Q-Tough
High performance, wear-resistant coating for production tubing
Wear is a pervasive problem in many upstream oil and gas applications, leading to low reliability and increased costs. Quantiam Technologies has developed a portfolio of customizable wear and corrosion resistant coatings, including those tailored to address specific challenges in the oil and gas sector.

In unconventional wells, high costs are driven, in large part, by the frequency of failures and the associated cost of workovers. For rod-driven wells, tubing perforations caused by sliding wear between the sucker rod and the inside of production tubing are among the most common causes of downtime. Our Q-Tough coating resolves this problem. Production tubing lasts longer when Q-Tough is applied at high-wear locations, eliminating resource-intensive workovers, reducing costs, and increasing reliability.

Field testing proves remarkable results

Over four years of field testing production tubing in 44 unconventional wells has shown stellar results. Field trial well runtimes have exceeded 4x typical runtimes, producing savings of over $75,000 in workovers per well per year. During this period, no coating related failures have occurred.

Q-Tough's many applications include production tubing in unconventional wells that is highly susceptible to sucker rod sliding wear.

**Composite microstructure** consisting of small, well-dispersed hard particles in a ductile corrosion resistant metallic matrix with negligible porosity

**15x improvement** compared to carbon steel under laboratory abrasive wear conditions (ASTM G65 – Procedure A)

**Compatible with** a wide variety of substrates (carbon and alloy steel, stainless steel, and Ni-based alloys)

**Metallurgical bonding** and high coating toughness eliminates the need for special handling and minimizes delamination
Microscopic inspection validates high performance

After more than 500 days of field use, borescope inspection of Q-Tough coated production tubing showed no observable material damage on the inner surface along the full tube length. Cross-sectional samples were taken at random locations for coating microstructural evaluation. This analysis showed that 93% of the Q-Tough coating thickness remains after more than 500 days downhole.

93% coating thickness remains after 500+ days

Cost-effective, non-line-of-sight manufacturing process enables coatings to be applied to parts with small internal diameters and complex shapes

Coatings can be applied to internal and external surfaces with thicknesses from 50 to 1000µm (0.002” – 0.040”)

Performance benefits can be realized by selectively coating problem areas

Smooth surface finish and unique composition enables long runtimes without accelerating wear of other components

Lab testing of Quantiam’s Q-Tough coating under sand abrasion wear conditions shows a 15x improvement over carbon steel

Relative Wear Resistance

Test Conditions: ASTM G65 (Abrasive wear) Procedure A

Microstructural Evaluation of Coating After 500+ Days of use

Coating Microstructure

10 µm

100 µm
Quantiam Technologies

A global leader in high performance coatings for internal surfaces and complex shapes

Twenty years on and our drive to innovate is stronger than ever. We continue to redefine what’s possible, creating novel coatings that solve persistent and expensive real-world problems.

We specialize in producing advanced coatings for internal surfaces and complex shapes using a cost-effective, proprietary, non-line-of-sight manufacturing process.

Our products are the result of leading edge research and expertise in coating development, surface and materials science, and catalysis. Our extensive lab and field testing prove that our products are capable of outlasting the rigours of everyday use under severe operating conditions.

We are
home to one of
the most extensive
advanced materials
and nanomaterials
development and
coloration
facilities in Canada’s
private sector

We develop
advanced coatings
that can be applied
to internal surfaces
and complex shapes
using our proprietary
non-line-of-sight
deposition process

We partner
with companies in
the petrochemical,
energy, CleanTech, and
aerospace sectors,
to solve real-world
problems using surface
and materials science

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