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FEED SECTION OF THE EXTRUDER PLASTICIZING SYSTEM

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In the paper, different design solutions for the feed section of the plasticizing system of a single screw extruder are presented, including solutions for the shape, size and position of the feed opening as well as the shape of the cross section of the polymer hopper. Proper conditions of polymer intake by the screw can be achieved by using a feed opening positioned eccentrically in relation to the axis of the plasticizing system, i.e., shifted compatibly with the direction of screw rotation. An appropriate size of the feed opening and the shape of its cross section have a large influence on the characteristics of the extrusion process. The paper discusses the relationship between polymer mass flow rate and rotational screw speed at different lengths of the feed opening. Also the most beneficial design solutions for polymer hoppers are shown. They enable proper compression and compensation of the compressibility of the polymer introduced into the hopper in the form of pellets. The best cross-sectional shape for a polymer hopper is the one that changes gradually from circular through oval and back to circular preventing pellets from becoming sticky and jamming in the feed opening, thus precluding bridging or premature melt blockage.