SIEMENS

Accurate, quick and simple:
Innovative level measurement of malt and grain

Point level detection	Continuous measurement
Detection of a certain position	Detection of level throughout the whole measurement range.
Position is defined by mounting position or length of probe	Differentiation between contacting and non-contacting methods
Protection and switching tasks	Control tasks Inventory management


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Level measurement technologies

- **Vision**
  - Sight gl ass
  - Float gauges
    - Perpendicular
- **Force**
  - Membr ane
  - Buoyan cy
    - Float
    - Magnetic float
    - Displacement
  - Weight
- **Pressure**
  - Air bubble
  - Hydrostatic
  - Differential pressure
  - Hydrostatic tank scaling
- **Electrical**
  - Elec./Mec.
    - Servomotor
    - Paddle Vibration
  - Resistance
  - Conductivity
  - Capacitance
  - Thermal
- **Radiation**
  - Radar
  - Nuclear
  - Optical
  - Ultrasonic
  - TDR
  - Laser

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Continuous level measurement –
Pro and Con

Guided wave radar
Pro: - high pressure and high temperature resistant
- interface measurement possible
Con: - wear and tear with solid applications
- problems with product build up
- product contacting

Ultrasonic
Pro: - wide range of use
- self cleaning
Con: - influenced by atmosphere
(e.g. pressure, temperature, gas composition)

Radar
Pro: - Little influence of ambient conditions
(e.g. pressure, temperature, dust)
Con: - Problems with product built up in the antenna
- no open air approval for 25 GHz

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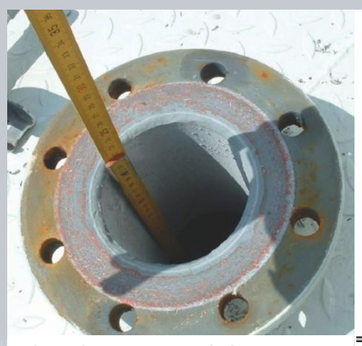
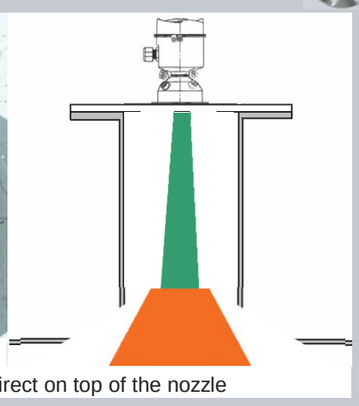
Silo: Interference of standpipe
Criteria: Beam angle

Using of a narrow and sharp
beam angle the installation can be direct on top of the nozzle

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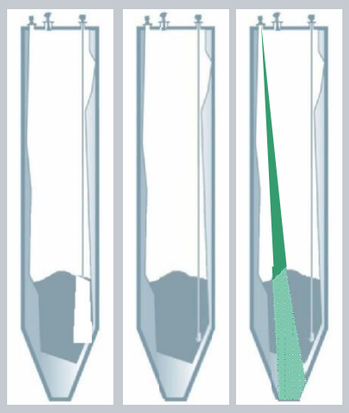
Silo: Measurement down to 0 %
Criteria: Beam angle



4° Beam angle, non contacting

Achievable with 78 GHz
and Lens antenna

The smaller the beam the lesser
the risk, to “stick” on a
build up reflection

Measurement down to the discharge point possible and only minor reflections in the conical section with silo heights up to **100 m**!

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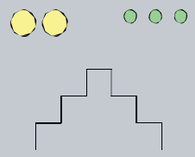
Radar level measurement for solids -
A new era starts

Narrow beam angle	Short wave length	Lens antenna
Measurement down to the discharge point	Direct product reflection (less indirect signals)	Efficient purging
Minor reflections of obstructions / product build up	High reflection quality	Antenna extensions are not necessary
No disturbing by the nozzle		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Radar level measurement for solids -
A new era starts

	Electro-mechanic	Ultrasonic	Guided wave radar	Radar 25 GHz	Radar 78 GHz
easy mounting					
product build up					
obstructions					
dust during filling					
no dust during filling					
gas composition					
temperature					
pressure					
indirect reflections					
maintenance					
measurement down to 0%					

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Radar level measurement for solids -
A new era starts

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siemens.com/processinstrumentation