

**EASTMAN**

# Eastman<sup>TM</sup> rosin products

for adhesives and sealants

*Natural resins for adhesion,  
wetting, & viscosity control*



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Eastman Chemical Company markets rosin and hydrocarbon resins worldwide, offering the greatest number and variety of resins available from a single producer. With rosin resin sourcing from Europe, North America, Mexico, and China, Eastman Chemical Company is uniquely able to supply rosin derivatives globally.

Rosin and its derivatives offer useful properties in numerous applications by providing specific adhesion, improved wetting characteristics to various substrates and viscosity control.

Application areas where rosin and rosin-based resins are used include

- Adhesives and sealants
- Cement and asphalt modification
- Coatings and inks
- Soaps and surfactants
- Papermaking
- Rubber and plastic compounding

Rosin is a complex mixture of organic materials produced by the pine tree and is a natural and renewable product. Crude rosins are treated by chemical and physical means to produce refined rosins and modified rosins. Polymerization is a modification used to increase softening point and stability. Hydrogenation greatly improves the color and thermal stability of rosin. Esterification with a variety of alcohols provides an array of products from liquid to over 120°C with increased stability and resistance to crystallization.

# Eastman™ rosin products for the U.S. market

## Typical values

Product	Source	Rosin base	Softening point, °C <sup>a</sup>	Gardner color <sup>b</sup>	Acid number	End use
<b>Modified rosins</b>						
Poly-Pale™	AP	Partially dimerized gum rosin	103	8	155	Adhesives, sealants, solder flux
Dymerex™	AP	Dimerized gum rosin	144	9	145	Adhesives, sealants, inks
Staybelite™ Resin-E	NL	Partially hydrogenated gum rosin	80	5	162	Adhesives, coatings, solder flux
Foral™ AX-E	NL	Hydrogenated gum rosin	81	1	165	Adhesives, coatings, solder flux
<b>Rosin alcohol &amp; special derivatives</b>						
Abitol-E™	NL	Hydrogenated gum rosin alcohol	Liquid	1 <sup>c</sup>	0.1	Adhesives, ski wax, depilatories
Foralyn™ 5020-F	NL	Hydrogenated gum rosin	Liquid	3 <sup>c</sup>	6	Adhesives, cosmetics, fragrance
<b>Glycerol esters</b>						
Permalyn™ 2085	US	Tall oil rosin	87	4 <sup>c</sup>	10	Adhesives, sealants
Permalyn™ 5095	AP, NL	Gum rosin	88	3	8	Adhesives, sealants, wax modification
Poly-Pale™ Ester 10	AP	Partially dimerized rosin	110	9 <sup>c</sup>	6	Adhesives, sealants
Staybelite™ Ester 10-E	NL	Partially hydrogenated gum rosin	86	6	9	Adhesives, sealants, cosmetics
Foralyn™ 90	NL	Hydrogenated gum rosin	82	2	8	Adhesives, sealants
Foral™ 85-E	NL	Hydrogenated gum rosin	85	2	9	Adhesives, sealants
<b>Pentaerythritol esters</b>						
Permalyn™ 3100	US	Tall oil rosin	99	5 <sup>c</sup>	13	Adhesives, sealants, wax modification
Permalyn™ 5110	AP, NL, MX	Gum rosin	100	6 <sup>c</sup>	15	Adhesives, sealants, wax modification
Permalyn™ 6110	NL	Gum rosin	103	1	13	Adhesives, sealants, wax modification
Permalyn™ 6110-M	MX	Gum rosin	95	3 <sup>c</sup>	14	Adhesives, sealants, wax modification
Pentalyn™ H-E	NL	Partially hydrogenated gum rosin	99	8 <sup>c</sup>	15	Adhesives, sealants
Foral™ 105-E	NL	Hydrogenated gum rosin	101	6	14	Adhesives, sealants
Foralyn™ 110	NL	Hydrogenated gum rosin	109	3	14	Adhesives, sealants
Pentalyn™ C	AP	Partially dimerized rosin	128	11	11	Adhesives, sealants, inks

<sup>a</sup>Ring and ball, ASTM E28

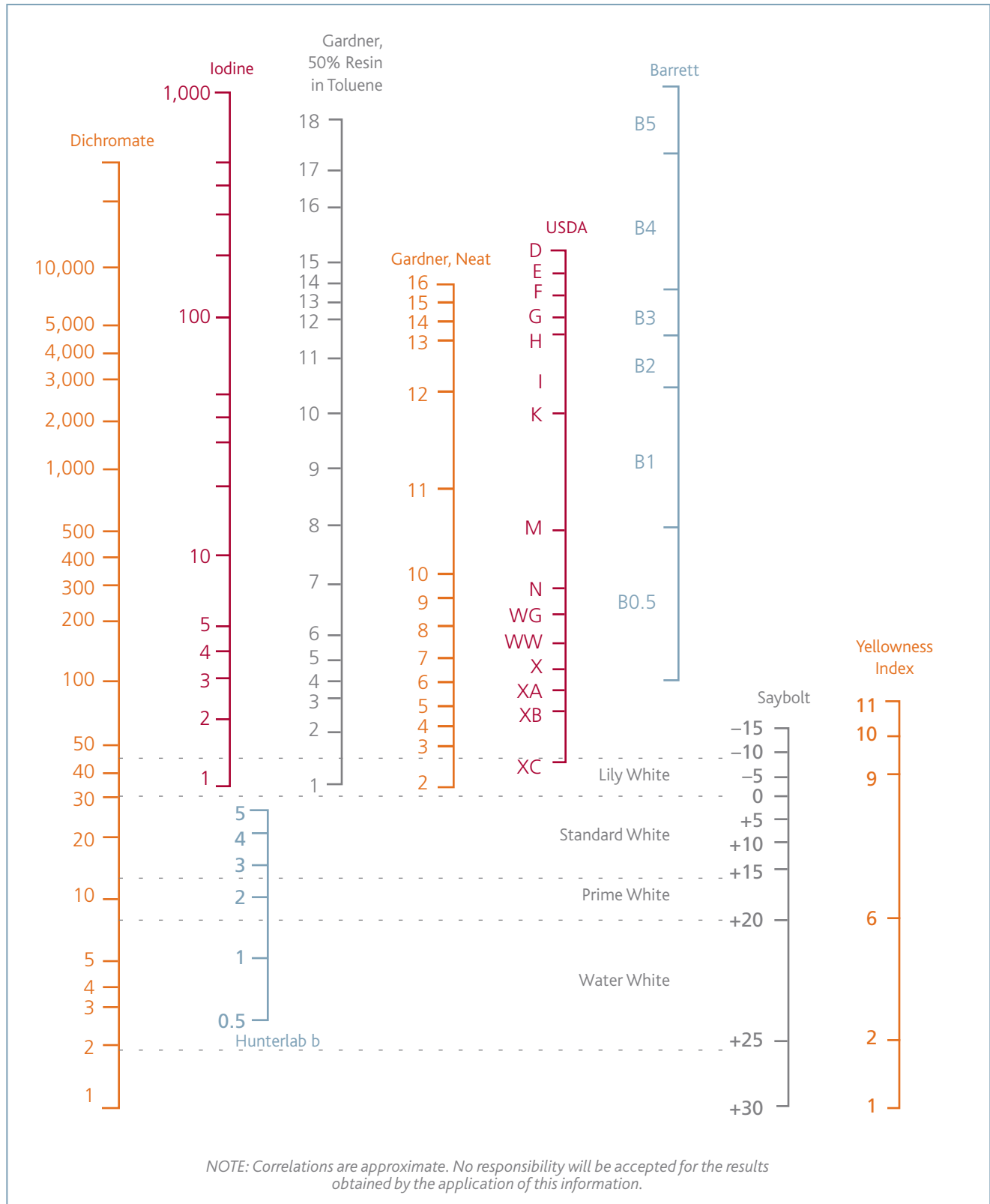
<sup>b</sup>Gardner color: 50% solids unless otherwise noted

<sup>c</sup>Gardner color: neat molten

AP = Asia Pacific  
MX = Mexico

NL = Netherlands  
US = United States

# Correlation chart of various color scales



**Test methods:**

Dichromate: mg/1,000 ml H<sub>2</sub>SO<sub>4</sub>, H-90-2c  
 Saybolt: ASTM D156  
 Iodine: mg/100 ml H<sub>2</sub>O

Gardner: ASTM D1544-80

Hunterlab: ASTM E450

USDA: R-25-4a

Yellowness Index: ASTM D1925

## Eastman™ rosin-based resins

Esterification alcohol	Rosin source						
	Gum rosin (75)	Tall Oil Rosin	Poly-Pale™ (105)	Dymerex™ (145)	Staybelite™ Resin-E (80)	Foral™ AX-E (80)	Foralyn™ (80)
Methanol CH <sub>3</sub> OH					Foralyn™ 5020-F		
Triethylene glycol HO(CH <sub>2</sub> CH <sub>2</sub> ) <sub>3</sub> H					Staybelite™ Ester 3-E		
Glycerol HOCH <sub>2</sub> CHCH <sub>2</sub> OH   OH	Permalyn™ 5095 (90)	Permalyn™ 2085 (85)	Poly-Pale™ Ester 10 (110)		Staybelite™ Ester 10-E (85)	Foral™ 85-E (85)	Foralyn™ 90 (85)
Pentaerythritol C(CH <sub>2</sub> OH) <sub>4</sub>	Permalyn™ 5110 (100) Permalyn™ 6110 (105) Permalyn™ 6110-M (95)	Permalyn™ 3100 (100)	Pentalyn™ C (130)		Pentalyn™ H-E (100)	Foral™ 105-E (100)	Foralyn™ 110 (110)

Numbers in ( ) are Ring & Ball Softening Points

### Typical values

The values presented in this brochure are average values for typical resin samples and should not be construed as product specifications. Products made in several locations may not have the same typical properties. You should consult the individual product data sheets for these products at <http://www.eastman.com/Products/chemicals.htm>.

### Food-contact information

Before using any of these products in food-contact applications, refer to Title 21, Code of Federal Regulations, Part 174.5 (General Provisions Applicable to Indirect Food Additives) and the full text of each listed FDA regulation for applicable limitations or restrictions. Use of these products is subject to the limitations given in the following sections of Title 21:

172.210	Coatings on fresh citrus fruit
175.105	Adhesives
175.125(b)	Pressure-sensitive adhesives
175.300	Resinous and polymeric coatings
175.320	Resinous and polymeric coatings for polyolefin films
175.380	Xylene-formaldehyde resins condensed with 4,4'-isopropylidenedi-phenol-epichlorohydrin epoxy resins

175.390	Zinc-silicon dioxide matrix coatings
176.170(a)	Components of paper and paperboard in contact with aqueous or fatty food
176.180	Components of paper or paperboard in contact with dry food
176.200	Defoaming agents used in coatings
176.210	Defoaming agents used in the manufacture of paper and paperboard
177.1200	Cellophane
177.1210(b)	Closures with sealing gaskets for food containers
177.1400	Hydroxyethyl cellulose film, water-insoluble
177.2600	Rubber articles intended for repeated use (Plasticizer total not to exceed 30 percent by weight)
178.3120	Animal glue
178.3800	Preservatives for wood
178.3850	Reinforced wax
178.3870	Rosins and rosin derivatives

Not all of these products are approved for use under these sections of Title 21.

Further regulatory information may be included on the MSDS for the products. This information can be downloaded from the Eastman Chemical Company website at: <http://www.eastman.com/Products/chemicals.htm>.

Questions on regulatory compliance of products should be directed to your Eastman Chemical Company representative through the addresses or website listed on the back cover of this brochure.

# Eastman™ rosin derivatives FDA clearances

Product	172.210	175.105	175.125(b)	175.300	175.320	175.380	175.390	176.170(a)	176.180
Abitol™ E		■		■		■	■		■
Dymerex™		■	■	■	■	■	■	■	■
Foral™ AX-E	■	■	■	■	■	■	■	■	■
Foral™ 85-E		■		■			■		
Foral™ 105-E		■	■	■		■	■		
Foralyn™ 90		■		■			■		
Foralyn™ 110		■	■	■		■	■		
Foralyn™ 5020-F		■	■	■	■	■	■	■	■
Pentalyn™ C		■		■		■	■		
Pentalyn™ H-E		■	■	■		■	■		
Permalyn™ 2085		■							
Permalyn™ 3100		■							
Permalyn™ 5095		■							
Permalyn™ 5110		■							
Permalyn™ 6110		■							
Permalyn™ 6110-M		■							
Poly-Pale™		■	■	■	■	■	■	■	■
Poly-Pale™ Ester 10		■	■	■	■	■	■	■	■
Staybelite™ Resin-E	■	■	■	■	■	■	■	■	■
Staybelite™ Ester 10-E		■	■	■	■	■	■	■	■

<sup>a</sup>For use only in resinous and polymeric coatings on metal substrates.



176.200    176.210    177.1200    177.1210(b)    177.1400    177.2600    178.3120    178.3800    178.3850    178.3870

	■				■				
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# EASTMAN

## **Eastman Chemical Company Corporate Headquarters**

P.O. Box 431  
Kingsport, TN 37662-5280 U.S.A.

Telephone:  
U.S.A. and Canada, 800-EASTMAN  
(800-327-8626)  
Other Locations, (1) 423-229-2000  
Fax: (1) 423-229-1193

## **Eastman Chemical Latin America**

9155 South Dadeland Blvd.  
Suite 1116  
Miami, FL 33156 U.S.A.

Telephone: (1) 305-671-2800  
Fax: (1) 305-671-2805

## **Eastman Chemical B.V.**

Fascinatio Boulevard 602-614  
2909 VA Capelle aan den IJssel  
The Netherlands

Telephone: (31) 10 2402 111  
Fax: (31) 10 2402 100

## **Eastman (Shanghai) Chemical Commercial Company, Ltd. Jingan Branch**

1206, CITIC Square  
No. 1168 Nanjing Road (W)  
Shanghai 200041, P.R. China

Telephone: (86) 21 6120-8700  
Fax: (86) 21 5213-5255

## **Eastman Chemical Japan, Ltd.**

AIG Aoyama Building 5F  
2-11-16 Minami Aoyama  
Minato-ku, Tokyo 107-0062 Japan

Telephone: (81) 3-3475-9510  
Fax: (81) 3-3475-9515

## **Eastman Chemical Asia Pacific Pte. Ltd.**

#05-04 Winsland House  
3 Killiney Road  
Singapore 239519

Telephone: (65) 6831-3100  
Fax: (65) 6732-4930

[www.eastman.com](http://www.eastman.com)

Material Safety Data Sheets providing safety precautions, that should be observed when handling and storing Eastman products, are available online or by request. You should obtain and review the available material safety information before handling any of these products. If any materials mentioned are not Eastman products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed.

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