Technical data of sheets of APP

Characterization

Crystalline phase Ii ammonium polyphosphate is a kind of environment protection nonhalogen flame-retardant cotaining N and P. It has high polymerization degree good heat-stability and small hydroscopicity.

Chemical name

APP (Crystalline phase II Ammonium Polyphosphate)

CAS number 68333-79-9

Applications

Crystalling phase II ammonium polyphosphate has a wide range of use. It is suitable for plastic (PP, PE, PVC etc.), polyester, rubber, various advanced expansion fire-retardant paint.

Features/benefits It is a kind of high efficiency environment protection inorganic flame-retardant.

Product forms APP

Appearance: White powder

Spcification

APPEARANCE :	White powder
P_2O_5%(W/W) :.	72-73
N%(W/W):	14-15
Solubility g/100ml H_2O, 25℃	<0.8
PH(10%aqueous suspension)	5-7
Water%(W/W)	<0.25
Particles>50um %(W/W)	<1

Physical Properties

Decomposition temperature ℃	>270
Density at 25℃ g/cm^3	approx 1.9

Handling & Safety

1. Not a hazardous substance; can be shipped as regular product.
2. Store in dry place.

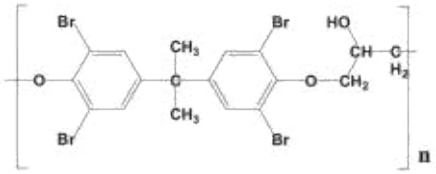
Technical data of sheets of BEO

Characterization BEP is a high molecular weight brominated epoxy polymeric flame retardant designed for a broad range of thermoplastic applications.

Chemical name Brominated epoxy oligomers

CAS number 68928-70-1

Structure BEO



Molecular weight 4000,10000,20000

Applications

BEP is recommended for thermoplastic polyesters (PBT, PET), thermoplastic polyurethanes (TPU), alloys (e.g. PC/ABS), styrenics (ABS, HIPS) and others.

Features/benefits Brominated epoxy oligomer has famous fusion rate, good fire-reardant efficiency, excellent heat stability and UV stability. It also can bring the materials nicer physical-nechanical property.

Product forms BEO

Appearance: White or light yellow powder

Technical data of sheets of BPS

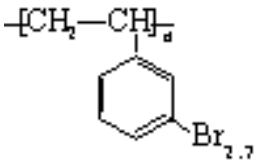
Characterization Brominated Polystyrene is a kind of high molecule flame retardants. It is an ideal substitute of SLFR-1.

Chemical name

Brominated Polystyrene

CAS number 57137-10-7

Structure BPS



Molecular weight

Applications

It is particularly suitable for engineering plastic applications such as polyester(PET,PBT,PCT) and polyamindes(nylons). These compounds meet the specific performance requirements for applications such as computers and TV sets, wire and cable insulation, furniture, carpets and wall coverings, and insulation and construction material.

Features/benefits Since polyatyrene is a kind of engineering plastic, which determines brominated polystyrene has excellent compatibility with other engineering plastics, also it has lowest effect on the mechanical property and can keep more than 90% mechanical properties of the materials

Product forms BPS

Appearance: Grey powder

Specification

APPEARANCE : grey powder
Content of bromine :.66-68%

Physical Properties

Melting point *260-320℃.*

Intenerating point 210-250℃

Technical data of sheets of DBDE

Characterization

DBDE is our new-developed new-type additive fire retardant of bromine series.It has very good thermal stability,high bromine content and is hardly soluble in all solvents.

Chemical name

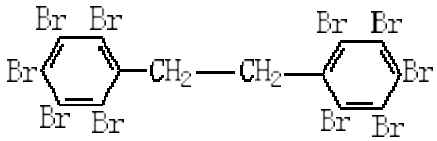
Decabromodiphenyl ethane

CAS number

84852-53-9

Structure

DBDE



Molecular weight

971.27.

Applications

This product is a new high efficiency,environment fridendly flame retardent developed by our company and Beijing Institute of Technology. The product has properties of high bromine content, excellent thermal stability, low toxicity and UV-resistance. It is used in high-impact polystyrene, engineering plastics,wires and cables,insulator,elastomer and thermoset plastics etc.

Features/benefits

DBDE has very good thermal stability,high bromine content and it exhibites good UV resistance.It has a lower transudation as compared to other fire retardant of bromine series,so it is especially suitable for slap-up materials used to produce computer, electrograph,telephone,manifdder, household electrical appliances etc.

Product forms DBDE

Appearance: White powder

Specification

APPEARANCE :	White powder
Total bromine content :.	81.5% max
Moisture:	0.1% max
Free bromide:	20 ppm max

Physical Properties

Whiteness	83 min
Melting point ℃	345

Handling & Safety

Handle with care,keep air-tight and dry.

Technical data of sheets of DBE

Characterization

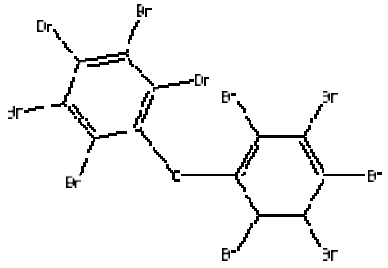
It is flame retardant additive with high bromine content. Perfect effectiveness of flame retardant & fine thermal stability.

Chemical name

Decabromodiphenyl Oxide

CAS number 1163-19-5

Structure DBE



Molecular weight 959.17

Applications

Decabromodiphenyl Oxide, belongs to a family of polybrominated flame retardant, is used polyolefins, styrenics, polyamides and thermoplastic polyester resins. Its end applications include elastomers, wire & cable, textile coatings, electrical & electronic equipments, automotive parts, construction materials, textile backcoatings and textile blends.

Product forms DBE

Appearance: White powder

Specification

APPEARANCE :	White powder
Bromine content % :.	82~83 min
Moisture %:	0.01max
Free bromine ppm	20 max
Particle size	5 max

Physical Properties

Witeness 85 min

Melting point ℃ *345*
Density 3.2

Technical data of sheets of IPPP

Characterization

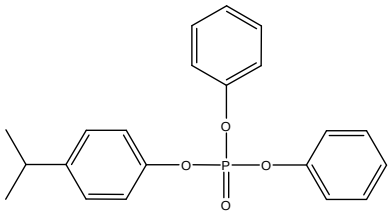
IPPP is a good plasticizer and antiflammable agent and it has lower fracture temperature and lower volatility than TCP.

Chemical name

Isopropyl phenyl diphenyl phosphate

CAS number 28168-99-8

Structure IPPP



Molecular weight 368

Product forms IPPP
Appearance: Colorless transparence liquid

Specification

APPEARANCE : Colorless transparence liquid
Moisture content :. 0.10% max
Acidity (mgKOH/mg): 0.10
nChroma (APHA): Below 75
Phosphor content: 8.2%-8.5%

Physical Properties

Density: 1.168-1.178
Viscosity: 50

Technical data of sheets of OBE

Characterization

This product is a high effective fire retardant with both aromatic bromine and aliphatic bromine .It has excellent heat and light stability .Because of its suitable melting point.it can firstly be melted to be uniform dispersion under nonmal temperature for plastic processing and can be easier to melt ang mix with plastic without the phenomenon of substance stratified and separated out.

Chemical name

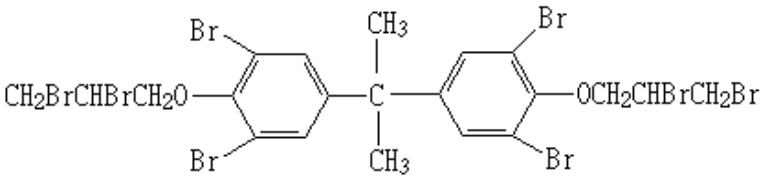
2,2-Bis[4-(2.3-dibromopropoxy)-3,5-dibromophenyl]propane

CAS number

21850-44-2

Structure

OBE



Molecular weight

943.62

Applications

It is additive in PP, PE, ABS, PVC and other resins as flame retardant, especially suitable PP. It has extreme heat and light stability.

Features/benefits

Decabromodipheny ether or pentabromotoluene fire retardant with high melt point can be added into other plastics,such as PE ,ABS and PS ,to be the carrier or disintegrating agent for other high melt point fire retardant and stibium oxide.

Product forms

OBE
Appearance: White powder

Guidelines for use

The effect is quite clear when it is used in PP plastic(generally,adding3-8% fire retardant and 1.5% antimony trioxide into PP plastic can made the product meet the stipulations of UL94-VOstandard.And it is the best fire retardant for PP plastic).

Specification

APPEARANCE :	White powder
Bromine content :.	67% min
Volatility:	0.5% max
Acetone insoluble matter	0.06% max
Content	92-94%
Colority APHA	50 max

Physical Properties

Melting degree	105-115℃
Heat resolve temperature	>240 °C

Handling & Safety

Avoid prolonged or repeated skin contact. Avoid inhalation of dust or contact with eyes. Protective gloves, chemical safety goggles and NIOSH-approved dust respirators should be worn where there is a chance of exposure. Wash hands after handling. Smoking and eating should be avoided when handling the product. Under the CERCLA/RCRA regulations currently in effect, this product is not regulated as a hazardous waste or material. Normal handling and disposal procedures in accordance with good industrial practice and any applicable state or local regulations are recommended. Complete material safety data and a summary of toxicological evaluations are available on request.

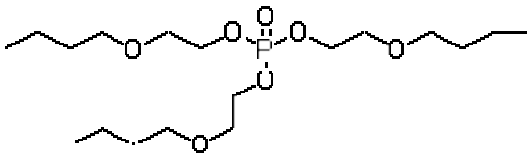
Technical data of sheets of TBEP

Characterization TBEP is a non-halogen phosphorus-containing flame retardant plasticizer with goad low-temperature properties.

Chemical name Tris(2-butoxyethyl) phosphate

CAS number 78-51-3

Structure TBEP



Molecular weight 398.47

Applications

TBEP is mainly used for rubbers, celluloses and resins as flame retardant plasticizer and processing aids. It's recommended for acrylonitrile rubber, cellulose acetate epoxy, ethyl cellulose, polyvinyl acetate, and casting grade thermoplastic urethanes. TBEP can also be used as anti-foaming agents in paper coatings, inks, textiles, detergents and paints.

Features/benefits The product is used as the flame retardant agent for polyurethane, cellulose, polyethylene alcohol etc. formed hard plastics. It is characterized by low temperature.

Product forms TBEP
Appearance: Colorless or light-yellow transparent liquid

Specification

APPEARANCE : Colorless or light-yellow transparent liquid
Acid Value(mgKOH/g) :. 0.1max
Color Index(APHA PT-CO): 50max
Viscosity(20°C): 12 mPas
Water Content %: 0.2% max

Physical Properties

Refractive Index(25°C)	1.432-1.437
Flash Point °C	224
Boiling Point °C	222
Density(20/20°C)	1.017-1.023

Technical data of sheets of TBP

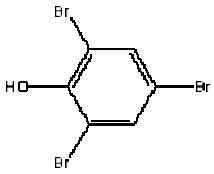
Characterization Flame-retardant reactive and additive with good thermal stability.

Chemical name

2,4,6-Tribromophenol

CAS number 118-79-6

Structure TBP



Molecular weight 330.80

Applications

Tribromophenol is a reactive flame retardant with a high content of aromatic bromine, used mainly as an intermediate for high molecular weight flame retardants, including end-capping of brominated epoxies. It is also an effective fungicide and wood preservative.

Features/benefits

Product forms TBE

Appearance: White powder

Specification

APPEARANCE : White powder
Bromine Content:. 71.8% min
Weight Loss: 0.5% max

Physical Properties

Melting Point 92°C

Handling & Safety

TBP is stable in storage over long periods of time. Store in a dry, cool, ventilated area, away from light.

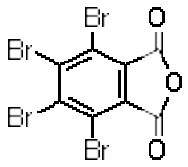
Technical data of sheets of TBPA

Chemical name

3,4,5,6-tetrabromophthalic anhydride

CAS number 632-79-1

Structure TBPA



Molecular weight 463.70

Applications

Features/benefits

Product forms *TBPA*

Appearance: White or grey powder

Guidelines for use

Specification

APPEARANCE : White or grey powder
Bromo content : 67%
Moisture content: 0.2%

Physical Properties

Melting point 270 min

Handling & Safety

Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing.

Avoid ingestion and inhalation. Store in a cool, dry place. Keep container closed when not in use.

Technical data of sheets of TCEP

Characterization

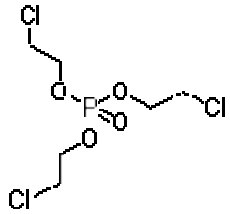
TCEP, the chemical name tris(β-chloroethyl) phosphate ,is Flame Retardant consisting chlorine and phosphorous. Can not dissolve in water, dissolve in most organic solvent, and have good compatibility with resins.

Chemical name

Tris(2-chloroethyl)phosphate

CAS number 115-96-8

Structure TCEP



Molecular weight 285.49

Applications

it is a fireproof plasticizer with excellent fireproof effect, low-temperature feature and ultraviolet light stability, mainly used in matters in which cellulose nitrate and cellulose acetate as substrate, fireproof paint and plastic. It is also used as fire retardant in polyester, acrylic resin and polyurethane.

Features/benefits

Applying as Flame Retardant in the production of acetate fiber, polyvinyl-chloride, PU foams, EVA, phenolics materials. Except the flame retarding, it can also promote the moisture resisting, low temperature resisting, the capability of antistatic and the softness of the materials.

Product forms *TCEP*

Appearance: light yellow liquid

Specification

Appearance :	light yellow liquid
The content of phosphorus :.	9.4% min
The content of chlorine :	32.4% min
Acidity:	0.1% max

Physical Properties

Boiling point	>200℃
Density	*1.294*

Handling & Safety

Avoid breathing vapor or mist. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Keep container closed to prevent absorbing moisture. Use with adequate ventilation. Wash thoroughly with soap after handling.

Technical data of sheets of TCP

Characterization

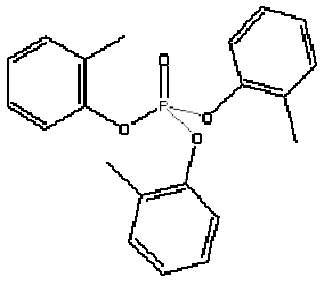
it is a fireproof plasticizer with excellent hydrolysis stability, oil resistance, electric insulativity and high fungus resistance.

Chemical name

Tricresyl phosphate

CAS number 1330-78-5

Structure TCP



Molecular weight 368.37

Applications

Tricresyl Phosphate is used as a plasticizer for PVC, rubber and plastics. It is used as an ingredient for flame-retardant in plastics, rubbers and in hydraulic systems. It is used as a heat exchange media. It is used a solvent and thinner for nitrocellulose, paints and varnishes. It is also used as an additive in high-pressure cooling lubricants. It is used as a lead scavenger in gasoline.

Features/benefits TCP is a durable antiflamming plasticizer for PVC product standing high mechanical stress. Its low temperature properties are worse than DOP plasticizer.

Product forms TCP

Appearance: clear to pale yellow oily liquid

Guidelines for use

It is mainly used as plasticizer and fire retardant in PVC, polyethylene, artificial leather, film, sheet material, plate material, conveying belt, floor material, wire&cable, synthetic resin, plastic, rubber and cellulose, to improve the products' processibility, anti-pollution, mildew resistance and abrasion resistance; also used as gasoline ignition controlling agent, lubricating grease extreme-pressure antiwear agent and to synthesize incombustible hydraulic oil additive.

Specification

APPEARANCE : clear to pale yellow oily liquid
Shade(APHA) ≤ :. 80
Acid Value(mgKOH/g) ≤: 0.1
Relative Density(20°C): 1.160-1.180
Free Phenol % ≤: 0.1

Physical Properties

Melting point	*-33℃*
Density	1.247
Flash point	410
viscosity:	78-85

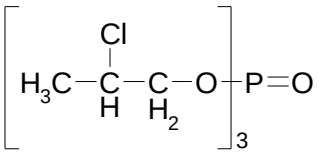
Technical data of sheets of TCPP

Characterization Tris (1-chloro-2-propyl phosphate (TCPP) has low volatility at ambient temperature and pressure and is produced in a closed system, therefore, exposure to the environment is expected to be minimal. In addition, exposure to the environment during the processing of the chemical as a flame retardant in rigid and flexible foam is also expected to be minimal. TCPP is harmful to aquatic organisms.

Chemical name Tris(1-chloro-2-propyl)phosphate

CAS number 13674-84-5

Structure TCPP



Molecular weight 327.56

Applications

Foam in strips or blocks. It has important properties that can prevent acidic residue from dissociating in water or under damp condition.

Features/benefits

TCPP is a low cost chlorine/phosphorus based flame retardant.It has the best hydrolysis stability among currently available halogenated organic phosphates.

Product forms TCPP

Appearance: clear liquid

Guidelines for use

Specification

APPEARANCE :	clear or light yellow liquid
Acidity :.	0.1% max
Moisture:	0.1% max
The content of chloride:	32.5%

Physical Properties

Reflactive ratio	*1.462-1.465*
Viscosity	64-70
Specific Gravity	1.28-1.30

Handling & Safety Contact with eyes-wash eyes with ample amount of water for at least 15 minutes. Contact with skin-wash with cold water or using soap Ventilation-suitable amount of ventilation needed.

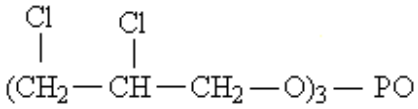
Technical data of sheets of TDCP

Characterization TDCP, the chemical name tris(2,3-dichloropropyl)phosphate ,is Flame Retardant consisting chlorine and phosphorous.

Chemical name tris(2,3-dichloropropyl) phosphate

CAS number 78-43-3

Structure TDCP



Molecular weight 431

Applications

The product, an additive type flame retardant with apparent flame retarding effect, is widely used in PVC resin, polyurethane foamed plastic, epoxy resin, phenolic resin and fibers of all types.

Features/benefits

A low cost flame retartant with good stability, TDCP is widely used in the production of foam in strips or blocks. It has important properties that can prevent acidic residue from dissociating in water or under damp condition.

Product forms TDCP

Appearance: Pale Yellow Transparent Liquid

Guidelines for use

Specification

APPEARANCE : Pale Yellow Transparent Liquid
Phosphorous Content: ≥7.2wt%

Chlorine Content: ≥49wt%
Acid value (mgKOH/g)<0.3%

Physical Properties

Boiling point≥200℃(4mmHg)

Decomposition point≥230℃

Density: 1.513g/cc(20℃)

Technical data of sheets of TDCPP

Characterization

Colorless or yellowish viscous liquid, additive-type flame retardant containing phosphorus and chlorine, mutually soluble with most organic polymers, high stability to water and alkali, difficult to volatilize.

Chemical name

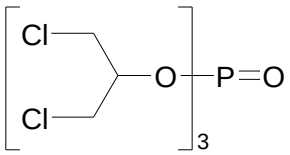
Tri(2,3-dichloropropyl) phosphate

CAS number

13674-87-8

Structure

TDCPP



Molecular weight 430.76

Applications

TDCPP is a low viscous and low acidic flame retardant additive used in flexible and rigid polyurethane and Polyisocyanurate foam, unsaturated polyester resins, pvc, adhesives, elastomers, cellulose acetate, nitrocellulose, epoxy resins and others.

Features/benefits

TDCPP can impove other performances of product, such as water proof, element resistance, antistatic performance, soft feeling, dosage is 15-10% for soft or hard foam polyurethane, 10% in pvc, self extinguishing in 1 seconds, 5% for polyester fiber.

Product forms TDCPP

Appearance: colorless or light yellow transparent liquid

Specification

APPEARANCE : colorless or light yellow transparent liquid
Acidity(mgKOH/g):. 0.10 max
Moisture(w/w),%: 0.20% max

Physical Properties

Specific gravity 1.50±0.01
Conversion rate(n20D) 1.498±0.03
Viscosity(25°C, centipoise) 400-8003

Technical data of sheets of Triethyl Phosphate

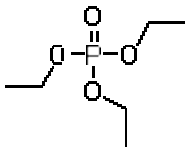
Characterization

Chemical reagent, for catalyst made by acetic oxide, cellulose acetate ce- unlose nitrate solvent, synthetic resin plasticizer, organic insect stabilizer, ethylation agent, chemical synthetic intermediate lubricating oil additive.

Chemical name Triethyl phosphate

CAS number 78-40-0

Structure **Triethyl Phosphate**



Molecular weight 182.15

Application

Used as fire-retardant, strength agent of rubber and plastic and the material of pesticides, aging and steady agent of resin.

Features/benefits

Product forms TEP

Appearance: clear liquid

Specification

Content : 99.5% min
Acidity:. 0.5% max
Moisture: 0.2%max

Physical Properties

Density	*1.069-1.072*
Refractive Ratio	*1.405-1.406*

Technical data of sheets of TIPP

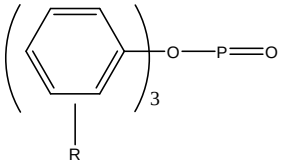
Characterization

TIPP is a low viscosity synthetic isopropylated triaryl phosphate ester that finds utility in a wide variety of applications as a flame-retardant plasticizer.

Chemical name Isopropylphenyl Diphenyl Phosphatel

CAS number 68937-41-7

Structure TIPP



R = isopropyl

Molecular weight 452.52

Applications

TIPP is widely applied in rubber and PVC plastic flame retarding conveying belt. Furthermore TIPP is applicable to such flam retarding products as leather, tent cloth, agriculture floor membrane, floor material, cable and wine.

Product forms TIPP

Appearance: Clear liquid

Guidelines for use

TIPP is recommended for use in plastisols for fabric coating and other applications where is low, stable viscosity offers improved processing. **Reofos 35** can give a drier finish to coated fabrics that other standard triaryl phosphate esters.

Reofos 35 has a high plasticizing efficiency that enable formulators to achieve better flame retardance at lower cost. **Reofos 35** is also designed for use as a flame retardant in phenolic laminates.

Specification

APPEARANCE : colourless or light yellow oil
Acidity: 0.25% max
Phosphate content: 8.5%

Physical Properties

Boiling Point :. 220-265℃

Flash Point: >225℃

Density 1.165-1.185

Handling & Safety

The use of proper protective equipment is recommended. Excess exposure to the product should be avoided. Wash thoroughly after handling. Store the product in a cool, dry, wellventilated area away from incompatible materials. Unless stated, proper storage will permit usage of the product for 6 to 12 months from the date of receipt. For additional handling and toxicological information, consult the GLCC Material Safety Data Sheet.

Technical data of sheets of TMP

Characterization

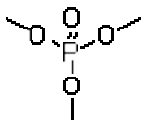
Trimethylphosphate is an alkylating agent which has been used as gasoline additive, a methylating agent, an intermediate for the production of polymethyl phosphates, and a flame retardant in polymers.

Chemical name

Trimethyl phosphate

CAS number 512-56-1

Structure TMP



Molecular weight 140.07

Applications

Trimethyl Phosphate is a methylating agent for nitrogen heterocyclic compounds. It is used as a color inhibitor for fibers (e.g.polyester) and other polymers. This compound is used as a solvent for aromatic halogenations and nitrations and for pesiticides and pharmaceuticals. It is used as a gasoline additive.

Product forms *TMP*
Appearance: colorless liquid

Specification

APPEARANCE :	colorless liquid
Moisture content :.	0.15 max
Chloride:	Non-turbid
Acidity:	0.2 max

Physical Properties

Boiling point ℃	197
Density	1.197
Convertion rate	90% max

Handling & Safety

Technical data of sheets of TPP

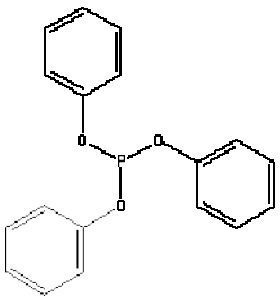
Characterization Flame retardant and plasticizer for nitrocellulose, triacetin film, PU foam, engineered plastics, natural/synthetic rubbers and coatings. High efficiency, low volatility, excellent transparency, softness and mechanical property.

Chemical name

Triphenyl phosphite

CAS number 101-02-0

Structure TPP



Molecular weight 310.28

Applications

TPP can be used as fireproof plasticizer in cellulose resin, vinyl resin, natural and synthetic rubber, with low volatility, high fireproof effect, excellent retention rate of mechanical property, transparency, softness and obdurability; used as plasticizer and fireproof additive in cellulose nitrate, a wide variety of coatings, the thin ester and soft sheet of glycerol triacetate, hard polyurethane foamed plastic, engineering plastics, etc.

Features/benefits it is useful for plastic, which is of cellulose ester radical, and it is insoluble in gas, nonflammable and it has good light stability

Product forms TPP

Appearance: White crystalline

Specification

APPEARANCE :	White crystalline
Purity :.	99.0% min
Color (APHA) :	60max
Acidity (mgKOH/g):	0.1 max
Solidifying point:	47℃
Free phenol:	0.1% max
Relative density (50℃) :	1.185-1.202

Physical Properties

Melting point	*22-24℃*
Flashpoint	218 °C
Density (20 °C)	1.184
Boiling point	360℃