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Automotive Industries

OUR 115th YEAR

Vol. 189 • Issue 2

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High-speed **crankshaft** measuring

Reducing **Emissions**

Addison D. Cole, founder and CEO of Adcole Corporation.

"The green cars of the future will have high performance small engines with very low emissions. Consequently, the production tolerances will continue to tighten which should lead their manufacturing plants to adopt Adcole technology. **Page 72**

Greener technologies = tighter tolerances

By: Lenny Case

If your company manufactures camshafts and crankshafts for the automotive industry, you will know that production tolerances will continue to tighten as the demand for greener vehicles increases.

The need to improve engine life performance, fuel economy and reduce emissions will continue to escalate, resulting in the need for more precise measurement equipment, predicts J. Brooks Reece, Adcole Vice-President. In response to the ever-tighter tolerances necessitated by developing greener technology engines, Adcole recently introduced the Adcole Model 1300 high-speed crankshaft gage, which "will virtually eliminate the risk of delivering a bad crankshaft. Designed for operating two or three shifts per day, this measuring machine has a granite base and incorporates a touch-screen operator interface, linear motors, air bearings, and dual optical linear scales for final inspection accuracy," he says.

Addison D. Cole, founder and CEO of Adcole Corporation

Founded in 1957, Adcole has manufacturing facilities in both Massachusetts and Florida, and offices around the world. Adcole maintains its leadership in the critical core competencies of high accuracy optical-mechanical measuring technologies and company know-how by investing 10% of revenues in R&D. In addition to manufacturing special purpose machines that measure engine components like camshafts, crankshafts and pistons, Adcole has been a leading supplier of sun sensors for space satellites for over 40 years.

Back on earth, nearly 60% of the company's business is generated from automotive OEMs and manufacturers of agricultural and construction equipment, motorcycles, outboards, and other small engine manufacturers, while the remaining 40% comes from the spacecraft industry.

Capable of measuring many parameters simultaneously, the Adcole 1310 High-Speed Camshaft Inspection Gage is easy to program, is Windows compatible, and permits fast changeover for inspecting different camshafts thanks to its adjustable followers, according to Adcole. This machine provides gage room accuracy at production line speeds. Over the past 25 years and through continuous design upgrades, Model 1310 Gages have measured tens of millions of camshafts and helped improve engine performance and longevity for many manufacturers.

To ensure that its measuring instruments live up to their 50 plus year earned reputation for innovation and quality, Adcole gages are assembled, tested, and certified at the company-owned, custom-designed building in Marlborough, Massachusetts. Built in 1983, this facility was expanded in 1998 to accommodate 200 employees. Adcole's Florida plant specializes in the production of the high-precision ball-bearing spindles used in its gages.

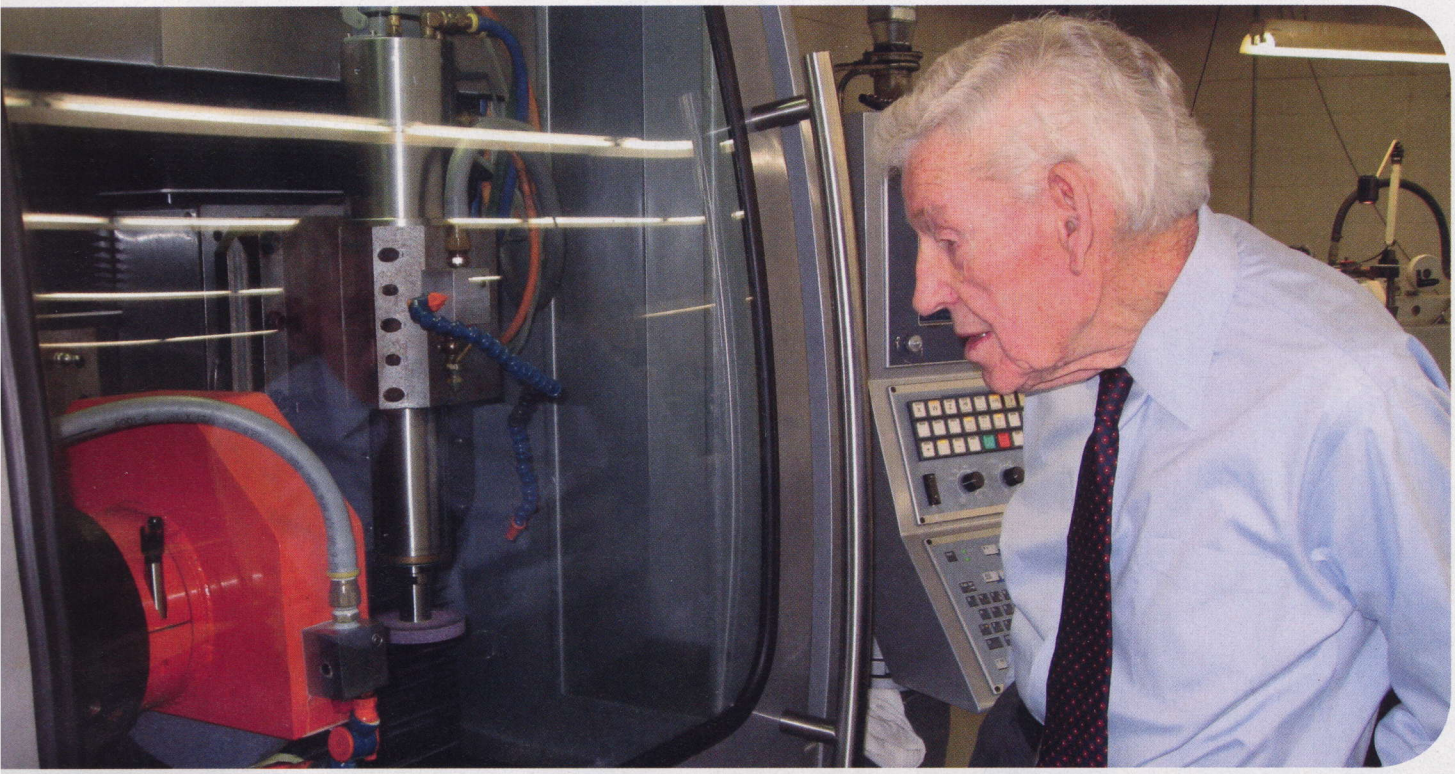
More than 500 major automobile and supplier companies in 31 countries worldwide employ Adcole computerized inspection gages for quality control checks on camshafts and crankshafts. These companies include General Motors, Ford, ThyssenKrupp, VW/Audi, Chrysler, Toyota, Fiat, Nissan, Renault, Hyundai, Volvo, Suzuki, Caterpillar, Daimler, BMW, Honda, Cummins, FAW, Tata, MAN, John Deere, SAIC and Dong Feng.

Automotive Industries spoke to Addison D. Cole, founder and CEO of Adcole Corporation, and asked him about Adcole's advanced optical mechanical measurement solutions for crankshafts and camshafts.

Cole: Over the years, Adcole equipment has provided our customers with a technical advantage in terms of accuracy and conformance with other Adcole gages. Our large users have Adcole gages in their powertrain development labs, plant gage rooms or nearby on the production floor, as well as 100% in-line production measuring. The advantage to these companies is that they know they are making what they designed at a low cost and that their end-users are getting the intended product and its intended performance.

AI: How did Adcole gages come to be so widely used around the world?

Cole: Our first customers were the largest automobile and heavy equipment engine manufacturers. They were the world experts at ▶



Addison D. Cole viewing the machining of an advanced technology air-bearing, vertical axis grinder for spindles.

Addison Cole – the man behind the company

Addison Cole, who started Adcole in 1957, is one of the auto industry's legends. He is best known in the space industry for developing the sun (solar aspect) sensor, which helps rockets and spacecraft maintain their orientation in space. After WWII, he co-founded Laboratory For Electronics (LFE) which went public in 1957. Prior to that, he was assigned to MIT's radiation laboratory's airborne radar unit during WWII as Program Manager. He then spent time in the UK training the RAF on use of the radar, which opened up the North Atlantic shipping lanes. At age 91, he is still active as President and CEO of Adcole.

using high accuracy equipment, and as they gained experience with our equipment they asked us to incorporate further refinements. Soon, these early users purchased our equipment for their other engine plants around the world and our reputation spread. Today, our camshaft and crankshaft gages are the world standard.

AI: What makes you believe the ADCOLE 1310 High-Speed Camshaft Inspection Gage is the best of its kind in its product segment?

Cole: Over 25 years, two generations of designs, and continuous improvements, the Model 1310's have measured tens of millions of camshafts. Not only do they conform to the accuracy of Adcole gage room equipment, they do so at production line speeds up to 200 parts per hour.

AI: How revolutionary is your Adcole Model 1300 High-Speed Crankshaft Gage?

Cole: The Model 1300 uses advanced linear motor technology, dual linear gratings and air bearings. It is a very sophisticated design. Unlike diameter only gages, we build a radius measurement system that provides not only diameter, but roundness, cylindricity and straightness, as well. These are the important parameters for emissions reduction and long engine life.

AI: How will it impact automotive OEMS who are aiming to manufacture greener cars?

Cole: Over the years, the critical tolerances for camshafts and crankshafts have been set significantly tighter to improve engine life performance, fuel economy and reduce emissions. In the last 25 years crankshaft roundness tolerances have been reduced from 8 microns to 3 microns. The green cars of the future will have high performance small engines with very low emissions. Consequently, the production tolerances will continue to tighten which should lead their manufacturing plants to adopt Adcole technology.

AI: What are your thoughts on the economic recovery in the automotive industry?

Cole: There may be short term setbacks in certain country markets, but the number of consumers in the world will increase from one billion people to two billion. The outlook for automobile demand has never been brighter. AI

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Camshaft and Crankshaft Measurements

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