Caulking of tank bottoms and walls

Introduction

Steel plate overlaps, seams and welds in tank bottoms and walls, the same as the chime area (the joint area between wall and floor plates) should be properly filled in to obtain a smooth, continuous surface to apply the tank lining system on.

This step, known as caulking, is especially important when applying reinforced systems (with fibreglass mat and chopped glass fibres), as if the surface is not even it is very difficult to obtain a regular, smooth application, particularly in the chimes.

The product to be used as caulking material (filler/surfacer) for these areas must have the same chemical resistance as the whole system to make sure the corrosion protection is not compromised in these areas.

Safety

Use adequate personal safety equipment and follow sound procedures. Apply only in well ventilated areas. Observe safety labels on packaging and paint containers and consult Hempel's Safety Data Sheets for the products to be applied.

Scope

The scope of this Technical Guideline is to provide specific advice on how to use silica sand as "filler" to produce caulking materials (fillers/surfacers) for tank bottoms and walls based on the same solvent free lining as in the specified system. This ensures having the same chemical resistance and also avoids using different, specific products in overlap areas, seams, welds and chimes.

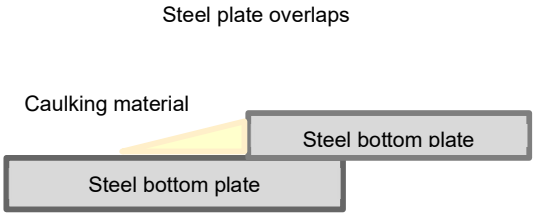
Typical Hempel products for this usage include:
- Hempaline Defend 400
- Hempaline Defend 630

Preparation of the caulking material

Type of silica sand
It is recommended to use silica sand of average particle size 200 microns, which has been sieved (300 microns), washed and (fire) dried.

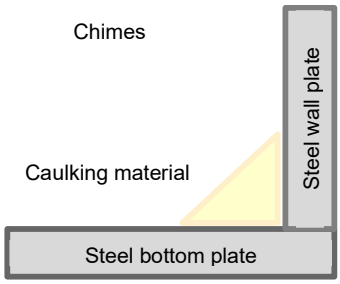
Surfacers
Caulking materials used for steel plate overlaps, seams and welds in tank bottoms and walls are also known as surfacers. The exception is moderate pitting on vertical areas, which are difficult to fill in due to the impossibility to push the material deep inside the pitting and to the high risk of sagging. Therefore, fillers (described in the following section) are recommended for these areas.

Recommended ratio and procedure to obtain a workable surfacer on horizontal surfaces is:
- 1 part by weight of the ready to apply, mixed solvent free lining
- 3 parts by weight of the silica sand
- mix properly with a heavy duty stirrer at low speed in order not to introduce too much air
- apply by spatula



Fillers
Caulking materials used for the chime areas (the joint area between wall and floor plates) are known as fillers. They are also used in moderate pitting on vertical areas, as mentioned above.

Recommended ratio and procedure to obtain a workable filler is:
- 1 part by weight of the ready to apply, mixed solvent free lining
- 4-5 parts by weight of the silica sand
- mix properly with a heavy duty stirrer at low speed in order not to introduce too much air
- consistency should be similar to clay (solid paste).
- apply by spatula. For chimes, use of a round object is recommended to obtain a smooth surface



General remarks
- Make sure the mixing ratio of the components of the lining system itself is correct before mixing the ready to apply lining with the silica sand.
- Depending on the material, steel temperature and local conditions, a small deviation from the above mentioned ratios

may be needed. However, the amount of silica sand shall not be higher than recommended in order to avoid a too dry, “cement like” surfacer/filler.

- The pot life of the surfacer/filler will be within the same range as the solvent free lining itself. Please refer to Product Data Sheet (PDS) of the relevant product.
- Do not apply more than a 6 mm (1/4 in.) thick section in one pass. If greater thickness is required apply in multiple passes allowing the caulk to harden between passes.
- Before application of the full coating system, the caulking material should be sealed with a thin coat of the same coating specified as first coat in order to avoid entrapped air.

This document is intended for professional use and provides generic advice in respect of the subject matter only. It is not intended to be used as a comprehensive guide. The buyer/applicator should always read the relevant Product Data Sheet (“**PDS**”) and Safety Data Sheet (“**SDS**”) relating to the Products ordered which are available for download on www.hempel.com. If in doubt, please contact your local Hempel representative for further advice. To the extent relevant, the disclaimer set out in the relevant PDS(s) applies to this document.