

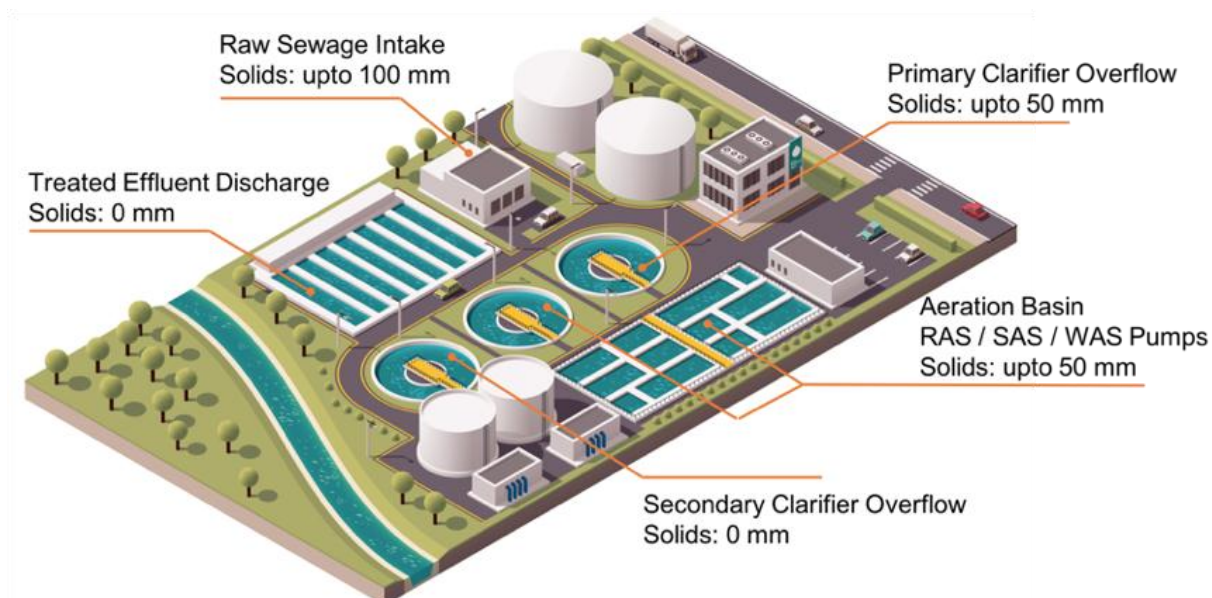
Maximising Pump Efficiency in Sewage Treatment Plants (STPs)

Sewage treatment plants are complex systems as far as pumps and concerned. Maximizing the efficiency of the pumps without getting clogged is important with increasing stress on energy resources and need for effective treatment of wastewater & sludge.

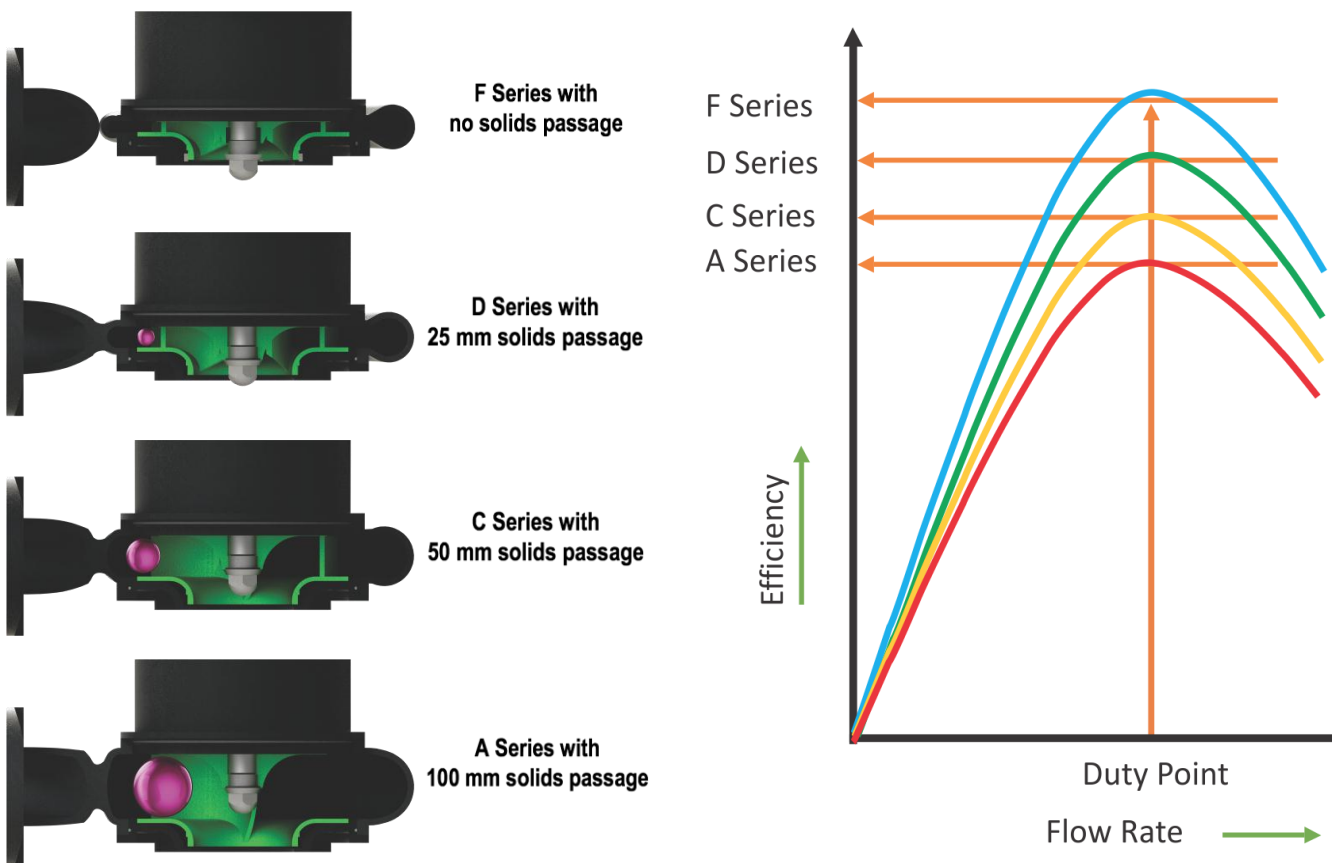
Understanding the applications requirements in STPs:

Sewage treatment plants (STPs) are critical infrastructure assets for any city. It is important that they run without glitches and consume lowest possible energy. Pumps are one of the most critical equipments in a STP from an energy consumption standpoint as well as from the reliability perspective. Being the major rotating equipment in the STPs, pumps often have the bear of brunt of insufficient, inadequate and unreliable upstream sewerage systems. Hence the goal in pump design and selection is to select pumps which will not clog despite the solids ingress from sewerage systems; and consume minimum possible energy at the same time. In a STP, there are multiple unit processes which convert raw sewage to the treated water and include physical, chemical and biological processes. In each of these unit processes, pumps play a critical role to ensure the right amount of liquid is transferred with minimum energy. For the pumps used in each unit process there is a characteristic solid handling size requirement. As the water moves from raw sewage grade to treated water grade, the solid handling requirement of the pumps goes down and is as good as clear water after the secondary treatment stage.

Effect of solids size on pump efficiency:



To accommodate the passage of solids through the pump, the internal hydraulic paths and passages need to design accordingly. Bigger the solid passage requirement, the more space needed inside the pump. Typically, with increased solids passage allowance, the pump efficiency reduces. Hence, there is a need to optimize the pump design based on the solid handling requirements. As mentioned above, primary purpose is that the pump should not clog but should also absorb lowest possible energy in doing so. KISHOR pumps for wastewater and sewage treatment plants are designed to ensure that the pump does not clog, and consumes lowest energy at the same time. Different hydraulic series are designed specifically for use in different unit processes in the STP. 'A Series' pumps are designed to handle raw sewage with upto 100 mm solids passage possibility. 'C Series' allow upto 50 mm solids passage, 'D Series' allow upto 25 mm solids and 'F Series' are clear liquid pumps typically used at the end of the treatment train. Naturally, for a given head and flow rate combination, efficiency reduces from 'A Series' to 'F Series'. However, the flexibility allowed by the intermediate hydraulic series like C & D allow for plant operators to maximize their plant efficiency without pumps getting clogged.



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