



Turning ordinary plastic into an engineering material.

Developed by Plastic Diamond · Advanced Polymers · Manufacturing



THE PROBLEM

The Kingdom imports 100% of a strategic high-performance polymer

Ultra-high-molecular-weight polyethylene (UHMWPE) is essential for fiber, medical, marine, aerospace, defense and wire-and-cable applications. There is no local production in KSA today — 100% of demand is met by imports — leaving a strategic, fast-growing market entirely dependent on foreign supply.

THE SOLUTION

The strongest man-made tapes, made from a Kingdom resource

Ethylene is abundant in the Kingdom as a product of its oil resources. By driving the repeat-unit count from tens to over a hundred thousand, the same monomer becomes an engineering polymer with far greater societal and economic value. Using a novel synthesis process at KAUST, the team has not only removed the need for the use of toxic solvents but also created the strongest man-made tapes, with superior impact and abrasion resistance and exceptional gas-barrier properties.

TECHNOLOGY · KEY SPECIFICATIONS

CO2 reduction	65% lower for 1 kg of product
Processing	Solvent-free
Performance	Strongest man-made tapes; superior impact and abrasion resistance
Global market	~USD 18 billion, growing at ~8.7% CAGR
IP portfolio	Polymer synthesis, blending, creep-resistant polymer and tape processing

IMPACT

01

Localizing production

Establishing the first local UHMWPE production to replace 100% import dependency.

02

Strengthening strategic sectors

Supplying military, marine, aerospace and medical industries from within the Kingdom.

03

Lower-carbon material

Cutting product CO2 by 65% through solvent-free processing.

04

Building local expertise

Generating high-tech jobs and cultivating cutting-edge polymer expertise locally.