

Brussels, 24th March 2023

## **Consortium on microplastics release during household washing processes**

### **Final update on project – Part II**

Signed by



### **Key findings of the study**

The study shows in detail the challenges faced in developing a fully **repeatable, reproducible, and consumer-relevant** method to verify the performance of solutions developed by household washing machines manufacturers and/or other companies providing machine external solutions. Setting requirements into legislation without proving the repeatability and the reproducibility of a possible measurement method would result in an *ineffective* verification on the market. Furthermore, the verification tolerance must match the measurement uncertainty to avoid problems during the verification procedure.

There are still **many parameters of influence** and open points to be studied and analysed. As an example, the problem of non-synthetic fibre fragments (wool, cotton, etc.), the use of powder detergent, washing machine load amount, and many other parameters that affect filter clogging and fibre fragments analysis are still an open issue. **The current study was related only to polymeric fibers' release under very limited conditions.**

There is a systematic error in the measurement of the effluent of washing machines, on one hand the results from this consortium provide proof that the weight of the filtrate on the filter is higher than the intentional added microplastic particles or fibres (due to use of detergent and e.g. cotton fibres in the system), on the other hand the results show a very high variation from run to run due to carry-over (left particles and fibres on textiles and inside the machine). Analyses show a **big variability of results** even in a laboratory-controlled environment. Therefore, from the measurements done in the consortium it might be possible to calculate few individual performance factors (e.g. the number of in-out ratio of poka dots). **A complete performance calculation for any future microplastic fibres retention solution cannot be calculated as of now.**

*For more information or if interested in joining the Consortium, please contact Giulia Zilla, APPLiA Energy & Environment Policy Manager at [giulia.zilla@applia-europe.eu](mailto:giulia.zilla@applia-europe.eu)*

It was proven in all labs that intentionally added **plastic particles and synthetic fibres** to the washing machines (simulating the release of synthetic particles and synthetic fibres during a washing process) **do only partially find their way to the drain (effluent)**. Many loose fibres and particles remain on the washed textiles (getting later lost in the environment when drying and wearing them), inside the machine (carry over) or get lost somewhere else (not found in lab testing). This percentage of **particles “lost in the environment” was in the range of 20 – 95%**, which means **only 5% but up to 80% were found in the effluent of washing machines, on the filters used for testing:**

### **Messages to policy makers**

1. Given the complexity of the issue, **further investigation and activities** such as the one executed by the Consortium are required, also at international level.
2. Setting minimum performance requirements on microplastics filters without a repeatable and reproducible method will result in a non-verifiable legislation, therefore, in an ineffective legislation. **We recommend introducing requirements only when these can be verified on the market.**
3. We recommend the **IEC/CENELEC to highlight and go in depth on the open points and questions arising from this study**. This will give a proper picture of the amount of work that still needs to be done.
4. The **standardization bodies (IEC/CENELEC) are the right place** to continue the discussion for the development of a measurement method for household washing machines.
5. **Policy makers shall follow and remain involved in the standardisation activities** to set measurable targets in the law.
6. Finally, for the reasons set above it is **extremely difficult to provide a timeline** by when a measurement method could be available to use for the verification of the requirements. This is due to the many issues that require an in-depth analysis and the difficulties in assessing a decent and accurate test procedure that could verify the performance of any solution.

### **Next steps**

The feasibility study was carried out and concluded in December 2022. A technical report was sent to IEC SC59D AG17 in March 2023. The Consortium has ceased to exist on 31 March 2023 as the group acknowledged the importance of acting now at standardisation level.

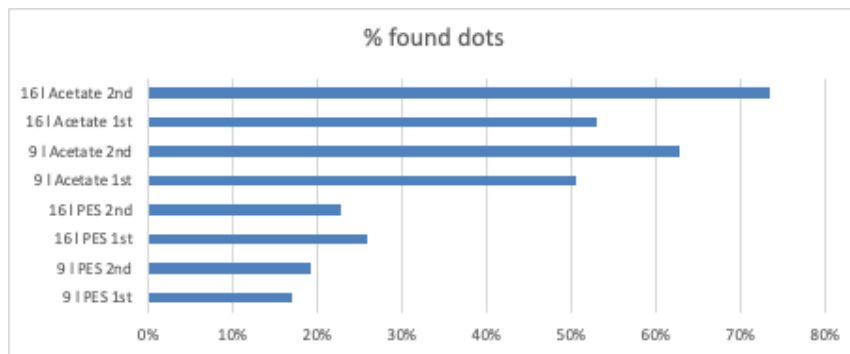
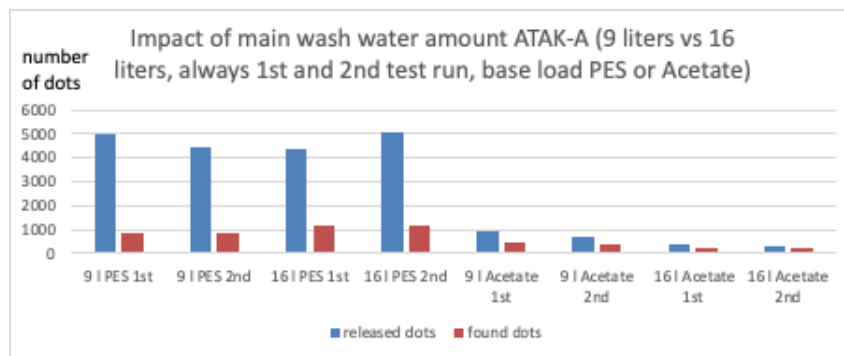
## **Test results**

Not all results are reported here because they can be only considered indicative due to different test conditions from lab to lab. The main question of the feasibility study was to check if the new test materials can be used for testing.

*[Remark about the diagrams included in this chapter: Both runs (1st / 2nd) are shown, not the average of the two runs.]*

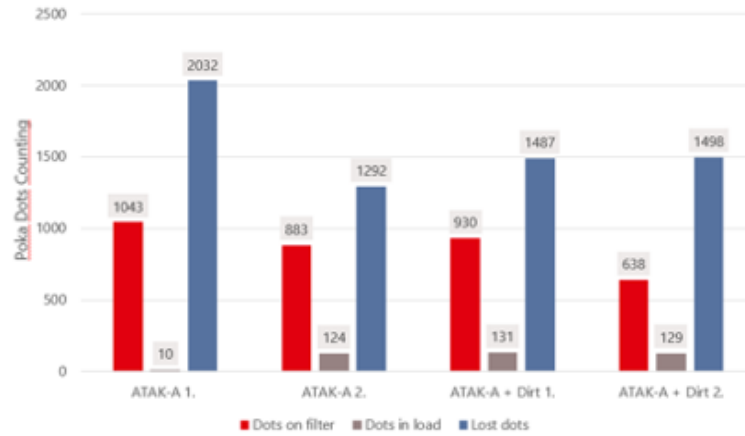
### **ATAK-A results**

The influence of main wash water amount is less relevant than the load type as illustrated below. The % of released dots found in the filters depends also more on the load type than on the investigated factor (main wash water amount).

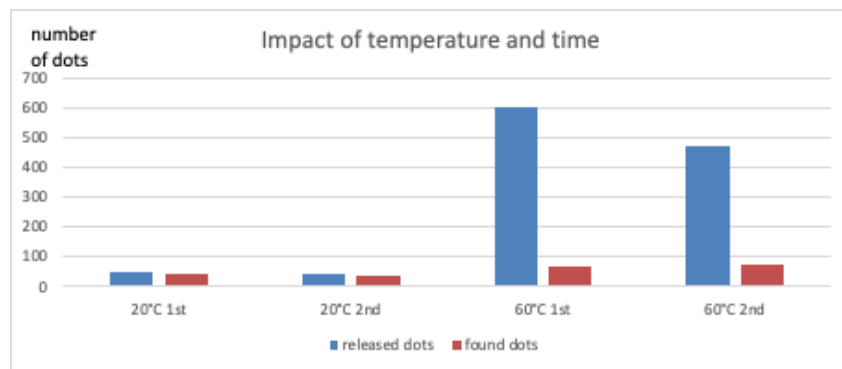
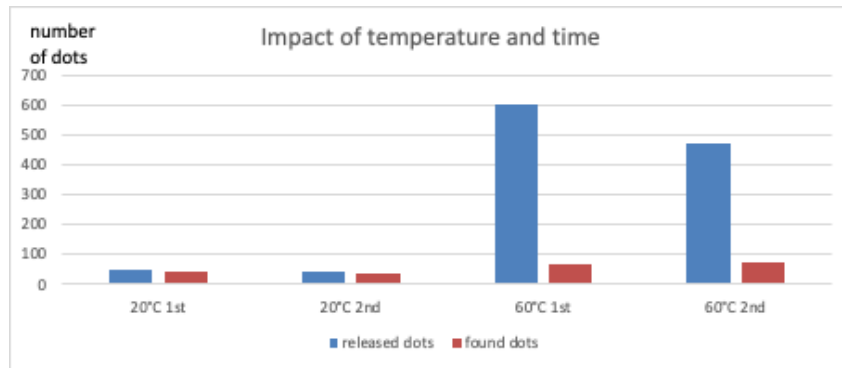


The influence of dirt was investigated in work packages, Sebum was used, no particle soil or hair or other dirt. There seems to be no impact of this type of soil.

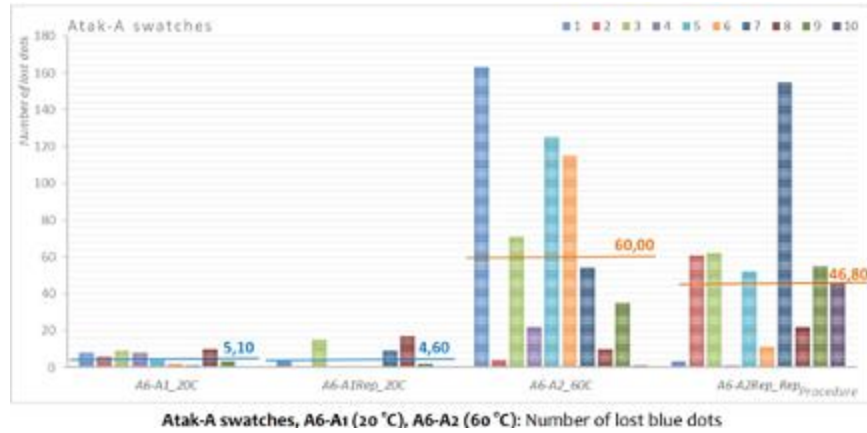
The percentage of found dots was even lower (7-10%) compared to other work package, where also an acetate load was used. But comparing the amount of released dots between these two work packages is not relevant because different machine (both HA and 9kg, but different model from different manufacturer) and different programme characteristics (e.g. 99 vs 70 minutes programme duration).



The influence of temperature was investigated in another work package. Looking into cycle data of the programmes used there is also impact of programme duration (35 minutes at 20°C vs 66 minutes at 60°C).

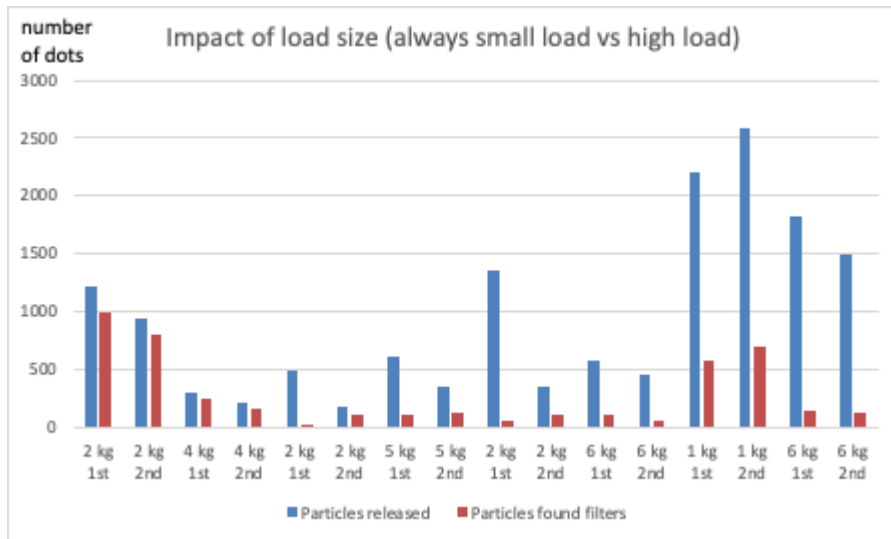


The following picture provides a more detailed picture on the differences between the 10 swatches of ATAK-A for this work package.

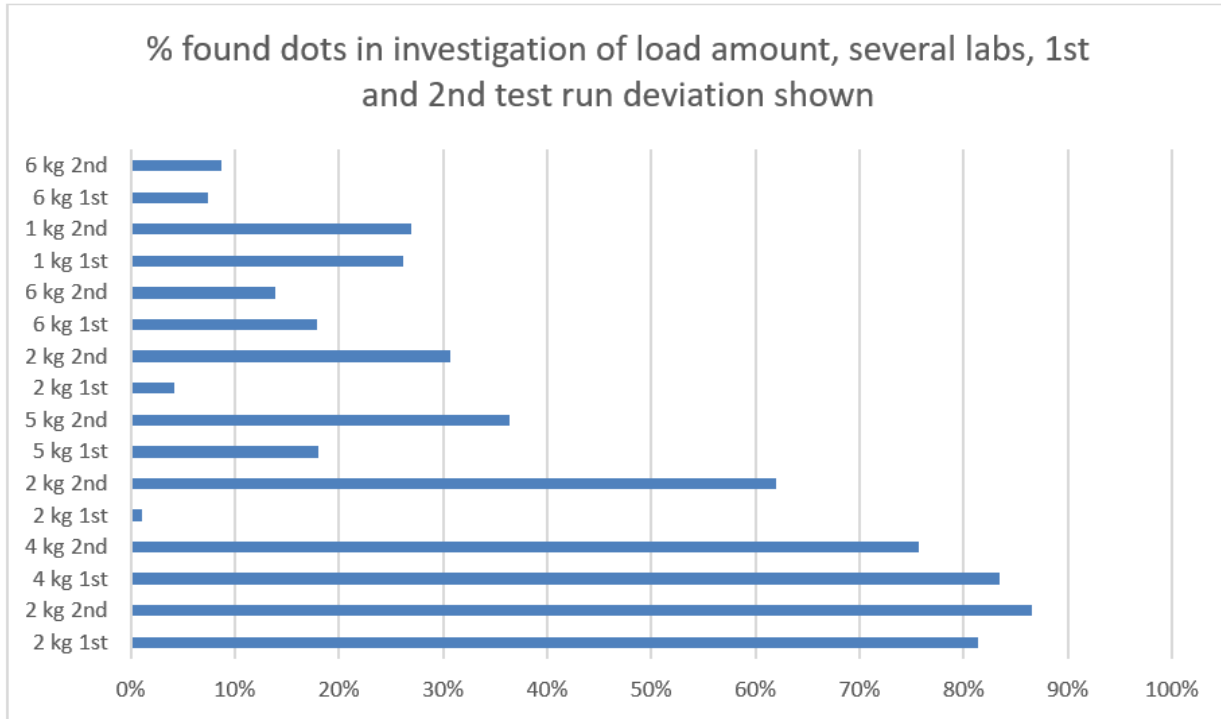


The impact of load amount was investigated in 4 work packages.

The overall picture is not consistent. Smaller loads tends to release more dots, but the deviation between the 2 test runs is huge and the lab-to-lab deviation too.



The % of found particles deviates a lot between laboratories.



**ATAK-B results**

The two types of ATAK-B (particles and fibres) were compared in 4 labs. Analysis of ATAK-B can be weighing only. The release of fibres and particles was different. Released fibres tend to stick to load items, less for Acetate, more for PES base loads. The amount of fibres / particles on the swatches was in total 1 gram for the 5 swatches used per test run. In one case there was more residuals on the filters than could be created by release from the swatches.

