UHWW Sheet Properties

VR UHMW - Virgin - White in colour

- F.D.A. Approved
- Most commonly specified
- Should be UV stabilized if used in outdoor applications (Special order)
- Standard stock sheet size = 4'x10'

Physical Properties	Typical Values	Test Methods
Density, g/cm^3	0.930 - 0.940	ASTM D 792
Hardness, Durometer Shore D	64 - 66	ASTM D 2240
Deflection temperature ºF (ºC)		ASTM D 648
At 66 psi	174 (79)	
At 264 psi	115 (46)	
Recommended Operating Temperature Range		
Maximum Continuous, ºF (ºC)	180 (82)	
Minimum Continuous, ºF (ºC)	-40 (-40)	
Tensile properties		ASTM D 638
Maximum strength, psi (MPa)	4,800 - 6200 (33 - 43)	2 in./min
Yield Strength, psi (MPa)	2,900 3,400 (20 - 23)	
Modulus, psi (MPa)	100,000 - 150,000 (689 1,033)	
Elongation at break, %	300 - 450	
Flexural modulus, psi (MPa)	100,000 - 150,000 (689 1,033)	ASTM D 790
Izod impact strength at 23ºC, ft-lbs/in. (J/M)		
Notched	No break	ASTM D 256A
Double Notched	>20 (42)	Internal
Mean coefficient of linear thermal expansion per ºC	2 x 10^{-4}	ASTM D 696
Coefficient of friction against Cr-plated steel at 23ºC		ASTM D 1894
Static	.20 - .25	
Dynamic	.13 - .17	
Abrasion Index (Relative to steel at 100)	10	Sand Slurry
Dielectric constant, 60 cycles to 10^6 cycles	2.3-2.35	ASTM D 150
Surface Resistivity, ohms	>10^{16}	ASTM D 257
Volume Resistivity, ohms-cm	>10^{16}	ASTM D 257

RP - UHMW - Re-Processed

- Retains most physical properties of virgin except impact (15% loss is typical)
- Not FDA approved
- Typical savings of 10-15%
- UV stabilized required for outdoor applications

Physical Properties	Typical Values	Test Methods
Density, g/cm^3	0.930 - 0.940	ASTM D 792
Hardness, Durometer Shore D	64 - 66	ASTM D 2240
Operating Temperature		
Maximum Continuous, ºF (ºC)	180 (82)	
Maximum Continuous, ºF (ºC)	-22 (-30)	
Tensile properties		ASTM D 638
Maximum strength, psi (MPa)	3,500 - 5200 (24 - 36)	2 in./min
Yield Strength, psi (MPa)	2,500 - 3,100 (17 - 21)	
Modulus, psi (MPa)	100,000 - 150,000 (689-1083)	
Elongation at break, %	150 - 400	
Flexural Modulus, psi (MPa)	100,000 - 150,000 (689-1083)	ASTM D 790
Izod impact strength at 23ºC, ft-lbs/in. (J/M)		
Notched	No break	ASTM D 256A
Double Notched	>20 (42)	Internal
Mean coefficient of linear thermal expansion per ºC	2 x 10^{-4}	ASTM D 696
Coefficient of friction against Cr-plated steel at 23ºC		ASTM D 1894
Static	.20 - .30	
Dynamic	.14 - .18	
Abrasion Index (Relative to steel at 100)	9 - 11	Sand Slurry

UHMW - Sheet Properties

Titanium - XP

- Superior abrasion resistance
- Impact resistant
- Low coefficient of friction
- Excellent chemical resistance
- Non magnetic
- Combines the superior properties of Titanium with that of UHMW-PE providing outstanding life cycle performance.
- Designed for highly abrasive environments such as aggregate chutes, bin liners, hopper liners, flume liners, belt scrapers, skirt boards, etc.

Physical Properties	Typical Values	Test Methods
Density, g/cm^3	0.930 - 0.940	ASTM D 792
Hardness, Rockwell R Scale	67	ASTM D 785
Recommended Operating Temperature Range		
Maximum Continuous, ºF (ºC)	180 (82)	
Minimum Continuous, ºF (ºC)	-22 (-30)	
Tensile properties		ASTM D 638
Maximum strength, psi (MPa)	5200 (36)	2 in./min
Yield Strength, psi (MPa)	2,800 (19)	
Elongation at break, %	400	
Flexural Modulus, psi (MPa)	75,000 (518)	ASTM D 790
Izod impact strength at 23ºC, ft-lbs/in^2. (KJ/m^2)		
Notched	No Break	ASTM D 256A
Double Notched	38 (784)	Internal
Mean coefficient of linear thermal expansion per ºC	1.6 x 10^{-4}	ASTM D 696
Coefficient of friction against Cr-plated steel at 23ºC		ASTM D 1894
Static	.12	
Dynamic	.10	
Abrasion Index (relative to steel at 100)	7.5	Sand Slurry
Surface Resistivity, ohms-cm	>10^{16}	ASTM D 257
Volume Resistivity, ohms-cm	>10^{166}	ASTM D 257

SR - UHMW - PE

- Specially modified by combining a mixture of carbon and graphite to dissipate static charge caused by friction
- Commonly used in grain, coal and package handling applications
- UV stabilized

Physical Properties	Typical Values	Test Methods
Density, g/cm^3	0.93 - 0.94	ASTM D 792
Hardness, Durometer Shore D	65 - 67	ASTM D 2240
Tensile properties		ASTM D 638
Maximum strength, psi (MPa)	4,800 - 5,600 (33 - 39)	2 in./min
Yield strength, psi (MPa)	2,800 - 3,200 (19 - 22)	
Elongation at break, %	300 - 400	
Modulus of elasticity, psi (MPa)	100,000 - 150,000 (689 - 1033)	
Flexural Modulus, psi (MPa)	100,000 - 150,000 (689 - 1033)	ASTM D 790
Izod impact strength at 23°C, ft-lbs/in.		
Notched	No break	
Double Notched	>20 (42)	
Mean coefficient of linear thermal expansion per °C		ASTM D 256A
-30 to 30°C	1.8 x 10^{-4}	Internal
Operating Temperature		
Maximum Continuous °F (°C)	180 (82)	ASTM D 696
Minimum Continuous °F (°C)	-22 (-30)	
Coefficient of friction against Cr-plated steel at 23°C		
Static	.20 - .25	
Dynamic	.12 - .16	
Abrasion Index (Relative to steel at 100)	10	
Surface Resistivity, ohms	10^5 - 10^7	
Volume Resistivity, ohms-cm	10^5 - 10^7	ASTM D 1894

HT - High Temp UHMW

- Meets required FDA regulation 21CFR177.1520, items 2.1 and 2.2 for articles intended for direct and indirect food contact usage and regulation 21CFR178.2010 governing additives and food contact usage.
- Specifically modified to operate in high temperature environments. Maximum operating temperature of 275°F.
- Commonly used in asphalt handling and transfers near high temperature areas such as over or waste burners.

Property	Method	SI Unit	SI Value	English Unit	English Value
Density	ASTM D-792	kg/m³	941	lbs/ft³	58.8
Yield Point	ASTM D-638	MPa	24.7	psi	3584
Elongation @ Yield	ASTM D-638	%	13.7	%	13.7
Tensile Break	ASTM D-638	MPa	52.5	psi	7618
Elongation @ Break	ASTM D-638	%	242	%	242
Tensile Modulus	ASTM D-638	MPa	820	psi	120,000
Flexural Modulus	ASTM D-790	MPa	760	psi	110,000
Izod Impact	ASTM D-4020	kJ/m²	60	ft-lbs/in²	29
Tensile Impact	DIN 53448	kJ/m²	2200	ft-lbs/in²	1050
Sand Wheel Wear	ASTM G-65	AR-01 Steel=100	90	AR-01 Steel=100	90
Hardness	ASTM D-2240	Type D	68	Type D	68
Static Friction	ASTM D-1894	Unitless	0.15	Unitless	0.15
Dynamic Friction	ASTM D-1894	Unitless	0.12	Unitless	0.12
Coefficient of Thermal Temp.	ASTM D-696	$°C^{-1}$	0.0002	$°F^{-1}$	0.00011
Maximum Operating Temp.	-	°C	135	°F	275
Compressive Modulus	ASTM D-695	MPa	536	psi	77750
Compressive Deformation	ASTM D-621	% at 454.5 kg	6-8	% at 1000 psi	6-8
Volume Resistivity	ASTM D-257	Ohm-cm	$>10^{13}$	Ohm-cm	$>10^{13}$
Surface Resistivity	ASTM D-257	Ohm	$>10^{13}$	Ohm	$>10^{13}$
Water Absorption	ASTM D-570	%	nil	%	nil

Tivar - 88 PE

- Promotes steady material flow
- Reduced friction
- Abrasion, chemical and corrosion resistant
- Better release characteristics
- Used extensively in bin, chute and hpper lining applications

Property	Method	SI Unit	SI Value	English Unit	English Unit
Density	ASTM D-792	Kg/m^3	944	lbs/ft^3	58.9
Yield Point	ASTM D-638	MPa	22.4	psi	3250
Elongation at Yield	ASTM D-638	%	12	%	12
Tensile Break	ASTM D-638	MPa	38.6	psi	5600
Elongation at Break	ASTM D-638	%	330	%	330
Tensile Modulus	ASTM D-638	MPa	1075	psi	155900
Flexural Modulus	ASTM D-790	MPa	744	psi	107900
Izod Impact	ASTM D-256A	J/m	No Break	Ft-lbs/in	No Break
Sand Wheel Wear	ASTM G-65	T-1000=100	95	T-1000=100	95
Hardness	ASTM D-2240	Shore D	69	Shore D	69
Static Friction	ASTM D-1894	Unitless	0.17	Unitless	0.17
Dynamic Friction	ASTM D-1894	Unitless	0.14	Unitless	0.14
Coefficient of Thermal Exp.	ASTM D-696	$°C^{-1}$	0.00018	$°F^{-1}$	0.00011
Melt Point	ASTM D-3417	°C	137-143	°F	278-289
Compression Modulus	ASTM D-695	MPa	480.2	psi	69650
Compression Deformation	ASTM D-621	% at 454.5 kg	6-8	% at 1000 psi	6-8
Volume Resistivity	ASTM D-257	Ohm-cm	$>10^{15}$	Ohm-cm	$>10^{15}$
Surface Resistivity	ASTM D-257	Ohm	$>10^{15}$	Ohm	$>10^{15}$
Water Absorption	ASTM D-570	%	nil	%	nil

* Values are and are not specifications.
** ASTM test methods are under current procedures.

UHMW - Sheet Properties

Polysteel - PE

- Metal detectable
- High specific gravity
- Increased dimensional stability
- Increased compressive strength
- Commonly used in conveyors and transfers where pulp chip contamination is an issue
- More abrasion resistant than most competitive products

Properties	Method	SI Unit	SI Value	Eng. Unit	Eng. Value
Specific Gravity	ASTM D-792		1.45		1.45
Yield Point	ASTM D-638	MPa	16.1	psi	1334
Elongation at Yield	ASTM D-638	%	15	%	15
Tensile Break	ASTM D-638	MPa	19	psi	2755
Elongation at Break	ASTM D-638	%	125	%	125
Izod impact	ASTM D-4020	kJ/m^2	30	$ft\text{-}lbs/in^2$	14
Tensile Impact	DIN 53448	kJ/m^2	525	$ft\text{-}lbs/in^2$	250
Sand Wheel Wear	ASTM G-65,	T-1000=100	240	T-1000=100	240
Flexural Modulus	ASTM D-790	MPa	750	psi	108750
Hardness	ASTM D-2240	Shore D	64	Shore D	64
Static Friction	ASTM D-1894	Unitless	0.20	Unitless	0.20
Dynamic Friction	ASTM D-1894	Unitless	0.14	Unitless	0.14
Compressive Strength	ASTM D-695	MPa	25	psi	3640