

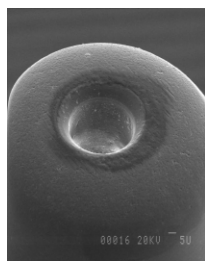
Introduction

Gaiser Tool Company is pleased to introduce our new technical newsletter. In addition to a technical feature article, we plan to provide *how to* articles, *common bonding problems*, *what's new* and more. Your comments and feedback are welcome.

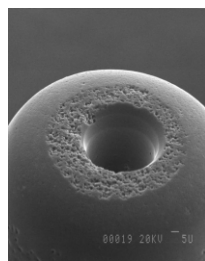
AETERNA (CZ3) New High Performance Ceramic

Fine and Ultra-Fine Pitch bonding requirements demand ever higher performance out of the ceramic bonding tools (capillaries). GaiserTool Company's answer to those requirements is the newly developed high strength, long life and ultrasonically stable AETERNA material also identified as CZ3 ceramic.

AETERNA combines hardness and bending strength to produce a tough durable ceramic capable of lasting beyond 3 Million bonds in real manufacturing environments (see photos #1 & #2).



Aeterna (CZ3)
Photo #1



Toughened Ceramic
Photo #2

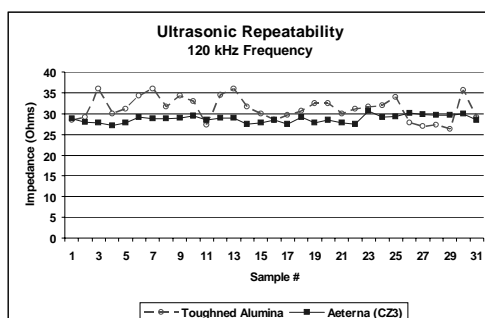
Other processes, such as Coatings or Chemical deposition can provide long life to

standard ceramic capillaries but stop short in providing additional physical and performance attributes.

Long tool life is not the only attribute sought in a capillary performance but process capability improvements as well.

AETERNA material gives our FP and UFP capillaries additional properties that significantly impact process capabilities. Some of these properties are increased ultrasonic efficiency, impedance repeatability and frequency transparency, low surface adhesion, and high breaking strength.

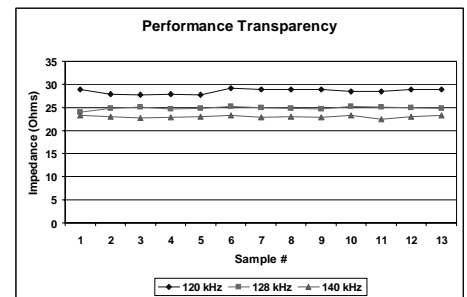
Ultrasonic efficiency results in more effective use of ultrasonic energy during the bonding cycle; ultrasonic repeatability measured as impedance feedback is significantly improved (see graph #1) and reflects a repeatable power delivery which in turns results in a repeatable bonding process.



Graph #1

Frequency transparency is obtained when similar performance is achieved at any of the various bonding frequencies now popular in new wire bonders (see graph #2).

Low surface adhesion results in less contaminant built up, allowing for a much longer effective tool life. Low surface adhesion impacts surface friction reducing its impact on wire looping; graph #3 compares friction data between AETERNA and standard toughened ceramic.

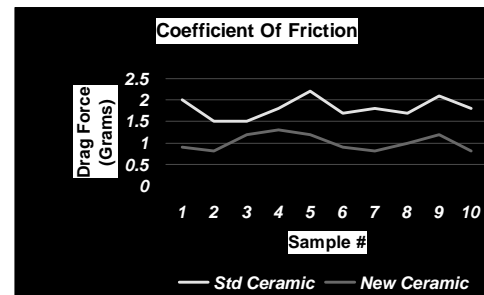


Graph #2

Higher bending strength means greater capability to design and build smaller tip geometries needed for current and future Fine Pitch (FP) and Ultra-Fine Pitch (UFP) processes.

AETERNA combines many of the good properties needed for a stable

and repeatable bonding process only achievable by a complete redesign of the ceramic material chemical structure and not by means of a coating process.



Graph #3

How To

Sizing a Vacuum Pickup Tool to the Die

Unlike a die collet, where the tool is sized exactly and uniquely to the die size, conical vacuum pickup tools may be used for more than one die size within a moderate range.

Generally, the tip diameter may be 50%-100% of the smaller of the die length or width, and the vacuum hole should be 1/2 to 2/3 of the tip diameter. Maximizing the tool size will provide maximum vacuum potential. If the vacuum hole is specified too large relative to the tip diameter, thin walls and reduced tool life may result.

