



QUESTEK'S FERRIUM® S53® STEEL VALIDATED IN T-38 LANDING GEAR FIELD SERVICE EVALUATION

*Successful Results of U.S. Air Force T-38 Field Service Evaluation
Demonstrates Use of S53 in Aircraft Landing Gear Service to Eliminate Toxic Cadmium Plating*

EVANSTON, IL, September 26, 2012 – A field service evaluation conducted by the U.S. Air Force was successfully completed on two main landing gear pistons made from corrosion-resistant, ultra high strength Ferrium® S53® steel that were only primed and painted and were not plated with cadmium. The S53 main landing gear pistons were in service for 19 months on a T-38 aircraft that operated in the U.S. Gulf Coast and experienced more than 500 landings. Each piston is approximately 39 inches long and two inches in diameter at a typical cross section.

The T-38 field service evaluation showed that primed and painted S53 pistons without cadmium plating performed at least as well as the baseline cadmium-plated, primed and painted 4340 pistons. No defects were found in the S53 pistons after conclusion of the field service evaluation when inspected using both magnetic particle and ultrasonic methods. No rust was visually observed in threaded areas or within the internal bore. Some small chips in the paint system were observed and the exposed base metal showed no rust with unaided visual inspection. Under magnification a few very small corrosion pits of approximately 0.01 inch or less in width were observed; the frequency of these pits was comparable to or less than those pits observed on cadmium-plated, primed and painted 4340 pistons. After the paint removal for inspection, both S53 pistons were cleaned using only a mild abrasive pad. Both S53 pistons are expected to return to T-38 flight service after re-painting.

Conventional 4340 or 300M steels are plated with cadmium in order to limit corrosion in landing gear service. In addition to providing general corrosion resistance without cadmium plating, S53 provides greater resistance to stress corrosion cracking (SCC), fatigue, corrosion fatigue, and grinding burn damage than 4340 or 300M steels provide. Successful fatigue testing of an identical S53 T-38 main landing gear piston in a laboratory rig demonstrated more than ten life-cycles, far exceeding the requirement to achieve four life-cycles.

S53 was computationally designed by QuesTek with support from the Strategic Environmental Research and Development Program (SERDP) and the Environmental Security and Technology Certification Program (ESTCP), which are led by the U.S. Department of Defense. S53 is commercially produced and sold by Latrobe Specialty Metals Co. and Carpenter Technology Corp., under license from QuesTek. S53 is covered by SAE AMS 5922 and is included in the MMPDS handbook. For more information about S53 see <http://www.questek.com/ferrium-s53.html> or about the field service evaluation results (including photographs) contact QuesTek's Rich Kooy at 1-847-425-8213 or rkooy@questek.com.

ABOUT QUESTEK

QuesTek Innovations LLC (www.questek.com) is a global leader in integrated computational materials engineering (ICME), serving commercial and governmental clients. QuesTek uses its proprietary *Materials by Design*® technology and expertise to rapidly develop new materials that reduce capital, processing, operating or maintenance costs, or improve environmental protection, competitive supply or competitive advantage. QuesTek has commercially introduced four new alloys via its licensees, has more than 10 new alloys in its design and development pipeline, and has more than 30 patents awarded or pending worldwide.