

Making a good thing better

## Piccotac™ 8095 hydrocarbon resin for use in hot melt packaging

When designing an adhesive for hot melt packaging applications, the formulator is faced with numerous tackifier resin choices. To narrow the search for a suitable resin, adhesive performance and aesthetic considerations provide a logical starting point. Traditionally, a formulator may turn to tall oil rosin ester tackifiers to get the job done. Although these esters are an excellent choice and serve the industry well, they are not the only choice. Piccotac 8095 hydrocarbon resin has been found to be an excellent tackifier that can offer an alternative to formulators that are currently using tall oil rosin esters in packaging adhesives. While giving comparable viscosity and processing characteristics, formulations based on Piccotac 8095 give higher cohesion and lower odor than formulations containing rosin ester.

Derived from petroleum sources, Piccotac 8095 offers consistent product quality, acceptable color and stability, good polymer compatibility, and noncorrosive chemistry.

A comparison of Piccotac 8095 and RE-1, a typical tall oil rosin ester, is shown in Table 1.

Table 1 Typical physical properties

Product	Description	Gardner color	Softening point	Acid number
RE-1	Pentaerythritol ester of tall oil rosin	5	99	10
Piccotac 8095	Modified aliphatic hydrocarbon resin	3	94	<1

To determine how Piccotac 8095 compares with RE-1, several blends were made and tested in Eastman's Applications Laboratory. In this study, Piccotac 8095 was compared with RE-1 in two typical packaging screening formulations shown in Table 2.

Table 2 Ethylene vinyl acetate (EVA) packaging formulations

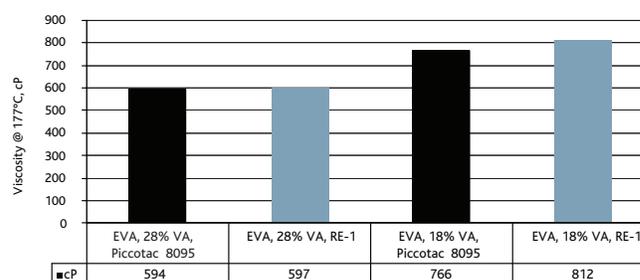
Components	Wt%			
Piccotac 8095	44.9	44.9		
RE-1	44.9		44.9	
EVA, 28% vinyl acetate	29.9	29.9		
EVA, 18% vinyl acetate			29.9	29.9
Synthetic wax	25.0	25.0	25.0	25.0
Irganox™ 1010	0.2	0.2	0.2	0.2

### Formulated viscosity

Piccotac 8095 offers the same viscosity as RE-1 in these two packaging formulations. This indicates comparable resin-to-polymer compatibility and processability.

If a rosin ester is currently the resin of choice, using Piccotac 8095 should cause very little if any change in application temperature.

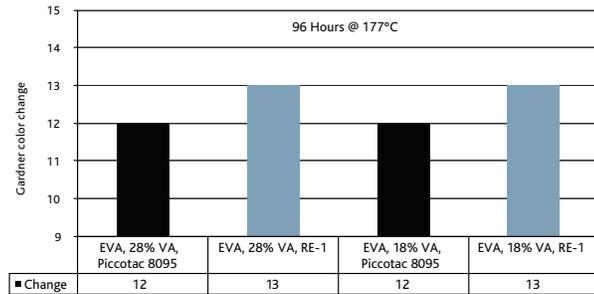
Figure 1 Formulated viscosity Piccotac™ 8095 and RE-1



## Formulated color stability

One of the many values of Piccotac 8095 is its reasonably low color and good thermal stability. Figure 2 shows Piccotac 8095 had less color change than RE-1 after 96 hours at 177°C aging.

Figure 2 Formulated color stability  
 Piccotac 8095 and RE-1

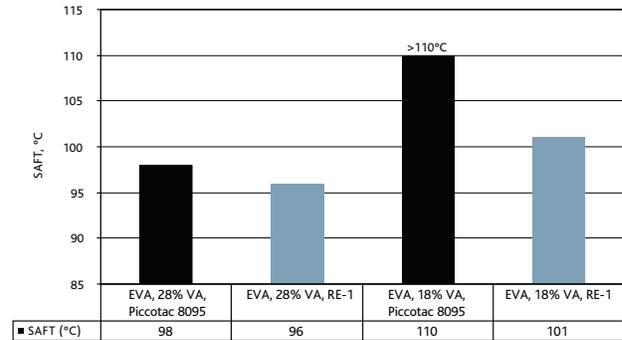


As was the case with RE-1, there was no evidence of char in the formulations containing Piccotac 8095 after 96 hours. This translates into less downtime due to plugged filters and nozzles. You should expect the same equipment service life with Piccotac 8095 as you would with a rosin ester.

## High-temperature performance

For an adhesive to perform properly, there must be a balance between adhesive and cohesive performance. Both must be present in exacting amounts to suit a particular application. In the packaging arena, the tackifier must promote good adhesion to a variety of packaging substrates but not at the expense of the cohesive strength of the adhesive. The adhesion characteristics between formulations containing Piccotac 8095 and RE-1 were found to be comparable. As Figure 3 shows, Piccotac 8095 offers superior cohesive strength in these two EVA systems.

Figure 3 Shear adhesion failure temperature  
 Piccotac 8095 and RE-1

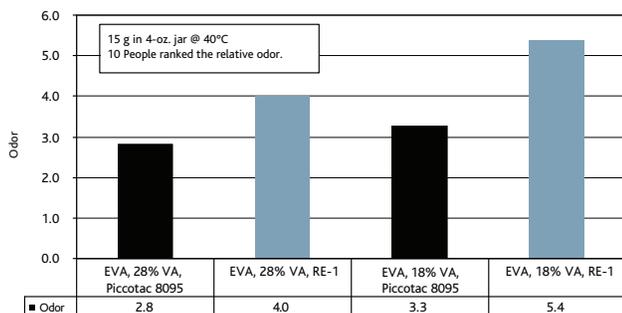


In formulations similar to these screening formulations, Piccotac 8095 would be very well suited with higher-temperature resistance, which would be useful in elevated temperature warehouse environments and in hot climates.

## Odor characteristics

An extensive odor evaluation was completed on the four formulations described in Table 2. Adhesive samples (15 g) were sealed in 4-oz glass jars and aged at 40°C for 1 hour. Relative odor was then evaluated. In this study, formulations containing Piccotac 8095 were lower in odor than formulations containing the rosin ester control, RE-1.

Figure 4 Relative odor Piccotac 8095 and RE-1



## Summary

To increase formulating options and diversify an existing adhesive portfolio, the formulator may want to consider using Piccotac 8095 to replace a tall oil rosin ester. An adhesive based on Piccotac 8095 was tested and gave equivalent viscosity, color stability, adhesion, and charring resistance. It provided an added bonus, however, versus rosin ester based formulations, namely lower odor and higher cohesion.

With high lot-to-lot consistency typical of hydrocarbon resins, Piccotac 8095 offers a reliable supply option to naturally derived tackifiers. Samples are available on request, so contact Eastman to determine how well Piccotac 8095 will fit into your adhesive product slate.



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