



Newsline

CHEMICAL

Return to good prospects in the chemical industry



Dear Readers,

It has already been six months since AICHEM. Much has happened in our industry since then: The crisis has given many companies a jolt; at the same time many companies have used the opportunity to prepare their employees for the upswing with further training both in-house and externally. In the chemical industry especially, there are several subjects that will be important in the coming years. Some of these will come up at the annual general meeting of the NAMUR association which takes place at the beginning of November. The association is celebrating the 60th anniversary this year.

Education and training on future subjects

SIL is one of those subjects. Interest remains high as demonstrated by the enthusiastic participation in the SIL seminar series put on by KROHNE together with TÜV Nord, engineers company Lippert & Fuhrmann and the authorised expert Mr. Udo Hug. The participants were far from passive here. Instead their questions were thoroughly discussed in an effort to organise and evaluate safety relevant systems. There is still a great need for information which is why there will be another SIL seminar series in 2010. Please contact us should you have any questions pertaining to safety relevant systems!

Level measurement: Solving practical problems

Recently organised trade fairs indicated an increased demand for level measurement, which is why we have prepared a "level special" for this edition of Newsline. The chemical industry is one of the largest markets for level measurement. Extremely demanding applications are often found here. For example, in plastics processing, granulate material, pellets and powders must be monitored in both tall and narrow silos. When it comes to manufacturing fertilisers, large hoppers, silos and waste dumps must be monitored. Our experience shows that it is level measurement with radar in particular that still poses many challenges in practice. Read about these inside in our "special" on level measurement.

And a piece of good news to close: The greatly anticipated end of the economic crisis seems to be within reach as many leading chemical companies have significantly reduced or even put an end to reduced working hours – if things continue to improve in this sector, the others are generally soon to follow.

Sincerely

Ralf Haut
Industry Manager Chemical

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Special section on level

The measurement of solids using radar is a hotly debated topic.

Read on for our interview covering the topic of level measurement of bulk solids.



Safely measuring aggressive media



OPTIMASS 7300 with the tantalum measuring tube measures acidic solvents in a Swiss chemical company



OPTIMASS 7300 with titanium measuring tube in use at AkzoNobel in the Netherlands

In the chemical industry there are many chemically aggressive and abrasive media that may only be transported and measured using materials with a very high resistance. If, in addition, the measuring device used is required to measure precisely while being as insensitive as possible, there is only one solution: a Coriolis mass device with a straight measuring tube made from the optimal material.

For just such applications, KROHNE has the OPTIMASS 7300, which was specially developed for demanding applications. It is available with four different measuring tube materials: Stainless steel 316L, Hastelloy C22, Titanium or Tantalum. Thanks to the straight measuring tube, the device basically behaves like a piece of piping and can also be handled accordingly during installation: OPTIMASS 7300 is not sensitive to vibration and can be installed virtually anywhere, even without a straight inlet segment. In addition to mass flow, the device can also output direct volume and density of conducting and non-conducting media.

When stainless steel and hastelloy cannot be used due to the abrasive nature of the slurry or with media with high solid content, titanium can be used as a material. Liquid hydrocarbons laden with solids are an example of what accumulates during the processing of plastics. An OPTIMASS 7300 with titanium measuring

tube is used to measure this inhomogeneous liquid with extremely abrasive qualities. The user chose titanium because of its resistance to abrasive wear. This guarantees precise measurement over a long period of time.

In the past, when maximum chemical resistance was the order of the day, zirconium was often used as the material for the measuring tube. It has since been replaced by the even more resistant Tantalum. With the OPTIMASS 7300, KROHNE is the only manufacturer to offer a Coriolis mass device with a straight measuring tube made out of Tantalum.

The device proves its reliability, for example, when measuring pre-products of a pesticide; the pipes of the system are made of enamelled steel. Measuring hydrochloric acid, sulphuric acid, bromine, nitric acid and phosphoric acid poses no problem either. OPTIMASS 7300 Tantalum is also frequently used in test plants where safety is the top priority and the highest possible chemical resistance is demanded for all components. Many test plants need such strategic resources in preparation for future delicate applications.

For more information please go to: www.krohne.com/optimass7300



OPTISONIC 6300 XT



Screw connection for the signal cable

Safely measuring hot products

With the OPTISONIC 6300 XT, KROHNE adds to its product range of clamp-on flowmeters for high temperatures. The device reliably measures liquids with temperatures up to 200 °C or 392 °F without having to open the pipeline or interrupt the process. In the chemical and petrochemical industries, the OPTISONIC 6300 XT can be used, for example, for high temperature processes such as measuring heated hydrocarbons, liquid sulphur, thermal oil and car-bamates. In addition, the device is suited to measuring hot water in district heating networks and also withstands the high temperatures in CIP/SIP processes in pharmaceuticals.

In addition to its accuracy and reliability, the OPTISONIC 6300 XT impresses with its simple installation and increased safety for operating personnel. The device can be installed onto the pipeline during operation with no need for cooling or even switching off the process. The sensor is easy and straightforward to clamp on to the pipeline; an indicator for the signal strength on the converter display helps when determining the optimal positions for the signal converter. This considerably reduces the effort required during installation.

The measuring device is designed for difficult ambient conditions and thanks to its approval for ATEX zone 1, even for hazardous areas. The OPTISONIC 6300 XT is available with two different lengths of clamp-on sensors for nominal sizes ranging from DN 15 to DN 400.

For more information please go to: www.krohne.com/optisonicXT

Special level section:

Radar and bulk goods: A relationship with a future

Interview with Volker Lenz, Product Management for level measuring devices, on the topic of non-contact level measurement

Question: Mr. Lenz, in the trade press users often report problems with non-contact level measurement. That is why radar measurement has the reputation of being complicated and often causing a disproportionately high amount of rework. Can you pinpoint the difficulties here?

Lenz: As a matter of fact, level measurement using radar is not that easy when compared to other measuring methods. Rarely are two applications the same in practice. Each measurement should be looked at individually. There are now a great number of radar level measuring devices on the market which can, in turn, be combined with a number of antennas and antenna options with various measuring frequencies. The device technology is generally

prevent the overflowing of silos and thus production stoppages. For this situation, a non-contact measuring method using radar is ideal since it can continue measuring during the filling process and is completely maintenance-free. However, if the user has not been properly advised or gets the impression that radar devices in their standard versions are always suitable for any application bar none, there is a high probability that problems will occur when measuring.

Question: What approach would have been better in this situation?

Lenz: In this situation, device suppliers must invest more time: In the case of a properly designed and installed radar device that has been pre-parameterised by the supplier, the customer usually only needs to input a few parameters at start-up. That is why our devices feature an integrated wizard which guides the user through installation and prompts values such as silo height, blocking distance and surface shape. For additional support, all parameters are also explained using graphics and text in the query. In addition, we also guarantee customers the necessary help as needed, even at short notice via telephone or



to a limited extent which means that every time the application conditions change, a lot of effort must be put in to rebuilding or replacing the devices.

Question: What about the purchase price?

Lenz: Naturally the advertising is based on the price of the basic version. However, this is not always enough for every application. What is often needed is additional equipment to align the antenna, a larger antenna e.g. a large parabolic mirror, a purging system or a protective cover to prevent deposits on the antenna or a more powerful converter. This then drives the cost up, which of course contributes to the reputation that radar systems are much more expensive than expected.

Question: What makes KROHNE radar level measurement devices different from the competition's products?

Lenz: We develop devices for a wide range of applications. For example, with our solids radar OPTIWAVE 6300 we can measure up to 30m, even with the basic version with a small DN 80 drop antenna. This allows us to cover an extremely wide range of silo sizes with this device. Other manufacturers must fall back on an expensive measuring device with a stainless steel horn antenna or large parabolic antenna as well as a different converter as soon as they exceed 15m. Our device design allows us to cover all measuring ranges up to 80m with just the one converter. In addition, thanks to the extremely high dynamics of our FMCW radar measuring principle, no special equipment is required to align the antenna. And there is also no need for purging systems or protective dust covers thanks to our drop antenna, which do not allow anything to adhere to them.

Question: Do you see any trends when it comes to measuring solids?

Lenz: In the field of solids, older technologies including ultrasonic measuring devices,



„High quality advice is crucial when selecting the right measuring device.“

good - the problem lies in the application of knowledge.

Question: Can you explain that in more detail?

Lenz: In order to select the right measuring principle and sizing of the device, two conditions must be met. The user must possess sufficient knowledge of the application and of the measurement requirements. The provider completes the picture with appropriate experience and advice. The quality of advice is crucial here: If the right questions are asked prior to selecting the instrument, then most of the typical application problems can be solved.

Question: Can you give some examples?

Lenz: In practice, we often have cases in which users replace electromechanical systems or ultrasonic measuring devices with radar devices and then encounter problems with unstable measurement. The reason for the change is generally cited as wanting to increase plant availability in the long term and to reliably

on-site service. Leaving the customer alone in such a situation would be a huge mistake.

Question: An investigation of two NAMUR member companies showed that the annual maintenance costs of a radar measuring system can be 2-3 times more than those of an average measuring system. How can this be?

Lenz: In our experience, this too can be traced back to less than perfect advice resulting in incorrect planning. If, after it has been installed and the initial parameterisation is done, the device functions but does not provide reliable measuring results, adjustments must be made. The device is reparameterised, the antennas are replaced by different or larger ones and purging systems or antenna aiming kits are retrofitted. The worst case scenario is that the devices were sized completely incorrectly and have to be replaced by more powerful systems. That can easily triple the original price of the device. Another cost factor is the lack of modularity: Many devices cannot be upgraded at all or only

Continuation

electromechanical systems, capacitive level measuring devices and guided microwaves (TDR devices) are increasingly being replaced by radar devices. They offer significant advantages over established methods when it comes to lack of maintenance and the possibility of measuring continuously and without contact, without the tensile forces of the sensor/product acting on the silo roof. This also applies to difficult applications: Over the past years, radar level measuring technology has undergone considerable development and is now even used in demanding solid applications with dusty atmospheres and poorly reflective materials. The examples of titanium dioxide and raw perlite come to mind.

Question: There are many suppliers active in the field of level measurement. Why should a user choose a KROHNE device?

Lenz: We have been active in the field of radar level measurement for over 20 years. In 1989 we launched the first process radar and were thus pioneers in this field, establishing radar technology around the world. Since that time, we have gained considerable experience with radar level measurement – especially when it comes to bulk goods. On top of that, we developed the OPTIWAVE 6300 with an innovative



„Users should discuss their measuring needs in advance with radar device manufacturers.“

drop antenna as the universal device for solid applications. Technologically speaking, this puts us on the cutting edge; in my view, there is currently no comparable device on the market. We also offer the necessary expert advice and practical experience required to successfully propose, provide and commission radar level

measurement devices.

Question: Is there any other advice you would like to offer potential users?

Lenz: Radar measurement technology leads the way in today's level measuring applications in the solids market. And rightly so. This technology features many important advantages for the user and works reliably in a large number of applications, sometimes in extremely harsh conditions.

At the same time the devices on the market differ in some cases markedly. The pulse radar and the FMCW radar represent two competing radar measuring methods. The radar devices of well-known manufacturers also differ when it comes to antenna systems and operating frequencies. In the end, the customer is spoilt for choice. However, don't get caught thinking that the limits of all radar level measurement devices for solids are the same. There are some very big differences at times – if the radar device of one supplier fails in an application or the supplier turns down the job, it still makes sense to revisit the topic of the measuring task with another supplier.

They may be able to offer alternatives which may be better suited to the individual application. For this reason, users should not be afraid to contact the manufacturers of radar devices in advance to discuss measuring task needs.

What was your experience? Voice your opinion: level@krohne.de



Everything under control: Non-contact level measurement of bulk goods and solids with OPTIWAVE 6300 C

- only 2-wire FMCW radar device (24-26 GHz)
- developed for use in silos, hoppers, storage containers and conveyor belts
- precise measurement even with uneven surfaces and extremely dusty ambient conditions
- drop-shaped antenna made of plastic that resists adherence
- no special device for alignment, no parabolic mirror or flushing system necessary
- basic version with DN 80 drop antenna covers measuring range up to 30m
- modular display and converter design
- high efficiency thanks to low cost of installation and maintenance

For more information please go to: www.krohne.com/optiwave6300

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