

UHMW-PE

Ultra High Molecular Weight
Polyethylene



ULTRA HIGH MOLECULAR WEIGHT POLYTHYLENE

UHMW-PE is an innovative polyolefin product created by our IRPC technology. IRPC is the first UHMW-PE manufacturer in Thailand and Southeast Asia and has pushed the product to the market from November 2010 until now.



Outstanding Properties



High abrasion resistance and high wear resistance



Highest impact strength of any thermoplastic presently made



Very low coefficient of friction, self-lubricating



High resistance to corrosive chemicals



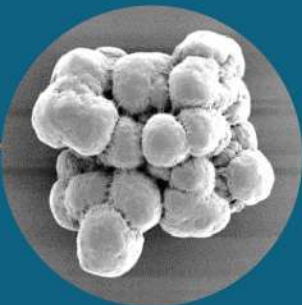
Extremely low moisture absorption

OUR UNIQUE UHMW-PE FEATURES



UNIFORM PROCESSIBILITY & PROPERTIES

- Narrow particle size distribution
- Spherical shape



HIGH PURITY PRODUCT & STABLE IN SEVERE CONDITION

- Low ash and elemental residue



EXCELLENT MECHANICAL PROPERTIES

- Very low coefficient of friction
- High abrasion resistance
- High tensile strength
- High impact strength



TAILOR-MADE SOLUTIONS

- Specific properties followed customer request
- Certificate ISO 9001
- Laboratory quality certified for each production lot
- Technical support



Head office
Bangkok, Thailand

Rayong Plant
Rayong, Thailand



UHMW-PE FOR LEAD ACID BATTERY SEPARATOR

Processed by calendarling sheet

FEATURES AND BENEFITS

- Small & uniform powder
- Low elemental residue
- High puncture & oxidation resistance
- Available with anti-oxidant additive
- Low electrical resistance (ER)
- Uniformity of the finished product's pore size

PROPERTIES	Test Method	Unit	U510B	U710B
Physical Properties				
Average molecular weight (cal.)	Margolies equation	10 ⁶ g/mol	5.8	7.8
Intrinsic viscosity	ISO 1628-3	dl/g	23.1	28.3
Average Particle Size, d50	Laser Scattering	micron	130	130
Bulk Density	ISO 60	g/cm ³	≥ 0.40	≥ 0.40
Density	ISO 1183	g/cm ³	0.93	0.93
Mechanical Properties				
Tensile strength at yield	ISO 527	MPa	≥ 20	≥ 21
Tensile strength at Break	ISO 527	MPa	≥ 37	≥ 38
Ultimate elongation	ISO 527	%	≥ 300	≥ 250

U510B & U710B

- Automotive Industrial
- Recreation

An efficient separator sheet can be produced by mixing microporous silica, oil, and additives with UHMW-PE as a binder then extrude and calendar. Uniform – durable sheet with extremely low metal contaminates deliver excellent safety performance for automotive and industrial applications.





VHMW-PE FOR LITHIUM-ION BATTERY SEPARATOR

Processed by casting separator film

FEATURES AND BENEFITS

- Small & uniform powder (Easily solubility in the wet process)
- Low elemental residue
- Narrow molecular weight distribution (separator having a uniform pore formation)
- Low content of low molecular weight (high puncture resistance, improve battery safety)
- Smallest film thickness (< 10 μm)

PROPERTIES	Test Method	Unit	H611LB
Physical Properties			
Average molecular weight (cal.)	Margolies equation	10 ⁶ g/mol	0.6
Intrinsic viscosity	ISO 1628-3	dl/g	5.2
Average Particle Size, d50	Laser Scattering	micron	110
Bulk Density	ISO 60	g/cm ³	≥ 0.40
Density	ISO 1183	g/cm ³	0.95
Mechanical Properties			
Tensile strength at yield	ISO 527	MPa	≥ 24
Tensile strength at Break	ISO 527	MPa	≥ 35
Ultimate elongation	ISO 527	%	≥ 650

H611LB

- Consumer Electronics
- Stationary energy storage
- Electric derive vehicle





UHMW-PE FOR FIBER

Processed by gel spinning

FEATURES AND BENEFITS

- Small & uniform powder
- Low elemental residue
- Can be applied to gel-spinning process for high-strength fiber with low water absorption, good chemical resistance, and lightweight properties

PROPERTIES	Test Method	Unit	U711FB	U810FB
Physical Properties				
Average molecular weight (cal.)	Margolies equation	10 ⁶ g/mol	6.9	8.7
Intrinsic viscosity	ISO 1628-3	dl/g	26.0	30.4
Average Particle Size, d50	Laser Scattering	micron	130	130
Bulk Density	ISO 60	g/cm ³	≥ 0.40	≥ 0.40
Density	ISO 1183	g/cm ³	0.93	0.93
Yellow index	ASTM D1925	-	≤ 2.0	≤ 2.0
Mechanical Properties				
Tensile strength at yield	ISO 527	MPa	≥ 20	≥ 20
Tensile strength at Break	ISO 527	MPa	≥ 38	≥ 39
Ultimate elongation	ISO 527	%	≥ 300	≥ 260

U711FB

Rope, Net, Sling

Mooring rope; Fishing (rope, net, line); Freight handling; Industrial sling; Sport (rope, net): climbing rope, parachute rope, golf net, baseball net; Cut-resistant glove, Tent



U810FB

Ballistic protection

UD sheet (Unidirectional sheet); Ballistic vests; Helmets; Shields; Soft stab resistant vests; Bulletproof & stab resistant jacket





UHMW-PE FOR FILTRATION

Processed by sintering

FEATURES AND BENEFITS

- Low elemental residue and no residual chemicals
- Chemical resistance (Acid/Alkali/Organic solvent)
- U510FW can be sintered without pressure and also receives a high-strength dust filter or applied to be a binder for an activated carbon filter
- Special particle size distribution for membrane application
- Special pore structure and high mechanical strength

PROPERTIES	Test Method	Unit	U510FW
Physical Properties			
Average molecular weight (cal.)	Margolies equation	10 ⁶ g/mol	5.7
Intrinsic viscosity	ISO 1628-3	dl/g	23.0
Average Particle Size, d50	Laser Scattering	micron	125
Bulk Density	ISO 60	g/cm ³	≥ 0.40
Density	ISO 1183	g/cm ³	0.93
Mechanical Properties			
Tensile strength at yield	ISO 527	MPa	≥ 22
Tensile strength at Break	ISO 527	MPa	≥ 35
Ultimate elongation	ISO 527	%	≥ 300

U510FW

- Sintered Filters
- Binder for Activated Carbon Filters



ROD & SHEET

Processed by compression molding, ram extrusion

FEATURES AND BENEFITS

- High mechanical strength
- High abrasion resistance
- Higher molecular weight, higher durability
- Low elemental residue
- Smooth white color after processing
- Available with anti-oxidant additive

PROPERTIES	Test Method	Unit	U311	U321	U511R	U521	U711
Physical Properties							
Average molecular weight (cal.)	Margolies equation	10 ⁶ g/mol	3.9	3.9	5.8	5.8	7.8
Intrinsic viscosity	ISO 1628-3	dl/g	17.6	17.6	23.1	23.1	28.3
Average Particle Size, d50	Laser Scattering	micron	130	200	130	200	130
Bulk Density	ISO 60	g/cm ³	≥ 0.40	≥ 0.40	≥ 0.40	≥ 0.40	≥ 0.40
Density	ISO 1183	g/cm ³	0.93	0.93	0.93	0.93	0.92
Yellow index	ASTM D1925	-	< 2	< 2	< 2	< 2	< 2
Mechanical Properties							
Tensile strength at yield	ISO 527	MPa	≥ 22	≥ 22	≥ 22	≥ 22	≥ 21
Tensile strength at Break	ISO 527	MPa	≥ 37	≥ 35	≥ 33	≥ 33	≥ 35
Ultimate elongation	ISO 527	%	≥ 350	≥ 330	≥ 300	≥ 300	≥ 260

U311, U321, U511R, U521, U711

- **Component exposed to wear** (wheels, sprockets, chain guides, bearings, chains)
- **Linings for handling large objects** (conveyor belts, rails, slide rails, wagons)
- **Pumps and valves exposed to chemicals**





EXTREME

Processed by compression molding, ram extrusion and skiving film

FEATURES AND BENEFITS

- Low elemental residue and Low coefficient of friction
- Good processing balance
- High mechanical strength and abrasion resistance
- High scratch resistance
- Low haze

PROPERTIES	Test Method	Unit	U310T	U511H
Physical Properties				
Average molecular weight (cal.)	Margolies equation	10 ⁶ g/mol	4.9	5.8
Intrinsic viscosity	ISO 1628-3	dl/g	20.7	23.1
Average Particle Size, d50	Laser Scattering	micron	150	130
Bulk Density	ISO 60	g/cm ³	≥ 0.40	≥ 0.40
Density	ISO 1183	g/cm ³	0.92	0.92
Yellow index	ASTM D1925	-	< 2	< 2
Mechanical Properties				
Tensile strength at yield	ISO 527	MPa	≥ 14	≥ 15
Tensile strength at Break	ISO 527	MPa	≥ 34	≥ 25
Ultimate elongation	ISO 527	%	≥ 340	≥ 350

U310T Transparency

Sliding surfaces for skis, snowboards, ice-skating rinks, and bowling alleys



U511H High impact strength

- Panel for marine fender
- Pipe





POLIMAXX
MAKE GREATER THINGS





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