

Wingtack® 10 – A Unique Liquid Tackifying Resin



Benefits

- Tackifying hydrocarbon resin
- Low-color liquid resin
- Broad compatibility
- Polymeric plasticization
- Enhanced flexibility
- Low-temperature tack and adhesion

Description

Wingtack® 10 is a unique liquid aliphatic hydrocarbon resin. Its very low molecular weight makes it compatible with a full range of polymers, from very non-polar (metallocene-based polyolefins, natural rubber) to highly polar (ethyl vinyl acetate, acrylics, urethanes).

Typical Properties

Product	Gardner Color*	Viscosity, Pa.s @ 25 °C	Mn, g/mol	Softening Point (RB), °C	Tg, °C
Wingtack 10	1.5	30	370	10	-31

* 50% in toluene

Applications

The studies described in this document will demonstrate that the unique Wingtack 10 liquid aliphatic resin can bring unique properties to various adhesives:

- **EVA-Hot Melt Adhesive for Deep-Freeze Cardboard Packaging**
 - Lower viscosity
 - Higher flexibility
 - Better sub-zero temperature adhesion
- **Hot Melt Protective Films**
 - Better cohesion
 - Thinner adhesive layer
- **Hot Melt Pressure Sensitive Adhesive**
 - Higher tack
 - Stronger cohesion
 - Better adhesion onto many substrates (SS, glass, acrylics)

TECHNICAL UPDATE

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CRAY VALLEY

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Examples of Starting Point Formulations

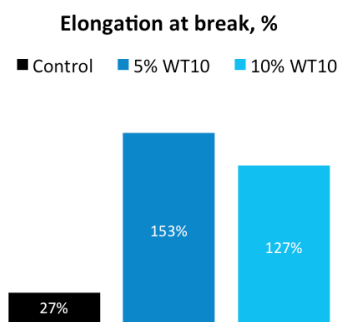
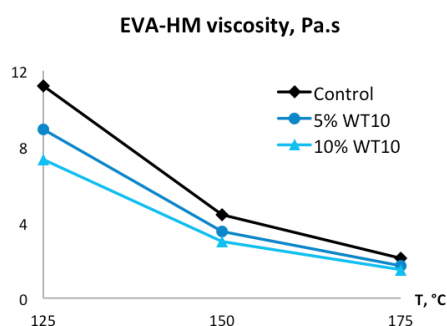
Component	Type	Content, wt%			
		HM-PSA	Low T Permanent Label	HM Protective Film	EVA-HM Deep-freeze
Base Polymer	SIS 40% diblock	35	-	-	-
	SIS 15% Sty, 19% diblock	-	-	45	-
	SIS 16% Sty, 55% diblock	-	15	-	-
	SBS 33% Sty, 78% diblock	-	20	-	-
	EVA 28% VA, MI = 40	-	-	-	30
Tackifying Resin	Wingtack 98 SP = 98 °C	-	-	45-50	-
	Wingtack Extra SP = 97 °C	50-57.5	-	-	-
	Wingtack ET SP = 95 °C	-	57.5	-	-
	C5 modified C9 Resin SP = 100 °C	-	-	-	37.5-42.5
	Wingtack 10 SP = 10 °C	0-15	10-20	0-10	5-10
Plasticizer	Process oil	0-7.5	0-10	0-5	-
	Fischer-Tropsch wax	-	-	-	22
Antioxidant	Phenolic	1	1	1	0.5

Acronyms

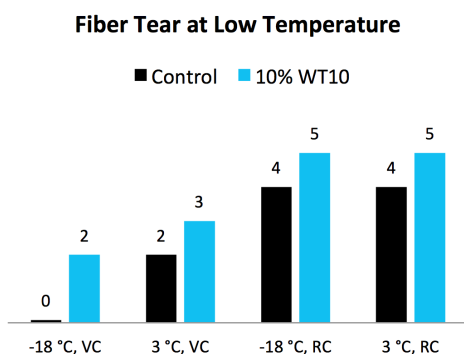
EVA	Ethyl Vinyl Acetate	S	Styrene
HDPE	High Density PolyEthylene	SBS	Styrene-Butadiene-Styrene copolymer
HM	Hot Melt	SIS	Styrene-Isoprene-Styrene copolymer
MI	Melt Index	SP	Softening Point (Ring & Ball)
PE	PolyEthylene	SS	Stainless Steel
PP	PolyPropylene	VA	Vinyl Acetate
PS	PolyStyrene	VC	Virgin Cardboard
PSA	Pressure Sensitive Adhesive	WT10	Wingtack 10
RC	Recycled Cardboard		

EVA-Based Hot Melt for Deep-Freeze Cardboard Packaging

Wingtack 10 demonstrates excellent compatibility with EVA-based HM. It works as a viscosity reducer and increases flexibility, while maintaining similar softening point and temperature resistance (SAFT) as well as a very short set time of the final adhesive. Depending on the starting point formulation, the open time can be slightly shortened when using increasing amounts of Wingtack 10. Another key advantage for cold packaging applications is the action of Wingtack 10 as a low-temperature adhesion promoter to virgin and recycled cardboard (VC and RC).



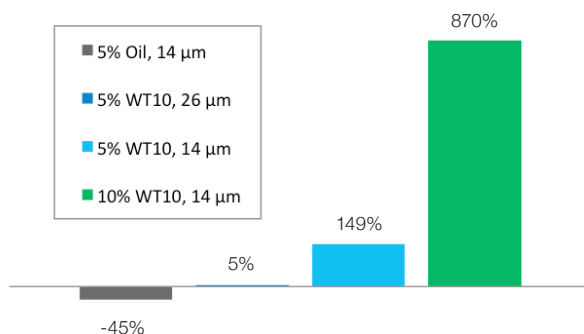
Low-temperature adhesion was tested by fiber tear (24 hrs at 3 °C and -18 °C). The results are qualitatively ranked (from 0 for no fiber tear to 5 for 100% fiber tear). The main improvement is observed on virgin cardboard at very low temperature compared to the control without Wingtack 10 (no adhesion).



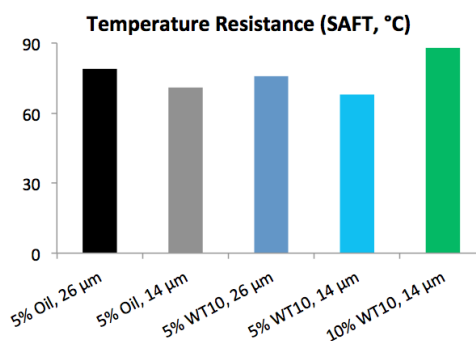
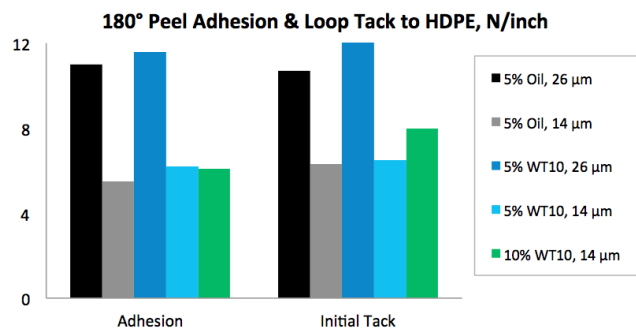
Hot Melt Protective Films

Protective films are typically used in the automotive industry to protect cars during pre-sale storage and transportation, or in the building industry to protect metal window frames until final setup. Such films are then removed without leaving any trace on their substrate. Hence, for protection purposes, the main objective concerns high cohesion of the adhesive. Depending on final application, medium to low tack and adhesion can be required. As a polymeric plasticizer in HM protective film, Wingtack 10 enhances cohesive properties. It also allows great performance using half the adhesive usually required.

Cohesion (Shear, Steel) vs. Ref (5% Oil, 26 µm)



The use of Wingtack 10 as an offset for traditional process oil leads to highly cohesive adhesive at RT (14 µm laminate). Adding more Wingtack 10 to the detriment of the traditional tackifying resin leads to an impressive increase of the cohesion. Comparatively, the use of mineral oil at typical 26 µm HM laminate leads to a degradation of room temperature cohesive properties.



Although tack and adhesion are not critical parameters for protective applications, slight improvement of those properties are observed (to HDPE, at given HM thickness).

Temperature resistance (SAFT to stainless steel) is not significantly affected by the change of plasticizer.

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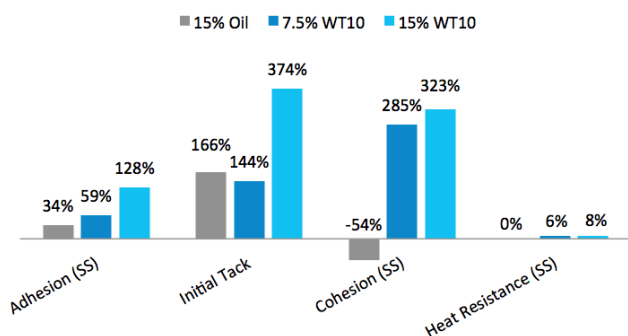
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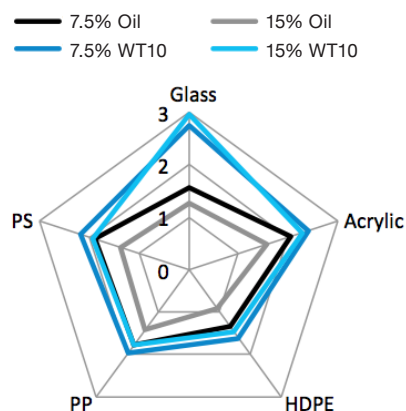
Hot Melt Pressure Sensitive Adhesive

Wingtack 10 provides superior performance compared to process oil in low-Tg block polymer PSAs, without creating the migration or shelf-life problems that process oils frequently cause. The performance of the adhesives at low or high levels of Wingtack 10 are more than 50% greater compared to the process oil for numerous substrates. This improvement in adhesion, tack and cohesion does not come at the expense of heat resistance.

Peel 180°, Polyken™ Probe Tack, Shear & SAFT vs. Ref (7.5% Oil)



Adhesion to Various Substrates (Peel 180°, N/cm)



About Total Cray Valley

Total Cray Valley is the premier global supplier of specialty chemical additives, hydrocarbon specialty chemical, and liquid and power tackifying resins used as ingredients in adhesives, rubbers, polymers, coatings and other materials. Total Cray Valley has pioneered the development of these advanced technologies, introducing hundreds of products that enhance the performance of products in energy, printing, packaging, construction, tire manufacture, electronics and other demanding applications.

For more information, please visit www.crayvalley.com

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