is responsible for the monitoring of composting and digestion plants and their product quality. The conformity check of the NQAO is executed in regular terms by the ECN Quality Manager. The approval is given by the ECN Quality Committee. In case of a successful participation in the ECN-QAS the national quality assurance organisation will award the ECN-QAS conformity label.



**Figure 2: The ECN Conformity Label for national quality assurance organisations**


Composting plants and digestion plants can be awarded with the ECN Quality Label by the national quality assurance organisation if they can proof the compliance with the ECN quality standards. The report of the analysis results will be sent to the Quality Committee of the ECN for monitoring and documentation.

This system doesn't replace the autonomy of national quality labels and certifications. However, it makes clear that a uniform product quality in the European context is given which simplifies compost and digestate marketing over the country borders.



**Figure 2: ECN Quality Label for compost and digestate**



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### Forecast

In January 2014 the EU Commission published the final report on 'End-of-waste Criteria for biodegradable waste subjected to biological treatment (compost and digestate): Technical proposals' [3]. These proposals include besides process requirements and product criteria for compost and digestate that the monitoring of a product standard for composts and digestates should be connected to a uniform, independent system of quality assurance. This would definitely contribute to legal security and deregulation of national control measures. With the European Quality Assurance Scheme for Compost and Digestate 'ECN-QAS' the European Compost Network has laid down uniform requirements for quality assurance organisations for compost and digestate and their quality products. Since 2012 the ECN-QAS is registered as European Trade Mark (OHIM 2012/210: TM Nr. 011007168) at the Office for Harmonisation in the Internal Market ([www.oami.europa.eu](http://www.oami.europa.eu)).



**Figure 3: European Trade Mark for certified organisations and quality assured compost and digestate according to ECN-QAS**

### More information

The Quality Manual of ECN-QAS including the concept of the European Quality Assurance with all requirements can be ordered by ECN.

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### References:

[1] EU KOM (2010): Communication from the Commission to the Council and the European Parliament on the future steps in bio-waste management in the European Union. COM (2010)235 final; <http://ec.europa.eu/environment/waste/compost/developments.htm>

[2] 2008/98/EC: Directive 2008/98/EG of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. L 312:3; <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0098:EN:NOT>

[3] Hans Saveyn & Peter Eder (2014): End-of-Waste Criteria for biodegradable waste subjected to biological treatment (compost & digestate): Technical proposals. Hrsg: European Commission; Joint Research Centre (JRC) Scientific and policy reports. <http://ftp.jrc.es/EURdoc/JRC87124.pdf>

[4] Amlinger, F., Favoino, E., Pollak, M., Centemero M. and V. Caimi (2004): Heavy metals and organic compounds from wastes used as organic fertilisers. Study on behalf of the EU Commission DG ENV. A.2, [http://ec.europa.eu/environment/waste/compost/pdf/hm\\_finalreport.pdf](http://ec.europa.eu/environment/waste/compost/pdf/hm_finalreport.pdf)

