

OIL & GAS WELL VALVES

Dicronite® reduces valve torque and extends valve seat life



BACKGROUND

One of the world's largest suppliers of products and services to the oil and gas industry designed a valve used in well completion. In an effort to provide wear resistance, the ball and seat surfaces were coated with boron nitride (BN). Wear resistance improved somewhat, but friction with the ball still caused it to wear faster than desired. In addition, valve torque was unacceptably high.

DESIGN

The manufacturer looked for surface treatments to fix the friction issue. Candidate treatments had to:

- Be compatible with, and adhere to, the boron nitride
- Significantly reduce the valve torque and seat wear
- Operate across a very wide temperature range
- Not create an explosion risk with potentially explosive gases encountered in the application conditions
- Not interfere with sealing of the valve surfaces

- Not require redesign or re-specification of the existing valve

RESULTS

The manufacturer tested a variety of potential coating solutions against the requirements. Dicronite® dry lubrication was found to meet the requirements, resulting in:

- Excellent adhesion to the boron nitride substrate
- Significantly reduced seat wear and valve torque due to its ultra-low coefficient of friction
- Excellent valve sealing
- No increased explosion risk to its compatibility with liquid and gaseous oxygen
- No redesign of the valve was required due to Dicronite®'s 0.5 micron thickness

Adding Dicronite® to the BN coated ball and seat surfaces significantly extended the life of the valve and is now a requirement in the well valve design.

