

GLOSSARY OF VESSELS AND TANK TERMS

AIA – APPROVED INSPECTION AUTHORITY – Organisation that is approved by the regulatory authority for Pressure Vessels.

AGITATORS – A general or alternate term also used with regard to mixers. The term is normally used in respect of impeller type mixers or top and side entry mixers. Many tanks have an agitator or mixer mounted on the top of the tank.

BAFFLES – Baffles are vertical mounted strips of metal that serve to reduce vortexing in mixing tanks. The baffles are normally mounted on the insides of the vessel or just away from the walls. Confirm if imperative in any tank as not always of value.

BATCH TANKS – Such tanks fitted with mixers handle batches of materials or product in sequential fashion and mix each batch to the set specification, before swinging over to the second batch vessel and so on.

BLENDERS – Blenders may blend liquid, liquid mixes or powder–powder mixes. Blender shells are a special type of vessel and may be under pressure or vacuum conditions, although a rare need. Jackets are more often required for cooling or heating and such jackets likely need design as pressure vessels in themselves.

BREATHER – Effectively a vent in a vessel or tank to equalize the external and internal pressure. The term breather is most commonly used when it comprises a desiccant pot, which dries incoming air according to the tank requirements.

BUND – A bund is a containment around an area where hazardous liquids are handled, processed or stored. The type of bund most often seen consists of four walls and a base surrounding the tank. If the tank leaks, the leak will be contained by the bund.

CAPACITY – The maximum net working volume in litres or m³ and excludes the overall protection volume and the maximum operating volume remaining in the tank.

CAPACITY MAXIMUM – Maximum capacity is the volume of product in a tank when the tank is filled to its design liquid level as defined in API 650 5.6.3.2.

CLEATS – these are wedge-shaped metal brackets welded onto a tank or vessel with the objective of having the cleats (typically 3 or 4) sit on a platform to hold the tank in place, obviating the need for special legs under the tank. Platform needs to be designed to carry the full tank load. Cleats enable load cells to be placed between the tank cleats and the platform locating plates.

COMPENSATORY PLATE - A plate formed to the shape of the tank or vessel around a nozzle or other fitment for extra strength. Also known as repad, weld pad, spreader plate or reinforcing plate.

DISPERSERS – Mixers in which agglomerates or clumps of particles are broken down into finely dispersed products. Tanks with Dispersers mounted have to be designed to cope with the lift up action of a disperser when running early stages of a process.

DISPERSION - Dispersion is a process of mixing by the breaking apart of solid particles into a bulk liquid using a high speed, rotating saw-tooth blade, or other special impeller design, and subsequent mixing thereof. The blade or impeller produces high shear forces that break apart the particles.

DOME – Term for top of tanks or even base/bottom of some tanks. Used mainly in pressure tanks.

FREE-BOARD - Also known as ullage, this is the space above the liquid in a vessel or tank that is designed into the tank height so that free space exists for further additions to the main batch produced – for adjustments, tinting (pigmenting) or other modifications to the main batch.

IMPOUNDING SYSTEM – Containing method whereby spilt liquids are led away from the tank to a remote containment area.

MANHOLE – Access-way into tanks normally placed at base and on side of tank.

HAZARDOUS CHEMICALS – Those chemicals that are listed in SANS 10228 and chemicals defined in national regulations for hazardous chemicals.

HOOD – A cover for product protection on vessels of many types and shapes. Serves as a type of lid.

JACKETS – Term used for an exterior tube set around a tank or vessel (such as a blender) to hold and circulate a cooling or heating fluid such as cooling water or hot oil for heating. Almost always a pressure vessel in itself and requiring full design with vacuum breakers especially when risk of steam condensation can arise leading to a vacuum condition.

LIPS – The top edge of the tank, especially where there is a lose lid, is finished with a rolled angle iron edge welded around the complete top edge. This fitment is termed the tank lip.

LOAD-CELLS - A load cell is a type of **transducer**, specifically a *force* transducer. It converts a force such as a tank weight into an electrical signal that can be measured and standardized. As the tank is filled, the force applied to the load cell increases, the electrical signal changes proportionally and a signal is sent to an indicator panel. The indicator is calibrated such that the empty tank is set to show zero on the indicator and thus the added chemicals will show as the correct weight on the indicator - as these are added to the tank.

AGS – Above Ground Storage

OVERFILL PROTECTION LEVEL/VOLUME (CAPACITY) – The designed volume in litres or m³ – between the normal fill level and design liquid level (refer definitions in API 650 section 5.2.6.3.).

PER – PRESSURE EQUIPMENT REGULATION – Pressure equipment regulation in the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) for use in South Africa and enforced by the regulatory authority.

PRESSURE ATMOSPHERIC – Defined in SANS 310 as pressure within the range of -2 kPa and 5 kPa gauge.

PRESSURE VESSEL – Defined in SA pressure regulations as equal to exceeding 50 kPa. Specified as design pressure and excludes any static head. Effectively design pressure is pressure under the vessel top section.

PRESSURE ACCESSORY – Device with an operational function and that has a pressure-bearing housing (vessel).

REINFORCING PAD - A plate formed to the shape of the tank or vessel around a nozzle or other fitment for extra strength. Also known as repad, weld pad, spreader plate or compensatory plate.

RIBS – A ring or other section rolled to tank shape and welded onto the outside of the tank to provide extra rigidity. Frequently of value in design of vacuum service vessels.

ROOFS – Otherwise known as tank top. Generally, the roof types are

SHELL – The tank wall. Typically, the equivalent of a vertical tube with a designed wall thickness for the stated process conditions.

SPREADER PLATE – See ‘Compensatory Plate’.

STANDARD TANK – The standard tank configuration is a useful reference standard for mixing process design. It provides adequate mixing for most processing requirements found in industry. However, it should be stressed that the Standard Tank Configuration is an arbitrary standard which in some circumstances is not the best configuration to use. For full details of key dimensions refer the Standard Tank section elsewhere on this site.

STATIC MIXERS – A vessel as a pipe with rigid internal parts. There is no rotation of the vessel or the internals – hence name as static mixers They are available in various metals and plastics, or PTFE lined plastic fitted pipes.

TANK FARM – Collection of fixed storage tanks within a designated facility.

TORI-SPHERICAL - A torispherical dome is the surface obtained from the intersection of a spherical cap with a tangent torus. The radius of the sphere R is called the "crown radius," and the radius a of the torus is called the "knuckle radius." Torispherical domes are used to construct pressure vessels or to provide a thorough draining tank bottom.

UGS – Under Ground Storage.

ULLAGE – Also known as free-board, this is the space above the liquid in a vessel or tank that is designed into the tank height so that free space exists for further additions to the main batch produced – for adjustments, tinting (pigmenting) or other modifications to the main batch.

VENT – A tank or vessel vent is an opening that allows air, gas, or liquid to pass out of, or into, the tank or vessel. There are a number of roles that vents play and consideration must be given to the maximum inflow into the tank (causing over pressurization) and also the maximum outflow (causing partial vacuum). These conditions may also result from the action of pumps and/or process upsets such as gas-blow by or from a vessel.

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