# REPORT

econetta

## MasterFinish RL 211

Ready Biodegradability in an Aerobic Aqueous Medium
$CO_2$ Evolution Test – OECD Guideline 301 B

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## 1 GENERAL INFORMATION

| | |
|---|---|
| Sponsor | Peter Gäberlein, Master Builders Solutions Schweiz AG, Schachen, CH-5113 Holderbank |
| Order and Test Item Receipt Dates | July 31, 2026, and July 31, 2026 |
| Test Facility | Econetta AG, Ifangstrasse 11, CH-8952 Schlieren |
| Test Period | September 10, 2026 – October 8, 2026 |
| Test Guideline | The applied test method follows the OECD Guidelines for the Testing of Chemicals, Test No. 301: *Ready Biodegradability*, Method 301 B: *$CO_2$ Evolution Test* (adopted July 1992) (Econetta internal SOP: SOP-1029). |
| Report No. | A26-00728 |

## 2 TEST ITEM

| | |
|---|---|
| Name | MasterFinish RL 211 |
| Sponsor's Reference / Batch No. | n.a. |
| Appearance | white liquid |
| Purity | Mixture/formulation considered as 100% pure |
| Econetta Internal Sample No. | M2607-02416 |

## 3 TEST CONDITIONS

| | |
|---|---|
| Treatments and No. of Replicates | Blank control (medium + inoculum): 2<br>Procedure control (medium + inoculum + reference item): 2<br>Test suspension (medium + inoculum + test item): 2 |
| Test Units | 2.3 L glass bottles containing 2.0 L of test mixture were connected to gas-absorption bottles filled with 140 mL of 0.13 M potassium hydroxide (KOH). The $CO_2$ generated by mineralization of the test item was trapped in the KOH solution through continuous aeration with $CO_2$-free air. |
| Inoculum | Activated sludge from the aeration tank of the ARA Werdhölzli (CH-8048 Zürich), a municipal biological wastewater treatment plant.<br><br>Sampling date and time: September 3, 2026; 08:45 Uhr<br>The sludge was not adapted to the test item but was aerated for 7 days prior to testing. |

| | |
|---|---|
| | The dry matter content was determined by drying a defined volume of sludge overnight in pre-weighed beakers at 105 °C to constant weight.<br>Concentration in the final test mixture: 30 mg/L dry matter. |
| Test Medium | Mineral salts medium according to OECD guideline 301 B. |
| Incubation | The test was performed over a period of 28 days at 22 ± 2 °C. Test vessels were continuously stirred and aerated, and kept in the dark. |
| Reference Value of the Test Item | Total Organic Carbon (TOC): 25.0%, determined by an external laboratory according to DIN EN 15936:2012-11, and used for calculating the nominal test concentration. |
| Reference Item and Reference Value | Sodium benzoate ($C_7H_5NaO_2$), TOC: 58.3% (based on molecular formula). |
| Test Concentrations | In each test vessel, the applied TOC content of the test and/or reference item was approximately 20 mg TOC/L (exact values are provided in Table 1). This corresponds to nominal concentrations of 80.0 mg/L for the test item and 34.4 mg/L for the reference item. |
| Item Application | The test item was applied by direct addition since it formed a stable emulsion in test medium. The reference item was also applied by direct addition. The pH of the test suspensions at test start ranged from 7.2 to 7.6. |
| Measurements | Several times per week, the $CO_2$ trapped in the KOH solutions was measured as Inorganic Carbon (IC) using a TOC-L CSH TOC analyzer (Shimadzu Schweiz GmbH, Hofackerstrasse 40B, CH-4132 Muttenz, Switzerland). At the end of the test, the residual $CO_2$ in the reaction mixture was determined similarly. This may explain why the final cumulative value does not necessarily follow the expected course of the degradation curve. |
| Calculations | The percentage degradation $D_i(t)$ in test unit *i* at time *t*, expressed as the percentage of TOC converted to IC, was calculated according to the following equation:<br>$$D_i(t) = \frac{IC_i(t) - IC_B(t)}{TOC_i(0)} \times 100$$<br>where:<br>▪ $D_i(t)$ = percentage degradation in test unit *i* at time *t*<br>▪ $IC_i(t)$ = IC in test unit *i* at time *t* (mg/L)<br>▪ $IC_B(t)$ = IC in the blank control at time *t* (mg/L)<br>▪ $TOC_i(0)$ = initially applied TOC in test unit *i* (mg/L) |

## 4 TEST RESULT

Based on $CO_2$ evolution and compared to the TOC applied, the following results were obtained (Table 1, Figure 1):

Procedure control (sodium benzoate):
- Biodegradation after 14 days: 72%. This confirms the suitability of the inoculum and test conditions.

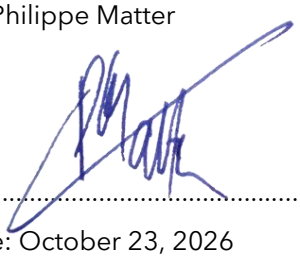
Test item (MasterFinish RL 211):
- Significant biodegradation (≥10%) was observed after a lag-phase of approximately 1 day.
- Biodegradation after 28 days: 66%.

All validity criteria were fulfilled (see Table 2).

## 5 SIGNATURE

The applied test method is accredited according to ISO/IEC 17025. Raw data and a copy of the final report are stored in the archives of Econetta AG, Schlieren, for 5 years.

Project Leader Ecotoxicology Dr. Philippe Matter



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Date: October 23, 2026

Specifications regarding the accuracy and precision of the applied measurement methods are available upon request. All reported results refer exclusively to the test item as received by the laboratory. The laboratory cannot verify the condition or representativeness of the sample prior to its receipt.

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## 6 ANNEX: TABLES AND FIGURES

Table 1 Inorganic carbon produced by the test and control units, and corresponding degradation data

| Time [days] | Blank control | Procedure control | | Test Suspension (Replicates 1 / 2) | | Mean | Toxicity control | | Water control | Abiotic sterile control | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | $CO_2$ prod. [mg IC/L] | $CO_2$ prod. [mg IC/L] | Deg. [%] | $CO_2$ produced [mg IC/l] | Degradation [%] | Deg. [%] | $CO_2$ prod. [mg IC/L] | Deg. [%] | $CO_2$ prod. [mg IC/L] | $CO_2$ prod. [mg IC/L] | Deg. [%] |
| 0 | 0.0 | 0.0 | 0 | 0.0 / 0.0 | 0.0 / 0.0 | **0** | n.d. | - | n.d. | n.d. | - |
| 1 | 0.6 | 2.1 | 7 | 1.0 / 1.1 | 2.1 / 2.6 | **2** | n.d. | - | n.d. | n.d. | - |
| 4 | 1.9 | 13.8 | 59 | 11.2 / 10.8 | 46.4 / 44.5 | **45** | n.d. | - | n.d. | n.d. | - |
| 7 | 2.9 | 17.5 | 73 | 14.7 / 14.8 | 58.9 / 59.5 | **59** | n.d. | - | n.d. | n.d. | - |
| 11 | 3.9 | 19.4 | 77 | 17.3 / 17.1 | 66.8 / 65.9 | **66** | n.d. | - | n.d. | n.d. | - |
| 14 | 4.4 | 18.8 | **72** | 17.1 / 17.8 | 63.2 / 67.1 | **65** | n.d. | - | n.d. | n.d. | - |
| 18 | 5.0 | 19.9 | 75 | 18.6 / 18.4 | 68.2 / 67.0 | **68** | n.d. | - | n.d. | n.d. | - |
| 21 | 6.3 | 22.8 | 82 | 20.7 / 22.6 | 71.9 / 81.1 | **77** | n.d. | - | n.d. | n.d. | - |
| 25 | 6.4 | 21.3 | 74 | 19.2 / 19.6 | 64.1 / 66.1 | **65** | n.d. | - | n.d. | n.d. | - |
| 27 | 6.9 | 21.6 | 73 | 19.7 / 20.2 | 64.0 / 66.6 | **65** | n.d. | - | n.d. | n.d. | - |
| 28 | **7.4** | 22.1 | 73 | 20.5 / 20.7 | 65.5 / 66.3 | **66** | n.d. | - | n.d. | n.d. | - |

$CO_2$ prod. [mg IC/L] : mg/l of inorganic carbon produced per liter of medium.

Deg. [%]: Biodegradation in % of the TOC; the total TOC concentrations taken into account for calculations are 20.0 and 20.0 mg/L for replicates 1 and 2 of the test suspension, resp., and 20.0 mg/L for the procedure control.

Table 2 Validity criteria

| Validity criterion | Required | Achieved |
|---|---|---|
| IC produced in the blank control after 28 days (mg/L) | ≤19.1[1] | 7.4 |
| IC content of the test suspension at test start (% of TC) | <5 | 1.7 |
| Difference of extremes of replicate values after 28 days (%) | <20 | 0.9 |
| Degradation of the reference item after 14 days (%) | ≥60 | 72 |
| Degradation of the mixture in the toxicity control after 14 days (%) | ≥25 | n.d. |

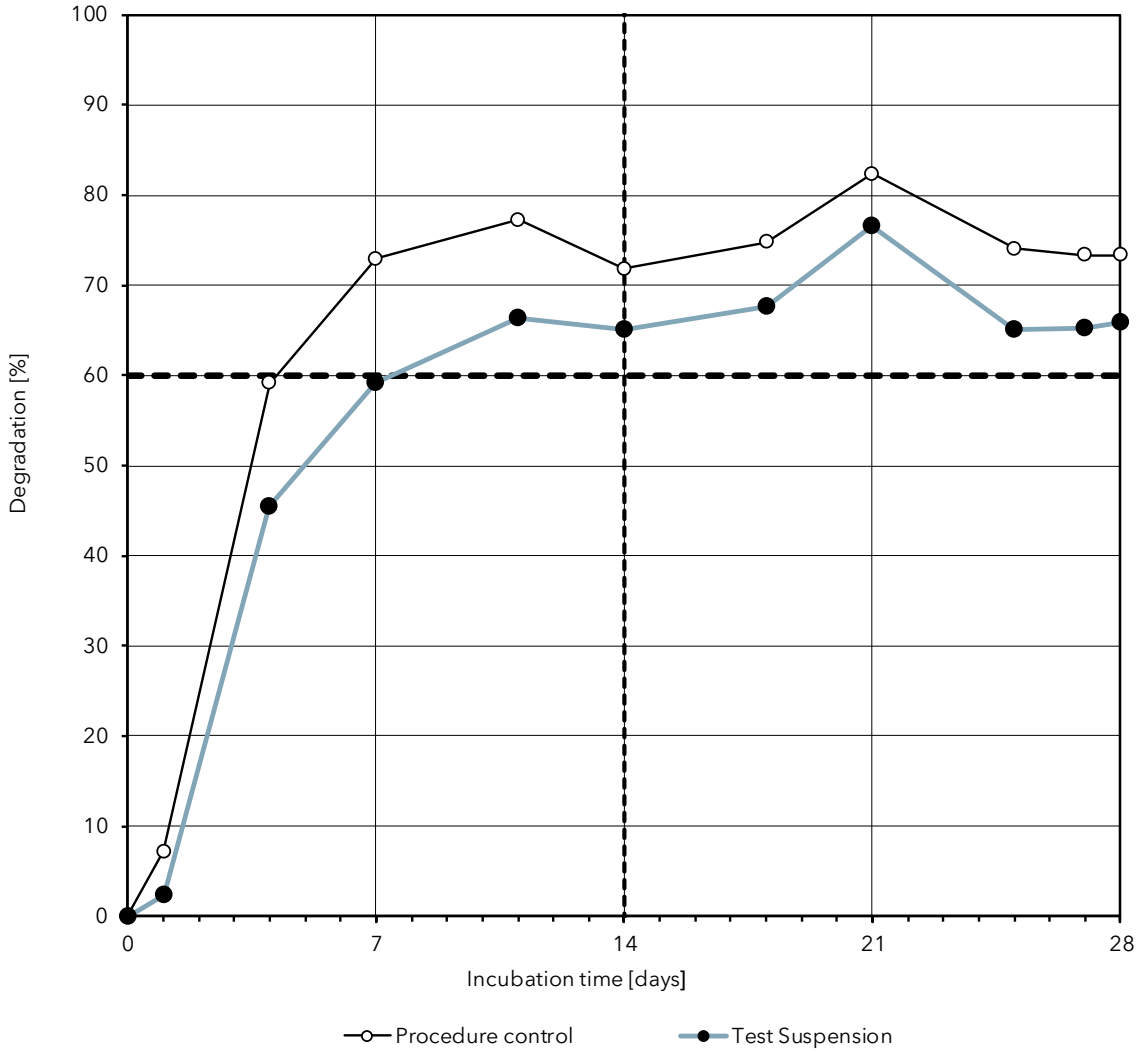
n.d.: not determined

[1] OECD 301 B sets a $CO_2$ limit of 70 mg/L for the inoculum blank; this was converted to 19.1 mg/L IC for consistency with other parameters.

Table 3 pH values at the end of the test

| Test Vessel | Value |
|---|---|
| Blank control | 7.4 / 7.4 |
| Procedure control | 7.5 / 7.5 |
| Test suspension | 7.3 / 7.3 |

Figure 1 Degradation curve for *MasterFinish RL 211* and the procedure control




The dotted lines indicate the minimum pass level of 60% degradation required for the procedure control by day 14.

Note: the observed higher degradation at day 21 is likely due to an experimental artifact (the blank control value was higher than expected) which does not have any influence on the outcome of the test: the test item's biodegradation is well above 60%.