



CERTIFICATE



of the Biodegradability of Plastic Products Made by
TerraCyclic International Ltd.
which Incorporate the ECM MasterBatch Pellet Technology*

This is to certify that numerous plastic samples, submitted by ECM BioFilms, Inc., have been tested by independent laboratories in accordance with standard test methods approved by ASTM, ISO and other such standardization bodies to determine the rate and extent of biodegradation of plastic materials.

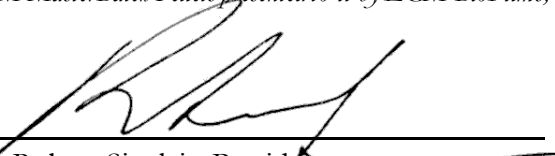
A Degradable Plastic is defined (ASTM D883-12) as a plastic that is designed to undergo a significant change in its chemical structure under specific environmental conditions resulting in a loss of some properties that may vary as measured by standard test methods appropriate to the plastic and the application in a period of time that determines its classification. A Biodegradable Plastic is defined as a degradable plastic in which the degradation results from the action of naturally occurring microorganisms such as bacteria, fungi and algae.

The biodegradation of the submitted plastic samples were tested using ASTM D5209-91, "Standard Test Method for Determining the Aerobic Biodegradation of Plastic Materials in the Presence of Municipal Sewage Sludge", ASTM D5338-98, "Standard Test Method for Determining Aerobic Biodegradation of Plastic Materials under Controlled Composting Conditions", which is equivalent to CEN prEN WI 261085, and the ISO 14855 method, "Evaluation of the Ultimate Aerobic Biodegradability and Disintegration of Plastics under Controlled Composting Conditions", ASTM D5511, "Standard Test Method for Determining Anaerobic Biodegradation of Plastic Materials Under High-Solids Anaerobic Digestion Conditions." The results of these tests and the related biodegradation and ecological impact experiments in various environments are contained in the Ecological Assessment of ECM Plastic report dated February 16, 1999, which certifies that plastic products manufactured with ECM additives can be marketed as biodegradable and safe for the environment.*

*This Certificate and the Ecological Assessment of ECM Plastic report, along with Scanning Electron Microscope and other studies that have been conducted since the publication of the Ecological Assessment, all of which use a one percent loading rate for the ECM MasterBatch Pellets rather than the higher additive levels used earlier, have been presented to **TerraCyclic International Ltd.** and may be used by it to validate its claims to the biodegradability* and environmental safety of plastic products that it manufactures that are made consistent with the manufacturing guidelines for uses of ECM MasterBatch Pellets presented to it by ECM BioFilms, Inc.*

Dated: April 29, 2019

Certified by:


Robert Sinclair, President
ECM BioFilms, Inc.

*** 49.28% biodegradation in 900 days under non-typical conditions. No evidence of further biodegradation.**