



QUADBEAM TECHNOLOGIES

~ Specialists in process suspended solids & turbidity ~

Suspended Solids and Turbidity Measurements in the Manufacture of Casein

Casein is manufactured from skim milk. Skim milk is usually produced in butter factories when the whole milk is separated into cream and skim, with the cream used for butter manufacture. The skim milk is stored in large vertical silos. A bacterial culture (the starter) is added to coagulate the skim milk. After about 12 hours when coagulation is complete, the coagulated milk is pumped out of the silo, cooked, acidified, de-wheyed, washed and dried.

Due to the height of the silos, there is considerably more pressure at the bottom of the silo than the top which causes a denser curd to form at the bottom. As this curd is pumped out of the silo (to the cooker) the curd density varies from very dense to thin. When the plant changes from an empty silo to a full silo the change in curd density is large and fast, causing process upsets.

Uniform cooking is essential to consistent quality of the end product. However, the energy requirement to cook the thin curd is very different to the energy required for the dense curd, making uniform cooking difficult.

This variation in curd density also causes another problem in the drying stage of casein manufacturing. Casein driers do not respond very well to large changes in solids loading and if the solids flow entering the drier can be kept uniform then the dried product will have uniform moisture content with minimal off spec product.

The solution to both these problems is to install a S20 sensor in the common line from the silos to the cooker. The sensor is connected to a MSSD53 transmitter which gives a 4 to 20 mA signal which is proportional to the curd density. A controller (PID algorithm) uses this signal to open a three way valve to control the whey addition and hence maintain uniform curd density.

Another application in casein manufacture is to monitor the whey from the dewheying screen for casein solids to monitor the fines level. An increase in fines is an indication of problems in the previous stages. This application requires a T30 sensor and a MSSD53 Transmitter.

Quadbeam sensors have also been used to control the quantity of solids feeding the dewatering decanters to stop the decanters from being overwhelmed. The S20 sensor is mounted in the feed line to the decanter and a PID loop controls the level of solids via a three way valve where whey is introduced to keep the solids level constant.

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