



Thomas Hahn

Dr.-Eng. Thomas Hahn studied chemistry at the Technical University of Kaiserslautern. From 2008 to 2012, he worked at the Department of Bioprocess Engineering, where he completed his doctorate on innovative downstream processes for the purification of heteropolysaccharides. In 2012, he joined the *Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB* in Stuttgart as a research scientist. Since then, he has developed and led industrial and publicly funded R&D projects on bioprocess development, analytical methods and the valorization of renewable resources and waste streams. A major focus of his work is the analysis and purification of chitin-containing biomasses from marine, insect and fungal sources, their conversion into high-purity chitosan, and the development of applications in textiles, coatings and wastewater treatment. Since March 2026, he has served as Operational Lead for Biotechnology in Stuttgart, coordinating staff, laboratories and technical resources.

Talk 1: Chitosan production from insect residues

The presentation introduces the production of chitosan from insect-derived side streams, with particular emphasis on residues from Black Soldier Fly processing. It explains how the composition of exuviae and adult insects determines the required sequence of defatting, deproteinization, demineralization and optional bleaching. A further focus is the quantitative balancing of chitin-containing streams to assess chitin recovery and identify suitable routes for their valorization. Special attention is given to analytical methods for monitoring chitin purity throughout the process and to the subsequent conversion of chitin into chitosan. The talk discusses process optimization, reduced use of chemicals and water, scale-up from laboratory to pilot scale, and the influence of process conditions on product quality. It concludes with opportunities for integrating chitosan production into insect biorefineries and valorizing additional fractions such as proteins, lipids and melanin.

Talk 2: Chitosan applications in the textile industry

This presentation provides an overview of chitosan as a versatile bio-based material for textile processing and finishing. Its cationic character, film-forming ability, biodegradability and accessible amino groups enable applications as a sizing agent, binder, coating matrix and functional finishing component. Examples include antibacterial treatments and water-repellent finishes in which modified chitosan supports the fixation of hydrophobic compounds on textile surfaces. The talk addresses formulation, cross-linking, application by established textile processes, performance testing and the influence of chitosan quality on the final material properties. Current limitations, including solubility, durability, mechanical performance and cost, are discussed together with future opportunities for circular and locally sourced textile materials.

