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Characteristics of Single Screw Compounding Extruder

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A large percentage of plastics today is mixed with substantial levels of fillers. These compounds are generally produced on twin screw extruders (TSCE), in particular co-rotating, intermeshing extruders with modular screws and barrel. TSCE are very capable machines that can process a wide range of material. This paper presents a new compounding extruder that is essentially a single screw compounding extruder (SSCE) with many characteristics of a TSCE. The newly developed SSCE™ uses multiple ports along the barrel for a staged addition of the compound ingredients and volatile removal. Starve feeding is used to control the energy input and mixing; this allows the machine to run at high screw speed. With low viscosity compounds it is possible to achieve screw speeds as high as 1000 rpm. The SSCE uses elongational mixing action to achieve efficient dispersive and distributive mixing. This allows the SSCE to achieve mixing capability comparable to TSCE. As a result, the SSCE provides an attractive alternative to TSCE.