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(54) **Title:** METHODS FOR ON-LINE DETERMINATION OF DEGREE OF RESIN STICKINESS USING A MODEL FOR DEPRESSION OF MELT INITIATION TEMPERATURE

(57) **Abstract:** In some embodiments, a method including the steps of: during a polymerization reaction producing a polymer resin in a fluid bed reactor, measuring reaction parameters including at least reactor temperature, at least one property of the resin, and amount of at least one condensable diluent gas in the reactor; determining from at least one measured resin property using a predetermined correlation, a dry melt initiation temperature value for a dry version of the polymer resin; and during the reaction, using a melt initiation temperature depression model to determine in on-line fashion a reduced melt initiation temperature.for the resin (e.g., a temperature at which the resin is expected to begin to melt) in the presence of the at least one condensable diluent gas in the reactor.

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