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## <u>About Company</u>

#### Scitechesy Research and Technology Private Limited

Scitechesy Research and Technology Private Limited is a start-up India DIPP recognized company that focuses on developing and manufacturing cross-cutting and cost-effective silver nanoparticles-based paste (Silver Nano paste) utilized for applications in solar panel, bio- sensors, textile industry and 3D printing among a few of them. Success of this proposal has profound impact on society as cost and sensitivity of silver nanoparticle-based product will be reduced, specifically solar cell, thereby contributing towards green energy. However, we have to synthesize silver Nano paste as per the need of industries so that it can replace costly silver paste.





Scitechesy Research and Technology Private Limited is a notable manufacturer and supplier of Colloidal Silver Nano Particles, Pure Silver Powder and Silver Nano Powder. We have been catering to the demands of public sector units, multinational companies, national companies, etc. engaged in the domain of manufacturing of Paints, Cosmetics, Soap, Leather, Plastic, Printing Ink, PVC Pipes, Paper Mill, and Rubber. Within a short span of time, we have grown into the market leaders by offering value-added and effective products to the clients within their budget. We always keep on introducing new products developed according to the needs of the clients and international quality standards.

#### **Our Business**

Innovation is a part of the company; hence, we are passionate about providing high-class products to the clients to exceed their expectations.

#### **Quality Policy**

We are committed to provide superior quality products such as Silver Nano Powder, Colloidal Silver Nano Particles, Silver Nano Paste, Pure Silver Powder, to the clients to ensure maximum satisfaction. We adhere to the national and international quality norms to provide the best to the clients. Our high-tech quality testing lab enables us to conduct different quality tests on the products to test purity, compositions, texture, effectiveness, etc.

#### **Our Team**

We have a team of diligent professionals that help us completing business operations in a skillful manner. The professionals utilize their rich experience and expertise in formulating the best quality products. They are also well-aware of handling different machines and technologies to provide high-quality products in bulk. These professionals work in close synchronization n with the customers to develop products according to their demands. Our team consists of the following experts.

- Quality controllers
- Sales and marketing executives
- Chemical experts
- Packaging experts
- Administrative staff



## **Certificates**





#### "Dear Valued Customers and Partners,

I am delighted to introduce all of you our nanomaterial's company and presenting our latest catalogue of cutting-edge products and solutions. I personally want to convey my gratitude for your interest and support.

As each customer has unique requirement and objective. Therefore, we offer a range of customizable options to ensure that our nanomaterial's align precisely with his specific needs. Our team of experienced scientists and engineers is ready to collaborate with you.

I am incredibly proud of dedicated and talented team behind our nanomaterials company. Their unwavering dedication, expertise, and passion for scientific excellence are the driving force behind our success. We are committed to shape the future of nanomaterials and making a positive impact on society.

Thanking you for choosing Scitechesy Research and Technology Private Limited. "

Sincerely,

**FOUNDER** Dr. Fanindra Pati Pandey Ph.D (Physics), BHU.



**Based Paste** 

## <u>Silver Nano-Particles (AgNPs)</u>

Silver nanoparticles (AgNPs) are tiny particles of silver with dimensions ranging from 1 to 100 nanometers. Silver nanoparticles exhibit unique optical, electrical, and antimicrobial properties due to their small size and high surface area-to-volume ratio. These properties make them highly attractive for various applications.

For instance, in the field of medicine, AgNPs have shown promising antimicrobial activity against a broad spectrum of microorganisms, including bacteria, viruses, and fungi. They can be incorporated into wound dressings, coatings, and medical devices to prevent infections and promote healing. In electronics, silver nanoparticles are used in conductive inks and pastes for printing circuits on flexible substrates.



**Nanoparticles Solution** 

Silver Nano Powder



### Silver Nanoparticle Based Paste:-

 Silver nano paste, also known as silver nanoparticle paste or silver nanomaterial paste, refers to a type of conductive paste that contains silver nanoparticles. Silver nanoparticles are particles of silver with dimensions in the nanometer range, typically less than 100 nanometers in size. They exhibit unique properties due to their small size and large surface area-to-volume ratio.



### Advantages of using silver nano paste :

- <u>Conductivity:</u> Silver is an excellent conductor of electricity, and using silver nanoparticles in paste form allows for the creation of highly conductive paths or connections in electronic circuits.
- <u>Compatibility</u>: Silver nano paste is compatible with a wide range of substrates used in electronics, such as glass, ceramics, and flexible materials, enabling its application in diverse electronic devices.
- <u>Miniaturization</u>: The small particle size of silver nanoparticles allows for precise and fine features to be created, making it suitable for applications requiring miniaturization and high-density circuitry.
- <u>Thermal conductivity</u>: Silver nanoparticles have high thermal conductivity, which is beneficial for applications requiring efficient heat dissipation, such as in power electronics and LED lighting.
- <u>Solder replacement:</u> In some cases, silver nano paste can serve as an alternative to traditional soldering methods, providing a reliable and conductive bonding solution.



### Application of silver nano-particle based paste

Silver nano paste, also known as silver nanoparticle paste or silver ink, is a versatile material with various applications due to its unique properties. Here are some common applications of silver nano paste:

- <u>Electronics and Printed Circuit Boards (PCBs)</u>: Silver nano paste is widely used in the electronics industry for creating conductive traces on PCBs. It can be printed or dispensed on to substrates to form conductive paths for electrical signals, replacing traditional wire bonding or soldering methods. It enables the miniaturization of electronic components and improves their performance.
- <u>Solar Cells</u>: Silver nano paste is used in the manufacturing of solar cells as a conductive ink for the front-side metallization. It helps in creating high-efficiency contacts for the collection of electric current generated by the solar cell. Silver's excellent electrical conductivity and compatibility with various substrate materials make it an ideal choice for this application.
- <u>Flexible and Printed Electronics</u>: Silver nano paste is crucial for flexible and printed electronics, where circuits and devices are fabricated on flexible substrates or even directly printed on various surfaces. It allows the creation of flexible, lightweight, and conformable electronic components like flexible displays, sensors, RFID tags, and smart packaging.
- <u>Medical and Healthcare</u>: Silver nanoparticles possess antimicrobial properties, making silver nano paste valuable in medical and healthcare applications. It can be used for coatings on medical devices, wound dressings, and bandages to prevent infection and promote healing. Silver nano paste is also employed in biosensors and diagnostic devices for its conductive and biocompatible properties.
- <u>RFID Antennas</u>: Radio Frequency Identification (RFID) antennas require highly conductive materials to transmit and receive signals effectively. Silver nano paste is often used to print RFID antennas on various substrates, such as paper or plastic, enabling low-cost and flexible RFID solutions for applications like inventory management, asset tracking, and contactless payment systems.



- Printed Heaters and Sensors: Silver nano paste is utilized to create printed heaters and sensors for applications like automotive, aerospace, and consumer electronics. It allows the production of thin, flexible, and efficient heating elements and sensor son different surfaces or substrates.
- Membrane Switches and Touch Panels: Membrane switches and touch panels rely on conductive traces to detect touch or activate functions. Silver nano paste is used to print conductive patterns on these interfaces, providing reliable and durable touch-sensitive controls for a wide range of devices, including appliances, control panels, and touchscreens.
- 3D Printing: Silver nano paste can be formulated for use in 3D printing, enabling the direct printingof conductive structures or components. Thistechnology opens up possibilities for creating complex electronic devices with customized geometries and functionalities.

#### **Product Technical Specification:**

- Product Name:
- Product Number:
- Formula Weight:
- Storage Temperature:
- Appearance :
- Silver content:
- Viscosity :
- Curing Condition :
- Particle size :
- Dispersion Matrix:
- Recommended Duration:

Silver Nano-paste (Conductive Paste) SRT101 Ag (107.87 g/mole) 2 -10 °C white or Gray color(Paste form) ≥ 80 % 20000 - 40000(cps) 1.5 rpm 25 to 75 °C / 5 min – 30 min 100nm Ethyl Acetate Best before 6 months from purchase date.



## <u>Colloidal Silver Nanoparticles</u> Solution:-

Colloidal silver nanoparticles are tiny particles of silver suspended in a liquid medium. They are typically in the range of 1 to 100 nanometers in size and exhibit unique properties due to their small size and high surface area-to-volume ratio. Colloidal silver solutions have been used for various purposes, including medicinal, industrial, and consumer applications.





### <u>Advantage of Colloidal Silver</u> <u>Nanoparticles:-</u>

Colloidal silver nanoparticles, as a specific form of silver nanoparticles suspended in a liquid medium, share many of the advantages associated with silver nanoparticles in general. Here are some advantages specifically related to colloidal silver nanoparticles



- <u>Enhanced Stability</u>: Colloidal silver nanoparticles can be stabilized in a liquid medium, preventing them from agglomerating or settling. This stability allows for a consistent and uniform distribution of nanoparticles, ensuring their efficacy and usability over extended periods.
- <u>Improved Bioavailability</u>: The colloidal form of silver nanoparticles facilitates their absorption and bioavailability in biological systems. This means that when administered orally or topically, colloidal silver nanoparticles may have improved delivery and interaction with the targettissues or pathogens.
- <u>Easy Application:</u> Colloidal silver nanoparticles can be readily applied in various forms, such as sprays, creams, gels, or solutions. This ease of application makes them convenient for both medical and consumer uses.
- <u>Versatile Applications</u>: Colloidal silver nanoparticles can be used in a wide range of applications, including wound healing, antimicrobial coatings, personal care products, and water treatment. Their colloidal form allows for easyintegration into different formulations and products.
- <u>Controlled Release</u>: Colloidal silver nanoparticles can be designed to release silver ions in a controlled manner. This controlled release mechanism can optimize the therapeutic or antimicrobial effects while minimizing potential toxicity or side effects
- <u>Synergistic Effects:</u> Colloidal silver nanoparticles can exhibit synergistic effects when combined with other antimicrobial agents or therapies. This means that their combined action can enhance the overall antimicrobial efficacy, making them valuable in combination therapies.



• <u>Stability in Complex Environments:</u> Colloidal silver nanoparticles can maintain their stability and antimicrobial properties even in complex environments, such as biological fluids or industrial settings. This stability ensures their effectiveness in challenging conditions.

### **<u>Application of colloidal silver nanoparticles:</u>**

**Colloidal silver nanoparticles have a range of applications across different fields. Some common applications include:** 

#### **Medical and Healthcare:**

- <u>Wound Dressings:</u> Colloidal silver nanoparticles are used in wound dressings and bandages toprevent infection and promote wound healing.
- <u>Antimicrobial Coatings</u>: They can be incorporated into medical devices, implants, and surfaces to create antimicrobial coatings that help prevent the growth of bacteria and reduce the risk of healthcare-associated infections.
- <u>Antifungal Treatments:</u> Colloidal silver nanoparticles have been explored for their antifungal properties and can be used in the treatment of fungal infections.
- <u>Dental Care</u>: They are used in dental products such as mouthwashes, toothpaste, and dental implants to provide antimicrobial action against oral pathogens.

#### **Consumer Products:**

- <u>Cosmetics and Personal Care</u>: Colloidal silver nanoparticles can be found in various cosmetic and personal care products, such as creams, lotions, soaps, and shampoos, due to their antimicrobial properties.
- <u>Textiles and Fabrics</u>: They are incorporated into textiles and fabrics to provide antimicrobial properties, reducing the growth of odor-causing bacteria and extending the lifespan of the products.
- <u>Water Treatment:</u> Colloidal silver nanoparticles can be used in water filtration systems to kill or inhibit the growth of bacteria and other microorganisms.



#### **Industrial and Environmental:**

- <u>Catalysis:</u> Colloidal silver nanoparticles exhibit catalytic activity and can be used as catalysts in chemical reactions, such as hydrogenation, oxidation, and reduction processes.
- <u>Electronics</u>: They are used in conductive inks and coatings for printed electronics, sensors, and flexible electronics due to their high electrical conductivity and stability.
- <u>Environmental Remediation</u>: Colloidal silver nanoparticles have been explored for applications in environmental remediation, such as the removal of pollutants or the treatment of contaminated water.

It's important to note that while colloidal silver nanoparticles have various applications, their use should be guided by proper regulatory guidelines, safety considerations, and in accordance with scientific evidence.

### **Product Technical Specification:**

<ul> <li><u>Avg particle size-</u></li> </ul>	20nm
<ul> <li><u>Concentration-</u></li> </ul>	<b>20 PPM and 1000 PPM</b>
<u>Particle size distribution-</u>	10-40nm
• <u>Ph-</u>	9.2-9.5
<ul> <li><u>Purity percentage:</u></li> </ul>	<b>99.9</b> %
<ul> <li><u>Light Stability-</u></li> </ul>	Should store in a dark place
• <u>Self-Life-</u>	More than one year
• UV resistance-	Highly UV resistive (does not show any change in
	UV absorbance after explore to UV lamp more
	than 24 hours)



### Silver Nano Powder:-

- Silver nano powder refers to a form of silver particles that are extremely small in size, typically in the nanometer range (1 nanometer is equal to one billionth of a meter). The unique properties of silver at the nanoscale have led to the development and application of silver nano powder in various industries.
- The small size of silver nano powder provides several advantages. First, it increases the surface area-to-volume ratio, resulting in enhanced reactivity and catalytic properties. Additionally, the nanoparticles exhibit unique optical, electrical, and antimicrobial properties compared to bulk silver. These properties make silver nano powder highly versatile and applicable in various fields. One of the significant applications of silver nano powder is in the field of medicine and healthcare. Due to its excellent antimicrobial properties, silver nano powder is utilized in wound dressings, medical.



### **Advantage of Silver nano powder :**

Silver nano powder, which consists of silver nanoparticles with dimensions in the range of nanometers, offers several advantages due to its unique properties. Here are some advantages of silver nano powder:

• <u>Antimicrobial properties</u>: Silver nanoparticles exhibit strong antimicrobial activity against a broad spectrum of microorganisms, including bacteria, viruses, and fungi. Their small size and large surface area-to-volume ratio enhance their interaction with pathogens, leading to effective inhibition of their growth and proliferation.



- <u>Wound healing</u>: Silver nano powder has been widely used in wound dressings and ointments due to its ability to promote wound healing. The antimicrobial properties of silver nanoparticles help prevent infections in wounds, while their interaction with wound fluids stimulates cell proliferation and tissue regeneration.
- <u>Odor control:</u> Silver nano powder is used in various applications, such as textiles and footwear, to prevent the growth of odor-causing bacteria. By inhibiting bacterial growth, it helps to control unpleasant odors and maintain freshness.
- <u>Catalytic activity</u>: Silver nanoparticles exhibit excellent catalytic properties, which find applications in various chemical reactions. Their high surface area and unique electronic properties make them effective catalysts for reactions such as oxidation, reduction, and hydrogenation.
- <u>Electronics and sensors</u>: Silver nano powder is used in the fabrication of conductive inks, pastes, and films for printed electronics. Due to its high electrical conductivity, silver nanoparticles enable the production of flexible and highly conductive circuits, sensors, and electrodes.
- <u>Optical properties:</u> Silver nanoparticles exhibit intriguing optical properties, including localized surface plasmon resonance (LSPR). These properties enable their application in areas such as photonics, sensors, and solar cells, where their interaction with light can be harnessed for specific purposes.
- <u>Environmental applications</u>: Silver nano powder has been explored for its potential in environmental remediation. It can be used for the removal of contaminants, such as heavy metals and organic pollutants, from water and soil. The high reactivity and large surface area of silver nanoparticles facilitate efficient adsorption and catalytic degradation of pollutants.
- <u>Drug delivery:</u> Silver nano powder has gained attention in the field of drug delivery due to its unique properties. It can be functionalized and used as carriers for drugs, facilitating targeted delivery to specific sites. The controlled release of drugs from silver nanoparticles can improve therapeutic efficacy while reducing side effects.



It is important to note that while silver nano powder offers these advantages, careful consideration should be given to its potential environmental and health impacts. Proper handling, disposal, and regulation are crucial to ensure its safe use.

### **Application of silver nano powder**

Silver nano powder finds applications in various fields due to its unique properties. Some notable applications of silver nano powder include:

- <u>Antimicrobial coatings:</u> Silver nanoparticles are incorporated into coatings and paints to provide antimicrobial properties to surfaces. This application is useful in healthcare settings, food packaging, and consumer products to inhibit the growth of bacteria, viruses, and fungi, thus reducing the risk of infections.
- <u>Wound dressings</u>: Silver nano powder is used in the production of advanced wound dressings and bandages. The antimicrobial properties of silver nanoparticles help prevent infections and promote faster wound healing.
- <u>Textiles and clothing:</u> Silver nano powder is added to fabrics and textiles to impart antimicrobial properties and control odor-causing bacteria. This application is used in sportswear, socks, undergarments, and other clothing items.
- <u>Electronics</u>: Silver nano powder is employed in the manufacturing of conductive inks, pastes, and films for printed electronics. It allows for the production of flexible and highly conductive circuits, electrodes, and sensors.
- <u>Catalysis:</u> Silver nanoparticles exhibit excellent catalytic properties, making them useful in various chemical reactions. They are employed as catalysts in organic synthesis, oxidation reactions, and hydrogenation processes.
- <u>Water purification</u>: Silver nano powder is utilized in water purification systems to remove contaminants and pathogens. It can help in disinfection, reduction of heavy metals, and degradation of organic pollutants.
- <u>Cosmetics:</u> Silver nano powder is used in cosmetic formulations, such as creams, lotions, and sunscreens, for its antimicrobial properties. It can also contribute to the formulation's stability and shelf life.



- <u>Biomedical applications:</u> Silver nano powder is explored for biomedical applications, including drug delivery systems, biosensors, and diagnostic tools. It offers opportunities for targeted drug delivery, imaging, and early disease detection
- <u>Energy technologies:</u> Silver nano powder finds applications in energy-related fields. It is used in solar cells and energy storage devices to enhance their efficiency and performance.
- <u>Environmental remediation</u>: Silver nanoparticles can be utilized for the removal of pollutants from water and soil. They can adsorb and degrade contaminants, making them useful in environmental remediation processes.

These are just a few examples of the diverse applications of silver nano powder. Ongoing research and development continue to explore new uses and expand its potential in various industries.

### **Product Technical Specification:**

- <u>Average particle size:</u> 50 nm
- Particle size distribution: 40-100 nm
- <u>Morphology:</u> Spherical
- <u>Purity percentage:</u> 99.9%
- <u>Appearance:</u> Grey Powder
- Bulk density: 10.5 g/cm3
- <u>Self-Life:</u> More than three years



### **About Packing**

- Along with the quality of products, we also concentrate on packaging of the chemicals. The process of packaging consists of storage, transport and handling for use and to maintain the quality. We have skilled team who are trained for proper packing of the chemicals.
- We have our own designed HDPE bottles with our 'RL' trademark. Powder forms items are packed in HDPE (High Density Poly Ethylene) bottles which are airtight (to avoid moisture absorbance and further contamination).





# COMPANY PROFILE 2023







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RTIFIA

**ISO** 9001:2015

MPA

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C-CAMP

and Molecula

#startupindia







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