

UNIPLEX 280 CG

SUCROSE BENZOATE

CAS NO. 12738-64-6

UNIPLEX 280 CG is a stable, clear, odorless, and non-crystalline brittle solid with a reasonably sharp softening range starting at around 200°F. It has excellent ultraviolet light stability. Uniplex 280 is compatible with a broad range of resins, plasticizers, and solvents, and insoluble in water and aliphatic hydrocarbons.

The UNIPLEX 280 CG is specifically designed for the coating and ink industry. However, this remarkably clean, clear product may also be used in numerous applications areas as indicated by the listing of compatibilities attached.

UNIPLEX 280 CG is an outstanding modifier for clear lacquers. It provides exceptional clarity with high gloss, excellent resistance to ultraviolet light, high film hardness combined with good flexibility, and excellent resistance to water and alcohol.

In addition to usage in the formulation of clear coatings for wood, paper and metal, and in formulation of ink systems, the properties of Sucrose Benzoate indicate that it should be of interest in metallic and pigmented coatings, and heat seal coatings.

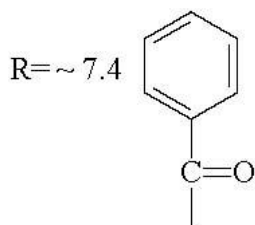
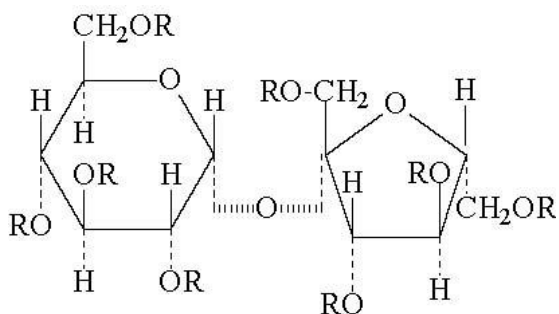
UNIPLEX 280 CG may be used to particular advantage in UV coating and inks. The Uniplex 280 CG improves the UV systems stability and allows easier processing. In addition, it imparts good film hardness, excellent gloss, and depth of gloss.

SPECIFICATIONS

UNIPLEX 280 CG

SPECIFICATION	LIMITS
Acidity, % as Benzoic acid, max.	0.3
Color, APHA in 50% xylene solution, max.	50
Turbidity, % transmission, in a 33 % (w/v) xylene / hexane solution, min.	85

STRUCTURE



TYPICAL PROPERTIES

Form and Appearance	Glassy clear solid
Color (Molten)	100 APHA
Specific Gravity, 25°/25°C	1.25
Refractive Index, 25°C	1.577
Softening Point, Ball & Ring Method, °C	98
Molecular Weight (Approx.)	1110
Saponification Equivalent, mgKOH/gram	153
Hydroxyl Content, meq. OH/gram	0.9
Acid Number, mg. KOH/gram	Less than 0.1
Iodine Number	Less than 0.01
Ash %	Less than 0.01
Flash Point, Tag. Open Cup, °F	500
Fire Point, Tag. Open Cup, °F	522

SOLUBILITY

A partial listing of solvents with which Sucrose Benzoate is miscible in all proportions at 25°C is shown below:

Solubility Table

Acetic Acid	Ethyl Acetate
Acetone	ETHYL CELLOSOLVE
Benzene	Ethylene Dichloride
Benzonitrile	Isophorone
Butyl Acetate	Methyl Benzoate
BUTYL CELLOSOLVE	METHYL CARBITOL
CARBITOL	METHYL CELLOSOLVE
Carbon Tetrachloride	Methyl Isobutyl Ketone
Dibutyl Phthalate	Methyl Ethyl Ketone
Diethylene Glycol Dibenzoate	Methylene Dichloride
Diisobutyl Ketone	Polyethylene Glycols
Diethyl Ether	SOLVESSO 150
Dimethyl Formamide	Toluene
Dioxane	Tricresyl Phosphate
Dipropylene Glycol Dibenzoate	Xylene (Mixed isomers)
Diocetyl Phthalate	

% SUCROSE BENZOATE IN BLEND

RESINS	20%	50%	80%
Gum Rosin N Grade	C (22)	CH (29)	C (37)
Glycerin Ester, Unmodified	C	CH	C
Glycerin Ester of Hydrogenated Rosin	I	I	I
Tall Oil Rosin SYLVAROS-90	CH (27)	I (30)	CH (39)
Sucrose Acetate Isobutyrate	C	C	C
VINSOL Resin	C	C	C

C= Compatible I= Incompatible CH= Compatible with haze

VISCOSITY CHARACTERISTICS
Viscosity
Molten Sucrose Benzoate vs. Temperature

Temperature (°C)	Viscosity (cP)
160	550
150	590
140	660
130	780
120	900
110	1,500
100	4,000

Viscosity
Solution Sucrose Benzoate in Toluene at 25° vs. Concentration

Sucrose Benzoate (Weight %)	Viscosity (cP)
5	0.6
10	0.7
15	0.8
25	1.3
40	3.7
60	35.1
70	530
80	22,000

COMPATIBILITY OF SUCROSE BENZOATE IN BLENDS

POLYMER	20%	50%	80%
Acrylics			
Poly (Methyl Methacrylate)	C (23)	C (31)	C(50)
Acrylic Ester Copolymer	C (Tack)	C (Tack)	C(28)
Alkyd Resins			
Alkyd, Phenolic Modified	C	C	C
Amide			
Nylon (Alcohol Soluble)	CH	-	-
Amino			
Melamine-Formaldehyde	C	C	C
Urea-Formaldehyde	C	C	C
Butylated Urea-Formaldehyde	C	C	C
Butylated Benzoguanamine Formaldehyde	C	C	C
POLYMER	20%	50%	80%
Cellulosic			
Ethyl Cellulose	C (43)	C (53)	I (53)
Nitrocellulose (1/2 sec. visc.)	C (43)	C (51)	C
Cellulose Acetate Butyrate	C (45)	C (46)	C (47)
Chlorinated Rubber (67% C1)			
	C	C	C
Congo Copal, Processed			
	C	CH	CH
Coumarone-Indene, Modified			
	C	C	C
Epoxy Ester-TEPA			
	C	C	C
Isobutylene			
	I	I	I
Polyester			
	C	C	C
Polyethylene			
	I	I	I
Styrenics			
	C		
Polystyrene	C (49)	C	C (48)
PICOFLEX 100 & 105	C	C	C
Vinyl			
Polyvinyl Chloride 13% PVAC	C (36)	C (48)	I (54)
Polyvinyl Acetate	C (35)	C (47)	C (48)
Polyvinylidene Chloride	CH (28)	CH	CH (54)

C= Compatible I= Incompatible CH= Compatible with haze

A partial listing of solvents with which Sucrose Benzoate is sparingly soluble, or soluble to less than 20% at 25°C is shown below. Specific solubilities are shown in some cases.

Amyl Alcohol	Isoamyl Alcohol
APCO THINNER 100 0.24% at 25°C	Isopropyl Alcohol
Butyl Alcohol	Kerosene
Butyl Stearate	Linseed Oil
Cyclohexane	Methyl Alcohol 4.7% @ 25°C
Diethylene Glycol	Turpentine
Ethyl Alcohol 2.3% at 25°C	ULTRASENE 0.08% @ 25°C
Ethylene Glycol	FREON 11 at 1.5% @ 25°C
Glycerin	Heptane. Less than 0.02% at 67°C

The following table shows film compatibility of Uniplex 280 CG with various polymers commonly used in processing, formulating, and compounding operations.

Sucrose Benzoate and each of the various materials under test were dissolved in a suitable solvent system to permit spreading a wet film 3 or 4 mils thick on a glass plate. After drying and aging at least 48 hours, compatibility was estimated by visual inspection. In certain cases, the Sward film hardness was measured. The abbreviations used in these tables to describe film compatibility are:

C	Compatible	Film had glass-like clarity.
CH	Compatible	Film had some haze.
I	Incompatible	Film was translucent or opaque.

NOTE: When Sward hardness of film was determined, it is indicated in parentheses following compatibility abbreviation.

STABILITY

1. Ultraviolet Light

Supported films of Sucrose Benzoate were prepared from toluene solution. Exposure was made using an Atlas Fade-O-Meter at approximately 140°F. Exposure time: 3000 hours. Appearance: No color change or evidence of degradation.

2. Hydrolytic

Sucrose Benzoate was held in contact with solutions shown below at 100°C. Change in acidity of aqueous layer was used to determine degree of hydrolysis.

Solution	Hydrolyzed in 24 hours	Hydrolyzed in 96 hours
Water	Nil	Nil
5% solution HCl	Nil	0.6%
5% solution Na ₂ CO ₃	1.9%	2.3%

3. Heat

Prolonged heating of Sucrose Benzoate at elevated temperatures causes darkening and increases in acidity. For example, heating for 4 hours in oven at 175°C (347°F) in aluminum dishes causes gradual color development from 60 APHA to about 3 Gardner - and 8 hours heating results in Gardner range of 5-10. This 8 hour heating also causes an increase in acid number from around 0.05 to around 0.35 mg. KOH/gram. Temperatures below 150°C (302°F) cause the Sucrose Benzoate to reach a 4 Gardner color in less than 2 hours. Addition of small amounts of oxirane oxygen containing compounds including epoxy soybean oil, epoxy esters, liquid epoxy resins, and glycidyl phenyl ether imparts improved heat stability to Sucrose Benzoate.

TOXICITY

Sucrose Benzoate LD₅₀ orally in rats is greater than 5g. / kg. All rats tested (12) survived forced-feeding 50% suspension in olive oil at level of 5 grams Sucrose Benzoate per kilogram body weight. This was the maximum amount which could be administered using this technique. Sucrose Benzoate is not a primary skin irritant, nor an eye irritant, based on tests with rabbits using terms and procedures outlined in the Federal Hazardous Substance Labeling Act. Until further data are obtained, it is recommended that Sucrose Benzoate be handled with the usual precautions for organic chemicals.

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HANDLING

Refer to the Sucrose Benzoate Material Safety Data Sheet (MSDS) for information concerning the safe handling of Sucrose Benzoate.

WAREHOUSE STOCKS

Warehouse Location: Greensboro, N.C.

PACKAGING

55 gallon fiber drum with Polyethylene Liner at 300 pounds net weight

SHIPPING REGULATIONS

Railroad Classifications	Chemicals, NOI
Motor Freight Classifications	Chemicals, NOI
DOT Regulation	Not regulated
Postal Regulation	Mailable

HANDLING INFORMATION:

Refer to Material Safety Data Sheet

These suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them on a commercial scale. Suggestions for uses of our products should not be understood as recommendations that they be used in violation of any patents.