# FABS and LABS

## From Powder to Product – Trans-Tech Does it All


Among the many world-class, high-volume manufacturing facilities located around the world within Skyworks, there is a small gem in Adamstown, Md. called Trans-Tech. Trans-Tech is a wholly owned subsidiary of Skyworks Solutions providing complementary state-of-the-art RF/microwave ceramic products. The company designs and manufactures a complete line of high quality, low cost ceramic based components for a number of applications within the RF/microwave business sector. Their product portfolio includes dielectric resonators and coaxial transmission line elements for DRO and VCO applications, ceramic bandpass filters, ferrite and garnet material for circulators/isolators. They also design and manufacture thermal barrier coatings and bio-ceramics. Trans-Tech services the wireless infrastructure, aerospace, automotive, military and medical markets — a broad reach for a small business.

The company was founded in Rockville, Md. by Dr. Herbert H. Greger in 1955 and was acquired by Alpha Industries, now Skyworks, in 1981. The company currently operates in 140,000 square feet of space in two locations employing about 240 people. Their locations include a circulator and isolator design team in Ireland, as well as sales, marketing engineering and quality workforce in China. Trans-Tech purchased MACOM's isolator business in 2011 and has been improving the ceramic resonator material by reducing its size while maintaining high RF performance levels. This has been accomplished using new ferrite material formulations producing a higher dielectric constant than previously achievable.

Trans-Tech's material expertise sets them apart from other manufacturers because they control the whole process from powder to finished product. The company performs all of the processing from raw materials, forming, firing, finishing, to assembly and test. Trans-Tech uses about 75 different elements and more than 400 compositions of materials to produce these specialized, custom products that provide high performance end products to their customers. For ceramic processing, Trans-Tech does powder preparation via solid-state reactions, vibratory milling, ball milling and spray drying. Their forming processes include dry pressing, extrusion and isostatic presses that use up to 60,000 psi of pressure. Sintering is performed via tunnel, periodic, bottom load and air-fired/pressurized kilns and grinding is performed using many methods including CNC, surface, lapping, through-feed, ID and OD slicing and centerless. They also have extensive analysis equipment to measure the physical and electrical properties of their ceramics and end products.

Trans-Tech is working on replacing typical cavity style filters with a ceramic based SMT or connectorized filters with power handling >100 W. They are also working to extend the typical 5.5 GHz frequency limit with ceramics, achieving designs up to 7 GHz. Work is ongoing to reduce resonator sizes and extend their frequency for 5G applications and others in the future.

As a small business within Skyworks, the culture is a family atmosphere driven to be agile. They respond quickly to customer needs and have an innovative spirit to solve problems with their materials expertise. Many workers have been there 30-plus years and some 40-plus years, demonstrating the close knit family environment. While they are a small group within Skyworks, their products are found in the most demanding wireless applications around the world as they continue to invent new material solutions for the wireless industry.

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