ENCOR® 9466

For Clear, Permanent and Paper Labels

Product Description

ENCOR® 9466 is a high solids, coater ready, inherently pressure-sensitive acrylic copolymer emulsion. This polymer offers excellent peel and tack adhesion with exceptional cohesive strength. The versatility of the polymer allows the converter to use the product as is for general purpose applications or formulate for specialty applications.

Typical Properties[1]

Total Solids, % by weight	63.0
Weight per Gallon, lb	8.6
pH Value	5.5
Particle Size, microns	0.4
Viscosity, Brookfield, LVT, No. 3, 60 rpm, cP	200
Glass Transition Temperature, °C	-40
Surface Tension, mN/m	31
VOC Potential, g/L	<5

Characteristics

- High solids with low viscosity
- Excellent balance of peel, tack and cohesive strength
- Cleaner converting due to low surface tension and high cohesive strength
- Very good adhesion to low surface energy substrates
- Exceptional tackifier response
- High line speed capability
- FDA 21 CFR 175.105 compliance
- EnVia® compliant[2]

[1]The data provided for these properties are typical values, intended only as guides, and should not be construed as sales specifications.

[2]These products meet the standards of Arkema Coating Resins' EnVia® program. These products are designed to assist formulators in meeting their sustainability and regulatory goals in their finished products.

Tackifier Response

ENCOR® 9466 latex offers excellent peel and tack adhesion with exceptional cohesive strength. Increased peel and tack can be achieved through formulating with resin dispersions.

The tackifier response of ENCOR® 9466 latex with commercially available products is listed below.

ENCOR® 9466 Tackifier Response[1]

Test	ENCOR® 9466	Snowtack® 880G			Tacolyn® 1070		
	(Neat)	20 pt*	30 pt*	40 pt*	20 pt*	30 pt*	40 pt*
180° Peel (lbs/linear inch)							
Stainless Steel:							
30 min.	3.0 A	3.0 A	3.4 A	4.0 A	3.7 A	3.7 A	3.9 A
24 h	3.7 A	3.5 A	3.7 A	4.3 A	5.0 C	4.8 C	4.7 C
HDPE:							
30 min.	1.0 A	1.7 A	2.5 A	2.9 A	2.4 A	2.3 A	2.5 A
24 h	1.2 A	1.8 A	2.4 A	2.5 A	2.7 A	2.7 A	3.2 A
Loop Track (lbs/inch²)							
Stainless Steel	3.2 A	3.0 A	3.7 A	3.9 A	5.6 A	5.5 A	6.0 A
HDPE	1.6 A	2.3 A	2.5 A	3.1 A	2.5 A	2.4 A	2.5 Z
Shear Adhesion (hours, 1/2"x1/2", 500 g)	>200	143	85	29	24	22	21

Modes of Failure
A=Adhesive C=Cohesive Z=Zippy

Test	ENCOR® 9466	Snowtack® 765A			Aquatac® 6025		
	(Neat)	20 pt*	30 pt*	40 pt*	20 pt*	30 pt*	40 pt*
180° Peel (lbs/linear inch)							
Stainless Steel:							
30 min.	3.0 A	5.6 C	5.5 C	5.0 C	5.0 C	4.6 C	4.6 C
24 h	3.7 A	5.6 C	5.5 C	5.0 C	5.2 C	4.5 C	4.8 C
HDPE:							
30 min.	1.0 A	2.5 A	2.7 A	3.0 C	1.6 A	2.2 A	4.2 A
24 h	1.2 A	3.7 A	3.0 A	3.0 C	1.7 A	2.2 A	4.2 A
Loop Track (lbs/inch²)							
Stainless Steel	3.2 A	5.2 A	5.2 A	5.9 A	4.6 A	5.4 A	6.0 A
HDPE	1.6 A	2.5 A	2.5 A	2.6 A	2.0 A	2.5 A	3.0 A
Shear Adhesion (hours, 1/2"x1/2", 500 g)	>200	8.9	6.9	5.3	14.0	4.4	2.2

Modes of Failure
A=Adhesive C=Cohesive Z=Zippy

Tested on 2-mil PET backing at a coat weight of 1.6 – 1.8 g/100 in2 , 73º F, 55% RH

[1]The data provided for these properties are typical values, intended only as guides, and should not be construed as sales specifications.

*Per 100pt dry latex

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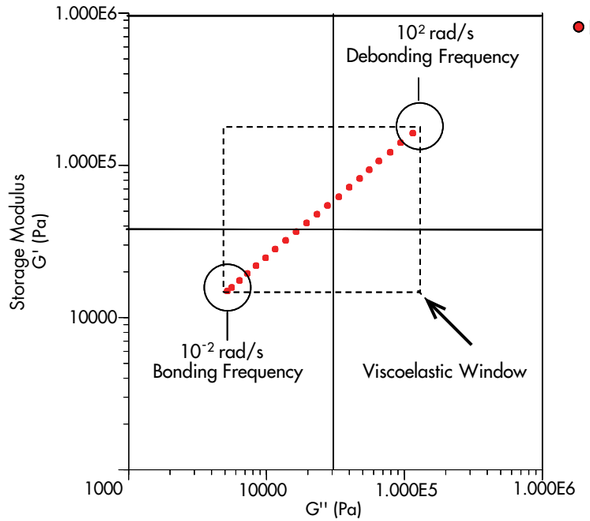
Formulating for Enhanced Performance

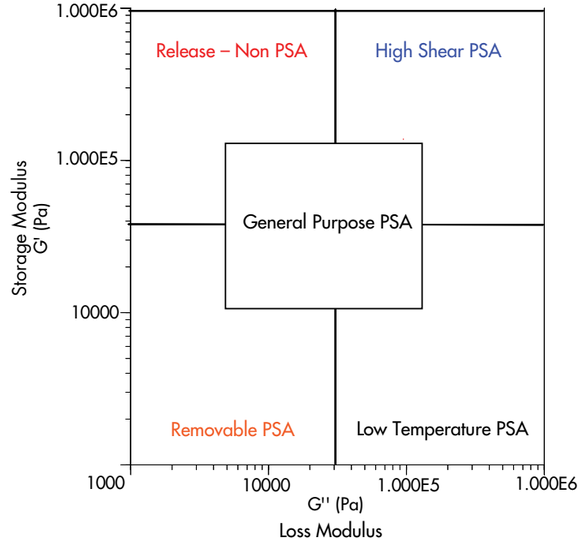
Predicting PSA performance and application space by mapping viscoelastic windows based on dynamic storage (G′) and loss (G″) moduli at bonding and debonding frequencies was proposed by Chang[3]. This methodology can be used to predict the performance of ENCOR® 9466 latex when formulated with specific tackifiers.

Figure 1: Storage and Loss Modulus of ENCOR® 9466 measured over a frequency range of 0.01 to 100 rad/s at 25°C.



Using 0.01 to 100 rad/s as the bonding and debonding frequency, respectively, G′ and G″ values of different PSAs can be plotted, creating a viscoelastic window of application.

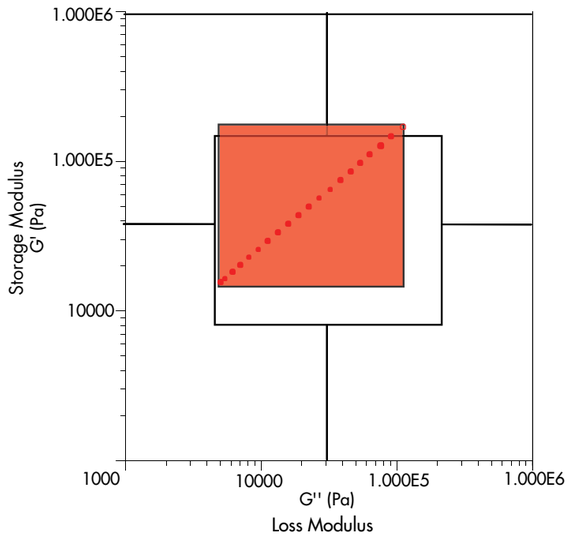
Figure 2: Viscoelastic windows of different Pressure Sensitive Adhesive types.



A four quadrant classification system can be instituted to categorize PSA types based on their visco-elastic windows of application.

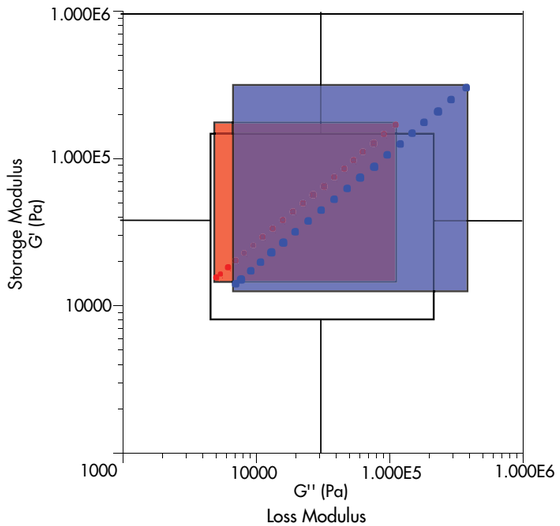
[3]Chang, E. P.; Viscoelastic Properties of Pressure-Sensitive Adhesives, *The Journal of Adhesion*, 1997, Vol. 60, pp. 233-248

Figure 3: The viscoelastic window for ENCOR® 9466 overlaps that of a general purpose PSA.



The exceptionally high cohesive strength of ENCOR® 9466 is predicted by the high storage modulus (G') at 0.01 rad/s.

Figure 4: The viscoelastic window for ENCOR® 9466 blended with Snowtack® 880G.



The addition of a high melting point tackifier such as Snowtack® 880G significantly increases the debonding or peel strength while having a minimal effect on cohesive strength. The result is a permanent PSA with excellent peel and tack while maintaining exceptional cohesive strength and convertibility.

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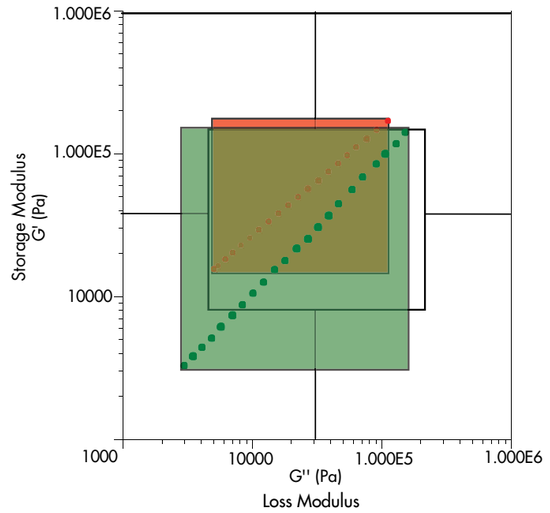
Figure 5: The viscoelastic window for ENCOR® 9466 blended with Snowtack® 724G.



The addition of a low Tg tackifier such as Snowtack® 724G significantly improves the wet out and bonding strength of the adhesive. The result is a permanent PSA with excellent peel and tack on low surface energy substrates with increased performance at low application temperatures.

Starting Formulations

Permanent Paper or Filmic Label (Untackified)

Raw Material	Dry Parts
ENCOR® 9466	100
Water	Adjust to coatings needs

Permanent Paper or Filmic Label (Tackified)

Raw Material	Dry Parts
ENCOR® 9466	100
Snowtack® 880G	30
Water	Adjust to coating needs

Raw Material	Dry Parts
ENCOR® 9466	100
Tacolyn® 1070	20
Water	Adjust to coating needs

Low-Temperature Label

Raw Material	Dry Parts
ENCOR® 9466	100
Snowtack® 724G	30
Water	Adjust to coating needs

Product Safety

Before handling the materials listed in this bulletin, read and understand the product MSDS (Material Safety Data Sheet) for additional information on personal protective equipment and for safety, health and environmental information. For environmental, safety and toxicological information, contact our Customer Service Department at 1-866-837-5532 to find an MSDS, or visit our web site: www.arkemacoatingresins.com

No chemical should be used as or in a food, drug, medical device, or cosmetic, or in a product or process in which it may contact a food, drug, medical device, or cosmetic until the user has determined the suitability and legality of the use. Since government regulations and use conditions are subject to change, it is the user's responsibility to determine that this information is appropriate and suitable under current, applicable laws and regulations.

Arkema Coating Resins requests that the customer read, understand, and comply with the information contained in this publication and the current MSDS(s). The customer should furnish the information in this publication to its employees, contractors, and customers, or any other users of the product(s), and request that they do the same.

Storage and Handling

Follow procedures typically recommended for polymer dispersions. Use corrosion-resistant storage tanks and piping. Air-operated diaphragm pumps are preferred. Avoid temperature extremes. Do not freeze; store between 4-40°C.

ARKEMA
INNOVATIVE CHEMISTRY

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