



### INLINE RHEOLOGICAL CHARACTERIZATION OF A PHBV COPOLYMER

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One of the current issues with PHA polymers processing is their poor thermal stability in the melt state due to sensitivity to hydrolisis inducing chain breaking. In the present work, the rheological behavior of polyhydroxybutyrate-co-hydroxyvalerate (PHBV) was investigated using both offline and inline capillary rheometry. While of line measurements were conducted on a standard capillary rheometer (with long residence time before testing in order to obtain complete melting of the polymer, typically more the 20 minutes), inline measurements were made directly on an injection molding machine using a device allowing capillary rheometry measurements in the 50 S-1 to 10<sup>4</sup> s-1 range. In the later case, the residence time before rheological testing can be as low a a few seconds, due to the rapid melting of the polymer by combined heat and shear. Due to the shorter residence time, limiting hydrolisis, significantly higher viscosity could be measured with the inline device, allowing to access to the effective rheological behaviour in the injection molding process. Another advantage of the inline device is to allow the study of the evolution of measured pressure drop signal and viscosity with increasing residence time from a few second to several minuts : The fastfast degradation kinetics of PHBV in the melt can be observed, but also unexpected flow instabilities.