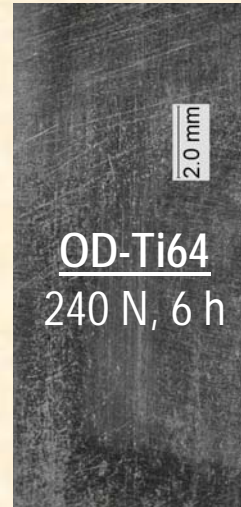
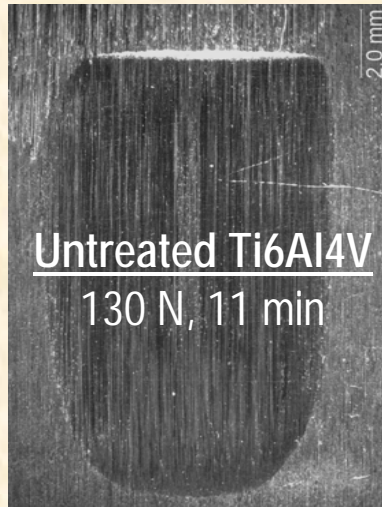
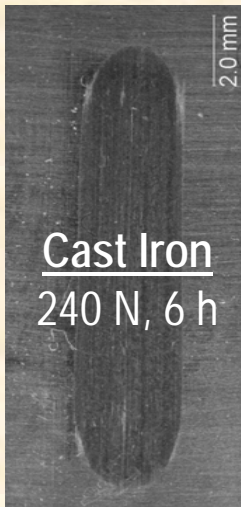


# Oxygen Diffusion (OD) Dramatically Improves Wear-Resistance of Titanium

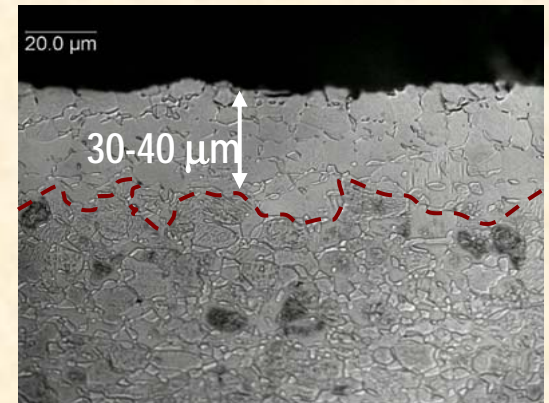
J. Qu, P.J. Blau, J.Y. Howe, L.R. Walker, ORNL

## ASTM G 181 Standard Test

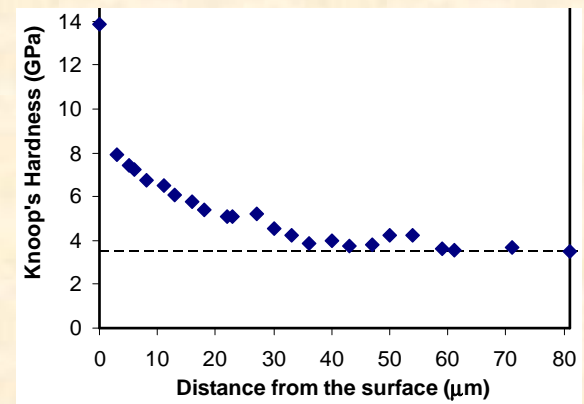
- Lubricant: 15W40 diesel engine oil @ 100 °C
- Counterface: Cr-plated diesel piston ring



## Oxygen Diffused Ti-6Al-4V Surface



- Increases hardness by >3 X
- Reduces friction coefficient by 70%
- Reduces wear rate by 1 million times!
- Enabling Anti-Wear Boundary Film Formation



# Anti-Wear Boundary Film Formed on OD-Ti Surface

