

# PET Molded Plaque Fluorescence Test

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## Introduction – Scope, Significance and Use

This document describes a method to visually detect fluorescence in injection molded plaques when performing the rPET-to-Fiber test as described in the Applications Guidance for Recycled PET (PET-A-01). Virgin grades of PET that are used for bottle or sheet manufacture do not show fluorescence when exposed to UV light with wavelengths between 320 and 390 nm. This document describes the process used to determine if test sample plaques visually fluoresce more than control plaques.

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## Reference Documents

None

## Test Method Summary

The 3mm control and test plaque molded in the APR's Critical Guidance Protocol for Clear PET Resin and Molded Articles, PET-CG-01, are examined for fluorescence using a UV light source that emits light between 320 and 390 nm. The test plaques should not show any visual increase in fluorescence over the control plaques. Photographic evidence comparing a UV exposed control plaque to a test plaque is required.

## Equipment Required

- UV light source producing long-wave UVA light between 320 to 390 nm
- Digital camera
- Non-fluorescing background on which to place and view plaques

## Materials Required

- 3mm injection molded control and test plaques from PET-CG-01
  - Path 1 Step 7 or
  - Path 2 Step 6

## Test Method Steps

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1. Randomly select five (5) control and five (5) test plaques from the molded sets of plaques.
2. Place the control plaques next to the test plaques on a non-fluorescing background.
  - a. Multiple samples of control and test plaques can be viewed at one time if the light source is large enough to equally illuminate all plaques simultaneously.
  - b. Alternatively, a single control plaque can be viewed next to a test plaque with this process repeated until all control and test plaques have been examined.
3. Position the UV light source above the plaques.
4. Irradiate the plaques with the 320-390 nm UV light.
  - a. All control plaques should appear similar to the eye and not show fluorescence.
    - i. If there are differences between the control plaques, then there is a potential problem with the control resin used and/or the plaques have picked up a fluorescing contaminant.
    - ii. If they are not similar, then the test must be repeated with new control plaques.
  - b. All test plaques should appear similar to each other, but they may not be similar to the control plaques.
5. Select one representative control plaque for photographic documentation.
6. If all test plaques are similar, select one for photographic documentation.
  - a. If there are differences seen, select the plaque with the highest level of fluorescence.
7. Place the control and test plaque side-by-side on a non-fluorescing background and take a photograph while irradiating the plaques with the 320-390 nm UV light.
8. Include photographic evidence for reporting.

A preferred result meets this criteria:

- There should be no noticeable visual increase of emission fluorescence intensity of the test plaques vs. the control plaques.

## DOCUMENT VERSION HISTORY

Version	Publication Date	Revision notes
1	Sept 2,2019	Original Document