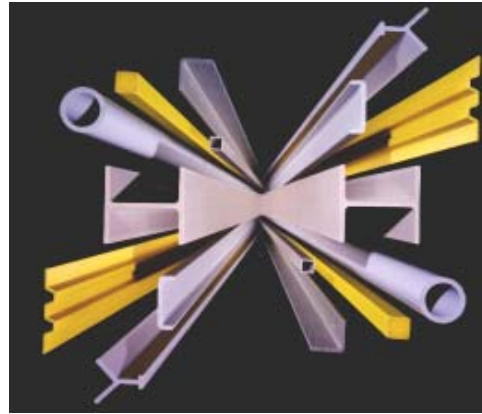


Material Reference Data Sheets

PRODUCT COMPARISONS

Pultex® vs. Traditional Materials

Pultex® pultruded fiber reinforced polymer structural profiles are designed and manufactured to provide lasting performance in areas where other materials corrode or decay.



Comparison Chart of Properties

	Pultex® 1500/1525	Pultex® 1625	Pultex® Solid Rod & Bar	Carbon Steel (M1020)	316 Stainless Steel	Aluminum 6061-T6 T651	Ponderosa Pine	Rigid PVC	Rigid PVC 10% Glass	Fiberglass Compression Molding (SMC)	Spray-Up (30-50% Glass)
MECHANICAL											
Tensile Strength (psi x 10³)											
LW	30	30	100	35	30-35	45	8.4	6.2	7.8	8-20	9-18
CW	7	7	-	35	30-35	45	--	6.2	7.8	8-20	9-18
Tensile Modulus (psi x 10⁶)											
LW	2.5	2.6	6	30	28	10	-	.39	.47	1.6-2.5	.8-1.8
CW	.8	1	-	30	28	10	-	.39	.47	1.6-2.5	.8-1.8
Flexural Strength (psi x 10³)											
LW	30	30	100	35	30-35	45	15.4	11	11.7	18-30	16-28
CW	10	10	-	35	30-35	45	9.4	11	11.7	18-30	16-28
Flexural Modulus (psi x 10⁶)											
LW	2	2.2	6	30	28	10	1	.35	.45	1.3-1.8	1-1.2
CW	.8	.8	-	30	28	10	-	.35	.45	1.3-1.8	1-1.2
Izod Impact (Ft.-Lbs./in.)											
LW	25	25	40	N/A	8.5-11	--	--	1.6	1.6	10-20	4-12
CW	4	4	--	N/A	--	--	--	1.6	1.6	10-20	4-12
Specific Gravity	1.7	1.7	2	7.8	7.92	2.5	.52	1.38	1.39	1.5-1.7	1.4-1.6
PHYSICAL											
Density (Lbs./in.³)	.062-.07	.062-.07	.072-.076	.284	.29	.092	.019	.052	.052	.054-.061	.05-.059
Coefficient of Thermal Expansion (10⁻⁶in./in./°F)	5.2	5.2	3	6-8	9-10	13.5	1.7	37	23	10-18	12-20
Thermal Conditions (BTU-in./Ft.²/HR/°F)	4	4	5	260-460	96-185	1200	.08	1.3	--	1.3-1.7	1.2-1.6

LW = Longitudinal/CW = Transverse

Pultex® 1500,1525 and 1625 standard 40 to 45% glass

Values are minimum ultimate properties from coupons

Specific Heat (cal./°C/gm) = .25

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* (LW = Lengthwise; CW = Crosswise)

Characteristic Pultex® Standard Structural Profiles		Steel A-36 Carbon
Corrosion Resistance	Various resin systems to meet corrosion requirements Painting suggested when exposed to UV rays	Subject to oxidation and corrosion Painting or galvanizing required
Weight	Lightweight: 75% lighter than steel - zero to minimal lifting equipment	Reduced installation and shipping cost.
Electrical Conductivity	Non-conductive Low Thermal Conductivity 4 (BTU/SF/HR/F°/IN)	Conducts electricity; grounding potential Thermal Conductivity 260-460 (BTU/SF/HR/F°/IN)
Strength	High strength-to-weight ratio; stronger than some steels in lengthwise direction Ultimate flexural strength (Fu) LW = 30 x 10 ³ PSI, CW = 10 x 10 ³ PSI	Homogeneous material
Stiffness	Flexural modulus LW - 2.5 x 10 ⁶ PSI, CW = .8 x 10 ⁶ PSI No permanent deformity under working load	Yield strength (Fy) 36,000 PSI Flexural modulus 20 x 10 ⁶ PSI
Impact Resistance	Glass mat distributes impact load to prevent surface damage. No permanent deformity under impact.	Can permanently deform under impact
EMI/RFI Transparency	Transparent to EMI/RFI transmissions	Can interfere with EMI/RFI transmissions
Versatility	Pigments provide inherent color; special colors available	Must be painted for color To maintain color and corrosion resistance, repainting may be required.
Ease of Fabrication	Field fabricated with simple hand tools Lightweight for easier erection and installation.	Requires welding and cutting torches Heavier material requires special handling equipment to erect and install
Cost	Lower installation and maintenance costs equals lower lifecycle costs	Expensive to install and maintain.
Characteristic Pultex® Standard Structural Profiles		Aluminum
Corrosion Resistance	Superior resistance to broad range of chemicals Surfacing veil and UV additives improve weatherability	Causes galvanic corrosion; Increase resistance through anodizing or other coatings
Weight	Lightweight - 30% lighter than aluminum	Lightweight - about 1/3 the weight of copper or steel
Electrical Conductivity	Non-conductive; high dielectric capability (i.e. ASTM standard)	Conducts electricity; grounding potential
Thermal Properties	Low thermal conductivity, 4 BTU/SF/HR/F°/IN; low thermal coefficient of expansion 4.4 (in/in/F°) 10 ⁻⁶ .	Heat conductor - high thermal conductivity, 150 BTU/SF/HR/F°/IN; thermal coefficient of expansion 11-13 (in/in/F°) 10 ⁻⁶
Strength	Ultimate flexural strength (Fu) LW = 30 x 10 ³ PSI, CW = 10 x 10 ³ 86% of the yield strength of aluminum and stronger than aluminum in the lengthwise direction	Flexural Strength (Fu) 35 x 10 ³ PSI Homogeneous material
Finishing and Color	Pigments provide inherent color; special colors available.	Silver color; other colors require prefinishes, anodic coatings and paints; Mechanical, chemical and electro-plated finishes can be applied
EMI/RFI Transparency	Electromagnetically transparent; used for radar and antennae enclosures and supports	Highly reflective
Fabrication	Field-fabricated with simple hand tools; adhesive bonding and/or mechanical joining. No torches or welding required.	Good machinability - welding, brazing, soldering or mechanical joining required
Cost	Slightly higher tooling costs; price per lineal foot marginally higher	Inexpensive tooling; part price comparable or slightly lower
Impact Resistance	Glass mat distributes impact load to prevent surface damage. No permanent deformity under impact.	Easily deforms under impact
Characteristic Pultex® Standard Structural Profiles		Structural Timber - Douglas Fir
Corrosion Resistance	Superior resistance to broad chemical range. Unaffected by moisture or immersion in water with sealed ends. Surfacing veil and UV additives create excellent weatherability	Warp, rot and decay potential from moisture, water and chemicals; coatings or preservatives rrequired to increase corrosion or rot resistance can create hazardous waste and/or high maintenance.
Insect resistance	Resists damage by insects	Susceptible to insect attack (marine borers, termites); coatings increase resistance to insects and are environmentally hazardous
Strength	Greater flexural strength than timber; Ultimate flexural strength (Fu) LW = 30 x 10 ³ PSI; CW = 10 x 10 ³ PSI Compression strength is 30,000 PSI	Extreme fiber bending = up to 2800 PSI Compression parallel to grain = up to 1800 PSI*
Stiffness	1.5-3.3 times as rigid as wood; Modulus of elasticity LW = 2.5 x 10 ⁶ PSI, CW = .8 x 10 ⁶ PSI	Modulus of elasticity = up to 1.8 x 10 ⁶ PSI
Electrical Conductivity	Non-conductive; high dielectric capability	Conductive when wet
Weight	Specific gravity = 1.7 with significantly higher strength-to-weight ratio	Specific gravity = .51 (oven dried).*
Finishing and Color	Pigments provide inherent color; special colors available.	Must be primed and painted for color; painting may be required
Cost	Lower maintenance; longer product life equals lower lifecycle costs	Lower initial cost replacements necessary
		*Surface dry at 19% max moisture content <u>Design Values for Wood Construction</u> , National Design Specification for Wood Construction.