

22th of September 2023

Topic: Statement by Leclanché to PFAS-free Electrode Manufacturing

In response to the PFAS restriction proposal:

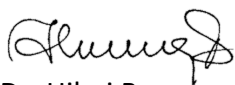
PFAS in the Battery Industry

Today, PFAS are used prominently in lithium-ion battery cell production, particularly as a binder in the electrode manufacturing process, combined with toxic solvents such as NMP, which is state-of-the art in cathode manufacturing. Notably, PFAS utilized in batteries can be released back into the environment during the recycling process of production scraps or batteries at the end of their lifespan. Contrary to the statement in Annex XV, page 107 of the ECHAS restriction report, the use of PFAS is also state-of-the art in solid state batteries, with PVDF or PTFE being the main binders used in the electrodes. The same applies to dry-processed electrodes.

Water-Based Electrode Manufacturing Without PFAS or Toxic Solvents

For approximately 13 years, Leclanché has been a global pioneer in utilizing aqueous binders within its electrode production processes (two patents: **US2013/0034651 A1** and **WO2023/166174 A1**). For both anode and cathode manufacturing, only water is used as solvent in Leclanché's processes. The water-based binder process technology helps eliminate the use of PFAS and avoids any reliance on highly toxic organic solvents, such as NMP. This choice not only limits the risk of explosions, but also ensures the safety of employees involved in the production process by drastically reducing health hazards. Moreover, the water-based method allows Leclanché to forgo energy-intensive steps like recycling solvents. This not only streamlines the process but also leads to a 10 - 30 percent reduction in energy consumption, thereby significantly reducing the carbon footprint of its battery cell production. Therefore, Leclanché's process ensures both ecological benefits as well as economic advantages. Currently Leclanché produces PFAS-free electrodes and is working with its suppliers and partners on PFAS free cells.

"Leclanché is ready to overcome the challenges brought forward by PFAS restrictions in Europe," emphasises Pierre Blanc, CEO of Leclanché. "Proven at an industrial scale in Leclanché's manufacturing facility (Willstätt, Germany) for over 13 years, this technology is now ready to meet the growing battery production demand in Europe".



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