

# **Santicizer® 141**

## **Plasticizers Product Profile**

### **Product Description**

Santicizer® 141 is an excellent, general-purpose plasticizers for most commercial resins, including polyvinyl chloride and its copolymers, cellulose nitrate, cellulose acetate-butyrate, ethyl cellulose, poly-methyl methacrylate and polystyrene. FDA regulated, it allows the formulation of clear, flame-retardant films, sheets or other products that will contact foods.

In polyvinyl chloride, Santicizer® 141 imparts flame resistance, low-temperature flexibility, good weathering characteristics, low odor, good heat-sealing characteristics, and has good light and heat stability. PVC compounds plasticized with Santicizer® 141 show good resistance to abrasion and to oil and grease extraction. Because of its excellent solvating power, Santicizer® 141 is fast fusing and improves the processing characteristics of most PVC formulations. The outdoor durability and weather resistance of flexible PVC films are significantly improved by replacing 10%-15% of the phthalate plasticizers with Santicizer® 141.

Santicizer® 141 imparts a low initial viscosity in vinyl plastisols. Plastisols made with Santicizer® 141 and Santicizer® 148 show very little dilatency, which is unusual for fast-fusing systems. As would be expected from fast-fusing plasticizers, the viscosity builds up rapidly during aging. The rapid fusion is an advantage in formulations for slush molding, textile and spray coatings.

#### **Performance in Plastisols**

Santicizer® 141 imparts a unique combination of properties to plastisols: shear thinning and rapid fusion. Normally, single plasticizers cannot impart the two properties, since the physical chemistries for each characteristic are opposed. Plastisols formulated with Santicizer® 141 possess a good balance between flow index and fusion temperature.

Although the initial viscosity of plastisols formulated with Santicizer® 141 can be quite low, the high solvating power and fast-fusion characteristics result in viscosity buildup upon standing. This can be an advantage in formulations requiring “body,” slow runoff or when thick films or coatings are required. It is not desirable in formulations that must maintain a low or fixed viscosity during storage or protracted use. Viscosity can be stabilized to a degree by the addition of a viscosity-control agent, such as polyethylene glycol mono-oleate.



## **Safety and Handling**

Complete toxicity and handling information can be found on the Material Safety Data Sheet, which is available on request.

## **Typical Properties**

Molecular Weight	362
Phosphorus, %	8.6 (Calc)
• Acidity (Meq/100gm. Max.)	0.20
• Apperance	Clear, oily liquid
• Color (APHA) [max.]	30
• Moisture (KF in Methanol) %, max.	0.10
Odor	Essentially odorless
• Refractive Index (@60°C)	1.506 – 1.510
• Specific Gravity (25°/25°C)	1.085 – 1.091
• Density (@25°C) Ca. Lbs./gal.	9.1
Pour Point (°C)	-54
Boiling Point @ 10 mmHG, °C	239 (decomposes)
Vapor Pressure (mm Hg) @150°C	0.2
@200°C	1.6
Viscosity (Centistokes) @0°C	61.0
@25°C	16.4
@98.9°C	2.5
Flash Point (C.O.C) [°F]	435
Pour Point (C.O.C) [°F]	460
Solubility in Water @34°C, %	0.002
CAS Number	1241-94-7
• Specification	

## **Santicizer® 148**

### **Plasticizers Product Profile**

#### **Product Description**

Santicizer® 148 is an efficient flame retardant, excellent for many commercial resins, particularly polyvinyl chloride and its copolymers, polyvinyl acetate and acrylics. It is high solvating and provides good low-temperature flexibility, and it is miscible with most common solvents.

Santicizer® 148 imparts flame retardance, low-temperature flexibility and low volatility in polyvinyl chloride. It can replace DOP part-for-part to the level needed for fire retardancy while maintaining the flexibility and the softening efficiency of that phthalate. Its use in the compound imparts low smoke-generation performance that is far superior to triaryl phosphates or antimony oxide. It also offers superior fusion properties and solvating action and imparts resistance to abrasion, oil and grease. Used as a 10%-15% replacement for phthalates, it imparts excellent weather and light stability. Hand and drape of the finished film or coated fabric containing Santicizer® 148 are outstanding.

In vinyl plastisols, Santicizer® 148 exhibits fast fusion, low initial viscosity and moderate viscosity stability. Cell structure of vinyl foams is excellent. Clear formulations show a sparkling clarity with Santicizer® 148. The cured compound possesses good low-temperature flexibility and flame retardance.

Santicizer® 148 offers PVC adhesives – such as laminating adhesives – fast fusion, good viscosity and flame retardance. When laminating PVC film to cloth, the use of a fire-retardant adhesive dramatically reduces the flammability of the laminate.

By the addition of silica aerogel and a non-ionic detergent, a shear-sensitive gel of Santicizer® 148 can be applied to expanded-glass air filters. Such treated filters are flame retardant and efficient dust collectors.

Santicizer® 148 is an efficient low volatility solvate for ethyl cellulose, nitrocellulose, SBR and nitrile (Buna N) rubbers.

#### **Flame-retardance Performance**

Vinyl compositions properly formulated with Santicizer® 148 show excellent performance in both flame-spread and smoke generation characteristics.



## **Safety and Handling**

**Complete toxicity and handling information can be found on the Material Safety Data Sheet, which is available on request.**

## **Typical Properties**

Molecular Weight	390
Phosphorus, %	7.9 (Calc)
• Acidity (meq/100gm. Max.)	0.20
• Apperance	Clear, oily liquid
• Color (APHA) [max.]	100
• Moisture (KF in Methanol) %, max.	0.10
• Odor	Essentially Odorless
• Refractive Index (@25 <sup>0</sup> C)	1.501 – 1.507
• Specific Gravity (25 <sup>0</sup> /25 <sup>0</sup> C)	1.061 – 1.071
Density (@25 <sup>0</sup> C) Ca.Lbs./gal.	8.94
Crystallizing Point ( <sup>0</sup> C)	<-35
Pour Point ( <sup>0</sup> C)	<-50
Boiling Point @ 10 mmHG, <sup>0</sup> C	245 (decomposes)
Vapor Pressure (mm Hg) @ 150 <sup>0</sup> C	<0.1
@ 200 <sup>0</sup> C	0.5
Viscosity (Centistokes) @ 0 <sup>0</sup> C	95
@ 25 <sup>0</sup> C	22.5
@ 98.9 <sup>0</sup> C	3.0
Flash Point (C.O.C) [F <sup>0</sup> ]	465
Fire Point (C.O.C) [F <sup>0</sup> ]	500
Coefficient of Thermal Exp. @ 10 – 40 <sup>0</sup> C (cc/cc/ <sup>0</sup> C)	0.00071
Solubility in Water @ 34 <sup>0</sup> C, %	<0.0008
CAS Number	29761-21-5

### **• Specification**



## Santicizer®160

### Plasticizers Product Profile

#### **Product Description**

Santicizer®160 is an excellent plasticizer with strong solvent action on a wide variety of resins.

In PVC hot processing, such as calendering and extrusion operations, Santicizer® 160 has reduced melt viscosity. It excels when processing products with thick cross-sections or when increased line speed is desired.

The solubilizing action of Santicizer® 160 helps ensure that lubricants and other surface-active additives don't interfere with post-decorative ink adhesion or dielectric sealing applications. In most PVC applications, Santicizer® 160 is used with general-purpose plasticizers to improve processing characteristics and finished product performance.

Santicizer® 160 plasticizer is the flooring industry standard. Tile flooring benefits from its exceptional processability, high filler tolerance and migration resistance to cutback asphalt adhesives. Santicizer® 160 provides sheet flooring more effective fusion and foam expansion rates. It permits the use of desirable high molecular weight resins and provides improved stain resistance versus DOP or other general-purpose phthalates.

Santicizer® 160 offers improved freeze-thaw properties compared to Benzoflex 50. Its viscosity is significantly lower than the many benzoates's, making it easier to pump in the winter months. Santicizer® 160 offers superior permanence through lower volatility as compared to dibutyl phthalate and also has better fungal resistance than most benzoates.

The preferred choice for nitrocellulose lacquers and films, Santicizer® 160 offers better permanence (lower volatility) and improved resistance to extraction by water than DBP. Santicizer® 160 gives PVAcetate adhesive (white glue) applications good initial viscosity and consistent viscosity stability over time. It promotes good wet tack and setting speed properties, permits adjustment of open time and improves adhesive ability to spread.

In general-purpose PVAcetate and acrylic caulks, Santicizer® 160 imparts and maintains good flexibility for unmatched performance. Good recovery properties and rheological properties in formulated caulk/sealants (i.e., gunnability) are other important benefits. In quick-tack, hot melts, wood glues and other adhesives, Santicizer® 160 gives added bonding strength to many hard-to-adhere substrates.



Santicizer® 160 is compatible with a wide range of urethane compositions such as caulks, sealants, coatings and elastomerics. Santicizer® 160 offers superior physical properties and retention of physicals. It also is resistant to hydrolysis and to extraction by jet fuels. Compared to Benzoflex 9-88, Santicizer® 160 provides extremely consistent and very low free-hydroxyl content.

In acrylic coatings, Santicizer® 160 allows excellent gloss as it resists water spotting and humidity. Santicizer® 160 also imparts desirable flexibility and flowout.

Santicizer® 160 is permitted to have indirect food contact subject to the following FDA provisions - regulations; the final formulator is responsible for complying with limitations listed in specific sections. 21 CFR 175.105; 21 CFR 175.300; 21 CFR 176.170; 21 CFR 176.180; 21 CFR 177.2420; 21 CFR 178.3740

### **Safety and Handling**

Complete toxicity and handling information can be found on the Material Safety Data Sheet, which is available upon request.

### **Typical Properties**

Molecular Weight	312
● Acidity (Meq/100 gm. Max.)	0.37
● Appearance	Clear, oily liquid
● Color (APHA) [max.]	40
● Moisture (KF in Methanol) %, max.	0.15
● Odor	Slight, characteristic
● Refractive Index (@25°C)	1.535 – 1.540
● Specific Gravity (25°C/25°C)	1.115 – 1.123
Density (@25°C) Ca. Lbs./gal.	9.3
Hydroxyl No.	<1
Crystallizing Point (°C)	<-35
Pour Point (°C)	-45
Boiling Point @ 10 mmHg, °C	240
Vapor Pressure (mm Hg)	
@ 150 °C	0.16
@ 200 °C	1.9
@ 250 °C	14.4
Viscosity (Centistokes)	
@ 0 °C	230
@ 25 °C	39.5
@ 98.9 °C	3.42
Flash Point (C.O.C) [F°]	390
Fire Point (C.O.C) [F°]	450
Coefficient of Thermal Exp. @ 10 - 40°C (cc/cc/°C)	0.00069
Solubility in Water @ 34°C, %	0.0003
CAS Number	85-68-7

#### ● Specification

## Santicizer® 261A

### Plasticizer Product Profile

Chemical type: C7-C9 Alkyl Benzyl Phthalate

### **Product Description**

Santicizer® 261A Plasticizer is a fast fusing benzyl phthalate plasticizer with a high level of permanence, yet retains the easy processing features of a monomeric plasticizer. It finds application in PVC film and sheeting, coated fabrics, plastisols, organosols, vinyl foams, polyurethane and polysulfide caulks and sealants, and acrylic lacquers. Extraction resistance against alcohol and kerosene is comparable to low molecular weight polymeric plasticizers.

### **Benefits**

- In vinyl plastisols and organosols, Santicizer® 261A provides relatively low initial viscosity and adequate viscosity stability. It offers fast fusion at normal temperatures, low volatility and permanence in finished vinyl products as compared to general-purpose plasticizers (GPP).
- In polyurethane, Santicizer® 261A has excellent compatibility, provides good viscosity control, and, excellent permanence. High filler loadings are possible because of the excellent wet-out characteristics of Santicizer® 261A.
- In acrylic coatings, Santicizer® 261A imparts excellent durability, anti-fogging properties, and better adhesion to metal undercoats, improved weatherability, and good solvent-craze resistance. It imparts excellent gloss, resists water spotting, and provides good flow characteristics and flexibility without brittleness for a long coating life. The low volatility and greater permanence of Santicizer® 261A make it an excellent choice for acrylic coatings that must have a long service life and/or must endure high-temperature exposure.
- In calendaring and extrusion, Santicizer® 261A combines the efficiency of monomeric esters with permanence approaching that of low molecular weight polymeric, and offers excellent processing characteristics. Santicizer® 261A, vinyl compounds can obtain oil, kerosene, and gasoline resistance that is better than that obtainable with low molecular weight polymeric or high molecular weight monomerics.
- In chemically and mechanically blown foams, Santicizer® 261A improves foam structures and creates better blowing ratios than with GPP. Its low volatility helps maintain a permanent, dimensionally stable foam.





## **Safety and Handling**

Complete toxicity and handling information can be found on the Material Safety Data Sheet, which is available upon request.

## **Typical Properties**

Appearance	Clear, oily liquid
Color (APHA)	75 max.
Specific gravity (25°C/25°C)	1.0550 to 1.0640
Refractive index at 25°C	1.5200 to 1.5260
Acidity (meq. KOH / 100 g)	0.37 max.
Moisture (KF in methanol)	0.15% max.
Molecular weight	381.9
Flash point (COC)	224°C
Dielectric constant (25°C):	
at 1 KHz	5.06
at 100 KHz	5.02
Surface tension (Dynes/cm)	36.27
Boiling point (1.25 mmHg)	231°C
Viscosity at 25°C (cP)	101.5





## Santicizer® 278

### Plasticizers Product Profile

#### **Product Description**

Santicizer® 278 is a high molecular weight benzyl phthalate that offers very low volatility and good permanence yet retains the aggressive solvating characteristics of the benzyl phthalates. High compatibility and low volatility give good processing along with permanence that compares with polymeric plasticizers. This unique combination makes versatile plasticizers for use in many differing resin systems.

In polyvinyl chloride, Santicizer® 278 shows low flexibilizing efficiency, yet formulations are fast processing. The end product will be highly resistant to staining and dirt pick-up and will retain its properties well even when exposed to high temperatures, extractants – such as solvents, oils, grease – and other severe-use conditions.

Santicizer® 278 has been found to be especially effective in vinyl systems, which require extremely good migration resistance. Typical of this effect is the use of Santicizer® 278 in automotive sealants. Santicizer® 278 provides excellent paintability with "Hi-solids" automotive enamels and resists migration into the paint.

In paints and coatings, Santicizer® 278 helps develop high-performance products. In acrylic coatings, Santicizer® 278 promotes excellent resistance to water spotting, greater toughness and excellent adhesion. When formulated at a level to impart flexibility equal to that obtainable with Santicizer® 160, acrylic powder coatings will show even better flow-out characteristics.

In polyurethane's, Santicizer® 278 shows excellent compatibility and is recommended for urethane fabric coatings and free film. Its excellent permanence allows it to be used without detracting seriously from the high performance that warrants the use of urethane for the application. Santicizer® 278 is excellent plasticizers for use in caulks and sealants, which are based on chlorinated rubber, butyl rubber, polysulfides or polyurethane. Santicizer® 278 is the standard against which other plasticizers are judged in polysulfide sealant applications, offering outstanding functionality and unequaled permanence. In polyurethane sealant applications, Santicizer® 278 offers excellent permanence, low free-hydroxyl content and outstanding "body" in the sealant. Its low-moisture content, and low acidity. It doesn't interfere with the chemistry of the curing system. In caulks and sealants for automotive applications, for example, its low volatility, anti-fogging and migration resistance characteristics are unique.

## **Safety and Handling**

Complete toxicity and handling information can be found on the Material Safety Data Sheet, which is available upon request.

## **Typical Properties**

Molecular Weight	455
• Acidity (Meq/100 gm. Max.)	0.37
• Appearance	Clear, oily liquid
• Color (APHA) [max.]	175
• Moisture (KF in Methanol) %, max.	0.15
Odor	Slight, characteristic
• Refractive Index (@25 <sup>0</sup> C)	1.516 – 1.520
• Specific Gravity (25 <sup>0</sup> /25 <sup>0</sup> C)	1.093 – 1.100
Density (@25 <sup>0</sup> C) Ca. Lbs./gal.	9.1
Boiling Point @ 10 mmHG, <sup>0</sup> C	243
Vapor Pressure (mm Hg) @ 200 <sup>0</sup> C	0.5
@ 250 <sup>0</sup> C	15
Viscosity (Centistokes) @ 0 <sup>0</sup> C	Ca. 10,000
@ 25 <sup>0</sup> C	860
@ 98.9 <sup>0</sup> C	11.5
Flash Point (C.O.C) [ <sup>0</sup> F]	440
Surface Tension @ 25 <sup>0</sup> C (dynes/cm)	34.8
Fire Point (C.O.C) [ <sup>0</sup> F]	535
Coefficient of Thermal Exp. @ 10 – 40 <sup>0</sup> C (cc/cc/ <sup>0</sup> C)	0.00073
Solubility in Water @ 34 <sup>0</sup> C, %	practically insoluble
CAS Number	16883-83-3

- Specification