

Study of microplastics formation from wood plastic composites and evaluation of prevention possibilities (MicroWPC)

Project funder – **Latvian Council of Science**

Project name – **LZP FLPP 2022/1**

Project No. **lzp-2022/1-0639**



Project's progress report for the period 01.07.2025. – 30.12.2025.

During the final reporting period, all of the work packages (WP) were finished. The final tests for the characterisation of the collected microplastics (MPs) using FTIR, TG, and DSC were carried out in WP2. The results showed that MPs separated from the wood plastic composites (WPCs) were partly oxidised and degraded with increased crystallinity. Additionally, the wood content of the MPs collected after four weeks of weathering from one of the experimental WPCs was determined. The wood content of the collected MPs did not exceed 10%, with the smallest fraction containing the largest amount of wood. In WP3, all commercial products were tested according to the developed process design. While the commercial WPC decking products did not release MPs during the eight-week testing period, they did show signs of degradation and potential release over longer exposure times, as microcracks were present on the surface. The situation may differ for other decking materials. All of these products were made of high-density polyethylene, which is more durable than polypropylene. Additionally, the additives composition can vary from product to product; therefore, more commercial decking products should be tested in the future to obtain a better overview of the potential risks. The situation was different for a commercial flowerpot made of WPC, which is also intended for outdoor use. It released a significant amount of MPs after just two weeks of weathering. The cumulative MPs release from this product after eight weeks of weathering was 58.9 g/m², which was higher than that observed for the experimental WPCs. During the reporting period, the results were presented at two international conferences (the 16th Polymer Meeting 2025 and the 21st Annual Meeting of the Northern European Network for Wood Science and Engineering WSE 2025) and two publications were written. The first publication, titled “Method for quantification of microplastic release from plastic-based materials during weathering”, describes the developed process design for the quantification of MPs and has been submitted to a Q1 journal. At the time of writing, the paper is under review. The second publication, titled “Quantification of microplastics formed during weathering from wood plastic composites”, focused more on the effects of WPC composition and the potential MPs emission of commercial products. This paper has also been submitted to a Q2 journal and is currently under review. This paper is based on an extended abstract that was submitted to the WSE 2025 conference. The scientific committee of the conference suggested publishing the research, and this opportunity was accepted. Including these two publications, the total number of papers reflecting project results is four. The data used to prepare the first two publications, which have already been published, have been deposited in Zenodo (1st publication: <https://zenodo.org/records/14591484>; 2nd publication: <https://zenodo.org/records/14603552>).

Publicity and training:

- Mg. Lotārs Oliveris Vasiljevs participated in the 16th Polymer Meeting 2025 with a poster presentation “Microplastic formation during weathering of wood plastic composites and the effect of additives” from 1st to 4th of September in Prague, Czech Republic (Figure 1). The book of abstracts is available [here](#).



Figure 1. Lotars Oliveris Vasiljevs presenting a poster on the MicroWPC project at the 16th Polymer Meeting.

- Ph.D. Edgars Kuka participated in the conference 21st Annual Meeting of the Northern European Network for Wood Science and Engineering WSE 2025 with an oral presentation “Quantification of microplastics formed during weathering from wood plastic composites” from 8th to 9th of October in Växjö, Sweden (Figure 2). The book of abstracts is available [here](#).



Figure 2. Edgars Kuka presenting the latest results of MicroWPC project at the 21st Annual Meeting of the Northern European Network for Wood Science and Engineering WSE 2025.

- Ph.D. Edgars Kuka was chosen as one of twelve scientists to be featured in the researchLatvia calendar, “Science for Latvia 2026”. A picture of Edgars and his research will be displayed on the February page (Figure 3). The research work presented in the calendar and video is directly connected to the findings obtained in the MicroWPC project. The opening ceremony for the calendar will take place in Riga on 7 January 2026. More information is available [here](#).



Figure 3. Cover of the calendar “Science for Latvia 2026”

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