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**TEST METHODS FOR SEALING LEVELS OF GRAIN STORES:
PRESSURE TESTS AND TRACER TECHNIQUES**

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ABSTRACT

(Full paper not available)

Verifiable and convenient predictors of fumigation or CA success are needed prior to the actual addition of the gas. Two test systems are in use: pressure testing and tracer gas techniques. There are two versions of the pressure test: the pressure decay (Pt) test and the pressure-flow (PQ) test. The former is quick and simple but can be less informative than the latter. Both suffer from two defects: they must be conducted while the contents of the structure under test are at constant temperature and they give 'worst case' estimates of fumigation suitability. Gasholding will typically be better than predicted, so on some occasions a structure may actually be adequately sealed even though it does not meet a set level. Tracer gas techniques (e.g. with CO) give a more directly applicable test but require several days of intensive monitoring to achieve a result. The various test results can be related mathematically. A pressure half life of 5 min from a Pt test in a full structure approximately corresponds to a gas loss rate of less than 5% per day in grain stores. This is an adequate level of sealing for most fumigation and CA procedures and corresponds to several national standards. As a special case, a decay time of >10 sec is adequate for freight containers. Practical examples of test results and their correlation with success or failure of treatments are given, and the approximate level of test value is discussed with regard to various treatment systems.