Product Information

Semiconductor Industry High Performance Materials

Chemical Mechanical Planarization

Ensinger provides a portfolio of products that are utilized in a variety of applications within the semiconductor industry. Chemical mechanical planarization is a vitally important manufacturing process that is integral to the high volume production of integrated circuits. Ensinger manufactures several materials that are used to produce CMP retaining rings. The following is a comparison of four key materials: TECATRON® SE natural, TECATRON® SX natural, TECAPEEK® SE natural, and TECAPEEK® CMP natural. These materials are used in interlayer dielectric, shallow trench isolation, interconnects, tungsten plugs, and other CMP applications.

TECATRON® SE natural

TECATRON® SE is a PPS material that is versatile with applications in oxide, ceria, tungsten and copper slurries. This material offers a good balance of mechanical, tribological, chemical, and physical properties. TECATRON® SE has proven to be “pad friendly” in oxide slurries meaning that the retaining ring produces a premium quality micro-texture on the pad that can enhance CMP performance.

TECATRON® SX natural

TECATRON® SX is a newly developed PPS material that offers unique material properties at an attractive pricing level. This product offers better ductility and is softer than standard PPS. Offering great value along with well-rounded properties, TECATRON® SX can be used with a variety of slurries and pads, so it could be used in a wide spectrum of applications.

TECAPEEK® SE natural

TECAPEEK® SE has better tribological properties than PPS material and also superior mechanical properties, making it ideal for demanding applications such as tungsten or ceria slurries. TECAPEEK® SE can also be used to optimize the copper damascene CMP process as foundries focus on improving planarization rates, uniformity, and defect levels. TECAPEEK® SE can be used in tough CMP applications that require the retaining ring to consistently perform at a high level.

TECAPEEK® CMP natural

TECAPEEK® CMP has outstanding properties for use in demanding chemical mechanical planarization processes, as well as for applications with firms that understand and appreciate that the retaining ring influences pad micro-texture which in turn impacts critical performance metrics such as: planarization rates, planarization uniformity, and defect levels. This advanced material can have a direct impact on the profitability and quality level of a high volume manufacturing operation. TECAPEEK® CMP has superior tribological properties when compared to traditional PEEK materials, as well as better ductility while also being softer. These material properties are ideal to optimize CMP output and quality levels.

Retaining ring
TECAPEEK CMP natural

Ensinger

TECATRON® SE natural...
Good performance with a proven history in mainstream applications

TECAPEEK® SE natural...
Better performance that is well suited for tough applications

TECATRON® SX natural...
Good performance at an exceptional value

TECAPEEK® CMP natural...
Best performance for CMP engineers that appreciate high performance

Comparison of Material Properties	TECATRON SE	TECATRON SX	TECAPEEK SE	TECAPEEK CMP
Tensile Strength (MPa)	102	102	116	110
Tensile Modulus (MPa)	4100	4000	4200	4100
Elongation at break (%)	4	11	15	50
Wear Performance	Good	Good	Better	Best
Ball Indentation Hardness (MPa)	248	230	253	240

Tube
TECATRON SE natural

For technical support or guidance regarding qualification of Ensinger materials for use in your semiconductor manufacturing process, please contact your Ensinger sales representative.

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