

# Pump selection – operating conditions

## 1 . Pumping temperature

If the pumping temperature is high, it is necessary to cool the bearing, the stuffing box, and the pedestal. The criteria for cooling are different depending on pump manufacturers. The cooling should not be required from the customers' side, however the pump manufacturers want to recommend cooling for safety.

If the pumping temperature is low, it is noted that the handling liquid doesn't evaporate. The air layer can be done when the liquid evaporates, and the air moves up. It is necessary to remove air before the pump is started. Therefore, pumps with easy vent, vertical pumps are usually used. However, the pump becomes high-priced.

## 2 . Rated flow, Normal flow

API 610 specifies that pumps shall have a preferred operating region of 70% to 120% of best efficiency flowrate and rated flow shall be within the region of 80% to 110% of best efficiency flowrate. It is because the longevity of pump shortens when the operating point that comes off from best efficiency flowrate.



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## 3 . Maximum flow

Though it depends on the system head curve, it generally examines when two or more pumps are driven in parallel. In a word, two or more pumps are mounted at the parallel operation, when large flowrate is required, two or more pumps are operated parallel, and when small flowrate is required, one pump out of the two or more pumps is operated. There is no problem if a discharge valve is installed and adjusted preventing from exceeding the rated power of driver. When an automatic operation without adjusting a discharge valve, the driver with large rated power is selected beforehand so that the driver should not exceed its rated power at the maximum flowrate.

However, the axial flow pump becomes opposite to this.

## 4 . Minimum flowrate

The minimum flowrate is decided so that the pump may not cause overheating neither abnormal vibration nor noise. The minimum flowrate of the prevention of overheating becomes smaller than that of the prevention of abnormal vibration and noise.



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## 5 . NPSHA

NPSHA is a value in which how many net positive head is shown in m in the impeller of pump. It needs to select the pump that doesn't cause a cavitation.

## 6 . Intermittent operation

A pump is not good at intermittent operation (ON-OFF operation). If possible, we should install the bypass line and operate the pump continuously. It is necessary to check strength of the pump rotation parts when not avoided.

