



A **STRONG** INVESTMENT

EndurAlloy™ Production Tubing



About Endurance Technologies

Mission: To provide patented diffusion alloying solutions to all applications in the global marketplace.

Trademarked **EndurAlloy™**, **EndurAlon™**
Manufacturing Plant in Calgary™, Alberta,
Canada

ISO 9001-2004 Certified

65+ Employees

Producing for the Canadian Oilfield Since
1993

Introduced into the US Market 2004



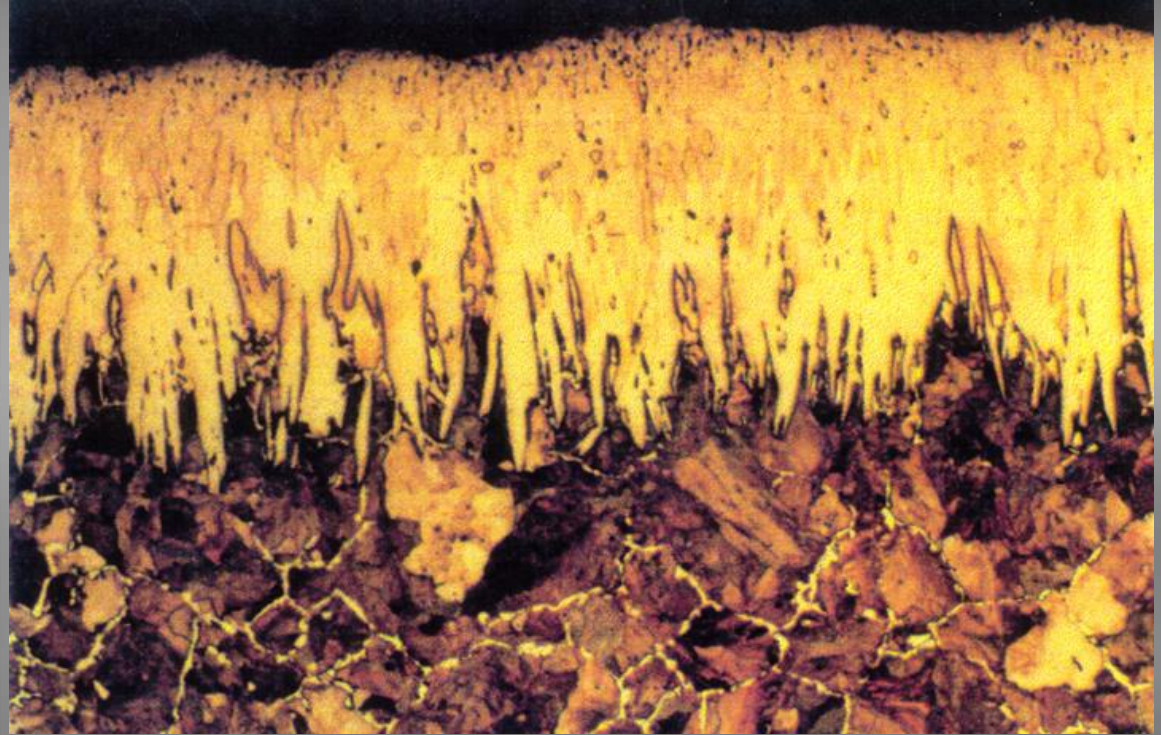
The EndurAlloy™ Process

- Joints packed with chemical.
- Fired at high temperature in gas furnace.
- Chemical vapor deposition occurs where Boron is diffused into the substrate of the steel.
- Joints are cleaned, straightened, inspected, painted and marked.
- ISO Q/C and HSE procedures throughout entire process.

The EndurAlloy™ Process



EndurAlloy™ to J55 Interface





Technical Advantages

- Hardness- 73-90 Rockwell C equivalent.
- Increased corrosion resistance.
- Reduced coefficient of friction.
- Temperature resistance to 450C/ 900F.
- Uniform case depth of diffusion alloyed surface.
- Material remains within API specification for J55 grade.
- Retains original weight and ID.



Technical Advantages

- EndurAlloy™ Production Tubing does not experience holidays, pits, separation, collapse, flaking, disbondment, etc.
- EndurAlloy™ Production Tubing can be worked in with down-hole tools like standard tubing.
- Not affected by hot oil or acid jobs.
- Endurance in house lab for test coupon analysis.
- Third party test data available.



Benefits

- Reduced tubing failures due to rod wear from deviations, directional drilling and side load. (rod on tubing and tubing on rod wear)
- Reduced tubing failures due to rod wear from fines and sand above pump discharge.
- Extended rod string life.
- Increased run time in severely corrosive high CO₂, H₂S, acid gas and water injection environments.

Benefits

- Significantly increased run times between tubing failures.
- Reduced workover, well servicing and maintenance costs.
- Increased production and revenue on stream.





Benefits

- Increased pumpability due to reduced coefficient of friction.
- Material compatibility.
- Peace of mind – QA/HSE.
- Proven performance, 150,000 + joints installed.



Typical Usage

- Installed above rod pumps, PCP pumps and ESP pumps.
- Multiple joints in deviated sections of the well-bore where excessive and repetitive wear occurs.
- Slant wells, S wells, directionally drilled wells and horizontal wells.
- At continuous rod connections.
- Only necessary to run EndurAlloy Production Tubing in “problem” sections

Identification

- EndurAlloy Production Tubing is painted gray to distinguish it from other tubing.
- The coupling can be marked with an indentation.
- Tube traceability by an electromagnetic dot peen marking system.





General Information

- Stocked in 2 3/8, 2 7/8, and 3 1/2.
- Other sizes as special order.
- Available ID or ID/OD processed.
- Collars are processed to resist corrosion.
- Also process pup joints, spool pieces, ESP stages, chokes, valves, pump impellers, cases, stuffing boxes, seal nipples, frac nipples, downhole tools and directional drilling equipment.
- EndurAlloy™ case depth is not detectable by magnetic inspection.



Well Economics

Cost avoidance example:

- Well servicing at a cost of \$20,000.
- 10 EndurAlloy™ Production tubing joints installed at wear zones.
- Incremental cost of 10 x 10m x \$65/m=\$6,500.
- Proactive installation of EndurAlloy Production Tubing at \$6,500 avoids workover cost of \$20,000.



Summary

- EndurAlloy™ Production Tubing has greatly improved resistance to wear, abrasion, and corrosion as well as a reduced coefficient of friction. These advantages provide the benefit of fewer and less frequent tubing and rod string failures. This reduces expenses while also increasing production rates and revenue on stream.



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**Questions/Discussion
Thank-you**

www.endurancetechnologies.com