Total Quality. Assured.

Number: HKGT05488905

TEST REPORT

Applicant:

Date: Jul 11, 2024

Attn:

Sample Description As Declared :

No. Of Sample	:	Several
Sample Description	:	PVC Rain Boot
Sample Weight	:	1.2kg
Fiber Content	:	PVC
Ref.	:	Colour: Black Style No: HVPVCRNM Brand: Unbranded Season: Spring PO No: 08954921 SKU No: 089-9534-6 Country Of Origin: China End Use: Men/ Women/ Children/ Infant's Consumer Casual Footwear Rainboot

Date Received/Date Test Started : Jul 09, 2024

For and on behalf of
Intertek Testing Services Hong Kong Limited

Amy K.W. Wong
Assistant General Manager

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Original Sample Photo:

Figure 1: Test Sample

For any sustainability support or queries on this report, you are welcome to contact our Assistant Director:
Brenda Wong - Mobile phone and Whatsapp at (852) 9726 1720 or via email brenda.ps.wong@intertek.com

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1 Terrestrial Plant Test: Seedling Emergence And Seedling Growth Test (OECD 208):

PROJECT DESCRIPTION:

PVC RAIN BOOT samples were submitted which was subjected to anaerobic biodegradation as per ASTM D5511 for 45 days. After biodegradation, the biodegraded residue was used for testing under standard OECD 208. Phytotoxicity test by OECD 208 involves the assessment of the seedling Emergence and seedling Growth of higher plants following the exposure to the test substance in the soil.

Principle of OECD 208:

Seeds are placed in contact with soil treated with the test substance and evaluated for effects following 14 to 21 days after 50% emergence of the seedlings in the control group. Endpoints measured are visual assessment of seedling emergence, biomass (fresh or dry shoot weight, or shoot height) and visual detrimental effects (chlorosis, mortality, plant development abnormalities, etc.). Measurements are made at least weekly or more often when recording the emergence of the seeds and compared to those of untreated control plants.

Depending on the expected route of exposure, the test substance is either incorporated into the soil (or possibly into artificial soil matrix) or applied to the soil surface, which properly represents the potential route of exposure to the chemical. Soil incorporation is done by treating bulk soil. After the application the soil is transferred into pots, and then seeds of the given plant species are planted in the soil. The test units (controls and treated soils plus seeds) are then placed under appropriate conditions to support germination/growth of plants.

Validity of the test:

For the test to be considered valid, the following performance criteria must be met in the controls:

- the seedling emergence is at least 70%;
-the seedlings do not exhibit visible phytotoxic effects (e.g. chlorosis, necrosis, wilting, leaf and stem deformations) and the plants exhibit only normal variation in growth and morphology for that particular species;
- the mean control survival is at least 90% for the duration of the study;
-environmental conditions for a particular species are identical and growing media contain the same amount of soil matrix, support media, or substrate from the same source.

DESCRIPTION OF THE METHOD

Natural soil - Artificial substrate

Plants may be grown in pots using a sandy loam, loamy sand, or sandy clay loam that contains up to 1.5 percent organic carbon (approx. 3 percent organic matter). Commercial potting soil or synthetic soil mix that contains up to 1.5 percent organic carbon may also be used. The soil could be pasteurized, or heat treated in order to reduce the effect of soil pathogens.

Incorporation into soil/artificial substrate: For solid, insoluble test substances, dry soil and the chemical are mixed in a suitable mixing device. Hereafter, the soil is added to the pots and seeds are sown immediately.

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PROCEDURE

Sample Treatment: PVC RAIN BOOT, sample was subjected to anaerobic biodegradation as per as per ASTM D5511 for 45 days. After biodegradation, the soil was used for testing under standard OECD 208.

Test design: Seeds of the same species are planted, and the number of seeds planted per pot will depend upon the species, pot size and test duration. The number of plants per pot should provide adequate growth conditions and avoid overcrowding for the duration of the test. The maximum plant density would be around 3 - 10 seeds per 100 cm^2 depending to the size of the seeds. As an example, one to two corn, soybean, tomato, cucumber, or sugar beet plants per 15cm container; three rape or pea plants per 15 cm container; and 5 to 10 onion, wheat, or other small seeds per 15 cm container are recommended. The number of seeds and replicate pots (the replicate is defined as a pot, therefore plants within the same pot do not constitute a replicate) should be adequate for optimal statistical analysis. It should be noted that variability will be greater for test species using fewer large seeds per pot (replicate), when compared to test species where it is possible to use greater numbers of small seeds per pot. By planting equal seed numbers in each pot this variability may be minimized.

Test conditions: The test conditions should approximate those conditions necessary for normal growth for the species and varieties tested.
The following conditions are generally recommended for greenhouse testing:
• temperature: 22°C ± 10°C;
• humidity: 70 % ± 25 %;
• photoperiod: minimum 16-hour light;
•light intensity: 350 ± 50 µE/m2 /s. Additional lighting may be necessary if intensity decreases below 200 µE/m2 /s, wavelength 400 - 700 nm except for certain species whose light requirements are less.
Environmental conditions should be monitored and reported during the course of the study. The plants should be grown in non-porous plastic or glazed pots with a tray or saucer under the pot. The pots may be repositioned periodically to minimize variability in growth of the plants (due to differences in test conditions within the growth facilities). The pots must be large enough to allow normal growth.

Control and treated plants must be kept under the same environmental conditions; however, adequate measures should be taken to prevent cross exposure. To determine whether a general chemical possesses phytotoxic properties, it may be appropriate to test at a maximum level of 1000 mg/kg dry soil. When necessary, a range-finding test could be performed to provide guidance on concentrations/rates to be tested in definitive dose-response study. For the range-finding test, the test concentrations/rates should be widely spaced (e.g. 0.1, 1.0, 10, 100 and 1000 mg/kg dry soil)

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Test species:

Plant Species:

1) Family: Brassicaceae
   Species: Brassica juncea
   Common name: Mustard
2) Family: Gramineae (Poaceae)
   Species: Triticum aestivum
   Common name: Wheat

Results:

After biodegradation of PVC RAIN BOOT sample, biodegraded residue is mixed in different concentrations in natural soil. Seeds of test species were planted in the soil.

Test condition:

Temperature: 25°C± 4°C; Humidity: 66% ± 10% ; Light intensity: 25000 lux with 16 hours of light

Test Concentration:

1mg/kg, 10mg/kg, 100mg/kg, 1000mg/kg, &10000mg/kg

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Table 1: Average Germination Rate and Shoot Weight, Shoot and Root Length of *Brassica juncea* seeds.

Plant species	Dose	Germination Rate (%)	Shoot weight (g)	Shoot Length (cm)	Root Length (cm)
Brassica juncea	Control	100	0.1541	12	6
	Test 1 (1mg/kg)	100	0.1345	10	5
	Test 2 (10mg/kg)	98	0.1104	11	5
	Test 3 (100mg/kg)	97	0.0996	9	4
	Test 4 (1000mg/kg)	96	0.0983	10	4
	Test 5 (10000mg/kg)	95	0.0942	11	6

Table 2: Average Germination Rate and Shoot Weight, Shoot and Root Length of *Triticum aestivum* seeds.

Plant species	Dose	Germination Rate (%)	Shoot weight (g)	Shoot Length (cm)	Root Length (cm)
Triticum aestivum	Control	100	0.1312	14	5
	Test 1 (1mg/kg)	98	0.1257	12	4
	Test 2 (10mg/kg)	97	0.1184	12	4
	Test 3 (100mg/kg)	96	0.0972	13	3
	Test 4 (1000mg/kg)	95	0.0895	11	5
	Test 5 (10000mg/kg)	96	0.0865	12	4

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The above results showed that they showed no effect on the plant growth and no visible damage to the plants.

	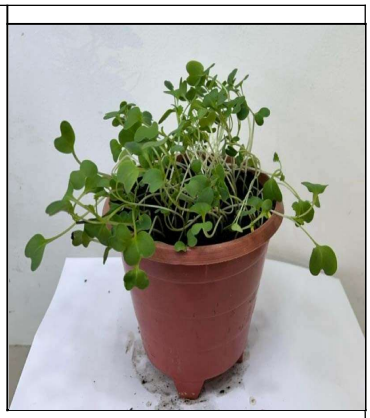
Control	**Test 1 (1 mg/kg)**
	
Test 2 (10 mg/kg)	**Test 3 (100 mg/kg)**
	
Test 4 (1000 mg/kg)	**Test 5 (10000 mg/kg)**

Figure 2: Effect of biodegraded samples soil at different concentration on *Brassica juncea* growth

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Control	**Test 1 (1 mg/kg)**
	
Test 2 (10 mg/kg)	**Test 3 (100 mg/kg)**
	
Test 4 (1000 mg/kg)	**Test 5 (10000 mg/kg)**

Figure 3: Effect of biodegraded samples soil at different concentration on *Triticum aestivum* growth

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Conclusion:

Compost after biodegradation (45 days) of PVC RAIN BOOT was used to study toxicity on plant as per standard OECD 208. It did not show any negative effect on germination rate and no visible damage to the plants was observed.

Remark: The test was subcontracted to laboratory under Intertek group.

End of Report

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