THERMAL-COMP™ BEARINGS

THERMAL-COMP™ Bearings are custom designed to compensate for adverse effects of temperature extremes on bearing performance in airborne applications.

THERMAL-COMP™ Bearings have a double-split rings design and once properly installed in bearing support structure at ambient temperature, they will maintain steady and predictable stiffness and torque characteristics throughout a temperature range, regardless of differences in coefficient of thermal expansion (CTE) of the bearing and the support structure materials.

In most airborne systems, large azimuth bearings are installed in support structures (shaft and housing), which have to be made from light aluminum alloys in order to control weight. While conventional bearings may be installed and fitted for optimum stiffness and rotational torque at ambient temperature, significant variations in bearing performance will be experienced at extremes of temperature in actual application. Such variations are caused by differences in CTE of bearing materials (hardened steels) and the aluminum alloys used for the support structure. At one temperature extreme, the bearing will be internally over-loaded to a much higher stiffness and rolling friction torque; yet at another extreme, the bearing internal preload may be compromised resulting in loss of stiffness or excessive deflection. Such undesirable variations in conventional bearing performance at extremes of temperature will have to be carefully analyzed and consequences mitigated, often necessitating utilization of larger drive motors and/or using more expensive support structure alloys with CTE properties as close to bearing steel as possible. With **THERMAL-COMP™ Bearings** such uncertainties in performance are greatly reduced.

The following is a typical illustration of **THERMAL-COMP™ Bearings** manufactured at RBC-Industrial Tectonics Bearings. Note that the free-state gap in ring split is determined based on bearing size and application temperatures involved. The gap will be closed to near zero when the bearing is operating at the coldest temperature in the application. The gap will be slightly wider when bearing is operating at higher temperatures. However, bearing performance will remain consistent.