



## QUESTEK'S ULTRA-HIGH STRENGTH, HIGH TOUGHNESS *FERRIUM*<sup>®</sup> M54<sup>™</sup> STEEL RECEIVES APPROVAL FOR INCLUSION IN AEROSPACE INDUSTRY MMPDS HANDBOOK

### *Increasing Application of M54 Steel in Demanding Aerospace Applications Expected*

EVANSTON, IL, USA January 7, 2014 – QuesTek Innovations LLC is pleased to announce that its ultra high-strength, high-toughness *Ferrium*<sup>®</sup> M54<sup>™</sup> steel has been approved for inclusion in the aerospace industry's Metallic Materials Properties Development & Standardization (MMPDS) Handbook. This marks QuesTek's second fully-qualified alloy, following the 2008 MMPDS approval of its ultra high strength, high toughness, corrosion resistant *Ferrium*<sup>®</sup> S53<sup>®</sup> alloy, which is being used without toxic cadmium plating in landing gear and other corrosion-sensitive applications.

Using Integrated Computational Materials Engineering (ICME) methodology and its *Materials by Design*<sup>®</sup> technology, QuesTek successfully designed and rapidly developed M54 steel to be a cost-effective, drop-in replacement for *AerMet*<sup>®</sup> 100. The alloy design project was funded under two Small Business Innovation Research contracts sponsored by the U.S. Navy Naval Air Systems Command (NAVAIR).

QuesTek accelerated M54 steel from a clean sheet design to a precise chemical composition in less than one year, and produced the first 10-Ton ingot the following year. SAE International issued an Aerospace Material Specification (AMS 6516) two years later. With this MMPDS approval, M54 steel has reached full flight qualification from clean sheet design in less than six years.

The rapid development and approval of M54 steel proves that QuesTek can meet the goals of the Materials Genome Initiative, created by the White House Office of Science and Technology in June 2011, as a multi-agency effort to greatly accelerate the pace of discovery, reduce the cost and shorten the development and deployment time of advanced material systems (cutting in half the typical development of new advanced materials and its implementation time of about 20 years).

The MMPDS Handbook provides standardized design values for alloys used in aerospace structures, and is accepted by the Federal Aviation Administration, the Department of Defense, and the National Aeronautics and Space Administration. The A- and B-Basis design minima for M54 steel will first be published in MMPDS-09, allowing engineers to design components using M54 steel for flight safety critical components such as landing gear and helicopter rotor shafts. M54 steel is also an upgrade from 4340 and Maraging steel grades, and is being used in demanding oil and gas and other industry applications.

QuesTek used the Accelerated Insertion of Materials (AIM) analysis technique on M54 steel, using data from just three production heats, to predict its MMPDS design minima (which are usually derived from testing ten full-scale production heats). This in part gave the US Navy's T-45 program office the confidence to fund manufacturing and rig testing of three M54 steel landing gear hook shanks before it was approved in MMPDS.

For more information on the properties, processing and leading applications of M54 steel, please visit <http://www.questek.com/ferrium-m54.html>

### ABOUT QUESTEK

QuesTek Innovations LLC ([www.questek.com](http://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*<sup>®</sup> technology and expertise to rapidly develop breakthrough alloys, coatings, powders, and other materials that provide improved processing and performance, reduced capital (as well as operating and maintenance costs) and provide competitive advantage. QuesTek has developed new materials that are commercially available, has a large portfolio of materials that are nearing commercialization or are currently under development, and holds more than 100 patents. For more information, please contact Jeff Grabowski at 1-847-425-8241.