

Potable water tank linings

Introduction

Lining systems in contact with potable and drinking water must not only protect the steel from corrosion but also meet additional requirements. These requirements are part of regional/ local standards defined by different institutes and organizations as well as local, national and regional authorities. Some of them are widely accepted globally.

Solvent-free technologies are the most suitable to design lining systems to be in contact with potable or drinking water, as there is no risk of solvent leaching from the coating into the water. However, solvent-borne lining systems approved for potable water use can be found in the market and may be used as long as they fulfil the relevant local requirements.

Besides the lining system itself, the application and curing of the coating, as well as the cleaning of the tanks or pipelines before starting service, are also relevant and some key factors must be taken into consideration to ensure a safe drinking water quality.

Scope

The scope of this Technical Guideline is to provide information and advice on:

- the most widely common potable and drinking water approvals/certificates
- the key points in application and curing of lining systems, as well as the highlights of cleaning procedures before taking tanks and pipelines into service

Typical Hempel products for this usage include (but are not limited to):

- Hempadur 35530
- Hempadur 35535
- Hempadur 35560
- Hempadur 35565
- Hempadur 35600
- Hempaline Defend 630 cure 72, 37820
- Hempadur 85671

Potable and drinking water certificates/approvals

The most widely accepted certificates/institutes globally are:

- **Water Regulations Advisory Scheme (WRAS), UK**
 - In accordance to **BS 6920** (*"Suitability of non-metallic materials and products for use in contact with water intended for human consumption with regard to their effect on the quality"*).
 - The test demonstrates that the non-metallic material/component does not contaminate the water.
 - The certificate is only valid for the specific coating system and colour shades tested and the application and curing conditions applied. No thinning of the coating is allowed.
 - To be renewed every 5 years.
 - Valid certificates are published on [WRAS website](#).
- **NSF, North America**
 - In accordance to NSF/ANSI 61 (*"Drinking water system components- Health effect"*).
 - Used for pipe internals and storage tanks.
 - The certificate is only valid for the specific coating system and colour shades tested and the application and curing conditions applied. No thinning of the coating is allowed.
 - Besides the above, the certificate is only valid for coatings manufactured in specific, NSF certified production sites which must be audited every year.
 - Hempadur 35565 and Hempadur 35535 are the only Hempel codes in NSF approved systems
 - Valid certificates are published on [NSF website](#).

- **AWWA (American Water Works Association)**

- Certificate on the technical performance of coatings intended for potable water installations.
- It does not include any health and safety requirements for materials in contact with potable water.

Lining system selection

The selection of the right lining system for contact with potable or drinking water depends on the operating conditions and the approvals/certificates it must meet.

Hempel recommends using solvent-free materials with relevant approval/certificate, as there is no risk of solvent migration to the water. However, we can also offer solvent-borne alternatives with potable water approvals if required. Systems with a solvent based holding primer/blast primer are also available for projects where the construction process requires a such a primer.

Application

It must be ensured that pumps and hoses/pipes are free from any traces of previous paints and/or cleaning solvents before starting application of the potable water approved paint. In this regard, Hempel recommends the following procedure:

- Ensure the equipment is thoroughly cleaned of any material used in the equipment previously. (Pump, hoses, valves).
- Drain cleaning solvent from all equipment as much as possible.
- Before the immersing the suction hose/ pipe into the paint, “suck” some air into the pump in order to empty the suction hose from solvents.
- Before immersing the suction hose into the drum with paint, clean it using a rag or similar to make sure there are not solvents on the external part.
- Use an extra empty drum/bucket to discard the first coating material. This is to flush out any remaining traces of solvent and other contaminants in the system. This paint should be discarded and cannot be sprayed on to the tank.

Solvent-free linings

If solvent-free linings are used, the temperature range for application and curing should be strictly kept in order to avoid exudation of uncured parts of the binder, which may have a negative impact such as bad taste or smell of the water or bacterial growth.

Solvent-free linings for potable water tanks must not be thinned.

Solvent-borne linings

Solvent retention in the lining is one of the possible reasons for water having bad smell or taste. This may also be considered a health risk. The following instructions should be followed:

- minimum recoating intervals should be prolonged (within the specified recoating interval) in order to allow most of the solvents of the first coats to leave the film prior to application of the next coats
- sufficient ventilation during drying and curing must be ensured
- **thinning should be avoided whenever possible.** If necessary, use only the recommended thinner at the minimum quantity needed

Curing and cleaning before taking tanks into service

- Ensure full curing.
- Before the tank or installation is taken into service, wash with fresh water and detergent to remove any possible contamination of loose dry spray, workmanship pollution, etc.
- Finally, flush with fresh water.

Note: Even after these procedures, it may be possible that small amounts of solvent and/or uncured parts of the lining migrate out during the first months of service. Under normal conditions, the concentration of these materials will be safely below any threshold values.

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