



RONCELLI PLASTICS

FAST | CLEAN | PRECISE

SEMICONDUCTOR

PRECISION PLASTIC MACHINING FOR SEMICONDUCTOR APPLICATIONS

1-800-250-6516
WWW.RONCELLI.COM



MANUFACTURING CAPABILITIES

CNC Machining (Temperature Controlled Machining Center)

- 5 Axis CNC Milling (up to 21")
- 3 Axis CNC Milling (up to 30"x60") - with Pallet Automation
- CNC Turning (up to 18" in diameter)
- CNC Swiss (30mm in diameter)
- Small hole drilling (.004" capable)
- Die Cutting / Stamping

Rapid Prototype Manufacturing (RPM)

- Quick Turn Machining Cell
 - 5 Axis CNC Mills
 - Tolerances +/- .0005"
 - Turnaround time < 1 week
- Fusion Deposition Manufacturing (FDM)
 - 3D printed precision parts from Ultem & Polycarbonate
 - Tolerances +/- .0015"
 - 2-3 day turnaround time



Quality Practices & Assembly

- ISO 9001:2008
- Class 1000 Clean Room packaging & assembly
- Class IV laser part marking
- Copy Exact
- Material is certified and lot traceable
- First article, in-process, and final inspections on all part orders

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SEMICONDUCTOR MATERIALS

(All listed materials are supplied with certification & lot traceability)

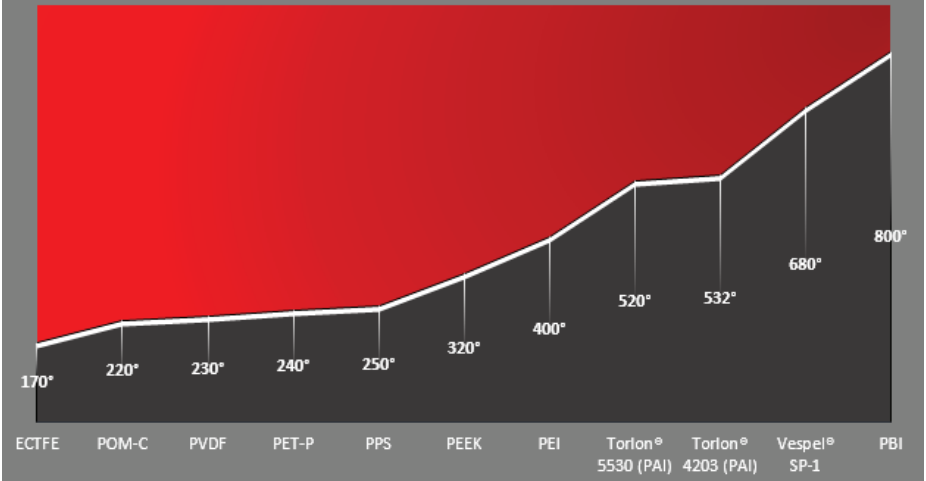
COEFFICIENT OF LINEAR THERMAL EXPANSION

POM-C	5.4×10^{-5}
PET-P	3.3×10^{-5}
PPS	2.8×10^{-5}
PEEK 1000	2.6×10^{-5}
PEI 1000	3.1×10^{-5}
Vespel® SP-1	3.0×10^{-5}
PBI	1.3×10^{-5}
ECTFE	6.6×10^{-5}
PVDF	6.6×10^{-5}
Semitron® CMP LL5 (PET-P)	4.5×10^{-5}
Semitron® CMP XL20 (Torlon®)	1.7×10^{-5}
Semitron® ESd 225 (POM)	9.3×10^{-5}
Semitron® ESd 410C (PEI)	1.8×10^{-5}
Semitron® ESd 420 (PEI)	1.95×10^{-5}
Semitron® ESd 420V (PEI)	1.5×10^{-5}
Semitron® ESd 480 (PEEK)	1.7×10^{-5}
Semitron® ESd 490 HR (PEEK)	2.8×10^{-5}
Semitron® ESd 520 HR (Torlon®)	2.8×10^{-5}
Torlon® 5530 (Torlon®)	2.6×10^{-5}
Torlon® 4203 (Torlon®)	1.7×10^{-5}

SURFACE RESISTIVITY (Ω / square)

Seimtron® ESd 225	$10^9 - 10^{10}$
Semitron® ESd 410C	$10^4 - 10^6$
Semitron® ESd 420	$10^6 - 10^9$
Semitron® ESd 480	$10^6 - 10^9$
Semitron® ESd 490HR	$10^{10} - 10^{12}$
Semitron® ESd 520HR	$10^{10} - 10^{12}$

HEAT DEFLECTION TEMPERATURE 264 PSI (°F)



SEMICONDUCTOR SEGMENT APPLICATIONS

WET PROCESS

Application(s)

- Spin discs & chucks, wafer motion gears, shower heads, wafer grabbers, pins & screws

Material(s)

- PP, PEEK, PVDF, ECTFE, PFA, PPS, PET

Key Considerations & Requirements

- Corrosion resistance
- Extreme flatness
- Strength & wear
- High purity
- Chemical resistance
- Dimensional stability

Roncelli Plastics offers the broadest range of chemically resistant, machinable plastics for wet process applications. Wet process engineers routinely request materials that are high in purity, corrosion and chemically resistant, with consistent high-quality appearances. No one material can address every rigorous wet process demand, however our, material and machining experience allows Roncelli Plastics to provide the broadest range of wet process application solutions in a cost effective manner.

FUNCTIONAL CHEMICAL COMPATIBILITY

	PP	PEEF	PVDF	ECTFE	PFA	PPS	PET-P	Ketron® CA30 PEEK
Strong Acids	+	0	+	+	+	0	-	0
Weak Acids	+	+	+	+	+	+	+	+
Strong Base	+	+	0	+	+	+	+	+
Week Base	+	+	-	+	+	+	0	+
Salts	+	+	+	+	+	+	+	+
Halogens	0	+	0	0	+	0	0	+
Aliphatic hydrocarbon	-	+	+	+	+	+	+	+
Aromatic hydrocarbon	0	+	+	0	+	+	+	+
Chlorinated hydrocarbon	-	0	0	0	+	+	0	+
Ketones	+	+	-	0	+	+	+	+
Amines	+	+	-	-	+	+	+	+
Alcohols	+	+	+	+	+	+	+	+
Esters	+	+	0	0	+	+	+	+
Alehydes	+	+	+	0	+	+	+	+
Phenoles	0	+	+	0	+	-	-	+

Tests @ 73° F

+ Acceptable Service
 0 Limited Service
 - Not Acceptable Service



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IN-CHAMBER

Application(s)

- Clamp & trench rings, valve housings, shower heads, screws & pins

Materials(s)

- PEEK, Torlon®, Celazole®, Vespel®

Key Considerations & Requirements

- Excellent chip resistance, durability & machinability in comparison to quartz.
- Excellent ionic purity
- Very low oxidation degradation
- Extraordinary temperature resistance

Within the In-Chamber semiconductor segment, engineers seek to pinpoint material selection on a per application basis to maximize cost vs. performance. Traditional materials like quartz or ceramic are historically well-understood, however the aggressive process environment and routine cleaning puts these more traditional and expensive materials at risk of damage. In chamber components produced from high purity polymers reduce these risks without cost penalization. Advancements in thermoplastic properties coupled with our clean manufacturing techniques allows Roncelli Plastics to offer a complete solution for In-Chamber component requirements



CHEMICAL MECHANICAL PLANARIZATION (CMP)

Application(s)

- Retaining rings, carrier/chucks

Material(s)

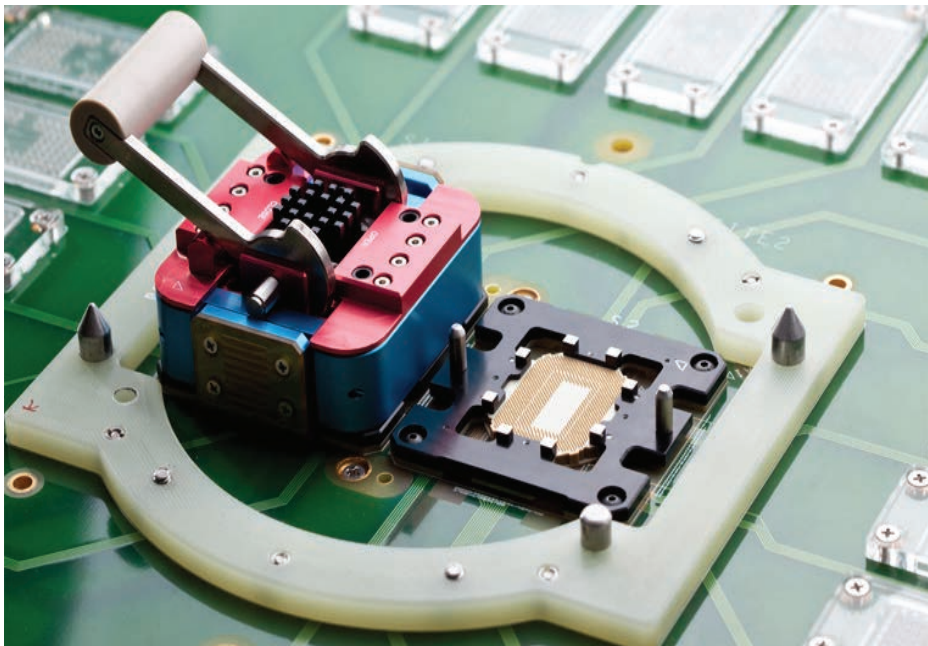
- Semitron® CMP XL20, Semitron® CMP LL5, PPS, PEEK

Key Considerations & Requirements

- High structural strength and extreme rigidity
- Very strong performance in oxide chemistries
- Enhanced life in slurry-less applications

CMP applications require outstanding product performance in multiple areas, including high chemical resistance to slurries, high wear rates, increased sensitivity to contamination sources, and an excellent overall process performance over the lifetime of the component. The diverse environments and conditions of different CMP processes dictates the need for proficient knowledge of high quality material machining. Roncelli Plastics extensive industry experience and strong material portfolio allows Roncelli Plastics to provide significant value for all machined plastic CMP components.

Since 1969, Roncelli Plastics has specialized in Precision Fabrication, CNC Machining, Die Cutting, Rapid Prototyping and Clean Room Assembly of plastic and non-metallic components. Our highly experienced staff of machinists, quality personnel, and supervisors is dedicated to delivering the best quality plastic and non-metallic components in the industry. We're proud to deliver finished components to some of the largest and most well-known organizations in the world.



BURN IN TESTING

Application(s)

- Test sockets, wafer combs, shuttle inserts

Material(s)

- Torlon®, Semitron®, Ultem®, Teflon®, PEEK

Key Considerations & Requirements

- High flexural strength
- Low tensile elongation to increase hole placement accuracy when machining
- Extremely low CTE to ensure excellent dimensional stability
- Higher heat deflection point for cleaner thru hole machining.
- Extremely low moisture absorption critical for maintaining tight tolerances

Roncelli Plastics routinely delivers functional test socket components while meeting the rigorous demands of the most critical requirements that affect the machinability and stability of the application. The challenge is to provide increased material stiffness while decreasing machining features like hole size and pitch. Our experience achieving tight tolerance features and strength requirements across a broad temperature range allows Roncelli Plastics to consistently deliver solutions to these complex application requirements.

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SEMICONDUCTOR INQUIRIES
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