

DuPont™ Vespel® SP-221

POLYIMIDE DIRECT-FORMED PARTS

Typical Direct-Formed Properties

DuPont™ Vespel® SP-221 parts and shapes are specified for low wear applications in non-lubricated conditions against soft metals like aluminum, brass, bronze; bearings (bushings, washers, etc.) SP-221 is a filled polymer with a coefficient of thermal expansion similar to aluminum.

Some data presented below are based on limited production runs and are subject to revision as new knowledge and experience become available.

Mechanical Property	Temperature	ASTM	Units	Typical Values
Tensile Strength	23 °C (73 °F) 260 °C (500 °F)	D638 or E8	MPa (kpsi)	38.6 (5.6) —
Strain at Break	23 °C (73 °F) 260 °C (500 °F)	D638 or E8	%	3.5 —
Flexural Strength	23 °C (73 °F) 260 °C (500 °F)	D790	MPa (kpsi)	55.1 (8.0) 31 (4.5)
Flexural Modulus	23 °C (73 °F) 260 °C (500 °F)	D790	MPa (kpsi)	3445 (500) 2205 (320)
Tensile Modulus	23 °C (73 °F) 260 °C (500 °F)	D638 or E8	MPa (kpsi)	—
Compressive Stress				
Ultimate	23 °C (73 °F)			111.7 (16.2)
Ultimate	260 °C (500 °F)			57 (8.0)
at 1% strain	23 °C (73 °F)	D695	MPa (kpsi)	14.5 (2.10)
at 1% strain	260 °C (500 °F)			—
at 10% strain	23 °C (73 °F)			—
at 10% strain	260 °C (500 °F)			—
Compressive Modulus	23 °C (73 °F) 260 °C (500 °F)	D695	MPa (kpsi)	1412 (204) 790 (114)
Specific Gravity	—	D732	—	1.6



The miracles of science™

DuPont™ Vespel® SP-221 Typical Direct-Formed Properties (continued)

Wear and Friction	Temperature	ASTM	Units	Typical Values
PV Limit	—	—	MPa·m/s	10.5
Coefficient of Friction PV = 0.875 MPa·m/s PV = 3.5 MPa·m/s	—	—	—	—
Wear Factor PV = 0.875 MPa·m/s PV = 3.5 MPa·m/s	—	—	mm ³ /Nm x 10 ⁻⁶	—
Wear and Friction against 6061 Wrought Aluminum PV = 0.875 MPa·m/s PV = 0.875 MPa·m/s	Coefficient of friction Wear rate Vespel®/Metal		mm/s 10 ⁻⁶	0.21 2.3/0
Wear and Friction against ADC 12 Diecast Aluminum PV = 0.5 MPa·m/s PV = 0.5 MPa·m/s PV = 4.7 MPa·m/s PV = 4.7 MPa·m/s				Coefficient of friction Wear rate Vespel®/Metal Coefficient of friction Wear rate Vespel®/Metal
Thermal Property				
Coefficient of Lineal Thermal Expansion Perpendicular	23 °C to 300 °C (73 °F to 572 °F)	D-696	µm/m·°C (in/in/°F)	29 (16 x 10 ⁻⁶)
Thermal Conductivity	23 °C (73°F) 200 °C (392 °F)	—	W/m·K	—
Specific Heat	23 °C (73°F) 40 °C (104 °F)	—	J/kg·K	—

Visit us at kalrez.dupont.com or vespel.dupont.com

Contact DuPont at the following regional locations:

North America
800-222-8377

Latin America
+0800 17 17 15

Europe, Middle East, Africa
+41 22 717 51 11

Greater China
+86-400-8851-888

ASEAN
+65-6586-3688

Japan
+81-3-5521-8484

The information provided in this data sheet corresponds to our knowledge on the subject at the date of its publication. This information may be subject to revision as new knowledge and experience becomes available. The data provided fall within the normal range of product properties and relate only to the specific material designated; these data may not be valid for such material used in combination with any other materials, additives or pigments or in any process, unless expressly indicated otherwise.

The data provided should not be used to establish specification limits or used alone as the basis of design; they are not intended to substitute for any testing you may need to conduct to determine for yourself the suitability of a specific material for your particular purposes. Since DuPont cannot anticipate all variations in actual end-use and disposal conditions, DuPont does not guarantee favorable results, makes no warranties and assumes no liability in connection with any use of this information. All such information is given and accepted at the buyer's risk. It is intended for use by persons having technical skill, at their own discretion and risk. Nothing in this publication is to be considered as a license to operate under or a recommendation to infringe any patent. DuPont advises you to seek independent counsel for a freedom to practice opinion on the intended application or end-use of our products.

CAUTION: Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also request a copy of DuPont POLICY Regarding Medical Applications H-50103-4 and DuPont CAUTION Regarding Medical Applications H-50102-4.

Copyright © 2014 DuPont. The DuPont Oval Logo, DuPont™, The miracles of science™, Kalrez®, and Vespel® are trademarks or registered trademarks of E. I. du Pont de Nemours and Company or its affiliates. All rights reserved.

(09/10) Reference No. VPE-A10883-00-B0614



The miracles of science™