PRODUCT Information
Specialty Rubber Chemicals

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KUMANOX 13 (6PPD)

- **Chemical Name**: N-(3-Dimethylbutyl)-N’-phenyl-p-phenylenediamine
- **CAS NO.**: 793-24-8
- **Molecular Weight**: 268
- **Appearance**: light amber transparent
- **Form**: 70% powder on silica gel
- **Solubility**: >96% soluble in acetone, ethanol, gasoline, methylene chloride.
- **Refractive Index (nD)**: 1.518 ~ 1.526 at 25°C
- **Color (APHA)**: < 100 at 25°C
- **Viscosity (cps)**: 2,000 ~ 6,000 at 25°C
- **Heat Loss (%) max.**: 0.2 at 70°C, 2 hrs.
- **Shading**: Severe
- **Vapor Pressure**: < 0.01% soluble in water.
- **Solubility**: Soluble in toluene, acetone, ethanol, methylene chloride, ethyl acetate.
- **Insoluble in water.
- **Storage**: Store in cool, dry, well-ventilated conditions, and avoiding exposure of the packed product to direct sunlight.
- **Double stacking of palletized material and/or exceeding 35°C can result in unusual compaction of product.
- **Liquid**: Store under nitrogen condition to maximum 80°C (preferred 60~70°C).
- **Packaging**: Liquid: Bulk, Drum (200kg), Paste: Paper bag (25kg), FIBC big bag (500kg, 1,000kg)

KUMANOX 3C (IPPD)

- **Chemical Name**: N-isopropyl-N’-phenyl-p-phenylenediamine
- **CAS NO.**: 793-24-8
- **Molecular Weight**: 226
- **Appearance**: brownish pastille
- **Form**: viscous liquid
- **Viscosity (cps)**: 30 ~ 80 at 25°C
- **Refractive Index (nD)**: 1.518 ~ 1.526 at 25°C
- **Color (APHA)**: < 100 at 25°C
- **Viscosity (cps)**: 2,000 ~ 6,000 at 25°C
- **Heat Loss (%) max.**: 1.0 at 70°C
- **Shading**: None
- **Vapor Pressure**: < 0.01% soluble in water.
- **Solubility**: Soluble in toluene, acetone, ethanol, methylene chloride, ethyl acetate.
- **Insoluble in water.
- **Storage**: Store in cool, dry, well-ventilated conditions, and avoiding exposure of the packed product to direct sunlight.
- **Double stacking of palletized material and/or exceeding 35°C can result in unusual compaction of product.
- **Liquid**: Store under nitrogen condition to maximum 80°C (preferred 60~70°C).
- **Packaging**: Liquid: Bulk, Drum (200kg), Paste: Paper bag (25kg, 250g), FIBC big bag (500kg, 1,000kg)

KUMANOX SP/SP-N

- **Chemical Name**: Styrenated phenol
- **CAS NO.**: 61788-44-1
- **Molecular Weight**: ca. 320
- **Appearance**: light yellow Liquid (solid under room temp)
- **Viscosity (cps)**: Clear solution at 25°C: > 100 at 22°C ~ 5°C
- **Refractive Index (nD)**: 1.518 ~ 1.526 at 25°C
- **Heat Loss (%) max.**: 5.0 max. 5.0
- **Shading**: None
- **Vapor Pressure**: < 0.01% soluble in water.
- **Solubility**: Soluble in toluene, acetone, ethanol, methanol, chloroform, toluene, or n-hexane.
- **Insoluble in water.
- **Storage**: Store in cool, dry, well-ventilated conditions, and avoiding exposure of the packed product to direct sunlight.
- **Packaging**: SP: Drum (200kg), SP-N: Paper bag (25kg)

KUMANOX 3020

- **Chemical Name**: 4,6-bis(phenylmethyl)-3-methylsulfanyloxybenzene
- **CAS NO.**: 110953-27-0
- **Molecular Weight**: 425
- **Appearance**: Light yellow Liquid (solid under room temp)
- **Viscosity (cps)**: Clear solution at 25°C: > 100 at 22°C ~ 5°C
- **Refractive Index (nD)**: 1.518 ~ 1.526 at 25°C
- **Vapor Pressure**: < 0.01% soluble in water.
- **Solubility**: Soluble in toluene, acetone, ethanol, methanol, chloroform, toluene, or n-hexane.
- **Insoluble in water.
- **Storage**: Store in cool, dry, well-ventilated conditions, and avoiding exposure of the packed product to direct sunlight.
- **Packaging**: Drum (180kg), Bulk
**KUMANOX 3020E**

**Formula**

![Chemical Name](Image)

- **Molecular Weight**: 425
- **CAS NO.**: 110553-27-0

**Product Properties**

- **Appearance**: Pale yellowish, viscous liquid-sold
d
- **Clarity of solution**: Clear solution at 25°C ± 5°C
- **Viscosity (cP)**: 60 ~ 100 at 25°C ± 5°C
- **Specific gravity**: 0.960 ~ 0.995 at 25°C ± 5°C

**Characteristics and Applications**

- **Non-staining, non-discoloring, low in volatility, stable to light and heat.**
- **Easy to use, store, and handle.**
- **Ideal for the protection of light coloured, non-staining goods.**
- **Non-discoloring and non-pinking.**

**How to use**

- Disperse in aqueous solution directly.

**Packaging**

- Drum (200kg), Bulk

**Storage**

- Store in cool, dry, well ventilated conditions, and avoiding exposure of the packed product to direct sunlight and/or air.

**Packaging**

- Paper bag (20kg)
- FIBC big bag (500kg, 1,000kg)

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**KUMANOX 5010L**

**Formula**

![Chemical Name](Image)

- **Molecular Weight**: 650(Mn)
- **CAS NO.**: 108616-51-5

**Product Properties**

- **Class**: Creosol Derivatives
- **Heat loss (%)**: max. 0.2 at 105 ± 5°C, 2hrs.
- **Ash (%)**: max. 0.1
- **Melting point (Initial, °C)**: 105.0
- **Specific gravity**: 1.0 ~ 1.15

**Characteristics and Applications**

- **A highly effective polyphenolic additive with high activity and very low volatility.**
- **Non-dissolving and non-pinking.**
- **Ideally suited for the protection of light coloured, non-staining goods derived from natural rubber and latex, SBR and carboxylated SBR latex, ABS, NBR, BR, SBS and SIS in applications where the retention of appearance and elastic properties during storage and use are important requirements.**
- **Used in-process stabilization of polymers as well as in manufacturing of gaskets, liners, parts, housing, etc., electronic appliance housings, and paper coatings.**
- **The level of addition of KUMANOX 5010L is 0.3 ~ 1.5 phr.**
- **Solubility**: Soluble in acetone, toluene. Insoluble in water.

**Storage**

- Store in cool, dry, well ventilated conditions, and avoiding exposure of the packed product to direct sunlight.

**Packaging**

- Paper bag (50kg)

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**KUMAC D (DPG)**

**Formula**

![Chemical Name](Image)

- **Molecular Weight**: 211
- **CAS NO.**: 102-06-7

**Product Properties**

- **Class**: Guanidines
- **Appearance**: White to off white pellet
- **Melting point**: (Init., °C) max. 144.0
- **Heat loss (%)**: max. 0.3 at 105 5°C, 2hrs.
- **Ash (%)**: max. 0.3
- **Vulcanization accelerating power**: Medium
- **Staining**: None

**Characteristics and Applications**

- **Used for NR, SBR, IR, BR, CI, NBR and polymer latex.**
- A representative basic vulcanization accelerator.
- Used together with other acidic accelerators, with a critical temperature at around 140°C.
- Can be widely activated by thiazole or thioether acclerators to display excellent effects on dark or black colored products.
- Unsuitable for the production of footstuffs because of its imparting a slightly bitter taste.
- Acts, in some cases, as a plasticizer for CI.
- Provides good dispersion characteristics despite of its high melting point, and providing a high degree of crosslinking and reversion resistance.
- In latex application KUMAC D can be used as a secondary gelling agent, (foam stabilizer).
- The level of KUMAC D is 0.4 ~ 1.5 with additional accelerator such as 1.0 phr of thiazole or 1.0 of sulfenamide (KUMAC NS).
- Main uses: Tires, Rubber shoes, rigid rubber products and goods for industrial uses.
- Not cause blooming but may cause a brownish discoloration when exposed to light at high level, 1 ~ 2 phr.

**Solubility**

- Soluble in benzene, chloroform and alcohol.
- Hardly soluble in water.
- Insoluble in gasoline.

**Storage**

- Store in cool, dry, well ventilated conditions and avoiding exposure of the packed product to direct sunlight and high humidity and/or high temperature conditions.

**Packaging**

- Paper bag (200kg)
### KUMAC NS (TBBS)

**Formula**

![Chemical Name](N-tert-butyl-2-benzothiazole-sulfenamide)

**Molecular Weight**: 238

**CAS NO.**: 95-31-8

**Product Properties**
- **Class**: Thiazole derivatives
- **Appearance**: White to off-white pellet
- **Melting point (Final, ℃)**: min. 106.0~112.0
- **Heat loss (%) at 75 ± 5 ℃, 2hrs**: max. 0.5
- **Ash (%)**: max. 0.5
- **Assay (%)**: min. 97.0
- **Vulcanization accelerating power**: High

**Characteristics and Applications**
- Primary accelerator with fast cure and good safety, and yielding higher modulus.
- Generally used alone or in combination with secondary accelerator for NR, IR, BR, SBR, NBR and EPDM.
- Does not form carcinogenic N-nitrosamines.
- May cause a slight yellowing in white or light compounds when exposed to light, but it is non-staining and non-discoloring.
- Based cure system can be boosted by thiurams, dithiocarbamates and guanidines.

**Solubility**
- Soluble in acetone, toluene, chloroform, methylene chloride, ethyl acetate and ethanol. Moderately soluble in n-hexane.
- Insoluble in water.

**Storage**
- Store in cool, dry, well-ventilated conditions, and avoiding exposure to direct sunlight and high humidity and/or high temperature conditions.

**Packaging**
- Paper bag (20kg, 25kg), RIBC big bag (400kg)

### KUMAC TS (TMTM)

**Formula**

![Chemical Name](Tetramethyl thiuram monosulfide)

**Molecular Weight**: 208

**CAS NO.**: 97-74-5

**Product Properties**
- **Class**: Thiurams
- **Appearance**: Yellowish pellet
- **Melting point (℃)**: min. 103.0
- **Heat loss (%) at 70 ± 5 ℃, 2hrs**: max. 0.3
- **Ash (%)**: max. 0.3
- **Vulcanization accelerating power**: Ultra
- **Staining**: None

**Characteristics and Applications**
- Used for NR, IR, BR, SBR, NBR, CR and EPDM.
- Acts as a secondary accelerator in combination with thiazoles, guanidines, sulfenamides.
- Has good processing safety, extremely curing activity.
- Acts as retarder of CR and as peptizer for the sulfur modified CR.
- Non-discoloring and non-staining of rubber articles and materials in contact with them.
- Main uses: Transparent and colored products, industrial parts, wires and cables, footwear and general air-vulcanized products.

**Solubility**
- Soluble in acetone, alcohol, benzene, chloroform and ethylene dichloride.
- Hardly soluble in gasoline.
- Insoluble in water.

**Storage**
- Store in cool, dry, well-ventilated conditions, and avoiding exposure to direct sunlight.
- Store away from oxidizing agents and bases.

**Packaging**
- Paper bag (25kg)

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### KUMISUL OT-20

**Formula**

![Chemical Name](Polymerized Sulfur with Oil)

**Molecular Weight**: Mixture

**CAS NO.**:
- Polymeric sulfur (9035-99-8)
- Sulfur (7704-34-8), naphthenic oil (Various)

**Product Properties**
- **Appearance**: Yellow Powder
- **Odor**: Slightly
- **Bulk Density (kg/m³)**: 600 - 700
- **Viscosity (mPa.s)**: Not Applicable
- **Specific gravity**: 1.2 (20°C)
- **Melting point (℃)**: 90 ~ 119
- **Auto ignition temperature (℃)**: > 330
- **Boiling point (℃)**: > 444.6
- **Vapor pressure (mBar)**: < 0.01 (20)

**Product Specifications**
- **Insoluble sulfur (on total S) (%)**: min. 95
- **Total sulfur content (%)**: 80.0 ± 1.0
- **Oil content (%)**: 20.0 ± 1.0
- **High thermal stability (on total S) (%)**: min. 75
- **Acidity (%)**: max. 0.05

**Characteristics and Applications**
- KUMISUL OT-20 is polymeric sulfur and is insoluble in elastomers.
- Non-blooming vulcanizing agent for radial tire and rubber.
- Able to retard bin scorch, prevent migration of sulfur.
- A metastable product which can revert to soluble sulfur if not stored under proper condition.
- Non-staining and non-discoloring.
- Widely used in the manufacture of the rubber chemistry such as shoes and tires.

**Solubility**
- Insoluble in water.
- Slightly soluble in Organic liquids.

**Storage**
- Store in cool, dry, well-ventilated conditions, and avoiding exposure to direct sunlight.
- Store away from oxidizing agents and bases.

**Packaging**
- Paper bag (25kg), Jumbo bag (500kg)
### KUMANOX 3110

**Formula**

![Chemical Structure](image)

- **Chemical Name**: Styrenated phenol
- **Molecular Weight**: 220 (average)
- **CAS NO.**: 61788-44-1

**Product Properties**

- Appearance: Slight yellow Viscous Liquid
- Color (G): < 1.5
- OH value: 230-260
- Water cont, %: < 0.2%
- Viscosity(cps) Max 300-600 at 25 ± 0.2°C

**Characteristics**

- Good Color
- Low Viscosity, Non Volatile Contents.
- High OH Value
- Non-Toxic
- Hi Performance: easy processing and application
- Excellent Solubility for most solvents

**Applications**

- Primers, Sealants, Epoxy glue, Plasticizer, etc.
- Surfactant Intermediate

**Storage**

- Store in cool, dry, well ventilated conditions and avoiding exposure of the packed product to direct sunlight.

**Packing**

- Drum (200kg)

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### KUMANOX 3111

**Formula**

![Chemical Structure](image)

- **Chemical Name**: Styrenated phenol
- **Molecular Weight**: 220 (average)
- **CAS NO.**: 61788-44-1

**Product Properties**

- Appearance: Viscous Liquid
- Color (G): < 1.5
- OH value: 230-260
- Water cont, %: < 0.5%
- Viscosity(cps): Max 300-600 at 25 ± 0.2°C

**Characteristics**

- Good Color
- Phenol-free, Non Volatile Contents.
- Non-Toxic
- Excellent Solubility for most solvents

**Applications**

- Antioxidant in rubber Compounding, Surfactant Intermediate

**Storage**

- Store in cool, dry, well ventilated conditions and avoiding exposure of the packed product to direct sunlight.

**Packing**

- Drum (200kg)

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### KUMANOX 3120 (TSP)

**Formula**

![Chemical Structure](image)

- **Chemical Name**: Styrenated phenol
- **Molecular Weight**: 367 (average)
- **CAS NO.**: 61788-44-1

**Product Properties**

- Appearance: Clear, Slight yellow liquid
- Color (G): < 1.5
- OH value: 140-150
- Water cont, %: < 0.2%
- Viscosity(cps): 30,000-40,000 at 25°C ± 0.2°C

**Characteristics**

- Good Color
- Phenol-free, Non Volatile Contents.
- Non-Toxic
- Excellent Solubility for most solvents

**Applications**

- Antioxidant in rubber Compounding, Surfactant Intermediate

**Storage**

- Store in cool, dry, well ventilated conditions and avoiding exposure of the packed product to direct sunlight.

**Packing**

- Drum (200kg)