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EASY PROCESSING OF CHALLENGING ADHESIVES FORMULATIONS USING A PLANETARY ROLLER EXTRUDER

ABSTRACT
Demanding adhesive formulations place high requirements on processing technology. High filler contents, widely differing viscosities of the individual components, temperature sensitive binders or volatile constituents require gentle yet highly effective mixing and dispersing. The planetary roller extruder (PRE) offers particularly favorable conditions for meeting these challenges.

Due to its unique operating principle with continuously repeated thin film rolling by the planetary spindles, the PRE combines very large energy exchange surfaces with excellent homogenisation while maintaining low shear stress. This makes it possible to process highly viscous, pasty, or heavily filled adhesive systems uniformly and gently, without subjecting the formulation to thermal or mechanical overload. Precise temperature control with active cooling enables the adjustment of uniform target viscosities, ensuring optimal downstream processing of the adhesive compound. In particular, sensitive polymers, reactive adhesives, and systems containing additives such as catalysts, crosslinkers, or blowing agents benefit from the accurate and controlled process conditions.

A further key advantage is the flexible integration of process steps. Variable degassing zones allow reliable removal of entrapped air, condensates, solvent vapors, or reaction by products, while multiple side feeding ports along the process section enable stepwise addition of critical components into different processing zones. This allows the formulation and the process to be precisely coordinated.

Overall, the PRE enables reliable, reproducible, and cost-effective production of even complex adhesive formulations. It combines high product quality with excellent process stability and therefore represents a high-performance alternative to conventional mixing and extrusion systems, especially in view of increasing demands for material diversity and product performance.