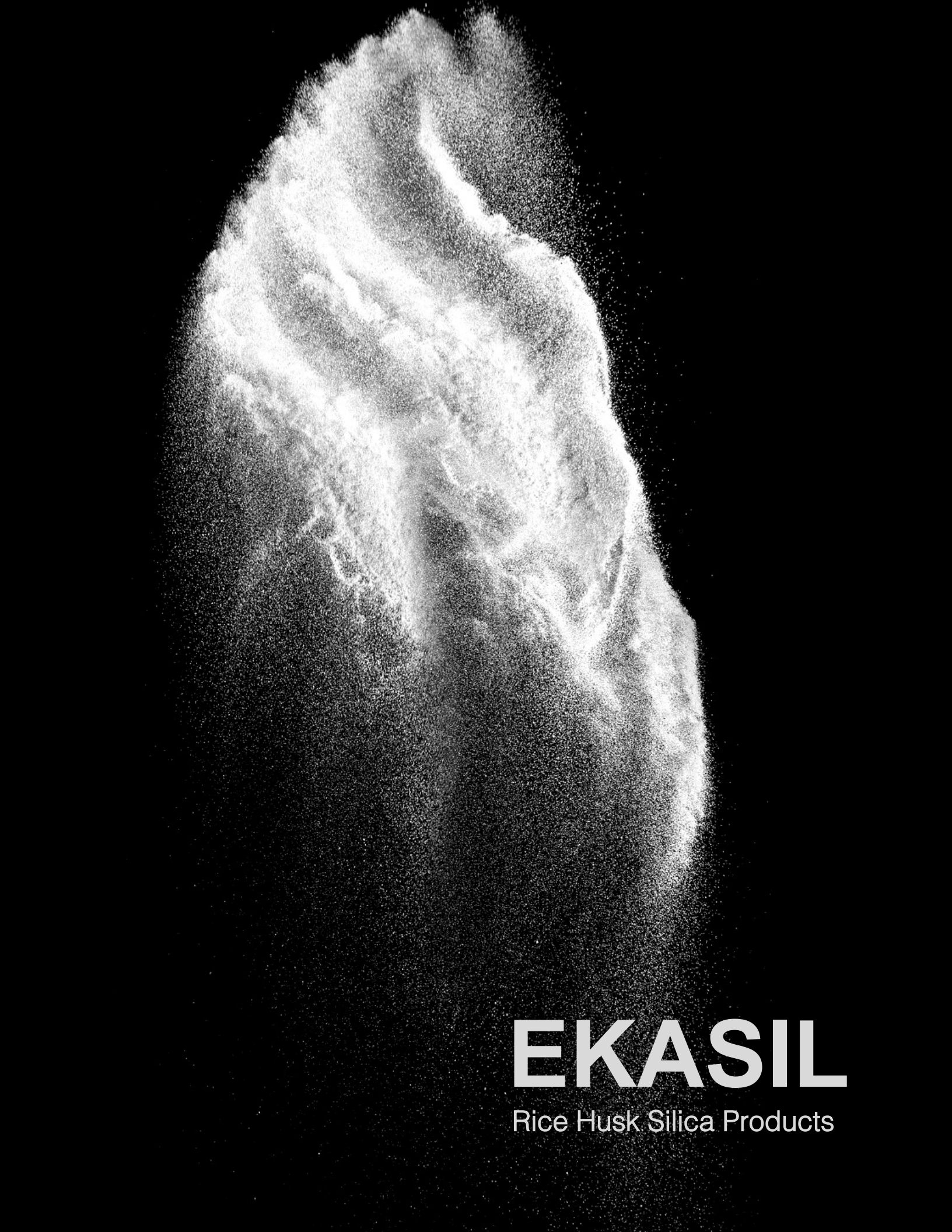

# EKASIL

Rice Husk Silica Products

# EKASIL Rice Husk Silica

**EKASIL Rice Husk Silica** is amorphous silicon dioxide products that are extracted from rice husk using EKASIL specially developed technology. Unlike typical silica from sand, EKASIL Rice Husk Silica is an environmentally friendly product as it is obtained through waste utilisation in a nonpolluting, low energy consuming manufacturing process. With better prices and more competitive specifications, EKASIL Rice Husk Silica is an excellent alternative to typical silica products in the market.

EKASIL Rice Husk Silica comes with two main specification categories.

- EKASIL Basic Specification
- EKASIL Advanced Specification

**Environmentally** friendly silica products, non-polluting

**Adjustable** physico-chemical properties for specific requests

**High purity** silica content up to more than 99.99%

**Better price** compared to other silica products in the market

**CSR & PR** for using environmentally-friendly products

**Stable** specifications and properties for specific applications

**Flexible** customisation of specifications and properties

**Amorphous** silica without crystalline structure

**Wide range** of user industries, covering all applications

# EKASIL Basic Specifications

EKASIL basic specifications are silica products that are obtained directly from the extraction process. The specifications are based on the purity of silica: 99.99% for **EKASIL A** and 96% for **EKASIL B**. Both the specifications are amorphous silica with physico-chemical properties that are adjustable to customers' needs.

| Characteristic Physico-Chemical Data | | | |
|---|---|---|---|
| **Properties and Test Methods** | **Unit** | **EKASIL A** | **EKASIL B** |
| Purity | [%] | 99.99% Purity Nano Silica | 96% Purity Nano Silica |
| Form | | Amorphous | Amorphous |
| Color | | Snow White | Light Gray |
| pH (5g/100ml H2O) | | 5.5-8.0 (Adjustable) | 6.5-7.5 (Adjustable) |
| Surface area (BET analysis) | m2/g | 350-600 (Adjustable) | 120-170 (Adjustable) |
| Mass fraction of moisture (2 hours at 1050 C) | [%] | 10-27 (Adjustable) | 10-27 (Adjustable) |
| LOI (2 hours at the 10000 C) | [%] | 13-30 (Adjustable) | 4.7-5.9 (Adjustable) |
| Water-soluble salts content (total) | [%] | ≤ 2 | 3.1-3.5 |
| The mass fractions of Carbon | [%] | ≤ 0.01 | 1.5-1.9 |
| The mass fractions of SiO2 | [%] | 99.99 | 96 |
| The mass fractions of Na2O | [%] | Not detected | Not detected |
| The mass fractions of MgO | [%] | Not detected | Not detected |
| The mass fractions of CaO | [%] | Not detected | Not detected |
| The mass fractions of K2O | [%] | Not detected | Not detected |
| The mass fractions of Cl | [%] | Not detected | Not detected |
| The mass fractions of Al2O3 | [%] | Not detected | Not detected |
| The mass fractions of P2O5 | [%] | Not detected | Not detected |
| The mass fractions of SO3 | [%] | Not detected | Not detected |
| The mass fractions of MnO | [%] | Not detected | Not detected |
| The mass fraction (residue) remaining on the 75 μм sieve | [%] | 4-6 | 4-6 |
| The mass fractions of FeO impurities | [%] | Not detected | Not detected |
| Mass fraction of crystalline Silicon Dioxide | [%] | Not detected | Not detected |
| Nanoparticle size | nm | 15-50 | 15-50 |

# EKASIL Advanced Specification

EKASIL advanced specifications are rice husk silicon dioxide products that are developed from EKASIL basic specifications for specific physico-chemical properties based on customer requirments. The specifications are various and applicable to a wide range of user industries. The characteristic physico-chemical properties are as follows.

| Physico-Chemical Properties | Unit | Adjustability |
|---|---|---|
| **Purity** | [%] | Adjustable |
| **pH** | | Adjustable |
| **Surface area** | m2/g | Adjustable |
| **Moisture** | [%] | Adjustable |
| **LOI** | [%] | Adjustable |
| **Hydrophilic / Hydrophobic** | | Adjustable |
| **Application properties** | | Adjustable |

| User Industries | Example of EKASIL Products |
|---|---|
| **Pharmacy** | EKASIL 200 PHARMA, EKASIL 300 PHARMA, EKASIL D120 PHARMA |
| **Paints and coatings** | EKASIL 200, EKASIL 300, EKASIL 380 |
| **3D Printing** | EKASIL 50, EKASIL 200, EKASIL D120, EKASIL P100 |
| | |
| **Paper and media coatings** | EKASIL 150, EKASIL 200, EKASIL 300 |
| **Toner** | EKASIL P100, EKASIL D120 |
| **Cosmetics** | EKASIL 200, EKASIL 300, EKASIL 380, EKASIL P100, EKASIL H180, EKASIL D120, EKASIL HM200 |
| **Health care** | EKASIL 200 PHARMA, EKASIL 300 PHARMA, EKASIL D120 PHARMA |
| **Personal care** | EKASIL 200, EKASIL 300, EKASIL 380, EKASIL 300 PHARMA |

| | |
|---|---|
| **Oral care** | EKASIL 200 PHARMA |
| **Food** | EKASIL 200 |
| **Home care** | EKASIL 200, EKASIL 300, EKASIL P100, EKASIL HM200, EKASIL HM250, EKASIL H180, EKASIL D120 |
| **Agriculture** | EKASIL 200, EKASIL 300 |
| **Tire** | EKASIL 80U, EKASIL 110U, EKASIL 160U |
| **Mechanical rubber goods** | EKASIL 110U, EKASIL 160U |
| **Shoe sole** | EKASIL 200, EKASIL 160U |
| **Silicone rubber** | EKASIL 130, EKASIL 150, EKASIL 200, EKASIL HM200, EKASIL D120 |
| **Unsaturated polyester resins** | EKASIL 200, EKASIL 300, EKASIL P100, EKASIL D120, EKASIL D170 |
| **Adhesive and sealants** | EKASIL 50, EKASIL P100, EKASIL D120, EKASIL D170 |
| **Thermal insulation** | EKASIL 150, EKASIL 200, EKASIL 300, EKASIL D170, |
| **Lubricating grease** | EKASIL 200, EKASIL 380, EKASIL P100, EKASIL D120, EKASIL D170 |
| **Oil and gas** | EKASIL 200, EKASIL HM250, EKASIL D120 |
| **Cable gel** | EKASIL 200, EKASIL 380, EKASIL P100, EKASIL D120, EKASIL D170 |
| **Catalyst** | EKASIL 50, EKASIL 200 |
| **Plastics** | EKASIL 50, EKASIL 200, EKASIL D120, EKASIL D170 |
| **Technical powder** | EKASIL 200, EKASIL D120 |
| **Electronics** | EKASIL 200, EKASIL D120, EKASIL D170 |
| **Battery** | EKASIL 200 |
| **Deformers** | EKASIL 130, EKASIL 200, EKASIL P100, EKASIL HM200, EKASIL HM250 |
| **Construction** | EKASIL 200, EKASIL D120 |
| **Ceramics** | EKASIL 50, EKASIL 200 |
| **Glass** | EKASIL 50 |
| **Metals** | EKASIL 200 |

# EKASIL 50

Hydrophilic Fumed Silica with a Specific Surface Area of 50 m2/g

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 35-65 | m2/g |
| pH Value | 3.8-4.8 | - |
| Loss on Drying | ≤ 1.5 | % |
| Tamped Density | apx. 100 | g/l |

## Applications

- Adhesives and sealants
- 3D printing
- Ultra-pure glass
- Polymers and silicone
- Composite materials
- Catalyst
- Ceramics
- Plastic

## Properties

- High filler loading
- Low thickening properties
- High tamped density
- High purity
- Improving physicochemical characteristics of polymers

# EKASIL 200

Hydrophilic Fumed Silica with a Specific Surface Area of 200 m2/g

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 175-225 | m2/g |
| pH Value | 3.7-4.5 | - |
| Loss on Drying | ≤ 1.5 | % |
| Tamped Density | apx. 50 | g/l |

## Applications

- Pharmacy
- Paints and coatings
- Adhesives and sealants
- 3D printing and inks
- Cosmetics
- Health and personal care
- Oil and gas
- Thermal insulation
- Silicone rubber
- Cable compounds

## Properties

- Improving free flow and anticaking characteristics of powder
- Reinforcement of silicone rubber
- Anti-settling, thickening and anti-sagging agent
- Rheology and thixotropy control of liquid systems, binders and polymers, etc.

# EKASIL 300

Hydrophilic Fumed Silica with a Specific Surface Area of 300 m2/g

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 270-330 | m2/g |
| pH Value | 3.7-4.5 | - |
| Loss on Drying | ≤ 1.5 | % |
| Tamped Density | apx. 50 | g/l |

## Applications

- Pharmacy
- Paints and coatings
- Adhesives and sealants
- Printing inks
- Cosmetics
- Health and personal care
- Thermal Insulation
- Unsaturated polyester resins

## Properties

- Optimal dispersion for thickening and thixotropy
- Reinforcement of silicone rubber
- Excellent transparency in unsaturated polyester resins
- Rheology and thixotropy control of liquid systems, binders and polymers, etc.

# EKASIL 380

Hydrophilic Fumed Silica with a Specific Surface Area of 380 m2/g

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 350-410 | m2/g |
| pH Value | 3.7-4.5 | - |
| Loss on Drying | ≤ 2.0 | % |
| Tamped Density | apx. 50 | g/l |

## Applications

- Paints and coatings
- 3D printing
- Adhesives and sealants
- Cosmetics
- Personal care
- Printing inks
- Silicone rubber
- Cable compounds
- Lubricating grease

## Properties

- High surface area for best thickening and thixotropy
- Reinforcement of silicone rubber
- Excellent transparency in unsaturated polyester resins
- Rheology and thixotropy control of liquid systems, binders and polymers, etc.
- Flow aid

# EKASIL D120

Fumed Silica aftertreated with Dimethyldichlorosilane

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 90-130 | m2/g |
| pH Value | 3.6-5.5 | - |
| Loss on Drying | ≤ 0.5 | % |
| Tamped Density | apx. 50 | g/l |
| C Content | 0.6-1.2 | % |

## Applications

- Paints and coatings
- Electronics
- Technical powder
- 3D printing
- Printing inks and toner
- Silicone rubber
- Adhesives and sealants
- Cable gels
- Lubricating grease
- Cosmetics
- Oil and gas

## Properties

- Hydrophobic component for thickening and reinforcement of silicone sealants
- Improving shelf-life of silicone sealants
- Water-resistant, hydrophobising of liquid systems
- Anti-settling agent for coatings
- Pigment stabilization and improvement of corrosion protection
- Improving hydrophobicity and rheology of inks
- Improving and maintaining free flow and anti-caking characteristics of powders

# EKASIL D170

Fumed Silica aftertreated with Dimethyldochlorosilane

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 150-190 | m2/g |
| pH Value | 3.7-4.7 | - |
| Loss on Drying | ≤ 0.0 | % |
| Tamped Density | apx. 50 | g/l |
| C Content | 0.7-1.3 | % |

## Applications

- Paints and coatings
- Electronics
- Adhesives and sealants
- Thermal insulation
- Silicone rubber
- Negative toner
- Coating polymers
- Cosmetics
- Lubricating grease
- Cable gel

## Properties

- Hydrophobic component for thickening and reinforcement of silicone sealants
- Improving shelf-life of silicone sealants
- Water-resistant, hydrophobising of liquid systems
- For coatings as an anti-settling agent
- For pigment stabilization and improvement of corrosion protection
- Improving hydrophobicity and rheology of inks
- Improving and maintaining free flow and anti-caking characteristics of powders

# EKASIL P100

Fumed Silica aftertreated with Polydimethylsiloxane

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 80-120 | m2/g |
| pH Value | 4.0-6.0 | - |
| Loss on Drying | ≤ 0.5 | % |
| Tamped Density | apx. 60 | g/l |
| C Content | 3.5-5.0 | % |

## Applications

- 3D Printing and toner
- Cosmetics
- Home care
- Unsaturated polyester resins
- Adhesives and sealants
- Lubricating grease
- Cable gel
- Deformers

## Properties

- Improving water resistance of moisture-sensitive formulations
- Guaranteeing marked hydrophobia of the product
- Highly efficient effect in the thickening and thixotropy of complex polar liquids
- Improving anti-settling behaviour of pigments and anti-sagging behaviour
- Surface additive to increase charge and improve flowability.
- High hydrophobicity, small particle with good flowability.

# EKASIL H180

Fumed Silica aftertreated with Hexadecylsilane

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 170-210 | m2/g |
| pH Value | 4.0-5.5 | - |
| Loss on Drying | ≤ 1.0 | % |
| Tamped Density | apx. 60 | g/l |
| C Content | 0.9-1.8 | % |

## Applications

- Cosmetics
- Home care
- Water-based coatings systems

## Properties

- Effective rheology control in complex liquid systems
- Anti-settling agent and corrosion protection

# EKASIL HM200

Fumed Silica aftertreated with Hexamethyldisilazane

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 195-245 | m2/g |
| pH Value | 5.5-9.0 | - |
| Loss on Drying | ≤ 0.5 | % |
| Tamped Density | apx. 60 | g/l |
| C Content | 3.0-4.0 | % |

## Applications

- Cosmetics
- Paints and coatings
- Health care
- Home care
- Silicone rubber
- Construction
- Adhesives and sealants

## Properties

- Effective rheology control in complex liquid systems
- Anti-settling agent and corrosion protection
- Free flow aid in powder coatings
- Improving mechanical and optical properties

# EKASIL HM250

Fumed Silica aftertreated with Hexamethyldisilazane

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 230-290 | m2/g |
| pH Value | 5.5-8.0 | - |
| Loss on Drying | ≤ 0.5 | % |
| Tamped Density | apx. 60 | g/l |
| C Content | 2.0-3.0 | % |

## Applications

- Home care
- Adhesives and sealants
- Cosmetics
- Powder coatings
- Oil and gas
- Deformers
- Toners
- Agrochemicals
- Polymer systems such as silicone rubber

## Properties

- Large specific surface area and high hydrophobicity
- Good flowability with dispersion properties
- Excellent effect in the rheological control of complex liquid systems
- Excellent flow agent for fine powders

# EKASIL D120 Pharma

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content (Assay) | 99.0-100 | % |
| Specific Surface Area | 90-130 | m2/g |
| Limit of Chlorides | ≤ 250 | ppm |
| Water dispersible fraction | ≤ 3.0 | % |
| Tamped Density | 50 | g/l |

## Applications

- High purity amorphous silica for pharmaceutical uses, especially for solid dosage forms and emulsions

## Properties

- Glidant for improving powder flow, suitable for very hygroscopic and/or cohesive powder
- Viscosity adjuster for thickening of non-polar pharmaceutical oils
- Stabilizer for water in oil emulsions
- Used to adjust release behavior of active ingredients

# EKASIL 200 Pharma

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content (Assay) | ≥ 99.8 | % |
| Specific Surface Area | 175-225 | m2/g |
| Chlorides | ≤ 250 | ppm |
| Al Content | Pass | - |
| Fe Content | ≤ 500 | ppm |
| Ca Content | Pass | - |
| Loss on drying | ≤ 2.5 | % |
| Tamped Density | apx. 50 | g/l |

## Applications

- High purity amorphous silica for pharmaceutical uses in all types of dosage forms

## Properties

- Free flow and anti-caking agent to improve powder properties
- Improving tablets properties such as hardness and friability
- Used as viscosity increasing agent to thicken and thixotropize liquids
- Used as anti-setting, thickening and anti-sagging agent
- High purity, low humidity
- No influence of taste
- Not alter natural color of powder formulations

# EKASIL 300 Pharma

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content (Assay) | ≥ 99.0 | % |
| Specific Surface Area | 260-320 | m2/g |
| Chlorides | ≤ 250 | ppm |
| Fe Content | ≤ 500 | ppm |
| Ca Content | Pass | - |
| Loss on drying | ≤ 2.5 | % |
| Tamped Density | apx. 270 | g/l |
| Particle Size | 20-60 | µm |

## Applications

- High purity granulated silica for pharmaceutical uses
- Carrier for liquid and pasty
- Increasing dissolution of poorly soluble active ingredients
- Desiccant for moisture activated dry granulation

## Properties

- Easy handling, low dust
- High purity
- Excellent flow behavior both loaded and unloaded

# EKASIL 80U

Precipitated Amorphous Silica
for Rubber Industries

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 99.8 | % |
| Specific Surface Area | 80 | m2/g |
| pH Value | 6.5 | - |
| Loss on Drying | 6.0 | % |
| Tamped Density | apx. 60 | g/l |

## Applications

- Tires
- Mechanical rubber goods

## Properties

- Improving dispersion properties
- High reinforcement
- Excellent hysteresis

# EKASIL 110U

Precipitated Amorphous Silica
for Rubber Industries

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 98 | % |
| Specific Surface Area | 110 | m2/g |
| pH Value | 6.5 | - |
| Loss on Drying | 5.5 | % |
| Tamped Density | apx. 60 | g/l |

## Applications

- Tires
- Mechanical rubber goods

## Properties

- High reinforcement
- Excellent hysteresis
- High filler loading for optimization of wet and winter properties

# EKASIL 160U

Precipitated Amorphous Silica
for Rubber Industries

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | ≥ 98 | % |
| Specific Surface Area | 160 | m2/g |
| pH Value | 6.5 | - |
| Loss on Drying | 5.5 | % |
| Tamped Density | apx. 60 | g/l |

## Applications

- Tires
- Mechanical rubber goods

## Properties

- High reinforcement
- Easily dispersible
- High abrasion resistance

# EKASIL XXX

Customised Silica for
Your Special Applications

## Physico-Chemical Data

| Properties | Value | Unit |
|---|---|---|
| SiO2 Content | xxx | xxx |
| Specific Surface Area | xxx | xxx |
| pH Value | xxx | xxx |
| Loss on Drying | xxx | xxx |
| etc. | xxx | xxx |

## Applications

- According to your applications

## Properties

- According to your requirements

*At EKASIL, we provide customisation of silica products based on your specially required properties and applications. Please contact us for the collaboration.*