Mirraloy™ TG&P vs. Commercial Grade

Mirraloy™ TG&P and Kromite® #3	SAE 4000 Series
ELECTRIC FURNACE MELT • smaller more refined chemistry • more control of heat lot	**OPEN HEARTH FURNACE** • large heats – less refinement • little control
CLEAN STEEL TECHNOLOGY • manufacturing process to eliminate impurities in steel and improve fatigue resistance	**NOT REQUIRED**
VACUUM DEGASSING • Removes impurities in the steel to refine the chemistry	**NOT REQUIRED**
UNIQUE CHEMISTRY • low phosphorus, low sulfur, nickel enhanced • cleaner chemistry and improved strength	**STANDARD CHEMISTRY** • commercial practice follows minimum standards
HEAT TREATED • thermal process is verified against strict guidelines	**HEAT TREATED** • lacks depth and uniformity compared to Kromite #3 and Mirraloy TG&P
PHYSICAL PROPERTIES • typical tensile strength 156K • typical yield strength 123K • typical hardness Rockwell "C" 30/32	**PHYSICAL PROPERTIES** • typically 20% less strength than Kromite #3 and Mirraloy TG&P • more susceptible to fatigue failure
MACHINE STRAIGHTENED • one half of the industry standard; 1/8" in any 5 feet	**MACHINE STRAIGHTENED** • 1/4" in any 5 feet
STRESS RELIEVED • thermal treatment process to reduce the chances of "walking" or movement during machining	**NOT REQUIRED**
FATIGUE RESISTANCE • excellent toughness • toughness resists fatigue failure	**FATIGUE RESISTANCE** • lower degree of toughness – subject to fatigue failure, the number one cause of shaft failure in heavy industry
MACHINABILITY • fine uniform grain promotes ease of machining	**MACHINABILITY** • not consistent, hard and soft spots
MECHANICAL TESTING • Tensile, yield, elongation, reduction of area, and jominy are checked every 10,000 lbs, resulting in better control over physicals	**MECHANICAL TESTING** • commercially done at 50,000 lbs increments • less control of physical properties
Designed to provide optimum performance.	SAE establishes safe <u>minimum</u> standards, not intended to provide optimum performance.