Humidity Control for Arms and Ammunitions

Military arms and ammunitions are high value items kept under tight security and secrecy. They must be in “ready-to-use” state at any given time. Military arms are often more sensitive to humidity damage than to high or low temperatures. Storage of steel or metal products presents major problems where the air is humid and there is a big variation in temperature during the 24 hour day causing condensation at times. Many of these military arms contain instruments, electronics and precision-machined surfaces which can be damaged by high humidity or condensation. Ammunition for most arms ranging in size from 0.22 calibre bullets to GPS guided missiles consists of an explosive charge somewhere in the design. Ammunition must be kept dry, because many explosive propellants and the charges cannot function effectively. Ammonium Nitrate, Gunpowder and solid fuel, etc. are extremely moisture sensitive and are rendered totally ineffective, if stored in uncontrolled conditions. The new material takes up moisture causing them to bind together, creating the product useless. Ammonium Nitrate becomes explosive in nature in the presence of high humidity. Proper ammunition storage is an important safety consideration in defence operations.

Effects of Uncontrolled Humidity

- Safety hazards leading to explosions in selective instances
- Ammunitions becoming ineffective and faulty leading to loss of reputation
- Fault in electronic equipments leading to major losses

Causes of Uncontrolled Humidity

Variation in temperature and ammunitions being transported from one region to other region under varying temperature and RH conditions.

General Recommendation

Moisture control is of utmost importance for the safe preservation of materials during storage, manufacturing and processing. Dehumidification is being widely used by the defence in the preservation of equipment in an active state..

Bry-Air Solution

The Bry-Air experience with several military arms and ammunition applications over the years shows that dehumidification basically is a function of:

A – The type of preservation the equipment has already received

B – The stage of readiness for which the equipment has been scheduled

C – The type of equipment

Typically, standard equipment such as trucks, tanks, guns usually falls into 35% RH category, requiring no temperature control. Whereas finished ammunition can be kept in the 35% RH area and max 27 ℃ (80 ℃), considering the volatility of raw material in the atmosphere of 10-50% RH and 2-24 ℃ (35-75 ℃) would be required. To prevent corrosion in warehouses where sensitive equipments are stored, the relative humidity should not surpass 35%-40% at ambient temperatures.

Partial Reference List

- DGDP, Ministry of Defence Bangladesh
- Gemas Camp Rejimen 51 Malaysia
- GGK Commando, SG.Udang Melaka Malaysia
- Masjid Tanah Army Depot Malaysia
- PSC Naval Dock Yard Malaysia
- Royal Thai Navy (Captain Narong Amsaeng) Thailand
- Taiwan Military Dept. Taiwan
- Thai Army (Thai Aviation Dept.) Thailand
- Custodial Weapon Room At Airport Australia
- US Air Base In Okinawa USA