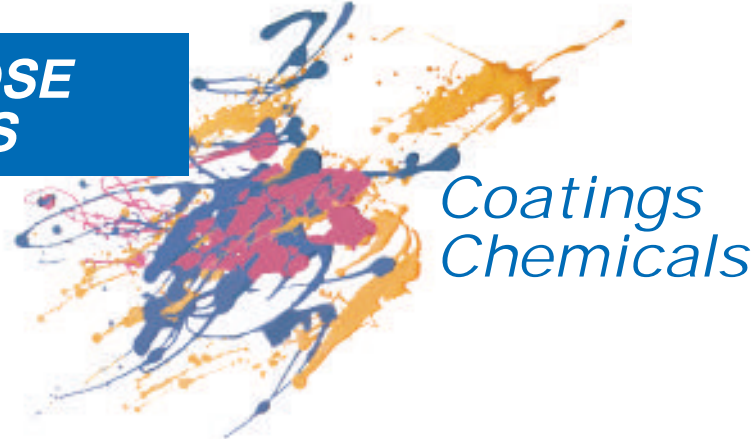


CELLULOSE ESTERS



Eastman CAB-321-0.1

Eastman cellulose acetate butyrate CAB-321-0.1 is designed for use in automotive basecoats which are subsequently topcoated in typical basecoat/clearcoat automotive formulation systems. This cellulose ester is similar to CAB-381-0.1, but displays better resistance to attack and redissolve by solvents contained in typical clearcoats. Because of its redissolve resistance, CAB-321-0.1 may also be useful in wood sealers and plastic barrier coatings.

Table 1

Typical Properties^a	
Butyryl content, avg. wt %	32.5
Acetyl content, avg. wt %	17.5
Hydroxyl content, avg. wt %	1.3
Viscosity, sec ^b	0.1
Viscosity, mP•s (cP) ^b	38
Color, ppm ^c	20
Haze, ppm ^c	5
Free acidity as acetic acid, wt % max.	0.03
Moisture content, wt % max.	3.0
Refractive index	1.475
Melting range, °C (°F)	165–175 (329–347)
Specific gravity	1.20
Weight/volume (cast film)	
kg/L	1.20
lb/gal	10.0
Dielectric strength	
kV/mil	2.0–2.5
kV/cm	787–984
Glass transition temperature, °C (°F)	127 (260)

^a Properties reported here are typical of average lots. Eastman makes no representation that the material in any particular shipment will conform to the listed properties.

^b Viscosity determined by ASTM Method D 1343 in the solution described as Formula A, ASTM Method D 817.

^c Determination of color and haze made on a solution of the cellulose ester dissolved in MIBK using PT-CO color standards and Johns-Manville Celite (diatomaceous silica product) haze standards.

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Solubility

Table 2

Solubility of CAB-321-0.1^a

Solvent	Solution Viscosity at 25°C, mPa•s (cP) 15% Conc.	Solvent	Solution Viscosity at 25°C, mPa•s (cP) 15% Conc.
Blends		Miscellaneous	
Methylene Chloride/Isopropyl Alcohol (90/10)	30	Tetrahydrofuran	35
Toluene/ <i>Tecsol</i> C Alcohol (95%) (80/20)	35	Methylene Chloride	55
<i>Tecsol</i> C Alcohol (95%)	55	Dimethyl Formamide	60
Ethyl Acetate (70/30)		<i>M-Pyrol</i> Solvent ^b	235
		<i>Exxate</i> 600 Solvent ^c	2,000
		1,1,1-Trichloroethane	I
		Heptane	I
		Toluene	I
		Xylene	I
Ketones		Glycol Ethers	
Acetone	20	<i>Eastman</i> PM Solvent	150
Methyl Ethyl Ketone	25	<i>Eastman</i> DM Solvent	400
Methyl n-Propyl Ketone	35	<i>Eastman</i> DE Solvent	Gel
Methyl Isobutyl Ketone	40	<i>Eastman</i> DP Solvent	Gel
Methyl Isoamyl Ketone	65	Dipropylene Glycol Monomethyl Ether	Gel
Methyl n-Amyl Ketone	75	<i>Eastman</i> EP Solvent	I
Cyclohexanone	180	<i>Eastman</i> EB Solvent	I
<i>Eastman</i> C-11 Ketone	I	<i>Eastman</i> DB Solvent	I
Diisobutyl Ketone	I	<i>Eastman</i> EEH Solvent	I
		Propylene Glycol Monobutyl Ether	I
		Propylene Glycol Monopropyl Ether	I
		Propylene Glycol Monotertiary Butyl Ether	I
Esters		Alcohols	
Ethyl Acetate	35	Diacetone Alcohol	290
n-Propyl Acetate	50	Methyl Alcohol	I
Isopropyl Acetate	50	Ethyl Alcohol	I
n-Butyl Acetate	65	<i>Tecsol</i> C Alcohol (95%)	I
Isobutyl Acetate	70	Isopropyl Alcohol	I
Ethylene Glycol Diacetate	375	<i>Texanol</i> Ester-Alcohol	I
Dibasic Esters	400		
Isobutyl Isobutyrate	I		
Ether Ester			
<i>Eastman</i> EEP Solvent	124		
Glycol Ether Esters			
Ethylene Glycol Monoethyl Ether Acetate	100		
<i>Eastman</i> PM Acetate	120		
<i>Eastman</i> EB Acetate	195		
<i>Eastman</i> DE Acetate	295		
<i>Eastman</i> DB Acetate	375		

^a Solubility expressed in terms of solution viscosity as measured with a Brookfield viscometer. (I = Insoluble)

^b I/SP

Table 3

Compatibility With Various Resins and Modifiers

Product Name	Company	Type of Resin	CAB:Resin Compatibility				
			1:9	1:3	1:1	3:1	9:1
<i>Acryloid A-21</i>	Rohm and Haas	Acrylic	C	C	C	C	C
<i>Acryloid A-101</i>	Rohm and Haas	Acrylic	C	C	C	C	C
<i>Acryloid AT-63</i>	Rohm and Haas	Acrylic	I	I	I	I	I
<i>Acryloid AT-64</i>	Rohm and Haas	Acrylic	I	I	I	I	I
<i>Acryloid AT-70</i>	Rohm and Haas	Acrylic	I	I	I	I	I
<i>Acryloid AT-954</i>	Rohm and Haas	Acrylic	I	I	VSI	C	C
<i>Acryloid AU-608S</i>	Rohm and Haas	Acrylic	C	C	C	C	C
<i>Acryloid AU-608X</i>	Rohm and Haas	Acrylic	C	C	C	C	C
<i>Acryloid AU-946</i>	Rohm and Haas	Acrylic	C	SI	C	C	C
<i>Acryloid AU-1003</i>	Rohm and Haas	Acrylic	I	I	I	I	C
<i>Acryloid AU-1004</i>	Rohm and Haas	Acrylic	I	I	I	I	C
<i>Acryloid B-44</i>	Rohm and Haas	Acrylic	C	C	C	C	C
<i>Acryloid B-50</i>	Rohm and Haas	Acrylic	SI	C	C	C	C
<i>Acryloid B-66</i>	Rohm and Haas	Acrylic	C	C	C	C	C
<i>Acryloid B-67</i>	Rohm and Haas	Acrylic	C	C	I	I	C
<i>Acryloid B-72</i>	Rohm and Haas	Acrylic	C	C	C	C	C
<i>Acryloid B-82</i>	Rohm and Haas	Acrylic	C	C	C	C	C
<i>Acryloid B-99</i>	Rohm and Haas	Acrylic	C	C	C	C	C
<i>AM-1004-BX-55</i>	Reliance	Urea-Formaldehyde	SI	VSI	C	C	C
<i>AM-1012-IT-55</i>	Reliance	Urea-Formaldehyde	I	SI	C	C	C
<i>Arochem 530</i>	Reichhold	Maleic	I	I	I	I	I
<i>Aroflint 202-A6X-60</i>	NL Chemicals	Polyester	C	C	C	C	C
<i>Aroflint 404-XX-60</i>	NL Chemicals	Polyester	C	C	C	C	C
<i>Aroplaz 1351</i>	NL Chemicals	Alkyd	VSI	VSI	C	C	C
<i>Aroplaz 2575-X-60</i>	NL Chemicals	Alkyd	SI	I	I	I	VSI
<i>Aroplaz 6065-X-50</i>	NL Chemicals	Alkyd	I	I	I	I	I
<i>Beckacite 43-101</i>	Reichhold	Maleic	I	I	I	I	I
<i>Beckacite 43-142</i>	Reichhold	Maleic	I	I	I	I	I
<i>Beckamine 21-510</i>	Reichhold	Urea-Formaldehyde	C	C	C	C	C
<i>Beckamine 21-511</i>	Reichhold	Urea-Formaldehyde	C	C	C	C	C
<i>Beckasol 12-035</i>	Reichhold	Alkyd	SI	I	I	I	VSI
<i>Beckasol 13-550</i>	Reichhold	Polyester	C	C	C	C	C
<i>Beckasol 13-542</i>	Reichhold	Alkyd	I	I	I	I	SI
<i>Beetle 216-8</i>	Cytec	Urea-Formaldehyde	C	C	C	C	C
<i>Beetle 227-8</i>	Cytec	Urea-Formaldehyde	I	I	I	I	I
<i>Butvar B-73</i>	Monsanto	Polyvinyl Butyral	I	I	I	I	I
<i>Chempol 11-2339</i>	CCP	Polyester	C	C	C	C	C
<i>Chempol 11-3363</i>	CCP	Alkyd	C	C	C	C	C
<i>Chempol 11-3819</i>	CCP	Polyester	I	I	I	I	VSI
<i>Chempol 11-3915</i>	CCP	Polyester	C	C	C	C	C
<i>Chempol 12-2602</i>	CCP	Polyester	VSI	I	I	I	C
<i>CK-1282</i>	Union Carbide	Phenolic	I	I	I	I	C
<i>CK-2103</i>	Union Carbide	Phenolic	C	C	C	C	C
<i>Cumar R-11</i>	Neville	Cormarone-Indene	I	I	I	I	I
<i>Cyplex 1473-5</i>	Cytec	Polyester	C	C	C	C	C
<i>Cyplex 1526</i>	Cytec	Polyester	I	I	SI	C	C
<i>Desmodur N-3390</i>	Miles	Polyisocyanate	C	C	C	C	C
<i>Desmophen 1300</i>	Miles	Polyester	I	I	SI	C	C
<i>D.E.R. 542</i>	Dow	Epoxy	I	I	C	C	C
<i>Desmodur N-75</i>	Miles	Polyisocyanate	C	C	C	C	C
<i>Desmodur N-100</i>	Miles	Polyisocyanate	C	C	C	C	C

Table 3 (Continued)

Compatibility With Various Resins and Modifiers							
Product Name	Company	Type of Resin	CAB:Resin Compatibility				
			1:9	1:3	1:1	3:1	9:1
<i>Elvacite</i> 2008	Du Pont	Acrylic	C	C	C	C	C
<i>Elvacite</i> 2009	Du Pont	Acrylic	C	C	C	C	C
<i>Elvacite</i> 2010	Du Pont	Acrylic	C	C	C	C	C
<i>Elvacite</i> 2013	Du Pont	Acrylic	C	C	C	C	C
<i>Elvacite</i> 2014	Du Pont	Acrylic	C	C	C	C	C
<i>Elvacite</i> 2028	Du Pont	Acrylic	C	C	C	C	C
<i>Elvacite</i> 2042	Du Pont	Acrylic	C	C	C	C	C
<i>Elvacite</i> 2044	Du Pont	Acrylic	VSI	I	I	I	C
<i>Elvacite</i> 2046	Du Pont	Acrylic	VSI	I	I	SI	C
<i>Elveron</i> 300	Du Pont	Polyester	C	C	C	C	C
<i>Epi-Rez</i> 510	Shell	Epoxy	C	C	C	C	C
<i>Epi-Rez</i> 520-C	Shell	Epoxy	I	I	I	I	I
<i>Epon</i> 828	Shell	Epoxy	C	C	C	C	C
<i>Epon</i> 1001F	Shell	Epoxy	I	I	I	I	I
<i>G-Cure</i> 868	Henkel	Acrylic	C	C	C	C	C
<i>Gelva</i> V-1.5	Monsanto	Polyvinyl Acetate	C	C	C	C	C
<i>Genamid</i> 250	Henkel	Polyamide	I	I	I	I	C
<i>Mondur</i> CB-60	Miles	Polyisocyanate	C	C	C	C	C
<i>Mondur</i> CB-75	Miles	Polyisocyanate	C	C	C	C	C
<i>Multron</i> R-221-75	Miles	Polyester	VSI	I	I	I	C
<i>Neocryl</i> B-723	Zeneca	Acrylic	C	C	C	C	C
<i>Neocryl</i> B-725	Zeneca	Acrylic	C	C	C	C	C
<i>Neocryl</i> B-728	Zeneca	Acrylic	C	C	C	C	C
<i>Neocryl</i> B-734	Zeneca	Acrylic	C	C	C	C	C
<i>Neocryl</i> B-750	Zeneca	Acrylic	C	C	C	C	C
<i>Nirez</i> V-2150	Reichhold	Terpene	I	I	VSI	C	C
Polyol 4294	NL Chemicals	Polyester	C	I	C	C	C
Polyol 4295	NL Chemicals	Polyester	C	C	C	C	C
Polyol 4357	NL Chemicals	Castor Oil	I	I	I	I	I
Polyol 4573	NL Chemicals	Acrylic	C	C	I	SI	VSI
Polyol 5610	NL Chemicals	Polyester	C	C	C	C	C
Polyol 5611	NL Chemicals	Polyester	C	C	C	C	C
Polyol 5880	NL Chemicals	Polyester	I	I	I	I	I
Polyol 8100	NL Chemicals	Castor Oil	I	I	I	SI	C
QI-10	K. J. Quinn	Urethane	I	I	I	I	I
R-1060 M2	CCP	Polyester	I	I	I	I	I
<i>Spengel</i> F-34-100	NL Chemicals	Urethane	I	I	I	I	I
<i>Spengel</i> F-35-100	NL Chemicals	Urethane	I	I	I	I	I
<i>Spengel</i> F-48-100	NL Chemicals	Urethane	I	I	I	C	C
TA-44	O. G. Innes	Dewaxed Damar	I	I	I	I	I
<i>Uformite</i> 21-805	Reichhold	Urea-Formaldehyde	C	C	C	C	C

Ratings: I = Incompatible: strong haze in film viewed in room light; SI = Slightly Incompatible: slight haze in film viewed in room light; VSI = Very Slightly Incompatible: clear film in room light, slight haze in high-intensity spotlight; C = Compatible: clear film under all viewing conditions.

The resins were tested as 10 mil wet films cast from a solvent blend of methyl ethyl ketone/n-butyl acetate/n-butanol/*Eastman* EEP sol-

vent/xylene (15/35/15/15/20 wt %). Other solvent blends may alter compatibility results.

Storage and Handling

Information on “Handling Precautions for Cellulose Esters in Formulating Coatings” is contained in Eastman Publication E-241. Material Safety Data Sheets providing safety precautions that should be observed in handling and storing Eastman products are also available on request. You should obtain

and review these publications before handling any of these products. If any materials are mentioned that are not Eastman products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed.

FDA Status

In accordance with food additive regulations published by the United States Food and Drug Administration (FDA), *Eastman* cellulose acetate

butyrate is lawful for use in certain food-contact applications subject to any limitations in the regulations listed below:

21 CFR 175.105	Adhesives
21 CFR 175.230	Hot-Melt Strippable Food Coatings
21 CFR 175.300	Resinous and Polymeric Coatings
21 CFR 175.380	Xylene-Formaldehyde Resins Covered With 4,4'-Isopropylidenediphenol-Epichlorohydrin Epoxy Resins
21 CFR 175.390	Zinc-Silicone Dioxide Matrix Coatings
21 CFR 176.170	Components of Paper and Paperboard in Contact With Aqueous and Fatty Foods
21 CFR 176.180	Components of Paper and Paperboard in Contact With Dry Foods
21 CFR 177.1200	Cellophane
21 CFR 177.1210	Closures With Sealing Gaskets for Food Containers
21 CFR 177.1400	Water-Insoluble Hydroxyethyl Cellulose Film

It is the responsibility of users to determine that *Eastman* cellulose acetate butyrate is safe, lawful, and technically suitable for their intended applications. Because of possible changes in the law and in regulations, as well as possible changes in our product, we cannot

guarantee that the status of this product will remain unchanged. We, therefore, recommend that customers continuing to use this product verify its status no less frequently than every two years from the date of this publication.

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

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