

## ProCycle

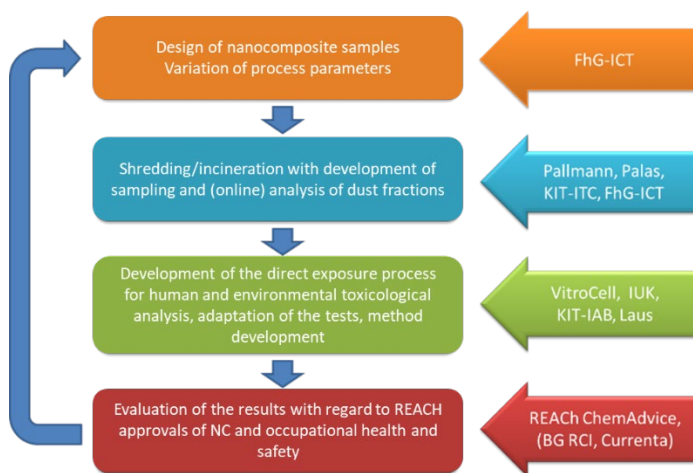
"Analysis and toxicological evaluation of dusts from recycling and recovery processes of nanocomposites and strategies for hazard minimization - ProCycle".

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**Project partners:** *Fraunhofer Institute for Chemical Technology ICT, KIT-ITC, KIT-IAB, IUK - Institute for Environmental Medicine and Hospital Hygiene, PALAS GmbH, VITROCELL Systems GmbH, PALLMANN Maschinenfabrik GmbH & Co KG, REACH ChemAdvice GmbH, LAUS GmbH*



In the joint project ProCycle, the recycling, EoL recovery and the human and environmental toxicological relevance of dust and gaseous emissions during mechanical and thermal processes were determined and evaluated. These investigations require a complete characterization of the dusts and resulting gases directly at the site of nanocomposite (NC) crushing or thermal recycling.

For toxicological investigations, near-emission sampling is required for the exposure modules and suitable measurement methods were developed and tested and verified with reference NC. Based on

such obtained findings, parameter studies were carried out with a variation of the addition of additives, the change of machine parameters during compounding and comminution.

The aim was to determine the hazard potential in recycling and thermal disposal of EoL waste, and to derive recommendations for action.

Based on TiO<sub>2</sub> in NC, methods of measurement and sampling were developed. In addition to TiO<sub>2</sub>, other nanomaterials such as CNT and silica were investigated. These were investigated and evaluated for their dust properties and hazard potential for humans and the environment.

By varying parameters during compounding and recycling, the NC are specifically optimized and resulting evaluation methods for the incorporation of nanomaterials into plastics as well as for material recycling and thermal recovery are developed.

The combination of project partners with competences in the fields of compounding, comminution, incineration, measurement technology, toxicology and REACH assessment enabled the project to consider the entire process chain.

Publications of the project results are available at:

<https://www.tib.eu/de/suchen/id/base:52a54196751e598ff0f8262c75baa10f45aad0d6/Thermische-Behandlung-der-Kompositmaterialien-im?cHash=3500c5d14a69a09f7e36b7b8ced91431>



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