



TOXICITY TEST FACT SHEET #7 – Marine

Chronic Toxicity Test Using Bivalve Larval Development

Bivalve molluscs such as oysters, scallops, mussels and clams constitute a diverse and widely distributed group of marine animals which are both ecologically and economically important. Toxicity tests utilising the short-term exposure of embryos are of comparable or greater sensitivity to many contaminants than other marine test species and life stages.

This test is commonly used throughout North America using APHA and ASTM protocols. In Australia, embryos of the rock oyster *Saccostrea glomerata*, the milky oyster *Saccostrea echinata*, the pacific oyster *Crassostrea gigas*, the doughboy scallop *Mimachlamys asperima* and the mussel *Mytilus edulis galloprovincialis* have been increasingly used in toxicity assessment programs.

In summary, this test involves exposing developing bivalve embryos to the test item for 48 hours (or up to 72 hours). For an effluent sample, the test is usually undertaken on a range of concentrations of a test material, eg 100, 50, 25, 12.5 and 6.3%. At the end of the exposure period, the number of normally developed and abnormal larvae are counted.

Statistical analyses are then applied to the test data to determine for example, the concentration of the test material causing 50% inhibition in larval development in the test population (EC50 estimate). The test data can then be used to estimate concentrations of the test material likely to cause chronic toxicity in the environment.

The Bivalve Larval Development test may be used to assess the toxicity of:

- Chemicals
- Effluents
- Leachates and groundwater
- Sediments

If toxicity is detected using the chronic Bivalve Larval Development test, a Toxicity Identification Evaluation (TIE) programme can be initiated to identify the cause of the observed toxicity.

Chronic Toxicity Test With the Bivalve Larval Development test	
Test type	Chronic static
Test end-point	Normal development rate
Test duration	48 hours (but can be extended to 72 hours)
Test Temperature	25±1°C (rock oyster); 29±1°C (milky oyster); 18±1°C (scallop); 20±1°C (mussel)
Sample volume required	1 L
Test availability	48hrs notice requested. Availability subject to season
Test turnaround time	Advice given within 72 hours of test initiation