MITSUBISHI CHEMICAL ADVANCED MATERIALS

TIVAR® ECO UHMW-PE

TIVAR® ECO UHMW-PE [Ultra High Molecular Weight Polyethylene] shapes are produced from reprocessed industrial UHMW-PE materials and are repurposed for use in a variety of industries such as construction and heavy equipment, agriculture, grain handling, parcel handling and transportation.

Sustainability Value

Supported by a robust buy-back program, we convert hard scrap into high-quality finished plates. TIVAR® ECO currently keeps at least 4,000 US Tons (8.8 million lbs) of drops, skeleton sheets from fabrication, and UHMW-PE scrap out of landfills annually.

TIVAR® ECO is supporting the Mitsubishi Chemical Advanced Materials vision of a circular economy and a recycling-oriented society. Get in touch with us to participate in our reclaim process!

Key Performance Properties

- Excellent abrasion and corrosion resistance
- Cryogenic temperature performance
- Outstanding impact strength
- Minimal moisture absorption
- Low coefficient of friction

Application Examples

- Dock fendering
- Wear components
- Conveyor components
- Strips, rails, guides, rollers
- Dunnage racks
- Impact plates
- Outrigger pads

Key Benefits

- Manufactured in CO2 neutral sites that use renewable energy
- Flexible design and application opportunities
- Less machine downtime and cost savings vs. traditional metal materials
- Excellent value

TIVAR® ECO UHMW-PE

		ISO*			ASTM*		
		Test methods	Units	Indicativ Values	Test methods	Units	Indicativ Values
Thermal Properties (1)	Melting temperature (DSC, 10°C (50°F) / min)	ISO 11357-1/-3 °C	°C	-	ASTM D3418	°F	275
	Coefficient of linear thermal expansion (-40 to 150 °C) (-40 to 300°F)	-	-	-	ASTM E-831 (TMA)	µin./in./°F	110
	Heat Deflection Temperature: method A: 1.8 MPa (264 PSI)	ISO 75-1/-2	°C	-	ASTM D648	°F	116
	Continuous allowable service temperature in air (20.000 hrs) (3)	-	°C	-	-	°F	180
	Flammability: UL 94 (3 mm (1/8 in.)) (5)	-	-	HB	-	-	HB
	Flammability: Oxygen Index	ISO 4589-1/-2	%	<20	-	-	-
Mechanical Properties (6)	Tensile strength	ISO 527-1/-2 (7)	MPa	-	ASTM D638 (8)	PSI	4000
	Tensile strain (elongation) at break	ISO 527-1/-2 (7)	%	-	ASTM D638 (8)	%	200
	Tensile modulus of elasticity	ISO 527-1/-2 (9)	MPa	-	ASTM D638 (8)	KSI	98
	Compressive strength	-	-	-	ASTM D695 (11)	PSI	2800
	Izod Impact notched	-	-		ASTM D256	ft.lb./in	No Break
	Flexural strength	ISO 178 (12)	MPa	-	ASTM D790 (13)	PSI	2000
	Flexural modulus of elasticity	ISO 178 (12)	MPa	-	ASTM D790	KSI	81
	Shore hardness D (14)	ISO 868	-	-	ASTM D2240	-	67
Miscella-neous	Colour	-	-	Black	-	-	Black
	Specific Gravity	-	-	-	ASTM D792	-	0.93
	Dynamic Coefficient of Friction (-)	ISO 7148-2 (18)	-	-	QTM 55007 (20)	-	0.14
	Limiting PV at 100 FPM (safety factor 4)	-	MPa	-	QTM 55007 (21)	ft.lbs/in².min	3000
	Chemical Resistance	https://www.mcam.com/en/support/chemical-resistance-information/			https://www.mcam.com/en/support/chemical-resistance-information/		

Note: 1 g/cm³ = 1,000 kg/m³ ; 1 MPa = 1 N/mm² ; 1 kV/mm = 1 MV/m

1 The figures given for these properties are for the most part derived from raw material supplier data and other publications.
2 Values for this property are only given here for amorphous materials and for materials that do not show a melting temperature (PBI & PI).
3 Temperature resistance over a period of min. 20,000 hours. After this period of time, there is a decrease in tensile strength – measured at 23 °C – of about 50 % as compared with the original value. The temperature value given here is thus based on the thermal-oxidative degradation which takes place and causes a reduction in properties. Note, however, that the maximum allowable service temperature depends in many cases essentially on the duration and the magnitude of the mechanical stresses to which the material is subjected.
4 Impact strength decreasing with decreasing temperature, the minimum allowable service temperature is practically mainly determined by the extent to which the material is subjected to impact. The value given here is based on unfavourable impact conditions and may consequently not be considered as being the absolute practical limit.
5 These estimated ratings, derived from raw material supplier data and other publications, are not intended to reflect hazards presented by the material under actual fire conditions. There is no 'UL File Number' available for these stock shapes.
6 Most of the figures given for the mechanical properties are average values of tests run on dry test specimens machined out of rods 40-60 mm when available, else out of plate 10-20mm. All tests are done at room temperature (23° / 73°F)
7 Test speed: either 5 mm/min or 50 mm/min [chosen acc. to ISO 10350-1 as a function of the ductile behaviour of the material (tough or brittle)] using type 1B tensile bars
8 Test speed: either 0.2"/min or 2"/min or [chosen as a function of the ductile behaviour of the material (btittle or tough)] using Type 1 tensile bars
9 Test speed: 1 mm/min, using type 1B tensile bars
10 Test specimens: cylinders Ø 8 mm x 16 mm, test speed 1 mm/min
11 Test specimens: cylinders Ø 0.5" x 1", or square 0.5" x 1", test speed 0.05"/min
12 Test specimens: bars 4 mm (thickness) x 10 mm x 80 mm ; test speed: 2 mm/min ; span: 64 mm.
13 Test specimens: bars 0.25" (thickness) x 0.5" x 5" ; test speed: 0.11"/min ; span: 4"
14 Measured on 10 mm, 0.4" thick test specimens.
15 Electrode configuration: Ø 25 / Ø 75 mm coaxial cylinders ; in transformer oil according to IEC 60296 ; 1 mm thick test specimens.
16 Measured on discs Ø 50 mm x 3 mm.
17 Measured on 1/8" thick x 2" diameter or square
18 Test procedure similar to Test Method A: "Pin-on-disk" as described in ISO7148-2, Load 3MPa, sliding velocity= 0,33 m/s, mating plate steel Ra= 0.7-0.9 µm, tested at 23°C, 50%RH.
19 Test using journal bearing system, 200 hrs, 118 ft/min, 42 PSI, steel shaft roughness 16±2 RMS micro inches with Hardness Brinell of 180-200
20 Test using Plastic Thrust Washer rotating against steel, 20 ft/min and 250 PSI, Stationary steel washer roughness 16±2 RMS micro inches with Rockwell C 20-24
21 Test using Plastic Thrust Washer rotating against steel, Step by step increase pressure, Test ends when plastic begins to deform or if temperature increases to 300°F.

mcam.com

Mitsubishi Chemical Advanced Materials

Europe
Mitsubishi Chemical Advanced Materials Europe NV
Galgenveldstraat 12
8700 Tielt, Belgium
T +32[0] 51 42 35 11
F +32[0] 51 42 33 10
contact@mcam.com

North America
Mitsubishi Chemical Advanced Materials Inc.
2120 Fairmont Avenue
PO Box 14235 - Reading, PA 19612-4235
T 800 366 0300 | +1 610 320 6600
F 800 366 0301 | +1 610 320 6638
contact@mcam.com

Asia-Pacific
Mitsubishi Chemical Advanced Materials Asia Pacific Ltd.
Unit 7B, 35/F, Cable TV Tower,
9 Hoi Shing Road, Tsuen Wan, Hong Kong
T +852 2470 26 83
F +852 2478 99 66
contact@mcam.com

Follow us

@MCAMconnect

MITSUBISHI CHEMICAL ADVANCED MATERIALS

Lit. TIVAR ECO UHMW-PE_03/2021