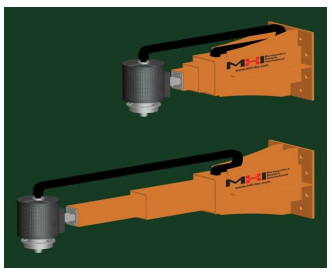
I AM HYDRO SUPER-FRICTIONLESS SURFACES QUASI-R®.
HTTPS://WWW.HEROX.COM/IAMHYDRO/ROUND/656/ENTRY/32468

SUPER-FRICTIONLESS SURFACES QUASI-R®

A COMPREHENSIVE ENERGY AND MANUFACTURING INNOVATION TO ASSIST HYDROPOWER WITH TWO PATENTED AMERICAN INVENTIONS

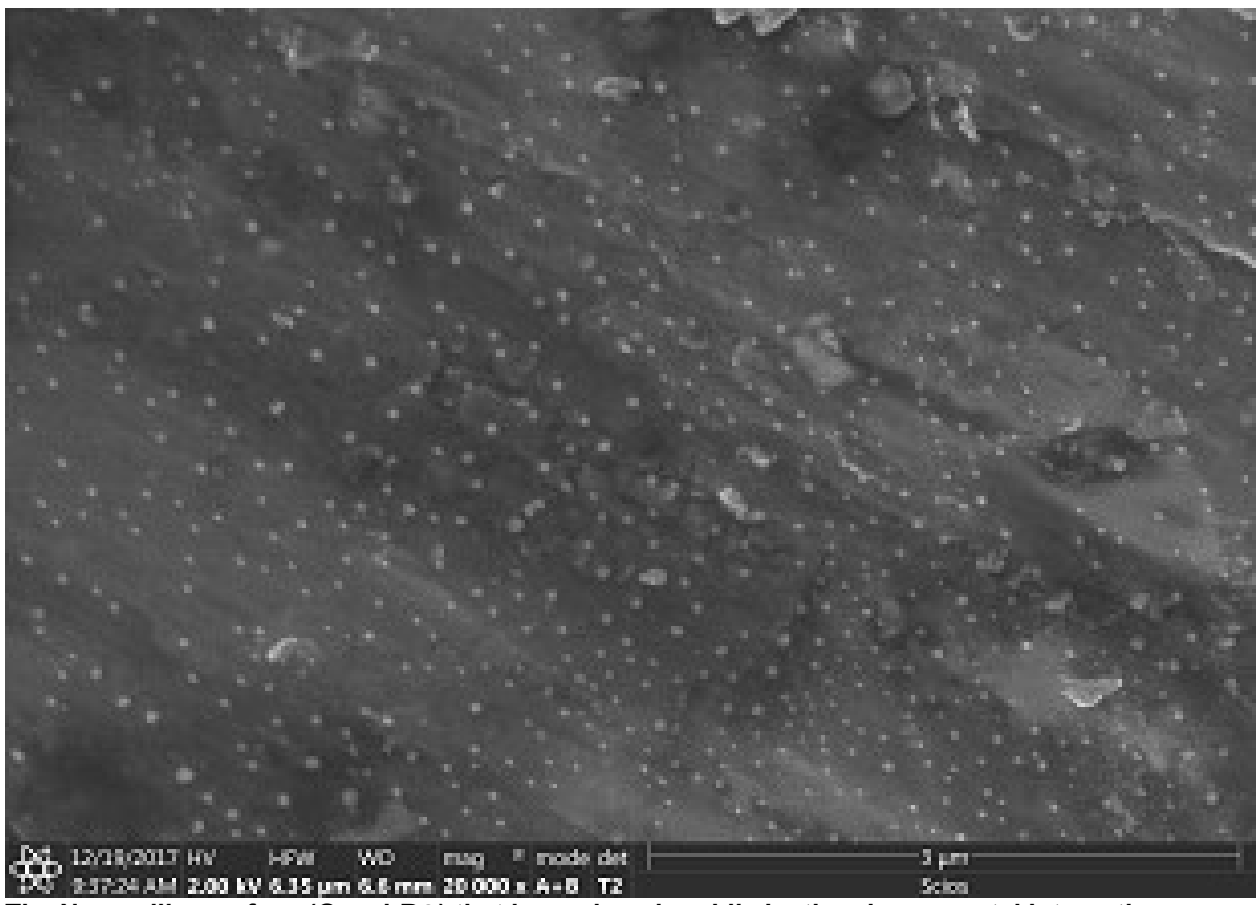


The electro-shear vibratory EION thermal Plasma

Super frictionless surfaces can save energy-loss, improve life of components, and enormously reduce machining efforts.

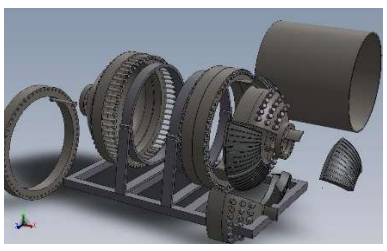
MHI INC., CINCINNATI, OH

Quasi-R® is an oxynitride nano pillar surface that forms as an epitaxial surface texture when the special vibratory open plasma beam impinges on any surface.



The Nano pillar surface (Quasi-R®) that is produced rapidly by the plasma-metal interaction.

All metal parts and tubes can be made low friction or designed for low friction factor



Relevance to the Hydropower Industry. Quasi-R®

MHI INC., CINCINNATI, OH

- ✓ Lower Cost and Improved Performance: In turbines low friction = lower energy loss and lower wear. Also expected to show lower cavitation and corrosion resistance.
- ✓ Lower biofouling on asperity containing surfaces.
- ✓ Lower Cost and Improved Performance: In all pipes, low friction factor = Lower head loss.
- ✓ Improve manufacturing productivity of many hydropower components and systems: From tools, drills, parts manufacturing, and daily use equipment one will experience effortless machining and longer tool life.

Innovation and Benefit: We have discovered, patented, and reduced to practice nano-textured surfaces comprising of high modulus nano-scale-pillar-oxynitride-asperities, that can yield significant benefits for dry and lightly lubricated friction-pairs. Enormous energy savings is possible.

Feasibility and Price: The processing cost is only 1 US cent per square meter (1¢/m2) for improved surfaces. An astounding ~23% of the world's total-energy consumption (of about 575 Exa-J) (Exa = 10^{18}), is lost from tribological-contacts or from two-phase contacts such as pressure-drop losses in pipes. About 20% of this total energy (~114 EJ/Year) is used to overcome friction and 3% (~17EJ/Year) is used to remanufacture worn parts and spare equipment. The broadest (and highest) **level of impact is the savings of a substantial part of this energy-loss with this innovation.**

THE TECHNOLOGIES CAN SAVE CONSIDERABLE ENERGY ACROSS ALL SECTORS OF HYDROPOWER.