HOUSTON POLYTANK

OPERATION AND MAINTENANCE

In-service integrity of tanks is maintained by correct operation and suitable maintenance including periodic examinations.

OPERATION

Thermoplastic tanks should be operated within the defined safe operating limits based on the original design. Tanks should be operated at a recommended 80% capacity for daily use. Should a tank be subjected to conditions outside the defined operating limits, the tank should be reviewed of the possible effects arising from the deviation by a competent person to determine whether the tank remains fit for service.

EXAMINATION

General requirements:

After installation but before use, a competent person should inspect the unit.

- The tank is manufactured to the required standard and is fit for the purpose required;
- Temperature and loading parameters are correct;
- The characteristics of the foundations, hold down equipment and pipe workloads are correct;
- Appropriate valves, plugs, drains, etc. and any instrumentation have been fitted correctly.

A pre-commissioning examination provides a record of the as-new condition. This sets a baseline against which degradation can be judged when assessing the results of future examinations. It also confirms that no damage has been caused to the unit before first use.

Subsequent internal and external inspections should be undertaken at appropriate intervals as determined by the user and competent person.

The scope, nature and frequency of inspections should be informed by a range of factors which include; the design and construction standards, operational experience, experience with similar tanks and contents elsewhere, foreseeable modes of failure, and the consequences of failure. Inspection requirements should be documented in a scheme of examination.

All internal and external examinations should be recorded and the competent person should issue an examination report indicating fitness-for-purpose for continued use until the date of the next examination (which should be stated) or alternatively indicating remedial work necessary for continued use.

Following an accident, an impact, an excursion beyond allowable operating limits, or a change of operating conditions it will usually be necessary to subject the tank to a further examination outside the normal periodic examination schedule to verify ongoing integrity.

Routine (e.g. daily, weekly, monthly) visual external checks of thermoplastic tanks and their secondary containment area are a good practice. Records should be kept at least on a monthly basis. Such checks may be carried out by operating staff trained to identify early indicators of integrity problems. Routine checks enable prompt corrective action to be taken in the event that a weep or leak is identified.

The secondary containment around the tanks should be inspected to make sure that it has not collected rainwater that would reduce the secondary containment capacity in event of a spillage. The secondary containment should also be examined for any product leakage. Where it is not possible to visually inspect for liquid levels in the secondary containment, provision should be made for monitoring liquid levels checked on at least a weekly basis.

EXTERNAL EXAMINATION:

External examination requirements should be specified in the documented scheme. Where tanks are located outside, external examinations are best undertaken in dry weather to aid detection of weeps or leaks. The tank inspector should decide whether the external examination is sufficient or if further examination, including internal examination, is necessary to ensure the continued safe operation of the tank.
Signs of degradation that can be detected during a visual external examination include the following:

- Bulges
- Discoloration
- Crazes
- Crack-like defects
- Leaning/loss of verticality
- Local wetting of external surfaces
- Erosion/corrosion of supporting structures and bases. The inspector should pay particular attention to the flooring areas
  - Area where the tank shell and base meet
  - Branch and manway attachments
  - Supporting structures of piping and valves

If signs of degradation are noted during routine checks, a competent person should assess the item for continued fitness for service. If the tank is found leaking in service, then corrective action should be taken immediately to avoid harm to persons or risk to the environment. Additionally, the cause should be investigated by a competent person.
Tank inspection regimes should include external examination by a competent person at suitable intervals. An initial external examination by a competent person should take place after a period in service not exceeding one year to inform the ongoing inspection regime where:

INTERNAL EXAMINATION:

Internal examinations should be undertaken by a competent person at appropriate intervals, as determined by the owner and competent person, taking into account the inspection history and operational experience. Technical justifications influenced by experience of the same types of tanks in comparable service elsewhere need to be carefully considered to ensure conclusions are soundly based.

When making internal examinations of tanks, great care should be taken to work safely. Entry into confined spaces should be carefully planned and supervised. Precautions set out to ensure safe work in confined spaces should be rigorously followed.

Take care during internal examinations to avoid damage to the tank. A means of access should be provided which does not impose unacceptable loadings on the tank or connections. All activity within the tank, e.g., personnel, use of scaffold, tools etc. should be carefully controlled and performed to prevent danger to personnel or damage to equipment.

INSPECTION TECHNIQUES

Inspection techniques may vary for different tanks and should take into account the contents, operating conditions, materials of construction, design code, and foreseeable failure methods. Visual examination may need to be supplemented by other non-destructive examination (NDE) techniques.