

General information

Designation

Ochroma spp. (ULD) L

Tradenames

FLEXICORE, CONTOURKORE, PRO-BALSA

Typical uses

Cores for sandwich structures; model building; floatation; insulation; packaging.

Composition overview

Compositional summary

Cellulose/Hemicellulose/Lignin/12%H2O

Material family	Natural	
Base material	Wood (tropical)	
Renewable content	100	%

Composition detail (polymers and natural materials)

Wood	100	%
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Price

Price	* 3.04	- 4.88	USD/lb
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Physical properties

Density	0.00325	- 0.00397	lb/in^3
Relative density	0.05	- 0.075	
Cells/volume	8.19e6	- 1.64e7	/in^3
Anisotropy ratio	10	- 30	

Mechanical properties

Young's modulus	0.305	- 0.363	10^6 psi
Yield strength (elastic limit)	* 0.74	- 0.914	ksi
Tensile strength	1.23	- 1.52	ksi
Elongation	* 1.09	- 1.34	% strain
Compressive strength	0.435	- 0.725	ksi
Compressive stress @ 25% strain	0.725	- 1.09	ksi
Flexural modulus	0.232	- 0.29	10^6 psi
Flexural strength (modulus of rupture)	1.39	- 1.71	ksi
Shear modulus	* 0.0218	- 0.0276	10^6 psi
Shear strength	* 0.247	- 0.305	ksi
Bulk modulus	* 0.00435	- 0.0058	10^6 psi
Poisson's ratio	* 0.35	- 0.4	
Shape factor	5.5		
Hardness - Vickers	* 0.08	- 0.1	HV
Hardness - Brinell	* 0.508	- 0.624	ksi
Hardness - Janka	* 18	- 22.5	lbf
Fatigue strength at 10^7 cycles	* 0.421	- 0.508	ksi
Mechanical loss coefficient (tan delta)	* 0.0177	- 0.0218	
Densification strain	0.75	- 0.85	
Differential shrinkage (radial)	* 0.02	- 0.03	%
Differential shrinkage (tangential)	* 0.04	- 0.05	%
Radial shrinkage (green to oven-dry)	* 3.2	- 7	%
Tangential shrinkage (green to oven-dry)	4	- 4.8	%
Volumetric shrinkage (green to oven-dry)	6.8	- 8.3	%

Work to maximum strength * 0.0604 - 0.0737 ft.lbf/in^3

Impact & fracture properties

Fracture toughness 0.182 - 0.273 ksi.in^0.5

Thermal properties

Glass temperature 171 - 216 °F
Maximum service temperature 248 - 284 °F
Minimum service temperature * -99.4 - -9.4 °F
Thermal conductivity * 0.0347 - 0.0404 BTU.ft/hr.ft^2.°F
Specific heat capacity 0.396 - 0.408 BTU/lb.°F
Thermal expansion coefficient * 1.11 - 6.11 µstrain/°F

Electrical properties

Electrical resistivity * 6e13 - 2e14 µohm.cm
Dielectric constant (relative permittivity) * 1.71 - 2.09
Dissipation factor (dielectric loss tangent) * 0.011 - 0.013
Dielectric strength (dielectric breakdown) 125 - 126 V/mil


Optical properties

Transparency Opaque

Magnetic properties

Magnetic type Non-magnetic

Bio-data

RoHS (EU) compliant grades? 
Food contact Yes

Durability

Water (fresh) Limited use
Water (salt) Limited use
Weak acids Limited use
Strong acids Unacceptable
Weak alkalis Limited use
Strong alkalis Unacceptable
Organic solvents Acceptable
Oxidation at 500C Unacceptable
UV radiation (sunlight) Good
Flammability Highly flammable

Primary production energy, CO2 and water

Embodied energy, primary production * 4.99e3 - 5.5e3 BTU/lb
CO2 footprint, primary production * 0.574 - 0.633 lb/lb
NOx creation 0.00257 - 0.00284 lb/lb
SOx creation 0.00656 - 0.00725 lb/lb
Water usage * 1.84e4 - 2.03e4 in^3/lb

Processing energy, CO2 footprint & water

Coarse machining energy (per unit wt removed) * 363 - 401 BTU/lb
Coarse machining CO2 (per unit wt removed) * 0.0634 - 0.07 lb/lb
Fine machining energy (per unit wt removed) * 1.79e3 - 1.98e3 BTU/lb
Fine machining CO2 (per unit wt removed) * 0.313 - 0.346 lb/lb
Grinding energy (per unit wt removed) * 3.38e3 - 3.74e3 BTU/lb

Grinding CO2 (per unit wt removed)	* 0.59	-	0.652	lb/lb
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Recycling and end of life

Recycle	✗			
Recycle fraction in current supply	8.55	-	9.45	%
Downcycle	✓			
Combust for energy recovery	✓			
Heat of combustion (net)	* 8.49e3	-	9.16e3	BTU/lb
Combustion CO2	* 1.69	-	1.78	lb/lb
Landfill	✓			
Biodegrade	✓			

Geo-economic data for principal component

Principal component	Balsa			
Annual world production	8.98e8	-	9.94e8	ton/yr

Eco-indicators for principal component

Eco-indicator 95	2.99			millipoints/lb
EPS value	62.7	-	69.3	

Notes

Warning

All woods have properties which show variation; they depend principally on growth conditions and moisture content.

Links

ProcessUniverse

Reference

Shape