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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 polymers comprising first and second polymer fractions include reacting ethylene monomer and optionally C₃-C₁₂ α-olefin comonomer in solvent in the presence of a reaction A catalyst in at least one tubular reactor to produce the first polymer fraction reaching an exit temperature of this reaction zone below 160 °C, wherein the weight averaged molecular weight (M_w) 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 two reaction B catalysts, and a shuttling agent 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 two reaction B catalysts, and a shuttling agent in the at least one agitated solution polymerization reactor to produce a second polymer fraction.

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