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Parvan™ wax for hot melt adhesive applications

Energy lives here*

Parvan™ is a line of fully refined paraffin waxes derived from petroleum. The waxes have a translucent color and are a highly crystalline material in their solid state. Their purity and excellent flexibility in formulation at low temperatures make them ideal for adhesives used in flexible food-grade packaging.

Exceptional performance in certain hot melt adhesive applications

Parvan waxes can be used in any hot melt adhesives (HMA) formulations and demonstrate exceptional performance in adhesives used for flexible cardboard food containers. These waxes comply with the FDA regulatory requirements applicable to HMA used in food application* and have been proven to enhance fiber tear at lower temperatures which relates to improved adhesive performance at refrigerator and freezer temperatures. Furthermore, their clarity in HMA formulations does not interfere with package designs.

Properties

Characteristics	ASTM	unit	limit	Parvan™ 1470	Parvan™ 1471	Parvan™ 1520	Parvan™ 1540	Parvan™ 1580
Melting point	D87	°C	Min/Max	62.8-65.0	62.8-65.0	66.1-68.3	67.2-69.4	68.9-73.3
		°F	Min/Max	145-149	145-149	151-155	153-157	156-164
		°F	Typical†	146	147	152	155	159
Oil content	D721	wt%	Max	0.7	0.5	0.8	0.8	0.75
Kinematic visc. @100°C	D445	mm2/s	Typical†	5.4	5.2	6.3	6.6	7.5
Needle pen. @25°C	D1321	0.1mm	Typical†	13	15	16	13	15
Needle pen. @40°C	D1321	0.1mm	Typical†	34	33	34	34	36
Saybolt color	D156	-	Min	+26	+28	+26	+26	+26
Flash point c.o.c.	D92	°C (°F)	Min	210 (410)	210 (410)	220 (428)	220 (428)	220 (428)

* Comply with FDA 21 CFR 178.3710, therefore an approved component in HMA, meeting FDA 21 CFR 175.105
† Typical values, provided for reference only, are not specifications and are not guaranteed.

Key benefits in HMA formulations

- FDA compliant for use in food-grade HMA
- Crystalline in solid state, clear in liquid state
- Strong adhesion to cardboard
- Excellent fiber tear
- Outstanding low-temperature performance in formulation
- Biodegradable under composting conditions‡

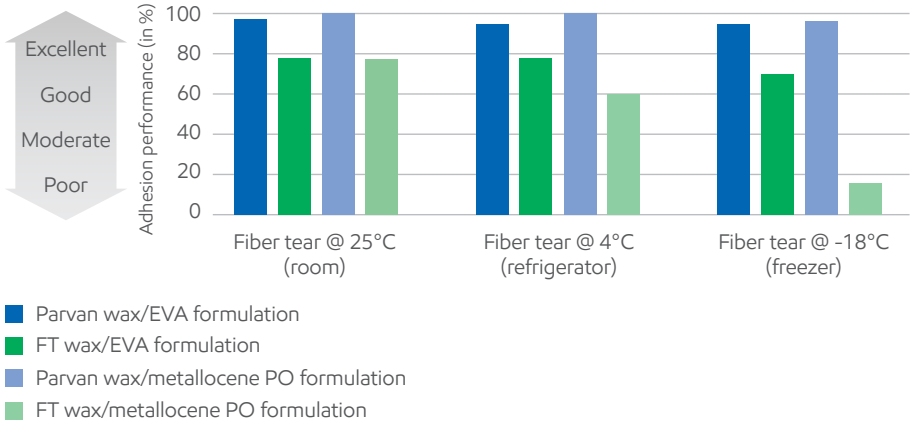
‡ According to ASTM D6400-12 using ASTM D5338-11

Hot melt adhesive sticking performance

Fiber tear is a visual measurement of the amount of paper substrate fibers still attached to a bond after the substrates are torn apart. For example, 100% fiber tear indicates that all of the adhesive is covered by substrate fibers, while 0% fiber tear indicates that the adhesive does not bond at all and simply pops off the substrate.

Parvan™ wax formulated adhesives showed superior adhesion performance in fiber tear test at lower temperatures compared to Fischer Tropsch (FT) wax. Once solidified, Parvan-based adhesive was more flexible and rubbery, performing better at refrigerator/freezer temperatures.

Fiber tear as a measure of adhesion performance



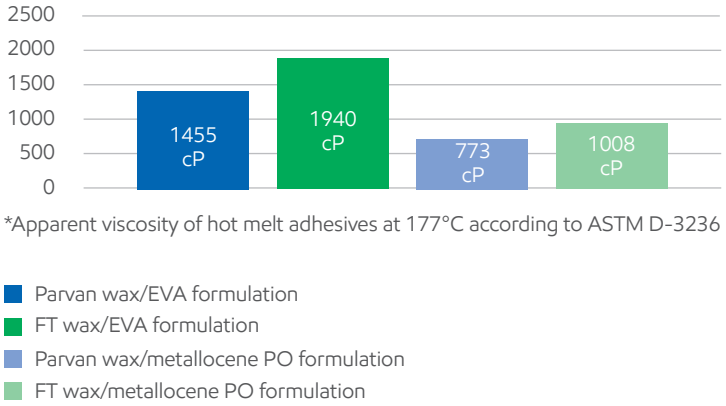
ExxonMobil in-house performance testing using typical commercial HMA formulations.

Hot melt adhesive flow performance

Parvan wax formulated adhesives exhibit a low viscosity when molten that enhances flow onto the substrate and improves surface wetting in all tested temperatures. Imparting lower viscosity to the adhesive, Parvan allows better coverage and substrate penetration.

In laboratory testing comparing Parvan to FT wax, Parvan improved product flow and substrate coverage for metallocene polyolefin and EVA (ethylene-vinyl acetate) formulations. The Parvan-based adhesives showed better flow when molten and better flexibility when set, representing dual advantages over alternatives wax.

Viscosity as a measure of flow properties in molten adhesive*



*Apparent viscosity of hot melt adhesives at 177°C according to ASTM D-3236

ExxonMobil in-house performance testing using typical commercial HMA formulations.

Other uses

Beyond adhesives, Parvan is a versatile additive used in a broad range of applications, including candles, wax blends and emulsions, paper converting, polishes and paste waxes, cosmetic formulations, crayons, sun-checking waxes for rubber and tires, and PVC extrusion lubricants.

About ExxonMobil

For more than 50 years, ExxonMobil has set the standard for technology leadership in the wax industry. Our waxes are produced and controlled according to rigorous proprietary and industry standards. You can expect state-of-the-art supply reliability and consistent quality to help improve your applications.

To learn more about Parvan or our full range of wax products, please visit **exxonmobil.com/wax**.

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