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(54) Title: POLYETHYLENE FILM WITH HIGH TENSILE STRENGTH AND HIGH TENSILE ENERGY TO BREAK

(57) Abstract: The present invention pertains to a UHMWPE film having a tensile strength of at least 2.0 GPa, a tensile energy to break of at least 30 J/g, an Mw of at least 500 000 gram/mole, and a Mw/Mn ratio of at most 6, and a film width of at least 5 mm. In a preferred embodiment the film has a width of at least 10 mm, more in particular at least 20 mm, still more in particular at least 40 mm, and a denier of at least 3000 dtex, in particular at least 5000 dtex, more in particular at least 10000 dtex, even more in particular at least 15000 dtex, or even at least 20000 dtex. The film may be manufactured via a process which comprises subjecting a starting UHMWPE with a weight average molecular weight of at least 500 000 gram/mole, an elastic shear modulus determined directly after melting at 160°C of at most 1.4 MPa, and a Mw/Mn ratio of at most 6 to a compacting step and a stretching step under such conditions that at no point during the processing of the polymer its temperature is raised to a value above its melting point. The film may be used as starting material in any applications where high tensile strength and high energy to break are important. Suitable applications include ballistic applications, ropes, cables, nets, fabrics, and protective applications.



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