



Advancing: Life

A detailed image of a yellow, curved shoulder implant, likely made of UHMWPE, shown against a dark background with a green circular graphic element.

activit-E SHOULDER

TECHNICAL MONOGRAPH

Highly crosslinked Vitamin-E UHMWPE is designed to offer a unique combination of benefits—improved wear resistance due to crosslinking and oxidative stability provided by the antioxidant vitamin-E when compared to conventional UHMWPE.¹⁻⁴

Crosslinked Polyethylene Generations:

In search of improved wear resistance, UHMWPE has historically been crosslinked using ionizing radiation (HXLPE). While improvements in wear properties were realized, crosslinking reduces the mobility of the polymer chains resulting in a reduction in ductility and toughness of the material as compared to conventional UHMWPE. Additionally, free radicals generated from the exposure to ionizing radiation threaten to cause oxidation which further reduces material properties and damage resistance.¹ Various downstream post processing treatments meant to alleviate the oxidation potential due to free radicals were subsequently introduced.

MANUFACTURING PROCESS



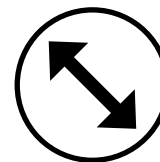
Compression mold
powder UHMWPE
into bars



Bars annealed
for stress relief



75 kGy
gamma
irradiation



Precision
machining

FEATURE/PROPERTY

BENEFIT

Wear Resistance

Reduced wear rate compared to conventional polyethylene¹

Vitamin E Stabilization

Reduces oxidative degradation over time⁵

Improved Mechanical Integrity⁶

Maintains ductility and toughness vs. remelted crosslinked polyethylene

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