

What you should consider for tanks handling Hazardous Chemicals in all Process Industries!

Assessment Step 1

Common solvents used in solvent-based paints or lacquers, other coatings, pastes and similar chemical products are unequivocally classified as hazardous chemicals, by definition, in SANS 10228 (The Identification and Classification of Dangerous Chemicals for Transport); and in SANS 310 (Storage Tanks for Hazardous Chemicals) and SANS 347 (Categorization for all Pressure Equipment) by referral in these additional standards to SANS 10228. The use of the term 'Transport' does not negate all non-transport applications, as it is used as a reference categorization by definition - in the standards referred to above. It is important to be aware that SANS 10228 is based on the International Standards for hazardous chemicals and is thus thoroughly globally researched. Solvent tanks and vessels designs in coatings plants thus undoubtedly fall under these standards and by reference these standards also fall under the Occupational Health and Safety Act.

Note: Reference to paints and lacquers in SANS 10228 is also specifically made in classifying paint solvents as flammable and thus hazardous and the content of solids in paints and lacquers is dealt with as: "Flammable liquids are liquids, or mixtures of liquids, that might contain solids in solution or in suspension (for example paints, varnishes and lacquers)".

Assessment Step 2

Tank or vessel designers must establish if pressure or vacuum conditions exist, or may reasonably arise, when assessing design criteria. E4A stresses the importance of a systems analysis to address all risks that may arise upstream and downstream from given installations.

Note: Although the South African Pressure Equipment Regulations (PER) do not deal with vacuum service, ASME VIII deals with vacuum service under the consideration of external pressures and thus does not exclude vacuum conditions from professional pressure vessel design. A vessel working in vacuum service is simply another form of pressure vessel when designed under ASME VIII. Simply to exclude vacuum service from a pressure vessel design by reference to the SA Pressure Regulations (PER) is to confuse the purpose of pressure vessel grading, as applied in SANS 347, with total vessel design considerations and can lead in some cases to unnecessary high-risk exposure. SANS 347 refers to ASME VIII, which as referred to above, deals with vacuum service.

Assessment Step 3

Designs of tanks and vessels for hazardous chemicals must thus be grouped in one of the following categories:

- 3a. Hazardous and under pressure or vacuum = SANS 10228, SANS 310, SANS 347, ASME VIII
- 3b. Hazardous and not under any pressure or vacuum = SANS 10228, SANS 310

For convenience the full standards names are listed:

- SANS 10228 - SANS 10228:2010 The identification and classification of dangerous chemicals for transport
- SANS 310 - SANS 310:2011 Storage tanks for hazardous chemicals – Above-ground storage tank facilities for flammable, combustible and non-flammable chemicals
- SANS 347 - SANS 347:2007 Categorization and conformity assessment criteria for all pressure equipment
- ASME VIII - ASME VIII Division 1: 2010 Rules for construction of pressure vessels

Assessment Step 4

In this article the design of equipment for solvents in the coatings industry is always under the requirements of SANS 310 and it is thus important to take note that proper compliance with this standard requires the appointment of a formally registered professional engineer, technologist or technician for design and other compliance requirements. Non-compliance with standards for such hazardous products is not wise and may be grounds for significant legal claims or other damages claims against the owner party in the event of a future tank or vessel failure. Care in this regard is strongly recommended.

We provide several tank-design services for our valued clients. This list is not exhaustive and must be treated as guidelines only. There may be other important design and operational considerations that clients should consider.



These guidelines and notes are presented as general guides only and no warranty is implied or provided.