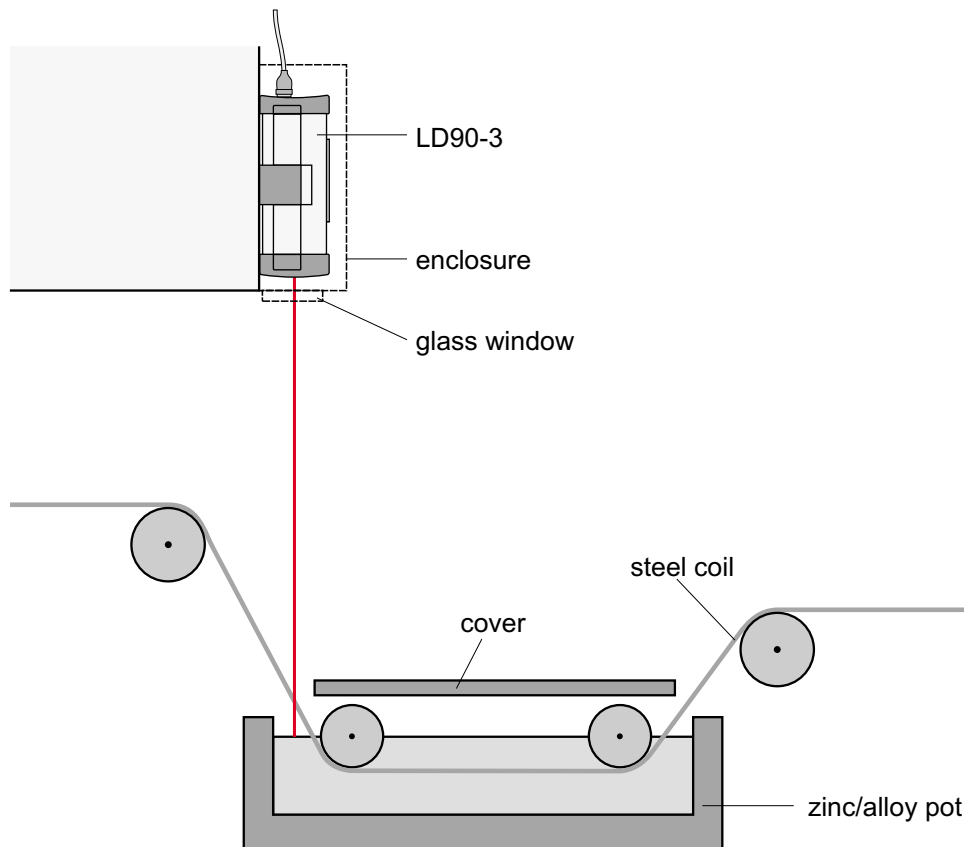


Applications of **RIEGL** Laser Instruments

Problem: Maintain constant level of molten zinc in steel coil galvanneal process to insure product quality.

Solution: Mount LD90-3 over molten zinc/alloy pot for non-contact continuous level measurement.



Advantages:

- ✓ Non-contact measurement
- ✓ Narrow beam requires only a small opening through protective cover
- ✓ Easily maintained
- ✓ Easy and inexpensive installation
- ✓ Accessible
- ✓ Rugged and reliable
- ✓ Accurate

Performance: for LD90-3100HS

- ✗ Measuring range: up to 100 m
- ✗ Repeatability: up to 2 - 3 mm

Accessories:

- ☞ Red semi-conductor laser places red dot on material to check sensor alignment.

(Continued on the next page)

Applications of **RIEGL** Laser Instruments

LD90-3

measuring beam

molten zinc

cover



zinc pot

molten zinc

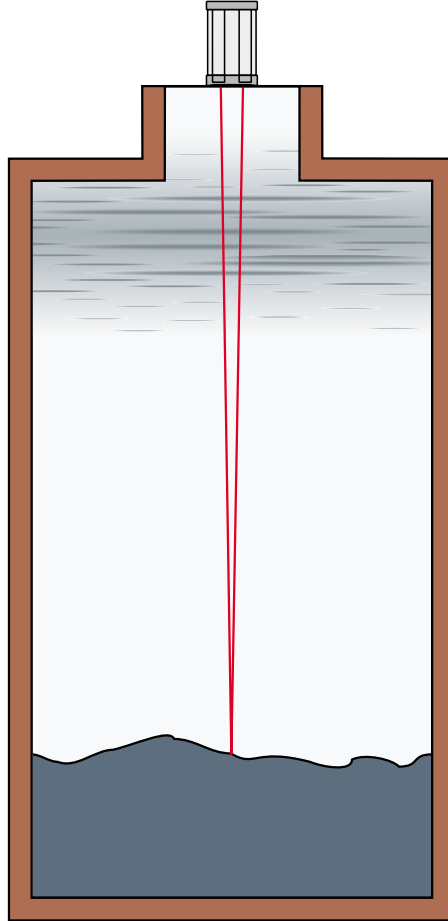
cover



Applications of **RIEGL** Laser Instruments

Problem: Level measurement in a coal silo with high dust occurrence

Solution: LD90-3200HiP with "High Penetration" facility



Advantages:

- ✓ Narrow measuring beam
- ✓ High measuring resolution
- ✓ Reliable operation even in very dusty environment
- ✓ Exact calculation of the volume possible
- ✓ Practically all kinds of material, whether coarse, fluid or powder form, can be measured

Performance:

- ✗ LD90-450:
measuring range up to 150 m
accuracy ± 2.5 cm
- ✗ LD90-3200HiP:
measuring range up to 150 m
accuracy ± 5 cm

Accessories:

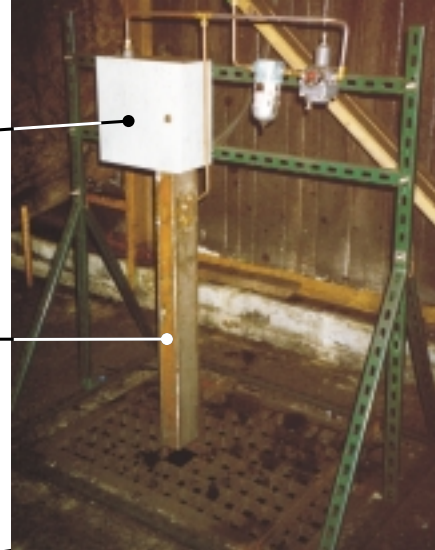
- ☞ Lens protection tube
- ☞ Vertical mount for silo measurements
- ☞ Adjustable mounting base

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Applications of **RIEGL** Laser Instruments



LD90-3200HiP
(in the protection box)



protection tube



RIEGL
LASER MEASUREMENT SYSTEMS

Application Note
AN-IA143

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Applications of **RIEGL** Laser Instruments

Problem: Level and tilt measurement in explosion endangered area ("gasometer")

Solution: Laser Distance meter LD90-3200HiP-ATEX "GAS ONLY" measuring downwards from the roof of the "gasometer" to the floating disc.



Key features of laser instrument:

- ✓ Explosion protected laser instrument for zones 1 and 2
- ✓ Specification:
II 2G EEx de IIC T6
- ✓ High measuring resolution
- ✓ Measuring range:
up to 250 m
- ✓ Accuracy typ. ± 25 mm

Limitations:

- ✗ The LD90-3200HiP-ATEX "GAS ONLY" must not be used for underground-mining.

Alternative:

- ✓ LD90-3200HiP-ATEX additionally specified for explosive dusts.
- ✓ Explosion protected laser instrument for zones 1 and 2, as well as for zones 21 and 22
- ✓ Specification:
II 2G EEx de IIC T6
II 2D IP65 T 85°C
- ✗ The LD90-3200HiP-ATEX must not be used for underground-mining.

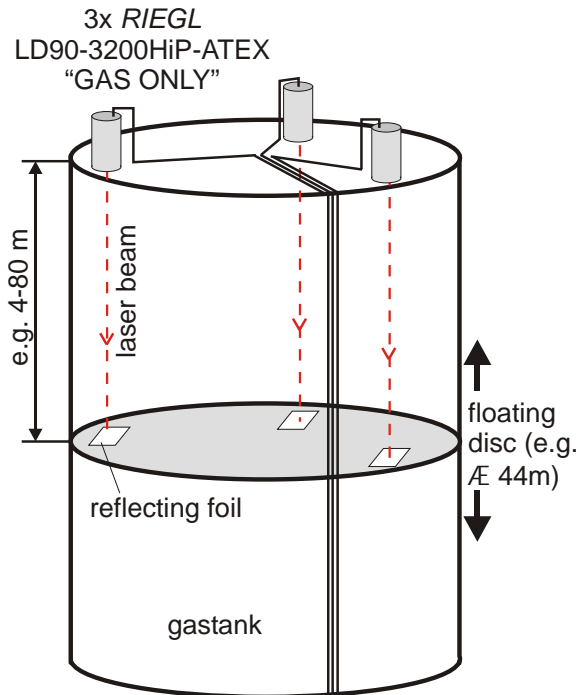
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Applications of **RIEGL** Laser Instruments

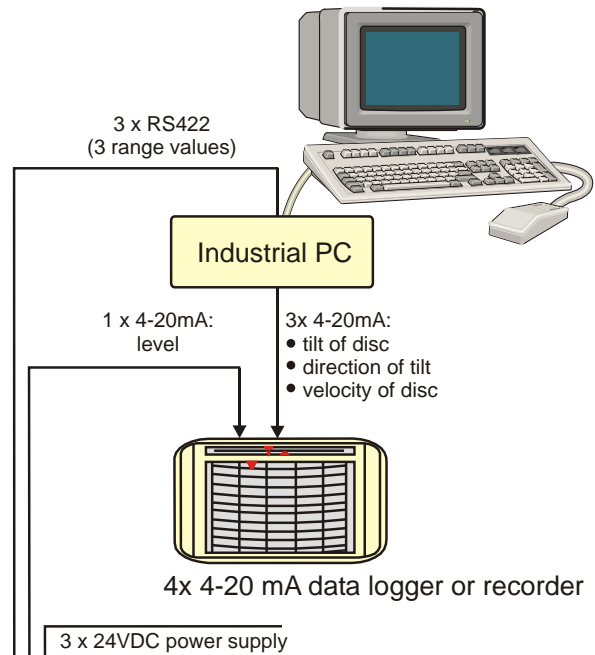
Principle of tilt measurement:

Three LD90-3200HiP-ATEX "GAS ONLY" are measuring the distance from the roof of the "gasometer" to the floating disc, which covers the gastank. The range data are sent via RS422 to an industrial PC, which is placed outside the explosion endangered area. The PC calculates the level and tilt of the floating disc.

Explosion endangered area



Control Center



Key features of PC software:

- ✓ Reception of the range values via 3 x RS422
- ✓ Exact calculation of
 - Volume of gastank
 - Level of disc
 - Velocity of disc
 - Tilt of disc
 - Direction of tilt
- ✓ Analog data output to data recorder or data logger
- ✓ Relay outputs for alarm signalling
 - Level minimum/maximum
 - Tilt maximum
 - Velocity maximum
- ✓ Error detection and logging

Technical data:

- ✓ Accuracy of level measurement ± 25 mm
- ✓ Accuracy of tilt of disc ± 50 mm (according to e.g. $\pm 0.07^\circ$ for \varnothing 44 m of floating disc)

Note that accuracy of tilt of floating disc and direction of tilt depends also on dimensions of the "gasometer"!