

Benzoate As A Safe Replacement To Phthalate



Introduction

Benzoate plasticizer is a non-phthalate plasticizer and uses benzoic acid as a key raw material. Benzoate plasticizers are an environmentally friendly option for formulators looking for an alternative to commodity and speciality phthalate esters.

Applications

1. Benzoate plasticisers are used in flexible PVC applications including flooring, but also in adhesives and sealants and cosmetics.
2. Benzoate plasticisers are useful for shoe soles, childrens toys and medical equipments etc.
3. As a plasticizer for PVDC food film applications.

Benefits

1. Safe (approved for food contact applications)
2. Benzoate plasticizers are an eco friendly.
3. After addition it can improve compatibility of PVC.
4. Reduce volatility of the plasticizer.
5. Improve oil and water resistance.
6. Enhancing the durability of product.
7. Improvement in “soft feel” properties.
8. Excellent low temperature flexibility.

Harmful Effects Of Phthalates

In recent years it was discovered that some of the low molecular weight phthalates can interfere with human hormone system. Phthalates have also been linked with obesity, reduced female fertility, preterm birth and low birthweight, carcinogenicity, a worsening of allergy and asthma symptoms.

These phthalates have therefore been banned from a number of critical applications like medical, food and toys applications where they can pose health risks.

List Of Banned Phthalates

1. Di(2-ethylhexyl) phthalate (DEHP)
2. Dibutyl phthalate (DBP)
3. Benzyl butyl phthalate (BBP)
4. Diisononyl phthalate (DINP)
5. Di-N-octyl phthalate (DNOP)
6. Diisodecyl phthalate (DITP)



Benzoates Are Safe Alternatives To Phthalates

Dr. J. Pharmachem Pvt. Ltd., manufacturers several benzoates plasticizers which is replace to Phthalate plasticizers.

| Sr No | Product Name | CAS No |
|-------|--------------------------------------|------------|
| 1 | 1,4-CYCLOHEXANEDIMETHANOL DIBENZOATE | 35541-81-2 |
| 2 | GLYCEROL TRIBENZOATE | 614-33-5 |
| 3 | NEOPENTYL GLYCOL DIBENZOATE | 4196-89-8 |
| 4 | PENTAERYTHRITOL TETRABENZOATE | 4196-86-5 |
| 5 | SUCROSE BENZOATE | 12738-64-6 |

Specifications

| Test | UOM | 1,4-Cyclohexanedimethanol Dibenzoate | Glycerol Tribenzoate | Neopentyl Glycol Dibenzoate | Pentaerythritol Tetrabenzoate | Sucrose Benzoate |
|----------------------|------------|--------------------------------------|------------------------------|-----------------------------|---|--------------------|
| Appearance | - | White solid powder | Crystalline powder/ granules | White to off white Powder | White to off-white crystalline, lumps or granules | Crystalline powder |
| Purity | % | > 97 | > 95 | > 98 | > 98.0 | - |
| Melting point | °C | 117 – 120 | 68 – 72 | 48 – 51 | 103 – 108 | 80 – 95 |
| Saponification value | mg KOH/g | 303 – 320 | 396 – 436 | - | - | 340 – 350 |
| Acidity | mg KOH/g m | < 8.0 | < 2 | < 0.2 | < 1.5 | < 0.3 |

Product FDA Status

1. 1,4-CYCLOHEXANEDIMETHANOL DIBENZOATE

| Title | 21- Food And Drugs |
|-------------|--|
| Chapter | I - Food And Drug Administration Department Of Health And Human Services |
| Sub Chapter | B - Food For Human Consumption (Continued) |
| Part | 175 - Indirect Food Additives: Adhesives And Components Of Coatings |
| Sub Part | B - Substances For Use Only As Components Of Adhesives |
| Section | 175.105 Adhesives. |

2. GLYCEROL TRIBENZOATE

| Title | 21- Food And Drugs |
|-------------|---|
| Chapter | I - Food And Drug Administration, Department Of Health And Human Services |
| Sub Chapter | B - Food For Human Consumption |
| Part | 175 - Indirect Food Additives: Adhesives And Components Of Coatings |
| Sub Part | B - Substances for Use Only as Components of Adhesives |
| Section | 175.105 Adhesives. |

| Title | 21- Food And Drugs |
|-------------|---|
| Chapter | I - Food And Drug Administration, Department Of Health And Human Services |
| Sub Chapter | B - Food For Human Consumption |
| Part | 176 - Indirect Food Additives: Paper And Paperboard Components |
| Sub Part | B - Substances For Use Only As Components Of Paper And Paperboard |
| Section | 176.180 Components Of Paper And Paperboard In Contact With Dry Food. |

3. NEOPENTYL GLYCOL DIBENZOATE

| Title | 21- Food And Drugs |
|-------------|--|
| Chapter | I - Food And Drug Administration, Department Of Health And Human Services (Continued) |
| Sub Chapter | B - Food For Human Consumption (Continued) |
| Part | 177 - Indirect Food Additives: Adhesives And Components Of Coatings |
| Sub Part | B - Substances For Use Only As Components Of Adhesives |
| Section | 175.105 Adhesives. |

| Title | 21- Food And Drugs |
|-------------|---|
| Chapter | I - Food And Drug Administration, Department Of Health And Human Services |
| Sub Chapter | B - Food For Human Consumption (Continued) |
| Part | PART 175 - Indirect Food Additives: Adhesives And Components Of Coatings |
| Sub Part | B - Substances For Use Only As Components Of Adhesives |
| Section | 175.105 Adhesives. |

4. PENTAERYTHRITOL TETRABENZOATE

| Title | 21- Food And Drugs |
|-------------|--|
| Chapter | I-Food And Drug Administration, Department Of Health And Human Services (Continued) |
| Sub Chapter | B-Food For Human Consumption (Continued) |
| Part | 175-Indirect Food Additives: Adhesives And Components Of Coatings |
| Sub Part | B-Substances For Use Only As Components Of Adhesives |
| Section | 175.105 Adhesives. |

5. SUCROSE BENZOATE

| Title | 21- Food And Drugs |
|-------------|--|
| Chapter | I - Food And Drug Administration Department Of Health And Human Services |
| Sub Chapter | B - Food For Human Consumption (Continued) |
| Part | 175 - Indirect Food Additives: Adhesives And Components Of Coatings |
| Sub Part | B - Substances For Use Only As Components Of Adhesives |
| Section | 175.105 Adhesives. |

Some Known Formulations

3M(TM) SCOTCH-WELD(TM) HOT MELT SPRAY ADHESIVE 611

| Ingredient | % Composition |
|---------------------------------------|---------------|
| 1,4-Cyclohexanedimethanol Dibenzoate | 7-13 |
| Propylene-Ethylene-Butene-1 Copolymer | 45-55 |
| Hydrocarbon Resin | 15-30 |
| Ethylene-Propene Copolymer | 7-13 |

PVA ADHESIVE & SEALER

| Ingredient | % Composition |
|--------------------------------------|---------------|
| 1,4-Cyclohexanedimethanol Dibenzoate | 30 – 40 |
| Poly(Vinyl Alcohol) | 1-10 |

TECHNOMELT PUR 7997 KNOWN AS PURMELT QR 7997

| Ingredient | % Composition |
|---------------------------------|---------------|
| Methylene Bis(Phenylisocyanate) | 1 – 5 |
| Glycerol Tribenzoate | 5 – 10 |
| Diphenylmethane Diisocyanate | 0.1 - 1 |

275 CORE LF

| Ingredient | % Composition |
|--|---------------|
| Tin | 0-100 |
| Antimony | 0-100 |
| Copper | 0-100 |
| Silver | 0-100 |
| Bismuth | 0-100 |
| Zinc | 0-100 |
| Denatured Acid Hydrogenation Gum Resin | ≤ 2.5 |
| Modified Rosin | ≤ 2.5 |
| Pentaerythritol Tetrabenzoate | ≤ 2.5 |

LOCTITE NC-AB WICK known as NCAB SOLDER WICK FT ECONO SPOOL

| Ingredient | % Composition |
|--|---------------|
| Copper | 90 – 100 |
| 1,3-Propanediol, 2,2- Bis[(Benzoyloxy)Methyl]-, Dibenzoate | 1 – 5 |
| Pentaerythritol Tetrabenzoate | 1 – 5 |

RAPIDRY TOP COAT

| Ingredient | % Composition |
|----------------------------|---------------|
| Ethyl Acetate | ≤ 30.0 |
| Isopropyl Alcohol | ≤ 25.0 |
| Cellulose Acetate Butyrate | ≤ 15.0 |
| Butyl Acetate | ≤ 10.0 |
| Propyl Acetate | ≤ 15.0 |
| Heptane | ≤ 5.0 |
| Sucrose Benzoate | ≤ 5.0 |
| Triphenyl Phosphate | ≤ 5.0 |
| Nitrocellulose | ≤ 5.0 |
| Dibutyl Phthalate | ≤ 1.0 |
| Camphor | ≤ 1.0 |

B101-G826 BLACK GLOSS JET SPRAY

| Ingredient | % Composition |
|------------------------------------|---------------|
| Ethyl Acetate | 21-30 |
| N-Butyl Acetate | 11-20 |
| Acetone | 11-20 |
| Propane | 11-20 |
| Isobutane | 1-10 |
| Toluene | 1-10 |
| Isopropanol | 1-10 |
| Cellulose Nitrate, Cellulose Ester | 1-10 |
| Sucrose Benzoate | 1-10 |
| Rosin Ester | 1-10 |
| Isobutyl Isobutyrate | 1-10 |
| Diisononyl Phthalate | 1-10 |
| Carbon Black | <1 |
| O-Xylene | <1 |



Trigon Chemicals Pvt.Ltd.



Polymer Add Pte.Ltd.



Polymer Add Pvt.Ltd.



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