

Date: 29 May 2025

Report: 19340/001



Test Report:

- **Compositional Analysis:**
 - Elemental Content: Determination of Prodegradant Catalysts

Test Reference: 19340 CYC Trading

Product Tested: HDPE Zip Tie - Red

Prepared for: CYC Trading

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TEST REPORT

1.0 AIMS

- To evaluate the presence of prodegradant catalysts in the HDPE Zip Tie - Red sample by determination of the prodegradant catalyst metal cations by X-ray fluorescence (XRF) spectroscopy.

2.0 SAMPLE DETAILS

Samples Provided by: CYC Trading

Product Type: HDPE Zip Tie - Red

Date Received: 02/05/2025

Table 1: Sample Details

SEPTL Sample ID	Client Reference	Polymer Type	Prodegradant Additive
19340/10672	A093	HDPE	1% d ₂ w 93390/I

Table 1 is based solely on information provided by the client.

3.0 RESULTS & CONCLUSIONS

3.1 Compositional Analysis

3.1.1 Determination of Prodegradant Catalysts

The presence of prodegradant catalysts in each sample is confirmed by determination of the prodegradant catalyst metal cations by energy-dispersive X-ray fluorescence (XRF) spectroscopy.

The prodegradant catalyst content result, as determined by X-ray fluorescence (XRF) spectroscopy, is given in Table 2.

Table 2: Determination of Prodegradant Catalyst

Sample ID	Spectrum Ref.	Prodegradant Content
19340/10672	212014/4712	Inconclusive, Cr interference

4.0 TEST METHODOLOGY

4.1 Preparation of Film Pressings

The sample was pressed into film using an Atlas series laboratory hydraulic press fitted with Specac heated platen accessory and Carver dispersion disc mold between 40 µm PET sheets, at a temperature of 170°C under a load of ~5 tons.

4.2 XRF Spectroscopy

The XRF spectrum of each unaged sample is recorded using a Bruker S2 Puma Series 2 benchtop spectrometer in air over 120 s live time, using an Ag X-ray anode and graphene window detector, with a 40.00 kV voltage, automatic current settings (300 kcps), and a 500.0 µm aluminium filter. Film samples were prepared in 38 mm diameter HDPE XRF sample cups and the total thickness made up to ~200 µm with 36 mm discs cut from the bulk material using a James Heal 230/10 sample cutter.

4.2.1 Determination of Prodegradant Catalyst

The concentration of prodegradant catalyst metal cations is quantified by correlation with a calibration of validated reference samples.

5.0 REPORT HISTORY

Date	Report Ref.	Author	Comments
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Previous Version

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Current Version – this report supersedes all previous versions

29/05/2025	19340/001	YB	Prodegradant content report
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6.0 REPORT AUTHORISATION

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The information presented in this report is based on the material tested. Performance of finished products depends on their formulation, the conditions under which, and length of time for which the additives and finished product is stored, and on the method of manufacture of the finished product, and the heat, light, stress, and other conditions to which the finished product is exposed. Nothing in this report constitutes or implies a license to use Symphony's intellectual property.

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