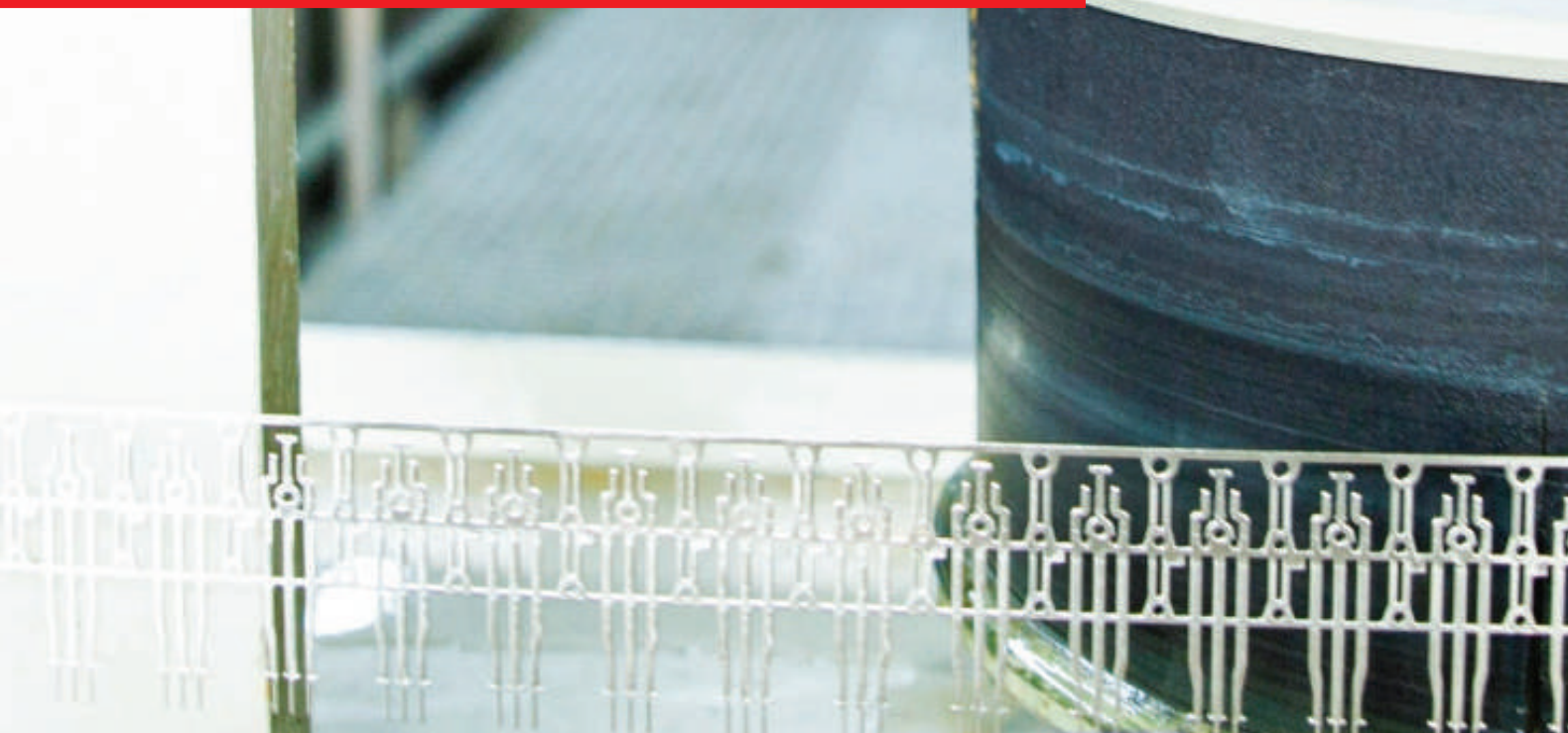


FUNCTIONAL ELECTRONIC COATINGS

Surface Coatings for the Electrical and Electronics Industries



Growel is one of the select few companies in India that offer a broad range of technology solutions customized for the electronics and PCB sectors. **In addition to our proprietary functional surface coatings, we provide state-of-the-art process plants sourced from global leaders.** This comprehensive approach ensures our customers receive a complete package encompassing equipment technology, top-notch plating chemistries, and unparalleled after-sales services.



CONNECTORS



WIRES



BUS BARS

Tin Plating

ALKALINE SATIN TIN SALT

Growel's Satin tin salt is an alkaline solution specially compounded for both vat and barrel plating applications. The alkaline satin tin process functions at an elevated temperature of up to 80°C, resulting in a smooth, non-porous matte finish, making it ideal for electrical components.

Features and benefits:

- Extremely high throwing power
- Simple to operate and maintain
- Suitable for plating on fabricated components

STANNOLUME BRIGHT ACID TIN

This process utilizes a distinctive blend of carrier additive and brightener to create a mirror-bright, silvery-white deposit.

Features and benefits:

- Deposit exhibits low porosity, excellent solderability, ductility, and corrosion resistance
- Meets strict specifications set for the electronic and electrical industries

TINNOMATTE ACID TIN

Sulphate-based acid tin process with a 2-part brightener system that produces electrodeposits with a pleasant, crystalline, and silvery-white matte finish. The easy to maintain electrolyte is highly stable during idle periods.

Features and benefits:

- Wide plating range
- Excellent plating solution stability
- Electrodeposits with outstanding ductility and solderability
- Suitable for use in plating of terminals, connectors, and bus bars

TINNOMATTE MT 100

Revolutionary single additive sulphate-based acid tin process that produces electrodeposits with a dull and silky matte finish.

Features and benefits:

- High stability of plating solution
- Exceptional ductility and solderability
- Suitable for plating of terminals, connectors, and bus bars



High Speed MSA-based Tin Plating

STANNOBRITE SN 21

Produces attractive, pure bright tin deposit for exposed sheet metal parts. This fluoborate-free low foaming, reel-to-reel plating process is ideal for strips, wires, connectors and lead frames plating. Being free from fluoborate and corrosive sulfuric acid also makes the effluent easy to treat, thus simplifying the process. Simple analysis is sufficient for process control.

Features and benefits:

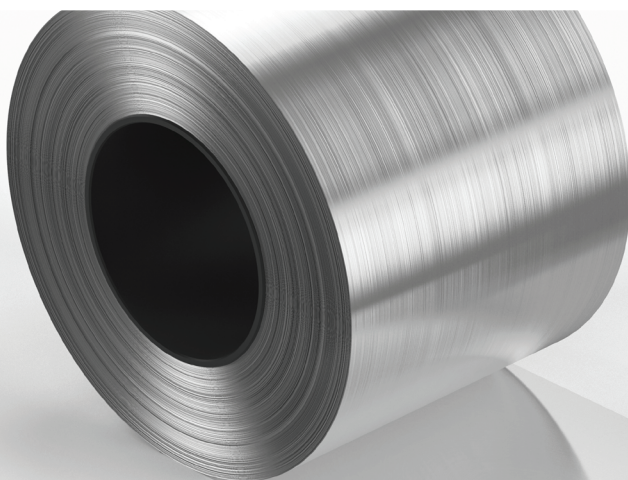
- Easily solderable substitute for lead-containing deposits restricted by international regulations
- Exhibits reduced whisker formation compared to other pure tin processes owing to its fine grain structure
- Adheres to EU Directive 2003/53/CE by being NP, NPE, and OPE free
- Functions within a broad temperature range of 20 - 45°C
- Minimizes Tin-IV formation
- Ensures stability of additives, allowing for easy analysis

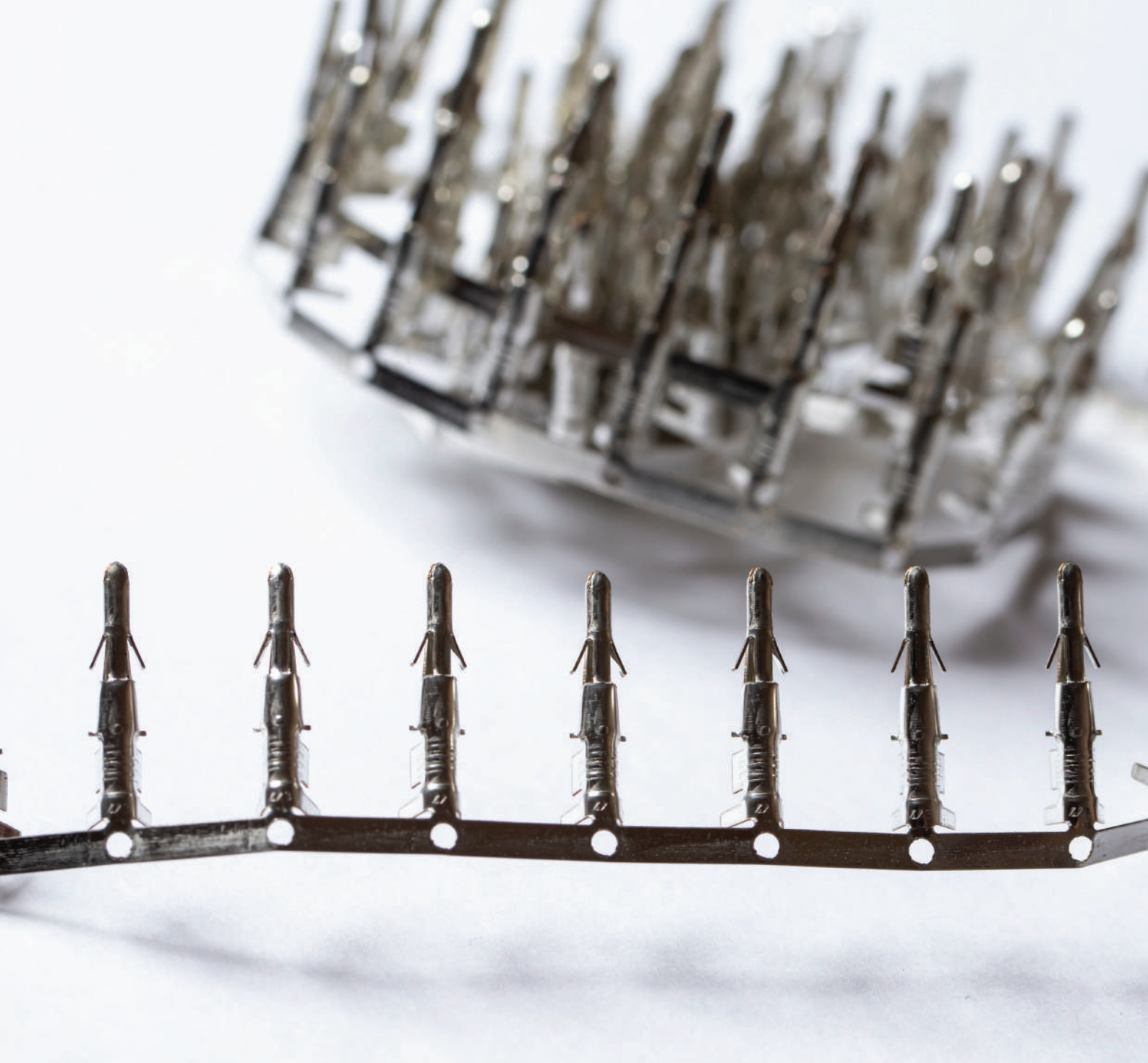
STANNOMATTE SOLDER 319

Growel's Stannomatte Solder 319 produces pure tin matte deposits with minimal carbon content and outstanding reflow characteristics. These fine-grained deposits are achieved through a specialized grain refiner and exhibit exceptional ductility and solderability, rivalling that of lead-containing tin alloys.

Features and benefits:

- Minimal organic co-deposition
- Reduced tendency for whisker formation due to fine grain structure of electrodeposits
- Complies with EU Directive 2003/53/CE as an NP, NPE, and OPE-free process
- Electrolyte with no foaming tendencies
- Simple and user-friendly operation
- Ensures outstanding thickness distribution across a broad current density spectrum
- Analyzable additives and grain refiner components
- Supports high-temperature operation up to 55°C





About Growel

India's trusted leader in metal finishing and surface treatment since 1957

We are pioneers in electroplating, paints, lubricants, surface treatment intermediates, and mission critical equipment. We partner with customers in diverse industries to provide comprehensive solutions backed by in-depth domain knowledge. Our R&D is recognised by the Indian Council of Science & Technology; our plants and processes are IMS certified.



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