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Medical Device Coatings

Solutions From

TST

Engineered Coating Solutions

A DIVISION OF FISHER BARTON


TST
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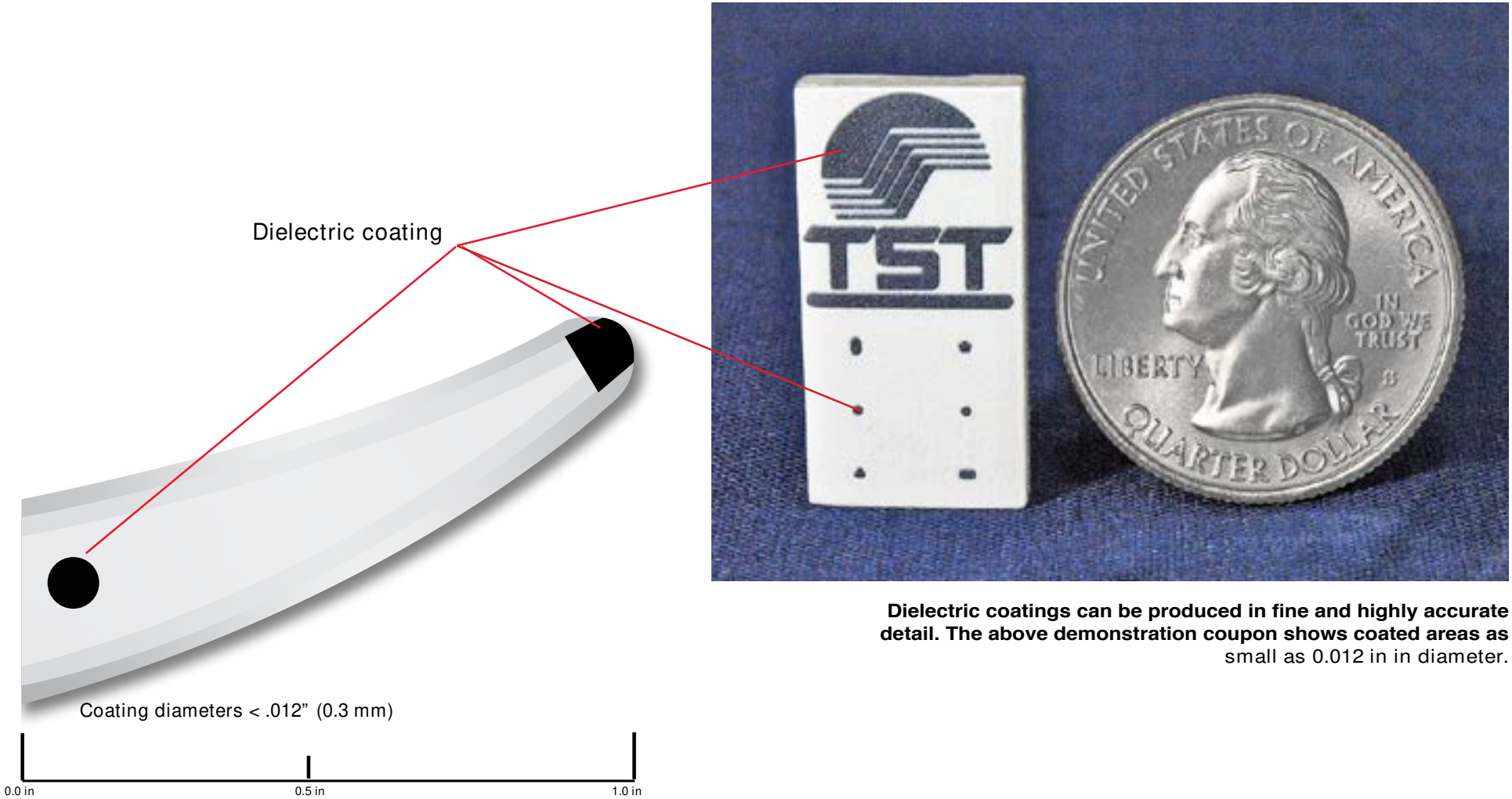
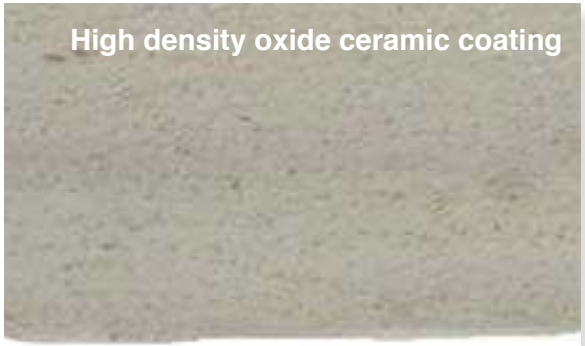
Coatings Can Be Accurately Applied to Selective Surfaces



Dielectric coatings can be produced in fine and highly accurate detail. The above demonstration coupon shows coated areas as small as 0.012 in in diameter.

Coating Properties:

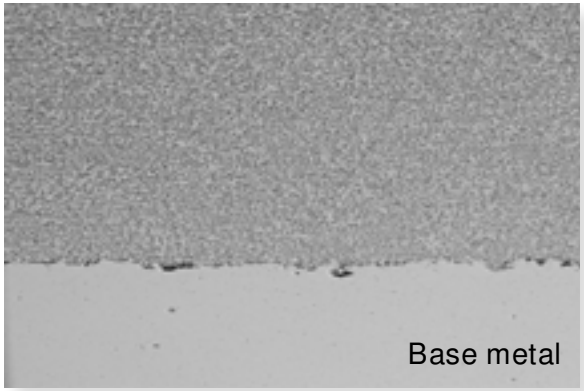


Cross section of medical dielectric coating

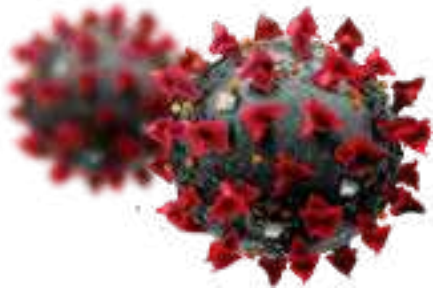
Dielectric Coating Properties

TST has developed a family of oxide ceramics coatings that provide electrical insulation for medical instruments. The coatings are HQJLQHHUHG WR SURYLGH VSHFL properties to a variety of surfaces and components. In many cases these coatings can be deposited onto select surfaces with a high degree of accuracy. Some of the properties of these coatings include:

- Dielectric strengths as great as 1000 volts/ 0.001 in
- Hardness greater than 900 Vickers
- High density with porosity levels less than 0.5%
- White, gray, or black color
- Excellent adhesion with bond strengths of m SVL
- Coating thickness from 0.001-0.020 inch
- High compressive strength
- Effective dielectric properties over a wide range of temperatures



Wear resistant carbide coating cross section



Wear Resistance

Coatings comprised of oxide ceramics, carbides, or hard metals can be deposited on medical device surfaces to provide extreme wear resistant properties. These coatings with hardness's as high as 1500 Vickers can greatly improve the life of critical surfaces by preventing wear.

- Hardness: 1200-1300 Vickers
-

Thermal Insulation/Heat Management

Thermal barrier coatings originally engineered for use in aerospace engines can be used to provide thermal insulation to surfaces of medical devices. These coatings are comprised of oxide ceramics. The thermal conductivity of these coatings can be controlled by the composition of the coating chemistry and the structure of the coating. Thermal conductivity can be engineered to be as low as 0.5 W/(m K) through controlling coating chemistry and coating deposition parameters. These coatings can also be selectively applied RQWR D VSHFL F VXUIDFH UHTXLULQJ WKHUPDO protection or insulation.

Anti-Microbial

Several coating alloys typically containing high contents of copper can be produced to provide anti-microbial surfaces. These coatings have proven to effectively kill many types of contagious viruses. These coatings can be applied to large and small surfaces to help prevent the spreading of viruses and bacterial infections.

CDC/NIH study shows Corona virus is killed **within 4 hours on copper** coated surface compared to 2-3 days on stainless steel or plastic

Thermal barrier coatings used to protect high temperature aerospace engine components can be used to **manage heat for medical devices**

Surface Engineering Technologies

TST provides surface engineering solutions for many of our customers FRPSRQHQWV XVHG LQ D YDULHW\ RI LQGXVWULH developed with a combination of materials engineering and the understanding of the thermal processes and their capabilities. When a new surface engineering project is introduced by one of our customers, our materials engineers will work closely with the customer to fully understand the components surface properties that are desired, along with the operating environment of the part. Next, our engineers will select the materials that can produce the preferred surface characteristics. These materials will then be paired with the correct thermal spray process that can be used to maximize the desired surface characteristics.

Coating properties such as porosity content, adhesion, oxidation, hardness, and microstructure are metallurgically examined during the coating development to assure the optimum coating structure is produced. When the successful surface solution is engineered, it can then be reproduced LQ YROXPH SURGXFWLRQ (QJLQHHUHG SURFHVV D measures assure the coatings are repeatably manufactured over the life of the coated component.

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