



Back-Up Bearings

for Active Magnetic Bearing Systems

Napoleon Engineering Services' (NES) recent expansion of its manufacturing capabilities includes back-up bearings for use with active magnetic bearing (AMB) systems. The NES bearings serve as high-reliability secondary failsafe systems for the AMB within electrical power generation, petroleum refining, machine tooling, natural gas pipeline, and other critical applications. NES is an industry leading ISO9001:2008 and AS9100C certified expert in custom bearing manufacturing, bearing inspection, bearing testing and bearing test rig manufacturing.

Active magnetic bearings (AMB) are increasingly used within electrical power generation, petroleum refining, natural gas pipelines, and other rotating equipment where electromagnets are used to levitate rotating shafts or other moving parts. The lack of contact between the bearings and the load they support removes the need for lubricating systems and increases the speed at which the moving parts can operate. To ensure the success of AMB systems, a reliable backup or auxiliary bearing must be in place to enable a controlled shutdown in case of power or control systems failure.



When using AMB to support a rotating shaft, any reduction or loss of power could cause the shaft to drop. With an NES AMB back-up bearing in place, the shaft will drop onto the back-up bearing system, allowing the shaft to coast to a stop without causing damage to the shaft or surrounding machinery.

NES AMB back-up bearings incorporate special heat treatments, wear resistant material combinations, conventional or dry film lubricants and a variety of cage and internal design characteristics to manage the safe coast down of the rotating shaft. "Understanding the magnitude and distribution of radial and axial loads, rotational speeds and lubrication constraints allows us to determine whether a full ball complement or caged design is warranted," states NES Chief Engineer Chris Napoleon. "In some cases standard bearings can be highly modified to meet the application needs resulting in very short lead times for the customer. Other applications require extreme design considerations including special heat treatment processes yielding very stable parts with extremely low residual stress. At NES, we've developed and manufactured many different AMB back-up bearing solutions in sizes ranging from 1" to 14" OD," advises Napoleon.