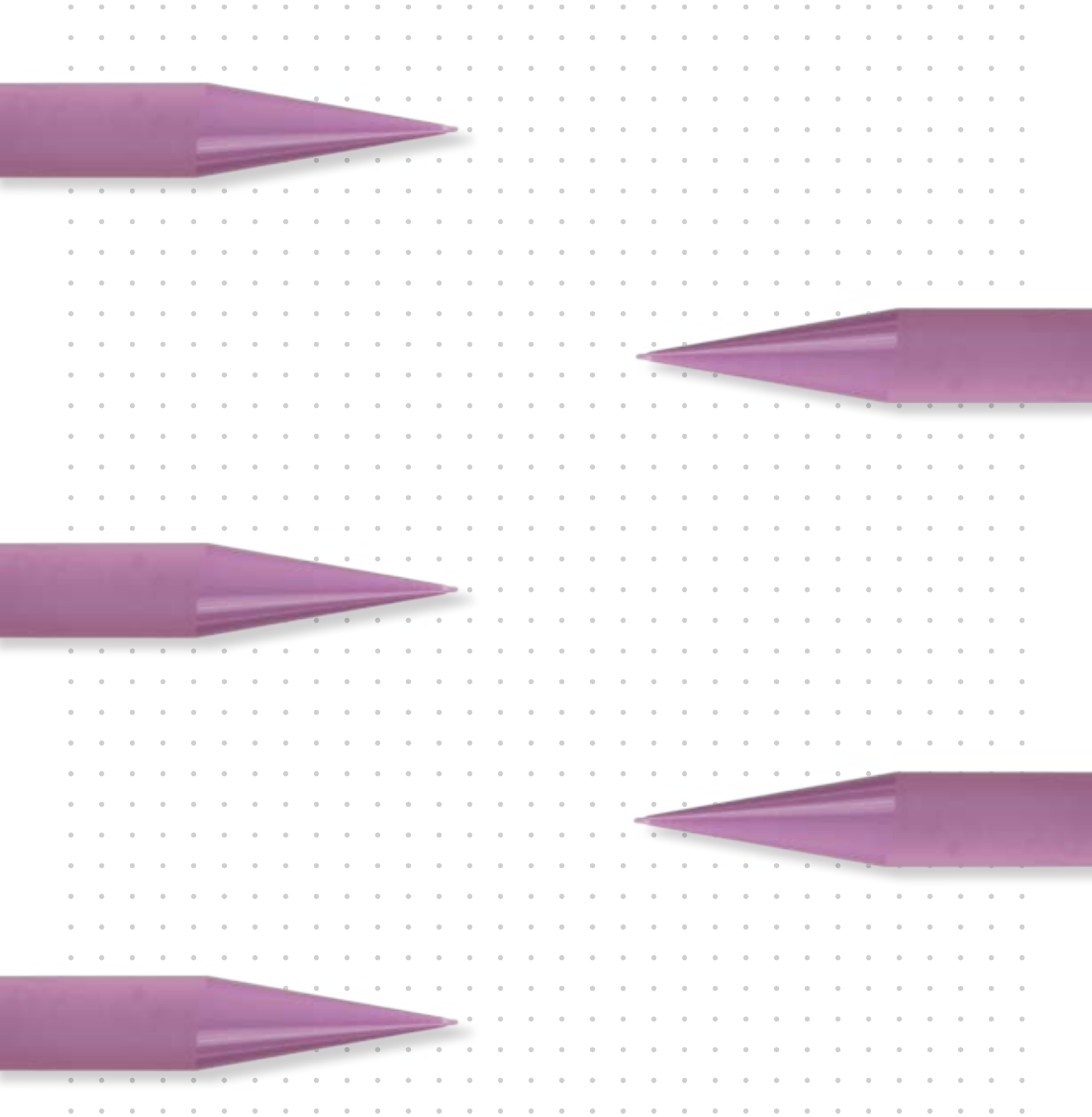




Gaiser® Advanced Copper Capillaries

CZRy™ Ceramics



Features & Benefits of CZRy™ Capillaries

Tip Finish

Several GatorGrip™ finish configurations are available to meet various copper wire bonding applications including NiPd, silver, and copper leadframes.

Physical Properties

CZRy combines higher hardness and bending strength properties for increased wear resistance & strong mechanical resistance to bond process stresses.

Chemical Properties

The ruby-like properties of CZRy improve grain boundary resistance to failures through increased density and optimized chemical composition. This translates to longer tool life. A denser surface finish makes it less prone to build-up and accumulation of foreign debris.

Mechanical Bonding Performance

CZRy grain size was designed to increase the mechanical coupling between the capillary and the copper wire. The granular finish provides a superior anchoring of the wire to prevent micro-sliding, greatly improving stitch strength, short-tailing, and adhesion with better Cu remains after stitch pull.

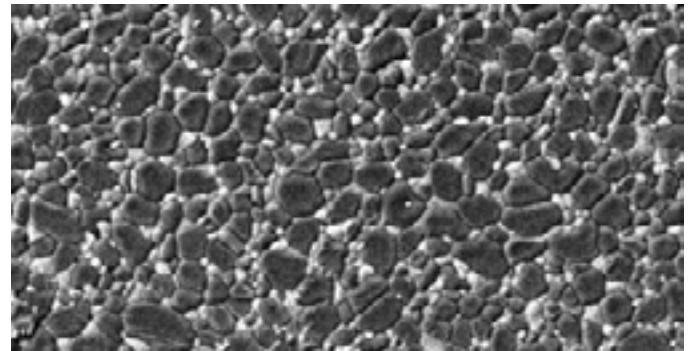
Ultrasonic Bonding Performance

The ceramic blend of CZRy produces an acoustically stable tool without the need for high ultrasonic power. Process optimization is made easy with this 'Plug & Play' advantage.

Material Engineering Results

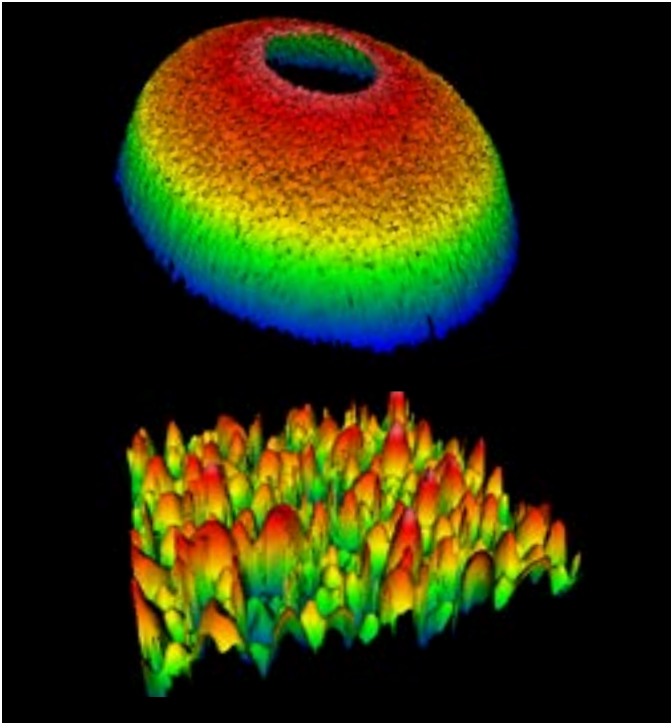
The unique material properties of CZRy offer:

- Near-perfect material distribution to prevent premature fatigue failures during bonding process
- High mechanical resistance to bonding stresses to improve life span
- Excellent acoustical performance to minimize ultrasonic power requirements
- Suitable for a wide range of product applications

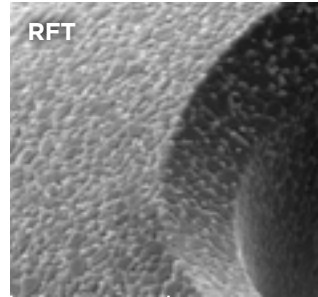


PHYSICAL PROPERTIES	CZRy
Bulk Density	4.40 g/cc
Avg. grain size, alumina	0.9 μm
Ultrasonic Efficiency	82.2 %

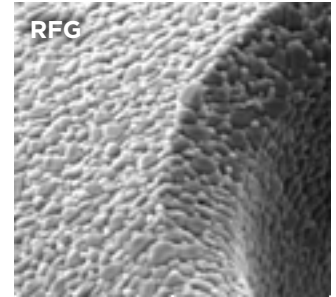
Surface Texture Comparison



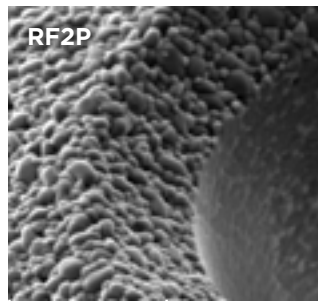
- Texture characterization is based on entire capillary surface area
- Each finish offers well-defined areal Ra and Rz values
- Texture finishes are tailored to application requirements



SRa	86.15 μm
SRz	345.53 μm



SRa	104.26 μm
SRz	411.48 μm



SRa	117.38 μm
SRz	482.55 μm

Following extensive surface texture analyses, CoorsTek Gaiser offers the latest and best materials and textured finish solutions to address the ever-growing challenges presented in newer and more advanced semiconductor packaging materials.

Peeled Stich Test

Bondability Results

CoorsTek Gaiser developed a specialized Peeled Stich Test to verify area of bondability and weld integrity. This test:

- Helps visualize stitch strength to axial stress components present during device encapsulation
- Exposes poor or marginal stitch bonds
- Facilitates process optimization and parameter settings
- Optimally shows 100% of welded area remaining

Pictures shown indicate excellent welded area coverage achieved with different CZRy finishes.

When optimized for each application, CZRy finishes yield optimum Peel Test results as seen on the magnified photos to the right.

Cu wire on Pd lead frame

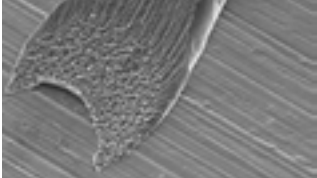
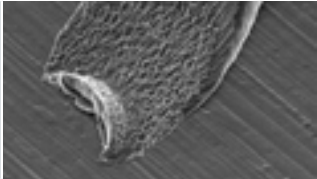

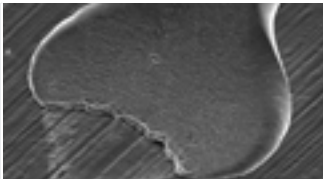


Cu wire on Ag lead frame



CZRy – Capillaries for Longer Tool Life

CoorsTek Gaiser CZRy ceramic capillaries provide exceptionally long-life durability. Combined with our superior, rough and tough GatorGrip tip finishes, these capillaries extend tool life far beyond current expectations. Let us show you the real difference – contact our experts today.

APPLICATION GUIDE	CZRy RFT	CZRy RFG	CZRy RF2P
COPPER (Cu) WIRE / BARE COPPER (Cu) SUBSTRATE	-	-	
COPPER (Cu) WIRE / NiPd SUBSTRATE	-	-	
COPPER (Cu) WIRE / SILVER (Ag) SUBSTRATE	-		-
GOLD (Au) WIRE / NiPd SUBSTRATE		-	-

CoorsTek Gaiser Bonding Tools

CoorsTek Gaiser® precision ceramic wire bonding tools represent decades of material and design refinement recognized by users all over the world. We invented the ceramic capillary and continue to lead the market with innovative, high-durability designs and unparalleled support services.

With over 50 manufacturing locations across four continents, CoorsTek is the international partner of choice for high-performance semiconductor materials.

Values presented here represent CoorsTek, Inc. improvements in ceramic processing and control guidelines of the original Gaiser products as well as new ceramic mixtures. These charts are intended to illustrate typical properties. Property values vary with method of manufacture, size, and shape of part. Data contained herein is not to be construed as absolute and does not constitute a representation or warranty for which CoorsTek assumes legal responsibility. CoorsTek and Gaiser are registered trademarks of CoorsTek, Inc. CRZy and GatorGrip are trademarks of CoorsTek, Inc.



CoorsTek, Inc.
 +1 303 271 7100
 +1 855 929 7100 toll free in USA
 info@coorstek.com

Japan
 +1 81 3 5437 8411
 jsales@coorstek.com

China
 +86 21 6232 1125
 gaiser@coorstek.com

coorstek.com

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