Analytical Measurement

Contamination ice water

Application: Use of turbidity sensor STS


Fig. 1: Example of refrigeration

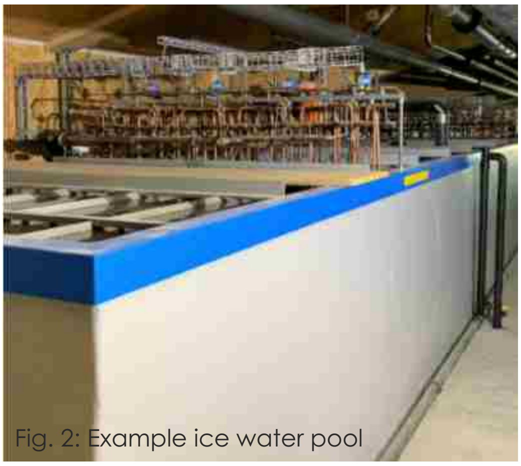
Fig. 2: Example ice water pool

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Hygienic Analytical Measurement

Our analytical measuring technology for aseptic applications has an extreme accuracy and meets the especially in the food industry industry in particular demands on hygienic production processes. It usually has aseptic measuring points and is typically programmable on the device or programmable on the PC.

Application and process description

In the dairy industry, depending on the product, heat or cold is required, which cools or heats the product via heat exchangers. In order to avoid contamination of the product in the event of a possible leak, the product side is operated with increased pressure.In the event of a leak, the product (milk) enters the cooling or heating circuit. Since the milk product always contains a certain amount of turbidity, suitable turbidity measuring devices can be used to detect product transfer or leakage.It is important here to identify this possible leak as quickly as possible so that no further contamination of the subsequent system components can occur. This can be ensured by the use of suitable turbidity measurement technology at various points in production.

Example: Cold supply in theDairy production (see fig. 1))

In a dairy, very large amounts of cooling water (ice water) are required to cool the products during production, which are buffered in an ice water storage tank and cooled down to 1 to 2 ° C by cooling compressors.Depending on the size of the dairy and the amount of ice water required, these buffers can also be tanks or basins. The individual product types or systems are fed with cold from here.The water heats up through the consumption of cold at the respective heat exchangers. This heated water flows through the respective return from the production back into another buffer tank.

There, the heated water is cooled down to the required temperature by the refrigeration system and then fed back to the ice water buffer tank.So we have a cycle of ice water in the entire dairy.Should a product enter through a breakthrough, for example in a heat exchanger in production, this contamination, if not detected, would run through the entire plant and contaminate all processes.In most dairies, laboratory measurements have been used to determine the levels of contamination in the ice water. These values are usually given with the designation "COD" (chemical oxygen demand).

Similarly, the COD value is also used in sewage treatment plants. Here it is measured how much oxygen the chemical cleaning processes in the wastewater consume. The higher the value, the worse the clarification of the water.Due to these laboratory measurements, valuable time is lost in the event of an error, which is then lacking for a quick response. It is also hardly possible to limit the location of the leak in this way.By using our turbidity sensors of the STS series, a change (contamination) can be detected very quickly.

Analysenmesstechnik

Kontamination Eiswasser

Application: Use of turbidity sensor STS

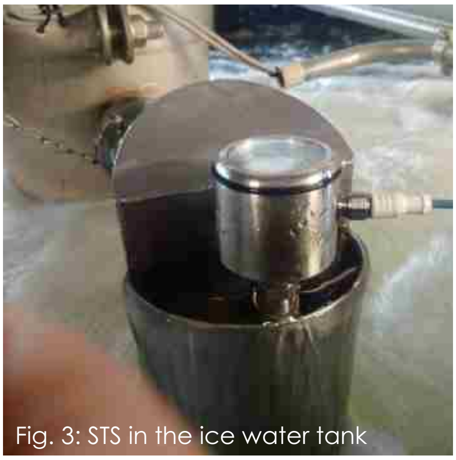
Fig. 3: STS in the ice water tank

In a large dairy, a COD value of 39 was measured in an ice water measurement during operation using a laboratory sample. No clouding could be seen here with the naked eye.

One liter of this ice water sample was filled into a container for a test and homogenized by stirring in order to ensure an even distribution of the turbid substances present.

The measurement with our turbidity sensor of the STS series with an OPL of 20mm resulted in a value of 1.2% turbidity. A tiny drop of milk was then added to this sample using a pipette. A new measurement now showed an increase to 3.5% haze.

The subsequent laboratory determination also showed an increase in the COD value to 54.7, whereby the maximum permissible value of 70 COD is assumed in this operation.

With our sensors it is therefore possible to determine even the smallest deviations very well. This result is made available by the sensor at the output after around 70 milliseconds, so that the signal can be processed further on the control side of the system.

For this, the installation location of the sensor should be chosen so that no interference measurements can be made.

Ingress of air or other influences lead to falsified measurements with these smallest measurement signals. Thanks to the early detection of product entries, it is now possible to determine at every point in the system where the breakthrough may have occurred.

Immediate automated intervention prevents the entire system from being contaminated and production from being maintained.

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