

Precision Component Supplier Augments World Class Quality Manufacturing Operations with a Corning Tropel FlatMaster®



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Corning Tropel
Metrology Instruments

Established in 1950, Camcraft has been a leading supplier of precision turned components for the automotive, heavy-duty truck and off-road vehicle markets for over half a century. Their expertise spans a wide variety of highly complex and critical hydraulic parts for engine management, fuel supply, ride control and braking system applications.

Camcraft's 85,000 ft² (8,050 m²) manufacturing facility is located near Chicago, IL, USA, and houses a variety of leading machine tools including Hydromat CNC rotary transfer machines, Euroturn & Schutte 8-spindle automatics and Citizen brand Swiss type turning centers. Their continual investment in leading edge manufacturing capability is equally matched by their comprehensive dedication to quality. From advanced product quality planning that employs a cross-functional team of quality engineers and manufacturing personnel to a full complement of advanced metrology systems, Camcraft is driven to provide their customers with "perfect parts everyday".

This commitment to quality requires Camcraft to constantly look for ways to improve their overall customer support and meet ever-increasing quality requirements. One of Camcraft's customers required tighter flatness & sorting for an existing component with multiple steps and configurations.



Also, a quicker turn-around on new product development programs to determine flatness for a wider variety of components is required. Previously, Camcraft had supported these demands with a leading CMM system, but long programming time, slow cycle time, and limitations in the number of data points necessitated investment in a newer, advanced metrology system.

After review of numerous systems from a variety of suppliers, Camcraft selected a Tropel® FlatMaster® 40 system. Camcraft's Quality Engineer, Dieter Happel explained "the FlatMaster was chosen based on its quick measurement time (5 seconds typical) and ability

to capture a high number of data points ($\leq 230,000$ per measurement). Equally important was the FlatMaster's high level of resolution, no need for part fixturing, and user-friendly programming."

Dieter also commented, "We use the FlatMaster for our high-end, intricate component jobs. As an example, we have a fuel injector component that has a flatness requirement of 0.2 microns (200 nm). A critical surface requiring measurement is not continuous but has multiple steps and features. A CMM would take an hour to measure enough locations, but utilizing the FlatMaster's optical, non-contact design, quality assurance is simple, fast and cost effective." These capabilities also now help Camcraft to better support their customers early in the product development process by enabling fast set up time and quick and accurate measurements during multiple component design reviews.

Developed by the Corning Tropel Corporation, the FlatMaster is a non-contact optical-based measurement system. It has the ability to measure the entire 3D profile of precision component surfaces up to 200 mm. The system offers up to 5 nm resolution and a standard accuracy of 50 nm, measuring flatness, line profile, surface profile, spherical radius and other surface parameters. It can measure a wide range of metal surfaces including ground, lapped, honed, polished and super-finished and also measure ceramics, polymers and glass.



The FlatMaster series offers the capability to measure parts that range in size from 5-200 mm. Each system comes with an interferometer (two versions shown here) and a Windows-based PC with Corning Tropel TMS software.

Camcraft installed their FlatMaster 40 in June 2005 and had it integrated into their quality system within a week. The system is currently relied upon for flatness measurements on single components and mating surfaces. Furthermore, Dieter mentioned, "there has been no downtime with the FlatMaster and in terms of time saved between programming and our overall inspection cycle, it has exceeded our expectations. The system has been vital to process improvements and enhanced quality assurance capabilities." Camcraft was QS certified in 1997, received their ISO/TS 16949 certification in 2002, and now aided by the FlatMaster 40, continues to support their goal of supplying their customers with "perfect parts everyday".



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