European Compost Network ECN

The ECN Concept for Quality Assurance of Compost

ECN-QAS

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Quality Assurance System

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The ECN Quality Assurance Scheme

1 Targets and Structure of ECN-QAS

2 Quality Assurance Organisations

3 The ECN-QAS for Compost

The ECN - Quality Assurance Scheme

The ECN-QAS was worked out by Working Group 2 "Standardisation and Quality Assurance"

- **2004 Start of discussion for an European standard for compost**
- **2006 Development of an European Quality Assurance Manual for Compost**

  Working group meetings in 2006/2008/2009
- **2009 Finalisation of the Quality Assurance Manual for Compost**
- **2010 Publication of the Quality Assurance Manual for Compost**

The ECN - Quality Assurance Scheme

The ECN-QAS Manual includes all requirements for Quality Assurance Organisations (QAO) and for process and product quality of compost

Contents of the ECN Quality Manual:

- Targets and structure of the ECN-QAS
- Requirements for national QAO
- List of input materials
- Operation quality requirements
- Product quality parameter
- Certification procedure

Targets and Structure of ECN-QAS

Targets of ECN-QAS

- Harmonisation of the compost quality across Europe
- Harmonisation of quality assurance schemes across Europe
- Assistance to build up national quality assurance schemes
- Assurance and monitoring of high quality compost products in Europe

Targets and Structure of ECN-QAS

2-Step Approach

1. Step

Conformity Assessment of (N) Quality Assurance Organisation ➔ requirements laid down in Part B done by ECN ➔ Awarding of the ECN-QAS Conformity Label to national quality assurance organisations (NQAO)

2. Step

Conformity Assessment of Composting Plants ➔ requirements laid down in Part C done by (N)QAO ➔ Awarding of a Quality Label for composting plants and compost products by a national quality assurance organisation (NQAO) in respect to ECN-QAS

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Targets and Structure of ECN-QAS

ECN/ORBIT Board
Supervision of the ECN-QAS
Nomination of ECN Quality Committee
and ECN QA Manager

ECN Quality Committee
(Nominated experts of NQAOs)
Responsible for certifcation

ECN-QA Managers
Reports to ECN Quality Committee
Responsible for the day-to-day work
and audits of NQAO

Certification of the conformity

Audit

Reports

National Quality Assurance Organisation NQAO
Analyses assessment,
operates central data base

Audit

Reports

Operator of Composting Plant
Recognised by the NQAO
Analyses and proofs according to ECN-QAS

The ECN-QAS for Compost (3.3)

ECN Quality Assurance Scheme for ompost

The part I describes the requirements for composting plants applying for the ECN quality label.

It includes basic requirements for

- Operation quality
- Product quality
- Certification process

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Elements of Quality Assurance

Input Materials	Positive list	monitored by Quality Assurance Organisation
Operation quality	Check list	
Product quality	Product control	
Product certification	Application recommendations	

The ECN-QAS for Compost (3.3)

Main elements of ECN_QAS:

- Specified **clean input biowaste** feedstocks from source separation schemes only
- **Quality managed and monitored process** providing save and fit for purpose products
- **Standardised high quality** with product certification by independent organisation
- **Meeting end of waste** criteria
- **Information** on product compost properties and appropriate application

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Elements of Quality Assurance

Operation quality

- suitable input materials in accordance with national legislation and the input list of ECN-QAS
- operation control by plant visits of independent quality managers
- control by independent sample takers

Independent analysis and declaration of the product quality

- 2 - 12 times a year according to the quality guidelines, depending on the amount of input material
- control and sanctions by an independent quality committee of the Quality Assurance Organisation
- certification with product declaration according to regulations

Application recommendations

- application recommendations based on national and European legal requirements
- application recommendations due to good fertilisation practice

Input Materials

List of suitable input materials for biological treatment

- including separately collected biodegradable waste

Biodegradable materials: biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises, comparable waste from food processing plants and it includes forestry or argricultural residues and manure

- excluding sewage sludge, mixed municipal waste, paper, natural textiles and processed wood

Operation Quality

The operation quality is defined by

- Documentation of suitable input materials
- Pre-treatment
- Composting process
- Sanitisation
- Compost refining
- Storage and declaration of compost products

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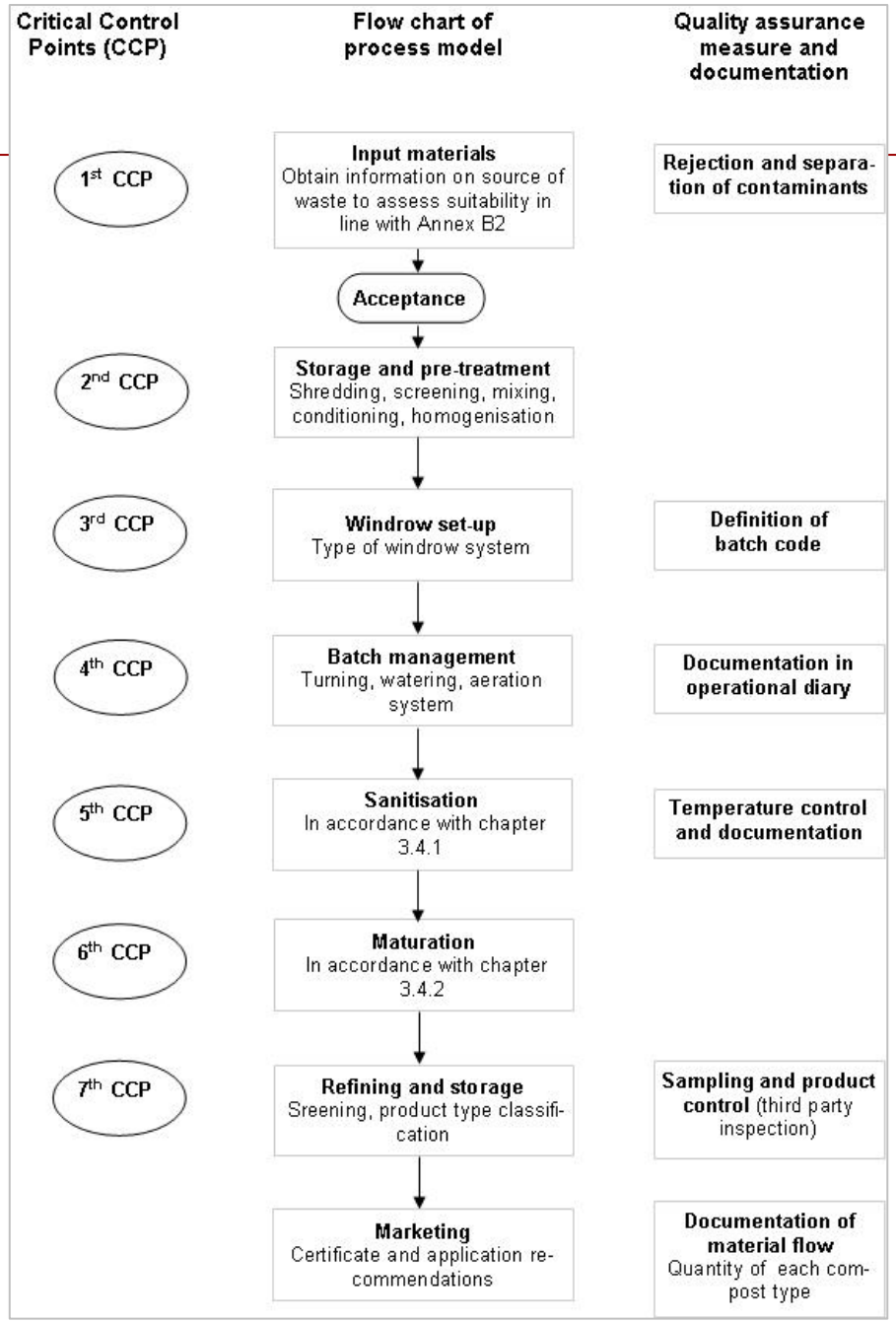
Process model

The composting process shall be described by a process model with critical control points.



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Process requirements

Each composting batch shall undergo a intensive decomposition and maturation in accordance with defined control points in the process model.

Intensive decompostion phase shall include thermal hygienisation in order to provide the necessary reduction of human, animal and plant pathogens

Recommendation for minimum time-temperature profiles		
Composting system	**Temperature**	**Time**
Open windrow system	> 55 °C > 65 °C	10 days 3 days
Closed system	> 60 °C	3 days

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Quality criteria

Product quality

Valuable criteria

- Decomposition degree (compost)
- Bulk density
- pH-value, salt content
- Plant nutrients
- Carbonats
- Organic matter content
- Plant response

Precautionary environmental criteria

- Hygienic aspects (salmonellae)
- Viable weeds and plant parts
- Impurities
- Potential toxic substances (heavy metals)

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European Standards for Heavy Metals

	Standard mg/kg DM]	**Cd**	**Cr**	**Cu**	**Hg**	**Ni**	**Pb**	**Zn**
Austria	Compost Ord. Class A	1	70	150	0,7	60	120	500
Belgium	Agricultural Ministry	1,5	70	90	1	20	120	300
UK	TCA Certificate	1,5	100	200	1	50	150	400
Germany	Biowaste Ord. Type II	1,5	100	100	1	50	150	400
Ireland	Draft	1,5	100	100	1	50	150	350
Netherl.	Class “Compost”	1	50	60	0,3	20	100	200
EU 2004[1]	**Proposal**	**1,3**	**60**	**110**	**0,45**	**40**	**130**	**400**

RESULT: Definition of one basic high compost quality suitable for all application areas

1 EU Study „Heavy Metals & Organic Compounds from Wastes Used as Organic Fertilisers“

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European Quality Standard for Compost

Quality criteria	Parameter	Dimension	Appraisal
Soil improvement	Organic matter	[% DM]	≥ 15 %, declaration
	Liming value (CaO)	[% DM]	declaration
Fertilizing properties	Nitrogen (N) total	[% DM]	declaration
	Phosphorus (P) total	[% DM]	declaration
	Potassium (K) total	[% DM]	declaration
	Magnesium (Mg) total	[% DM]	declaration
Material properties	Maximum particle size	[mm]	declaration
	Bulk density	[g/l FM]	declaration
	Dry matter	[% FM]	declaration
	Salinity / El. conductivity	[mS/m]	declaration
	pH value		declaration
Biological parameters	Aerobic biological activity		declaration
	Plant response		declaration

European Quality Standard for Compost

Precautionary quality criteria	Parameter	Limit value
Hygiene	Salmonellae	Absent in 25 g dry matter
Undesired ingredients and properties	Impurities (content)	≤ 0,5 % dry matter
	Weed seeds	≤ 2 seeds per liter
Inorganic pollutants	Lead (Pb)	130 mg kg^{-1} dry matter
	Cadmium (Cd)	1.3 mg kg^{-1} dry matter
	Chromium (Cr)	60 mg kg^{-1} dry matter
	Copper (Cu)[1)]	200 mg kg^{-1} dry matter[2)]
	Nickel (Ni)	40 mg kg^{-1} dry matter
	Mercury (Hg)	0.45 mg kg^{-1} dry matter
	Zinc (Zn)[1)]	600 mg kg^{-1} dry matter[2)]

[1)] Copper (Cu) and Zinc (Zn) are considered as trace elements. Threshold values above 110 mg Cu kg^{-1} dry matter and 400 mg Zn kg^{-1} dry matter must be declared.
[2)] These values represent orientation thresholds.

Sampling and Frequency of Analyses

Sampling according to EN 12579

Recommendation: 100 % external sample taking

Possibility: up to 50 % by plant manager

Analyses frequency

Recogniton procedure (first year of recognition)

Analyses frequency: up to 4 analyses per year

Monitoring procedure

Analyses frequency is calculated on the amount of input material (12 analyses per year at maximum):

Analyses per year = Amount of input material / 10.000 [t] + 1

Precondition: Analyses by accredited laboratories

Analytical Test Methods

Until no European horizontal standards (EN) for compost analysis exist, it is recommended to use European Standards (EN) for the analysis of growing media and soil improvers.

If no European standards (EN) for methods are required in an EU legislative on bio-waste national test methods and accepted test methods by national provisions may be used.

Analysis should be carried out by reliable laboratories that are preferably accredited for the performance of the required tests in an acknowledged quality assurance system.

ECN-QAS Conformity and Quality Label

Conformity label for recognised Quality assurance schemes

Quality label for compost

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Thank you for your attention!

ECN-QAS