A series of experiments was conducted to demonstrate the applicability of a new Filtomat(R) thread filtration principle for microfiltration of semiprocessed blackcurrant juice and cherry juice. The effect of juice temperature (3-20°C), flow (20-80 L/h), and filter pore size (3-10 μm) on the transmembrane pressure, juice turbidity, protein, sugar, and total phenols levels was evaluated in a lab scale microfiltration unit employing statistically designed factorial experiments. Thread microfiltration reduced significantly the turbidity of both juices. For blackcurrant juice, in all experiments, the turbidity was immediately reduced to the level required for finished juice without compromising either the protein, the sugar or the phenols content. High flow rates increased the turbidity in blackcurrant juice, but did not affect cherry juice quality. Filtomat(R) thread microfiltration therefore appears suitable as a novel technology for berry juice processing, especially for blackcurrant juice filtration.