

Non-Invasive Radar Measurement

Radar signals can penetrate non-conductive products such as glass or plastic. This allows for easy installation of a measurement device on a vessel without having to penetrate the vessel in any way.

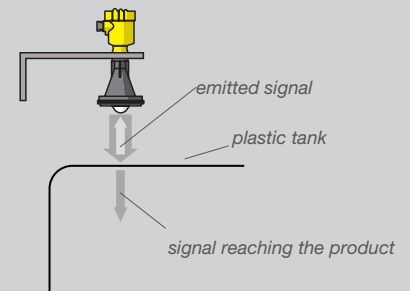
EXAMPLE Automate a Temporarily Installed Vessel

A benefit can be realized by measuring the level in plastic intermediate bulk containers (IBC) or plastic barrels. Radar can provide an easy way to not only measure the level in the container, but transmit the value to a control system allowing for automation to be used on a container that is temporarily installed.



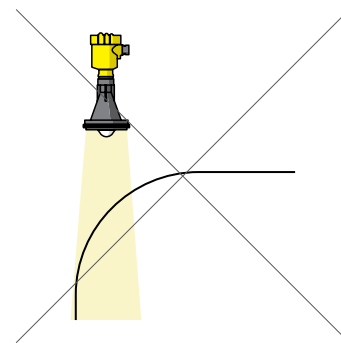
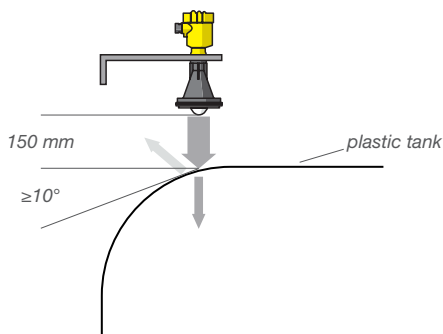
Mounting Considerations

Physically, the fundamental laws of reflection apply to measuring through a non-conductive material. The radar signal is partially reflected by the top of the vessel or the glass window. The remaining signal reaches the product surface with enough strength to be able to provide reliable return signals.



The partial signals reflected by the top of the vessel or the glass window will be detected by the sensor. Steps can be taken to minimize this false reflection.

- It is best if the vessel is located indoors. Any moisture or precipitation that is on the outer surface of the vessel or window below the sensor will greatly impact the measurement. It could make it so that measurement is not possible when outdoors. Users have been known to construct a special cover that prevents snow, rain, and condensation from forming or settling between the sensor and the plastic tank top.
- Place the sensor over a curved portion of the plastic tank. Any reflected signals can be reflected laterally instead directly back up to the antenna surface.
- Place the sensor at least 100 mm (4 in) above the surface of the plastic tank. This gives the reflected signals the space to move laterally away from the sensor.
- An inclined surface also helps any moisture or condensation that forms on the inside of the vessel to drip away.
- On a plastic vessel, make sure the sensor is not too close to the sidewall. Metallic objects outside of the vessel can be detected by the sensor.
- Ensure that the radar signal strikes the surface of the liquid at a 90 degree angle.



VEGAPULS 64

Measuring Through a Site Glass

EXAMPLE High Purity Liquids

If high purity is required, measuring through the vessel eliminates any concerns the sensor or process connection could contaminate the material inside.

EXAMPLE Highly Corrosive Material

Often, highly corrosive materials are stored in plastic vessels. If the tank does not have to be opened there is less risk of material leaking from the vessel. Additionally, the level sensor does not have to be constructed of exotic materials in order to survive the measuring environment.

EXAMPLE High Temperature or Pressure Vessels

Measuring through a sight glass at the top of metallic vessels allows for radar to be used on vessels that exceed the temperature and pressure specifications of the radar antenna.



VEGAPULS 64 Mounting Considerations

On sight glasses, moving the sensor 100 mm (4 in) above may make it more difficult to measure because of the overall nozzle height. Balance this requirement with the overall ability to get a good signal from the product surface.

Sight glasses inclined at least 10 degrees are preferred. This is so that energy that does not penetrate the glass will reflect away from the sensor.

The narrow beam of the 80 GHz VEGAPULS 64 allows mounting above a site glass and above a tall nozzle. Make sure that there is a clear path for the reflected energy to travel away from the sensor.

