Anoxia

What is anoxia?
Anoxia means "without oxygen" and refers to a treatment method where insects are deprived o oxygen by replacing the oxygen with nitrogen. Insects can tolerate very low levels of oxygen, so to be effective, this type of treatment needs concentrations of nitrogen greater then 99.7%.

Treating large/multiple objects.
These objects should be treated in an anoxic chamber (museums are beginning to install these) or in cubicles or bags made from heat-sealed barrier film such as Marvelseal or Escal. These films have low oxygen permeability. Polythene is not suitable as it is highly permeable to oxygen.

The nitrogen must be humidified and the levels of oxygen should be monitored with an oxygen meter to ensure that a level of 0.3% is maintained. The temperature should be kept at 20^{o}C and the object(s) should remain in the enclosure for 3 - 5 weeks. Anoxia may be ineffective at lower temperatures so additional heating may be required.

Nitrogen may be obtained from cylinders or produced from a nitrogen generator.

Treating small objects
Small objects can be treated as above, but they can also be sealed into a barrier film bag with ar oxygen scavenger such as Ageless Z^{TM}. Ageless ^{TM} contains finely divided iron compounds that react with the oxygen and remove it from the atmosphere in the bag. This produces a very low oxygen environment and the insects die. The oxygen scavenger sachets are expensive, so this is not economic for large objects.

Other grades of Ageless ^{TM} are available, such as Ageless RP ^{TM} (all produced by the Mitsubishi Company). These can be used for long term storage; this can help to slow oxygen-fuelled degradation and lengthen the life of the object.

Some users of anoxia have put some Ageless ^{TM} sachets into enclosures for large objects to remove any remaining oxygen and as a safeguard against air leakage.