Keg monitoring during cleaning and filling

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Preventive quality assurance is becoming evermore important against a background of more stringent requirements and an increase in individual fills as containers become smaller.

As a rule, problems encountered in daily operation can be divided into 3 categories:

- Problems which cause an immediate stoppage of the plant or of individual production lines: this relates to upsets which could have grave commercial consequential implications, e.g. potential infections from serious upsets in the disinfection process or beers being off-specification;
- Problems which can be remedied during ongoing operation: this accounts for the majority of upsets arising, such as defective kegs, sensors or leaks;
- Chronic problems: this refers mainly to problems as a result of process equipment inadequacies which can be overcome through various deft interventions by operators. Their origin can possibly be determined, the problem is frequently not eliminated.

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A modern keg plant with several lines or rotary machines is complex, with hundreds of valves, pressure switches, temperature sensors and other components. Even the best maintenance and repair cannot prevent malfunctions arising from time to time. The detection of malfunctions or evidencing of optimal process conditions for product quality and hygiene is absolutely essential.

Keg hygiene

In principle, the keg is a closed system and thus represents a hygienic unit. This, together with its operative friendliness during distribution, was one of the main arguments in its favour in replacing casks.

But after the keg leaves the brewery, the brewer relinquishes control over the container and its contents. Only when the keg comes back to the brewery is it possible to determine with assurance that it will be handled properly. The time in circulation and the treatment it receives from the person in whose possession it has been up to the point of return is open to speculation. For safety's sake, it should be assumed that the keg is contaminated and possibly very dirty when returned to the brewery. Those breweries which have a high export share face difficult problems because a separation of kegs in accordance with origin cannot be done or would be a big logistic challenge.

Due to the reasons mentioned above, it is advantageous to select a minimal standard for cleaning and disinfection which can in all cases be assured by the plant. On the other hand, it must be ensured that the plant can meet or exceed this standard. Should this not be the case, an alarm has to be given or the plant has to stop.

It is impossible to check every keg as is done in bottle filling. It is only possible to carry out indirect monitoring of plant operations in order to assure optimal cleaning success.

Adequate keg hygiene is achieved when all contaminants, in particular beer spoiling agents, are inactivated, when the residual O_2 quantity in the keg is as low as possible and when recontamination from the plant itself can be excluded. This does not go as far as sterility but most causes of