Technical Information

DuPont™ Vespel® Material Selection Guide

For High Temperature Bushings/Washers in Turbines, Jet Engines and Aircraft Applications

Applications

- There are a wide variety of locations on a jet engine and aircraft where parts have relative motion that benefit from wear resistant, low friction materials.
- Common applications are variable stages and actuation systems in jet engine compressors, bleed valve systems, valves, and actuators for nacelles and aircraft surfaces.

Challenges

- Damage can occur to expensive metal components such as vanes from metal on metal engagement resulting in galling and locked components.
- Components need to withstand thermal excursions for duration of expected engine life with temperatures in excess of 600 °F/315 °C.
- Bushings need to withstand impact, cantilever loading, and accommodate designs with tight fits.
- Most jet engine applications do not have lubrication.
- Each application has a unique set of operating conditions and requirements.

Solution

- DuPont™ Vespel® offers a wide variety of products that have demonstrated high performance on bushing and washer applications across turbines, engines, and aircraft for more than 40 years (see selection guide).
- Product selection can be optimized to help provide a customized solution to your unique application conditions.

Features and Benefits

- High temperature material capabilities in application environments in excess of 600 °F/315 °C.*
- Longer component life for higher cost mating components.
- Potential weight savings of 40% over aluminum and 75% over stainless steel and titanium due to lower density of composite materials
- Lower friction vs. metal with dynamic coefficient of 0.2 or less.
- Fiber and metal reinforced product options for high load applications. ASB grades utilize metal retainers with low friction/wear resistant liners.
- Broad material options allow for customized solutions to help meet specific application requirements.

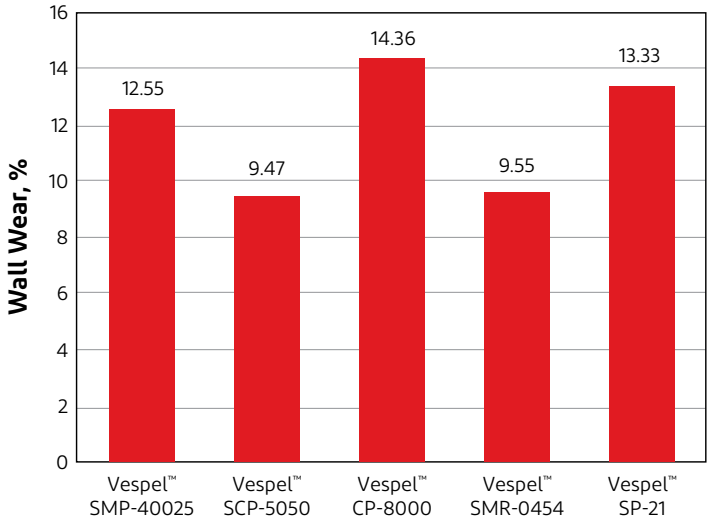
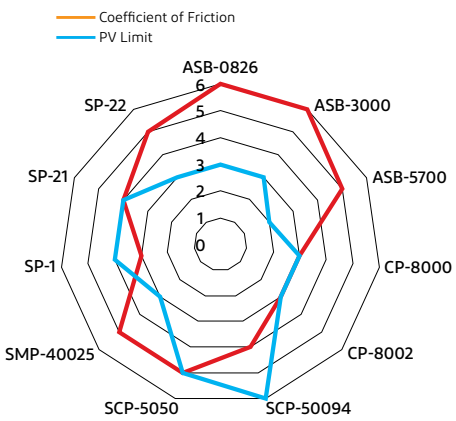


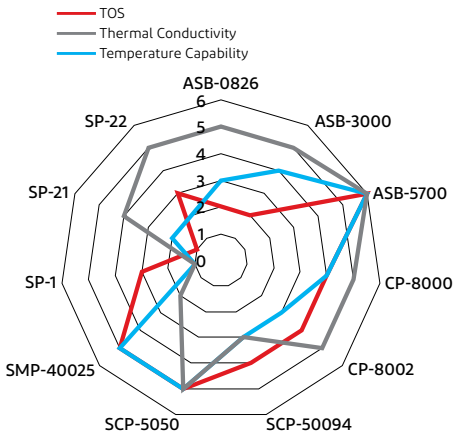
Figure 1. DuPont Vibratory Rig Wear; 475 °F/25 hr/55 lb

* Actual temperature limits are dependent on specific application conditions. For more information, please contact your DuPont representative.

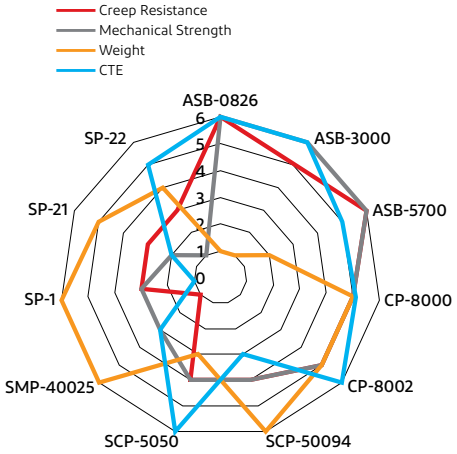
Wear and Friction Performance



Thermal Performance



Mechanical Performance



Fair = 1 ⟷ 6 = Outstanding

		ASB-0826	ASB-3000	ASB-5700	CP-8000	CP-8002	SCP-50094	SCP-5050	SMP-40025	SP-21	SP-22
Wear and Friction Performance	Coefficient of Friction	6	6	5	3	3	4	5	5	4	5
	PV Limit	3	3	2	3	3	6	5	3	4	3
Thermal Performance	TOS	2	2	6	4	4	4	5	5	1	3
	Thermal Conductivity	5	5	6	5	5	3	5	2	4	5
	Temperature Capability	3	4	6	4	3	3	5	5	2	2
Mechanical Performance	Creep Resistance	6	6	6	5	5	4	4	1	3	3
	Mechanical Strength	6	6	6	5	5	4	4	3	2	1
	Weight	1	1	2	5	5	6	3	6	5	4
	CTE Match	6	6	5	5	6	3	6	3	2	5

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