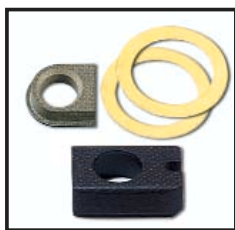


TYPICAL PROPERTIES

VESPEL® CP- 0600 SERIES



LAMINATE SERIES

The fabric laminate series of Vespel® CP parts offer an array of fabric types consisting of woven graphite, carbon, glass, Teflon® PTFE, and/or Nomex® aramid fibers bonded together using a variety of polyimide resins, selected to optimize performance versus cost.

Laminates are particularly well suited for simple geometries such as strips, wear pads, and washers, but are also used for more complex shapes that require the durability that fabrics offer.

CP-0648			
MECHANICAL	TEST METHOD	SI UNITS	ENGLISH UNITS
ULTIMATE TENSILE STRENGTH Room Temp. 260°C/500°F	ASTM D-638	150 MPa 130 MPa	22 ksi 19 ksi
TENSILE MODULUS Room Temp. 260°C/500°F	ASTM D-638	21,000 MPa 19,000 MPa	3,100 ksi 2,700 ksi
ULTIMATE FLEXURAL STRENGTH Room Temp. 260°C/500°F	ASTM D-790	250 MPa 195 MPa	36 ksi 28 ksi
FLEXURAL MODULUS Room Temp. 260°C/500°F	ASTM D-790	19,000 MPa 16,000 MPa	2,800 ksi 2,300 ksi
ULTIMATE COMPRESSIVE STRENGTH* Room Temp. 260°C/500°F	ASTM D-3410	170 MPa 140 MPa	25 ksi 20 ksi
COMPRESSIVE MODULUS* Room Temp. 260°C/500°F	ASTM D-3410	23,000 MPa 20,000 MPa	3,400 ksi 2,900 ksi
SHORT-BEAM SHEAR STRENGTH* Room Temp. @ 260°C/500°F	ASTM D-2344	37 MPa 28 MPa	5.3 ksi 4.0 ksi
NOTCHED IZOD	ASTM D-256	123 J/m	2.3 ft. lbs./in.
HARDNESS, ROCKWELL 15-T	ASTM D-2240	79	79

THERMAL	TEST METHOD	SI UNITS	ENGLISH UNITS
GLASS TRANSITION TEMPERATURE, T_g	Thermal Mechanical Analysis	330°C	626°F
THERMAL EXPANSION COEFFICIENT* (21–316°C/70–600°F)	ASTM E-228-85	34.6x10 ⁻⁶ m/m/°C	19.2x10 ⁻⁶ in./in./°F
THERMAL EXPANSION COEFFICIENT (21–316°C/70–600°F)	ASTM D-696	1.6x10 ⁻⁶ m/m/°C	0.9x10 ⁻⁶ in./in./°F

OTHER PROPERTIES	TEST METHOD	SI UNITS	ENGLISH UNITS
SPECIFIC GRAVITY	ASTM D-792	1.48 gm/cc	1.48 gm/cc
WATER ABSORPTION (180 hrs. @ 23°C/73°F)	ASTM D-570	2.6% Weight Gain	2.6% Weight Gain

Note: All values listed are for compression-molded samples and are measured in the plane perpendicular to the direction of molding pressure unless otherwise indicated.

* Measured in the plane parallel to the direction of molding pressure.

CP-0648 may be processed using a variety of lay-up techniques with single or multiple debulking steps to optimize process capability for each part configuration. These design considerations can cause variation from the typical values listed above. Listed properties are based upon technical data that DuPont believes to be reliable. DuPont makes no warranties, expressed or implied, and assumes no liability in connection with use of this information.

CP-0650

MECHANICAL	TEST METHOD	SI UNITS	ENGLISH UNITS
ULTIMATE TENSILE STRENGTH Room Temp. 260°C/500°F	ASTM D-638	130 MPa 110 MPa	19 ksi 16 ksi
TENSILE MODULUS Room Temp. 260°C/500°F	ASTM D-638	23,000 MPa 19,000 MPa	3,300 ksi 2,800 ksi
ULTIMATE FLEXURAL STRENGTH Room Temp. 260°C/500°F	ASTM D-790	210 MPa 165 MPa	30 ksi 24 ksi
FLEXURAL MODULUS Room Temp. 260°C/500°F	ASTM D-790	18,000 MPa 15,000 MPa	2,600 ksi 2,200 ksi
ULTIMATE COMPRESSIVE STRENGTH^a Room Temp. 260°C/500°F	ASTM D-3410	145 MPa 120 MPa	21 ksi 17 ksi
COMPRESSIVE MODULUS^a Room Temp. 260°C/500°F	ASTM D-3410	23,000 MPa 22,000 MPa	3,400 ksi 3,200 ksi
SHORT-BEAM SHEAR STRENGTH^a Room Temp. 260°C/500°F	ASTM D-2344	34 MPa 25 MPa	5.0 ksi 3.6 ksi
NOTCHED IZOD	ASTM D-256	144 J/m	2.7 ft. lbs./in.
HARDNESS, ROCKWELL 15-T	ASTM D-2240	80	80

THERMAL	TEST METHOD	SI UNITS	ENGLISH UNITS
GLASS TRANSITION TEMPERATURE, T_g	Thermal Mechanical Analysis	330°C	626°F
THERMAL EXPANSION COEFFICIENT^a (21–316°C/70–600°F)	ASTM E-228-85	30.2x10 ⁻⁶ m/m/°C	16.8x10 ⁻⁶ in./in./°F
THERMAL EXPANSION COEFFICIENT (21–316°C/70–600°F)	ASTM D-696	4.0x10 ⁻⁶ m/m/°C	2.2x10 ⁻⁶ in./in./°F

OTHER PROPERTIES	TEST METHOD	SI UNITS	ENGLISH UNITS
SPECIFIC GRAVITY	ASTM D-792	1.49 gm/cc	1.49 gm/cc
WATER ABSORPTION (180 hrs. @ 23°C/73°F)	ASTM D-570	2.3% Weight Gain	2.3% Weight Gain

Note: All values listed are for compression-molded samples and are measured in the plane perpendicular to the direction of molding pressure unless otherwise indicated.

^a Measured in the plane parallel to the direction of molding pressure.

CP-0650 may be processed using a variety of lay-up techniques with single or multiple debulking steps to optimize process capability for each part configuration. These design considerations can cause variation from the typical values listed above. Listed properties are based upon technical data that DuPont believes to be reliable. DuPont makes no warranties, expressed or implied, and assumes no liability in connection with use of this information.

CP-0644

MECHANICAL	TEST METHOD	SI UNITS	ENGLISH UNITS
ULTIMATE TENSILE STRENGTH Room Temp. 260°C/500°F	ASTM D-638	125 MPa	18 ksi
		97 MPa	14 ksi
TENSILE MODULUS Room Temp. 260°C/500°F	ASTM D-638	23,000 MPa	3,400 ksi
		16,000 MPa	2,300 ksi
ULTIMATE FLEXURAL STRENGTH Room Temp. 260°C/500°F	ASTM D-790	220 MPa	32 ksi
		165 MPa	24 ksi
FLEXURAL MODULUS Room Temp. 260°C/500°F	ASTM D-790	21,000 MPa	3,000 ksi
		17,000 MPa	2,400 ksi
ULTIMATE COMPRESSIVE STRENGTH ^a Room Temp. 260°C/500°F	ASTM D-3410	140 MPa	20 ksi
		100 MPa	15 ksi
COMPRESSIVE MODULUS ^a Room Temp. 260°C/500°F	ASTM D-3410	19,000 MPa	2,700 ksi
		14,000 MPa	2,100 ksi
SHORT-BEAM SHEAR STRENGTH ^a Room Temp. 260°C/500°F	ASTM D-2344	33 MPa	4.8 ksi
		24 MPa	3.5 ksi
NOTCHED IZOD	ASTM D-256	171 J/m	3.2 ft. lbs./in.
HARDNESS, ROCKWELL 15-T	ASTM D-2240	79	79

THERMAL	TEST METHOD	SI UNITS	ENGLISH UNITS
GLASS TRANSITION TEMPERATURE, T _g	Thermal Mechanical Analysis	360°C	680°F
THERMAL EXPANSION COEFFICIENT ^a (21–316°C/70–600°F)	ASTM E-228-85	43.2x10 ⁻⁶ m/m/°C	24x10 ⁻⁶ in./in./°F
THERMAL EXPANSION COEFFICIENT (21–316°C/70–600°F)	ASTM D-696	2.3x10 ⁻⁶ m/m/°C	1.3x10 ⁻⁶ in./in./°F

OTHER PROPERTIES	TEST METHOD	SI UNITS	ENGLISH UNITS
SPECIFIC GRAVITY	ASTM D-792	1.51 gm/cc	1.51 gm/cc
WATER ABSORPTION (180 hrs. @ 23°C/73°F)	ASTM D-570	2.1% Weight Gain	2.1% Weight Gain

Note: All values listed are for compression-molded samples and are measured in the plane perpendicular to the direction of molding pressure unless otherwise indicated.

^aMeasured in the plane parallel to the direction of molding pressure.

CP-0644 may be processed using a variety of lay-up techniques with single or multiple debulking steps to optimize process capability for each part configuration. These design considerations can cause variation from the typical values listed above. Listed properties are based upon technical data that DuPont believes to be reliable. DuPont makes no warranties, expressed or implied, and assumes no liability in connection with use of this information.

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Caution: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement."