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(54) Title: MULTI STAGE PROCESS FOR PRODUCING ETHYLENE-BASED POLYMER WITH (ULTRA) HIGH MOLECULAR
WEIGHT POLYETHYLENE COMPONENT

(57) Abstract: Embodiments of methods of producing ethylene-based polymer comprising first and second polymer fractions includes reacting ethylene monomer and optionally C₃-C₁₂ α -olefin comonomer in solvent in the presence of a first catalyst in at least one initial reactor to produce the first polymer fraction reaching an exit temperature of this reaction zone below 160 °C, wherein the weight averaged molecular weight (Mw) of this first polymer fraction is larger than 500,000 g/mol; introducing the first polymer fraction, ethylene monomer, optionally C₃-C₁₂ α -olefin comonomer, solvent, at least one second catalyst to at least one agitated solution polymerization reactor; and reacting the ethylene monomer and optionally C₃-C₁₂ α -olefin comonomer in solvent in the presence of the at least one second catalyst in the at least one agitated solution polymerization reactor to produce a second polymer fraction.



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