

# Inspection of internally lined underground storage tanks

In 1991, Minnesota underground storage tank (UST) rules required all existing steel tanks to be upgraded to prevent corrosion by December 22, 1998. The installation of an internal lining was one accepted method of upgrading such tanks. This fact sheet describes the requirements for inspecting internally lined tanks to ensure that the lining is performing properly to prevent corrosion and leaks.

## What is an internal lining?

An internal lining is a coating applied and bonded to the entire inside surface of the tank. Linings are made of various synthetic materials such as epoxy and fiberglass, and must be compatible with the product stored in the tank. Linings can be applied in various thicknesses and are often reinforced with additional materials.

The purpose of an internal lining is to prevent internal corrosion and leaks in a steel tank caused by the stored product or by the action of water, additives, or impurities. An intact lining will not prevent external corrosion, but it may also serve to keep the tank from leaking if external corrosion should perforate the shell, depending on the type and extent of corrosion and the lining thickness.

## Why must an internal lining be inspected?

Proper installation of an internal lining is the most important factor in lining performance. If improperly installed, a lining will soon crack, buckle, or wear through. Even a properly installed lining will degrade over time or may be damaged, and will ultimately fail. Lining lifetime is highly variable from tank to tank and depends on a number of factors. If the lining fails, the tank becomes much more likely to leak. A leaking tank will cost the tank owner significant time and money to remedy.

The condition of the lining cannot be fully evaluated while the tank is still in service. Therefore, the tank must be emptied and inspected by a trained professional at regular intervals, in order to assure the tank owner and the Minnesota Pollution Control Agency (MPCA) that the lining is still intact.

## Must all internally lined tanks be inspected?

Some internally lined tanks are protected from corrosion in an additional way (cathodically protected tank, jacketed steel tank, fiberglass reinforced plastic tank, secondarily contained tank). These tank owners may have chosen to line a tank for extra protection, or for another purpose such as product purity.

If a lined tank employs an additional corrosion protection method meeting MPCA requirements, and the method either dates from the original installation or was added by 1998, and the method has been properly maintained over time (e.g. cathodic protection testing), then the additional method is primary for purposes of MPCA requirements. Lining inspections for these tanks are recommended, but not mandatory.

Tanks installed prior to 1985, and used solely to store heating oil are regulated, but are not required to maintain a corrosion protection method. If such a tank is lined, lining inspections for these tanks are recommended, but not mandatory.

## How often are lining inspections required?

An internally lined tank must be inspected **within ten years** after the original installation of the lining. After that, the lining must be inspected **every five years**.

## Who can inspect a lined tank?

At this time, the MPCA does not train or certify lining inspectors. The MPCA rules state, “lining inspectors shall be approved by the manufacturer of the lining, if an approval process exists, or shall be qualified by reason of training and experience in the application and inspection of the type of internal lining to be inspected.”

Ask potential inspectors for their qualifications, and consult the MPCA if you have questions about qualifications.

## What are the procedures for an internal lining inspection?

The inspection must be in accordance with API 1631, “Interior Lining and Periodic Inspection of Underground Storage Tanks.” Inspection must be by means of manned entry; video observation alone is not sufficient. The key elements of the inspection include: thorough cleaning of the lining; visual inspection of the lining for cracking, blistering, perforation, disbonding, and excessive wear; ultrasonic thickness testing of the tank’s steel shell; holiday (spark) testing for lining continuity; lining thickness measurements; and lining hardness testing. Representative photographs of the interior must be taken.

## What if the lining needs minor repairs?

If minor abnormal conditions in the lining are discovered, such as short cracks or localized disbonding, these conditions should be repaired by the inspector. **Minor repairs may involve no more than 5% of the lining surface area**, and must be able to return the lining to substantially the original design specifications.

If minor repairs to the lining are made, or if the tank itself must be repaired, the tank must pass a tightness test within 30 days after being returned to service. Testing may be done using the automatic tank gauge (0.1 gallon per hour leak rate) or by a tightness testing service.

## What if the lining needs major repairs?

If more than 5% of the lining surface area is damaged or degraded, then the lining is considered to have failed. If the lining is the sole method of corrosion protection for the tank, the failed lining is not allowed to be repaired and may not be replaced with a new lining or with another method of corrosion protection. **The tank must be permanently closed.** For more information, see the fact sheet “Temporary and Permanent Closure of Underground Storage Tanks.”

## Does the tank owner receive an inspection report?

The lining inspector is required to provide a report, which describes the results of all tests and evaluations, including any required tightness testing, and identifies any abnormal conditions found during the inspection and measures taken to correct the problems. The inspector must certify in the report that, in the professional judgment of the inspector, the tank is structurally sound, the lining is performing according to original design specifications, and the tank and lining will maintain their integrity for at least five years under the anticipated conditions of use.

## Is the MPCA involved in lining inspections?

At least ten days prior to the inspection, the MPCA must be notified using the form “Ten Day Advance Notice.” An MPCA inspector may visit to observe the inspection. Within 60 days following the inspection, the inspection report must be submitted to the MPCA.

- The lining inspector may do the advance notice and report submittal, but the tank owner remains responsible for ensuring that the MPCA receives the required information in a timely fashion.

## Need more information?

Visit the UST Program at <https://www.pca.state.mn.us/waste/underground-storage-tank-systems>. The site has forms, fact sheets, and other information about USTs and UST requirements.

You can also call the MPCA at 651-296-6300 or 1-800-657-3864 and ask for the UST Program.