Several studies on stored grains indicated that the temperature and relative humidity of the grain are the main controlling factors for safe storage. Due to the geographical position of Brazil and its large land area has great climatic variations. To ensure the quality of stored products must meet the conditions of the air in the storage site. The objective of this study was to evaluate the physical quality of stored corn with controlled temperatures and relative humidities of 10% and 90 °C, 30 °C and 40%, respectively, simulating two regions of different climates. In total, 4,000 kg of corn healthy and damaged were stored in two chambers. Samplings of corn were done in 0, 3 and 6 months of storage. The results showed that the damaged corn grains not germinated in any of the storage conditions. Under the conditions of 30 °C and 40% RH, 10 °C and 90% RH, the rate of germination of the grains started to decrease (90%) from the three and six months of storage, respectively. A high amounts of ions leached (511 μS.cm⁻¹.g⁻¹) in grain stored at high temperatures and low relative humidity air were observed. The storage time had a negative impact on grain quality, increasing the electric conductivity of 580 μS.cm⁻¹.g⁻¹ to 1908 μS.cm⁻¹.g⁻¹ in damaged grains and 137 μS.cm⁻¹.g⁻¹ to 511 μS.cm⁻¹.g⁻¹ in healthy kernels. The corn grains stored on the conditions of low temperature and high relative humidity was presented better quality.