The feed rate of the reactor feed screw can be controlled. This advantageously opens up the possibility of influencing the residence time of the reaction mixture in the reactor. In the event that a lower conversion takes place than originally assumed, for example, the conveying speed can be reduced in order to achieve a longer residence time and thus a higher conversion. In the event that the conversion takes place faster than originally assumed, the conveying speed can be increased and thus the throughput of the reactor can be increased.

According to one embodiment, it is provided that water obtained after removal of solids from the reaction mixture obtained after pressure and heat treatment and freed of gaseous components, and/or water obtained from gaseous water extracted via a steam extraction point, is added to a reaction mixture to be provided, optionally after addition of reaction additive. A circulating process is thus advantageously carried out in which water from an aqueous medium already used is at least partially returned to the continuous process, thus reducing resource consumption.

A further aspect of the invention relates to a device for carrying out a method as described herein. The device comprises a first line with a first screw conveyor arranged therein, the first line opening into a reactor via a filling opening designed as a pressure lock, a reactor screw conveyor being arranged in the reactor and the reactor, which is tapered at least in one end region, opening into a second line by means of a removal opening designed as a pressure lock, in which a second screw conveyor is arranged, an evaporation zone being provided in the second line in which a higher temperature can be specified than in the reactor, and the second line having a degassing point in the evaporation zone via which gaseous components can be removed from the second line. Such a device is accordingly suitable for transporting a reaction mixture as described herein, namely a reaction mixture comprising a plastic material which contains polyurethane and is in the form of a solid, and further comprising an aqueous medium, optionally containing a reaction additive with which the plastic material is moistened, via the first screw conveyor of the first line to the filling opening, designed as a pressure lock, of the reactor which tapers at least in one end region. After entering the reactor via the filling opening, the reaction mixture is exposed to the pressure and temperature conditions prevailing there and converted, and can be transferred to the second line via the removal opening, designed as a pressure lock, in the end region of the reactor. By means of the second screw conveyor arranged in the second line, the pressure- and heat-treated reaction mixture can be transported to the evaporation zone, in which gaseous components can be removed via at least one degassing point. The pressure- and heat-treated reaction mixture thus depleted of gaseous components can be removed after further transport