

Hong Kong Organic Resource Centre

Compost and Soil Conditioner Quality Standard

2021



香港有機資源中心
HONG KONG ORGANIC RESOURCE CENTRE

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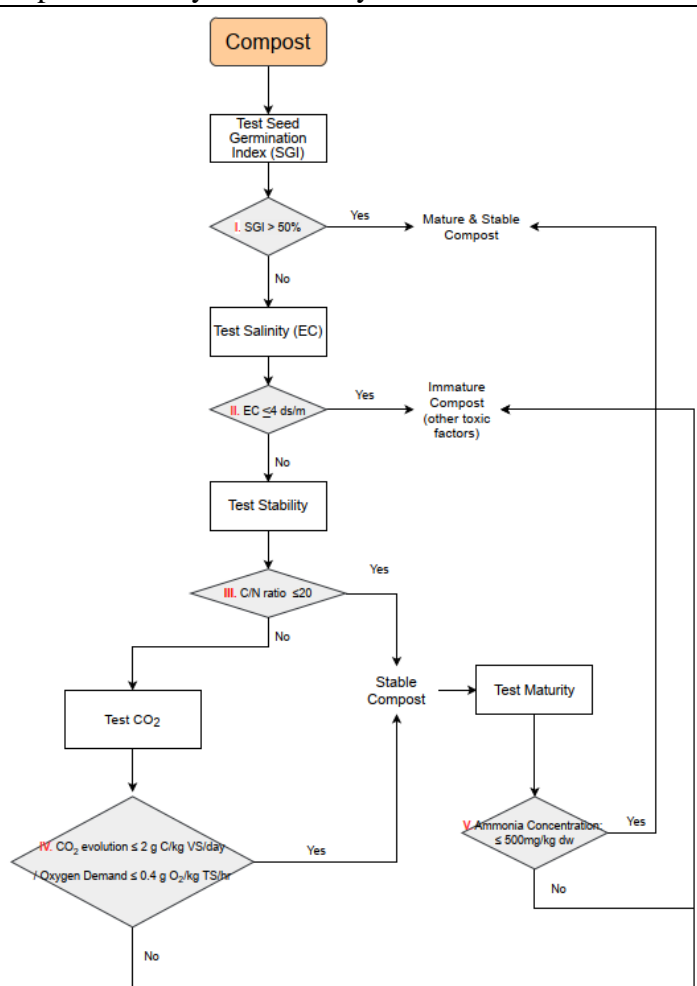
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HKORC Compost Standard

Table (1)

Item	Description																						
1	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  <pre> graph TD A[Compost] --> B[Test Seed Germination Index (SGI)] B --> C{I. SGI > 50%} C -- Yes --> D[Mature & Stable Compost] C -- No --> E[Test Salinity (EC)] E --> F{II. EC ≤ 4 dS/m} F -- Yes --> G[Immature Compost (other toxic factors)] F -- No --> H[Test Stability] H --> I{III. C/N ratio ≤ 20} I -- Yes --> J[Stable Compost] I -- No --> K[Test CO2] K --> L{IV. CO2 evolution ≤ 2 g C/kg VS/day Oxygen Demand ≤ 0.4 g O2/kg TS/hr} L -- Yes --> J L -- No --> M[Test Maturity] M --> N{V. Ammonia Concentration ≤ 500mg/kg dw} N -- Yes --> J N -- No --> G </pre> </div> <div style="width: 50%;"> <p>Step I Seed Germination Index (Solid: Water =1:5 dry weight)</p> <table border="1" style="width: 100%;"> <tr> <td>SGI > 50%</td> <td>SGI ≤ 50%</td> </tr> <tr> <td>Mature and stable compost (STOP)</td> <td>Go Step II</td> </tr> </table> <p>Step II Salinity (EC value, Soil: Water =1:5 dry weight)</p> <table border="1" style="width: 100%;"> <tr> <td>EC ≤ 4 dS/m</td> <td>EC > 4 dS/m</td> </tr> <tr> <td>Immature compost (STOP)</td> <td>Go Step III since EC is confounding factor</td> </tr> </table> <p>Step III Stability (C/N ratio)</p> <table border="1" style="width: 100%;"> <tr> <td>C/N ratio ≤ 20</td> <td>C/N ratio > 20</td> </tr> <tr> <td>Stable compost (Go Step V)</td> <td>Go Step IV</td> </tr> </table> <p>Step IV CO₂ evolution OR Oxygen demand</p> <table border="1" style="width: 100%;"> <tr> <td>CO₂ evolution ≤ 2 g C/kg VS/day</td> <td>CO₂ evolution > 2 g C/kg VS/day</td> </tr> <tr> <td>Oxygen demand ≤ 0.4 g O₂/kg TS/hr</td> <td>Oxygen demand > 0.4 g O₂/kg TS/hr</td> </tr> <tr> <td>Stable compost (Go Step V)</td> <td>Immature compost (STOP)</td> </tr> </table> <p>Step V Maturity (Ammonia concentration)</p> <table border="1" style="width: 100%;"> <tr> <td>Ammonium NH₄-N ≤ 500 mg/kg</td> <td>Ammonium NH₄-N > 500 mg/kg</td> </tr> <tr> <td>Mature compost (STOP)</td> <td>Immature compost (STOP)</td> </tr> </table> </div> </div>	SGI > 50%	SGI ≤ 50%	Mature and stable compost (STOP)	Go Step II	EC ≤ 4 dS/m	EC > 4 dS/m	Immature compost (STOP)	Go Step III since EC is confounding factor	C/N ratio ≤ 20	C/N ratio > 20	Stable compost (Go Step V)	Go Step IV	CO ₂ evolution ≤ 2 g C/kg VS/day	CO ₂ evolution > 2 g C/kg VS/day	Oxygen demand ≤ 0.4 g O ₂ /kg TS/hr	Oxygen demand > 0.4 g O ₂ /kg TS/hr	Stable compost (Go Step V)	Immature compost (STOP)	Ammonium NH ₄ -N ≤ 500 mg/kg	Ammonium NH ₄ -N > 500 mg/kg	Mature compost (STOP)	Immature compost (STOP)
SGI > 50%	SGI ≤ 50%																						
Mature and stable compost (STOP)	Go Step II																						
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Stable compost (Go Step V)	Immature compost (STOP)																						
Ammonium NH ₄ -N ≤ 500 mg/kg	Ammonium NH ₄ -N > 500 mg/kg																						
Mature compost (STOP)	Immature compost (STOP)																						

Flow chart for determination of compost

2	Foreign matter	Small stone above 5 mm: $\leq 5\%$ dw Men-made foreign matters including glass, plastic and metal larger than 2 mm $\leq 0.5\%$ dw			
3	Heavy metal	Unit : mg/kg dw			
			<u>Organic farming</u>	<u>General agricultural use</u>	<u>Non-agricultural use</u>
		Arsenic	≤ 10	≤ 13	≤ 41
		Cadmium	≤ 1.5	≤ 3	≤ 39
		Chromium	≤ 100	≤ 210	$\leq 1,200$
		Copper	≤ 300	≤ 700	$\leq 1,500$
		Mercury	≤ 1	≤ 1	≤ 17
		Nickel	≤ 50	≤ 62	≤ 420
		Lead	≤ 100	≤ 150	≤ 300
			Selenium	≤ 2	≤ 5
	Zinc	≤ 600	$\leq 1,300$	$\leq 2,800$	
4	Physicochemical properties	pH: 5.5 – 8.5 Organic matter > 20% dw Moisture 25 – 45%			
5	Pathogen	<i>Salmonella sp.</i> ≤ 3 MPN/4 g <i>Escherichia coli (E. coli)</i> $\leq 1,000$ MPN/g			
6	Nutrient content [non-mandatory standard]: total nitrogen + total phosphorus + total potassium $\geq 4\%$ dw				

Compost to be used in organic farming should not contain any genetic modified organisms and its derivatives.

Table (1) Remarks:

Compost and Soil Conditioner Quality Standard Remarks			
Seed Germination Index			
Seed Germination Index using distilled water mixed with fresh compost product in ratio 5:1 (dry weight), distilled water was added and the mixture was shaken for 30 minutes. 10 ml of the filtered mixture would be extracted and added to filter paper in a sterilized Petri dish, after that 10 cress seeds are evenly distributed on the filter paper. The set up would be inoculated in dark condition in 25°C for 48 hours. Control sample is made using distilled water instead of the mixture extract. After counting the number of seeds germinated and measuring the length of roots, Seed Germination Index was calculated as follow:			
$\text{Seed Germination Index(\%)} = \frac{\text{Germination rate in product mixture} \times \text{root length}}{\text{Germination rate in control sample} \times \text{root length}} \times 100\%$			
The above test method codes are based on			
<ol style="list-style-type: none"> Zucconi, F., Monaco, A., Forte, M., & Bertoldi, M. D. (1985). Phytotoxins during the stabilization of organic matter. Composting of agricultural and other wastes/edited by JKR Gasser. HKORC. 2021. Compost and Soil Conditioner Quality Standards. Hong Kong Organic Resource Centre. ps://hkorc-cert.org/hkorc-content/uploads/2021/10/香港有機資源中心---堆肥質量標準2021-1.pdf 			
	Test Method Code		Test Method Code
Salinity (EC value)	TMECC 04.10	Oxygen demand	TMECC 05.08-A
Ammonia concentration	TMECC 04.02-C	Carbon dioxide evolution	TMECC 05.08-B
Compost Quality			
Foreign Matter			
Stones larger than 5mm	TMECC 03.08-A		
Man-made Foreign Matters include glass, plastic and metal larger than 2mm			
Heavy Metal (For Organic Farm, Conventional Farm and Non-Agricultural Use)			
Arsenic	TMECC 04.06-AS	Nickel	TMECC 04.06-NI
Cadmium	TMECC 04.06-CD	Lead	TMECC 04.06-PB
Chromium	TMECC 04.06-CR	Selenium	TMECC 04.06-SE
Copper	TMECC 04.06-CU	Zinc	TMECC 04.06-ZN
Mercury	TMECC 04.06-HG		
Physicochemical Properties			
pH	TMECC 04.11	Moisture content	TMECC 03.09-A
Organic matter	TMECC 05.07-A		
Pathogen			
Salmonella sp.	TMECC 07.02-A1-2	E. Coli	TMECC 07.01-B
Nutrient content			
Total N (Count as N)	TMECC 04.02-A	Total K (Count as K ₂ O)	TMECC 04.04-A
Total P (Count as P ₂ O ₅)	TMECC 04.03-A		

The above test method codes are based on Test Methods for the Examination of Composting and Compost (TMECC) (Eds. W.H. Thompson (Chief) Ed.), P.B. Leege, P.D. Millner & M.E. Watson, 2002. The USDA and US Composting Council, USA.), please refer to the book for test method in details.