

GREEN technology for a GREEN industry

Innovative membrane filtration solutions for sustainable dairy production



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Just before the turn of the century, the problem of human contribution to global warming was addressed officially, when the world's largest industrialized countries agreed to reduce greenhouse gas emissions to stop the rapid progression of global warming. Environmentalists, scientists, and international organizations had long been fighting to make the world take preventive action; and encouraged by consumers, green thinking and environmental awareness has now become a natural part of new investment schemes in the food and dairy industry, particularly in the western hemisphere.

As an environmentally responsible company, DSS Silkeborg was at

the forefront with a dedicated green strategy to reduce energy and water consumption of dairy membrane plants, setting a target of a 25% reduction on the environmental load of any given DSS membrane filtration plant. The target was to be met within 5 years, by including the GREEN concept in all our membrane technology solutions. New thinking and extensive scrutiny of our plant engineering has produced noticeable savings in energy consumption that contribute positively to the green image of the dairy industry in the areas with the largest environmental impact: power, cooling, heating, and water consumption.

Reduced power consumption

An example of the many green initiatives we have taken is the introduction of the "ESA" Energy Saving ATD, a patented technology for membrane plants that reduces power consumption with up to 30%, while maintaining the output of the plant. A typical,

large-scale membrane plant uses 260 kW/h equalling 6,000 kWh/day, 325 production days equals 1,925,000 kWh per year. And 30% reduction equals 585,000 kWh/year. Recalculated into carbon dioxide, this is just above 250 tons of CO₂ emission per year. Furthermore, savings in the power uptake mean less heat generation, and the subsequent savings in cooling equal around 60 tons of CO₂ - totalling 300 tons/year. Not surprisingly, the "ESA" is a huge success in a great number of DSS membrane plants around the world.

Water reuse/savings

The dairy industry is traditionally a heavy user of water, so water-saving measures are an extremely important part of a green strategy. Membrane filtration technology is ideal for recovery of water from products and product streams, procuring water of exceptional purity that can be recycled for reuse in a variety of processes. This reuse of water is already widely practiced worldwide in dairy factories with DSS Reverse Osmosis installations; they reduce net demand on water supply systems and thus overall water consumption - and they cut costly effluent discharge. Undoubtedly, this technology will be developed much further in the coming years.

Another initiative supporting green growth is our recently introduced "Green Flush" solution, which reduces water consumption by more than 25% compared to traditional membrane plants. A membrane plant typically requires large volumes of water over a short period of time for effective flushing. ■

Example - Green Flush

An existing membrane plant without the Green Flush solution has a flushing capacity of 100 m³/h and requires a flushing time of 10 minutes. The total water consumption of a flush is 16.7 m³. The overall cleaning procedure typically needs 4 flushes, meaning a total spent volume of water of 66.8 m³ and 40 minutes for a cleaning cycle.

A similar-sized DSS membrane plant equipped with the Green Flush solution requires 13 m³ per flush. Altogether, the Green Flush solution requires only 52 m³ of water, and in addition, reduces the time needed for flushing.

The savings, therefore, total 14.8 m³ of water and 8 to 10 minutes per cleaning. A Green Flush plant which is cleaned 300 times a year saves 4,440 m³ of water per year and between 40 and 50 hours of cleaning time, which can instead be used for production.

Hence, by embracing new, green technology it is possible to grow the world's dairy production and help feed the planet in an environmentally responsible and economically viable way.