



GUIDE TO VESPEL® PI GRADES AND APPLICATIONS

VESPEL® PI ranks in the top tier of high-performance plastics, and all grades share these characteristics:

- Operating range from cryogenic levels to 300°C (572°F) continuous; short-term excursions up to 500 °C (932 °F)
- High modulus, compressive strength, creep resistance and toughness
- PV values with dry pressure velocity limits to 12 MPa m/s, and higher with lubrication
- High dielectric strength, electrical and thermal insulative properties; low outgassing
- Resistance to a broad range of chemicals and solvents; resistant to ionizing radiation

In addition, each grade has distinct performance attributes. This chart is a guide to the main differences of major VespeL® SP and VespeL® SCP grades, and their typical applications.

VespeL® PI Grade	Fillers, Additives	Key Properties	Typical Applications
SP Grades: Traditional VespeL® polyimide resin and filler technology			
VespeL® SP-1	Unfilled polyimide resin	<ul style="list-style-type: none"> • Maximum tensile strength and elongation • Minimal thermal conductivity • Optimum electrical properties • Lowest modulus SP grade 	<ul style="list-style-type: none"> • Mechanical and electrical parts at high temperatures • Valve seats, seals, insulators
VespeL® SP-21	15% graphite	<ul style="list-style-type: none"> • Improved wear and friction properties, strength, dimensional stability, compared to SP-1 	<ul style="list-style-type: none"> • Rotational, sliding bearing, and wear applications: seals, thrust washers, bearings
VespeL® SP-211	15% graphite 15% PTFE	<ul style="list-style-type: none"> • Lower static friction than SP-21 with or without lubrication 	<ul style="list-style-type: none"> • Lower friction and wear applications in moderate temperature and PV environments
VespeL® SP-22	40% graphite	<ul style="list-style-type: none"> • Maximum creep resistance • Dimensional stability; lowest CLTE grade • Highest modulus • Lowest elongation 	<ul style="list-style-type: none"> • Friction and wear parts requiring highest dimensional stability • Components under continuous dynamic load
VespeL® SP-3	15% MoS ₂ (molybdenum disulfide)	<ul style="list-style-type: none"> • Maximum friction and wear resistance in dry conditions • Ultra-low outgassing 	<ul style="list-style-type: none"> • Optimum grade for bearing and wear components in vacuum and inert gases
SCP Grades: Advanced VespeL® polyimide resin and fillers improve oxidative stability over SP grades			
VespeL® SCP-5000	Advanced PI resin-unfilled	<ul style="list-style-type: none"> • Higher mechanical properties compared to SP-1 • Best long-term property stability 	<ul style="list-style-type: none"> • Aerospace bearing, wear, and structural parts requiring high oxidative stability • Valve seats, seals, insulators
VespeL® SCP-5009	Proprietary filler	<ul style="list-style-type: none"> • Low coefficient of friction unlubricated • Low creep under extreme conditions 	<ul style="list-style-type: none"> • Ball bearing retainers, bushing, thrust washers
VespeL® SCP-50094	Proprietary filler	<ul style="list-style-type: none"> • Highest PV limit VespeL grade 	<ul style="list-style-type: none"> • Valve seats, test sockets, bearings and bushings
VespeL® SCP-5050	Highest content proprietary	<ul style="list-style-type: none"> • Lowest CLTE - matches steel, iron • Lowest deformation under load • Unsurpassed high temperature wear resistance 	<ul style="list-style-type: none"> • Friction and wear parts requiring optimum dimensional stability and high temperature performance

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