

CONTINUOUS SUPERCRITICAL EXTRACTION OF SOLIDS IN AN EXTRUDER

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Supercritical extraction (SCE) of solids is currently a batch process. To reduce the extraction costs it is desired to make this a continuous process. An EU-shared cost project, called C-REX, was started with the goal to realise continuous extraction by means of an extruder.

The main bottleneck for extraction in the extruder is to keep the SC-fluid inside the extruder while maintaining the high needed extraction pressure. For this, two dynamic plugs from the feed material are formed at the beginning and at the end of the extruder. In between, the extraction fluid is added which flows in the opposite direction as the solid material flow. Doing so, a continuous counter-current extraction device is created with which optimal extraction efficiency can be achieved.

Currently, the dynamic plugs are stable enough when fluid extractions at atmospheric pressures are performed. At SC-circumstances however, the dynamic plugs will have to be denser to avoid total disruption and a gas flow through the plugs during extraction. In this study therefore, the effect of feed materials, plasticiser, extrusion speed and barrel configuration on the stability of the dynamic plugs is examined.