Specific speed of francis turbine

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Specific speed is an index used to predict desired pump or turbine performance. i.e. it predicts the general shape of a pump"s impeller. It is this impeller"s "shape" that predicts its flow and head characteristics so that the designer can then select a pump or turbine most appropriate for a particular application.

The Francis turbine is a type of water turbine. It is an inward-flow reaction turbine that combines radial and axial flow concepts. Francis turbines are the most common water turbine in use today, and can achieve over 95% efficiency.

The presented methodology was applied to design the runner blade for a Francis turbine model with runner diameter Ø250 mm, characterized by a very high specific speed of about 95 with imposed inflow from the spiral case and an axisymmetric draft tube.

Francis turbine is a mixed flow turbine. In a Francis turbine, the water enters radially to the runner blades while exits axially. It is a combination of a reaction turbine and an impulse turbine. Francis turbines are most commonly used in large or medium hydropower plants to produce electricity.

This paper presents a comprehensive experimental analysis of a model high specific speed Francis turbine carried out at a head of 12 m, with a kinematic specific speed n sQ of 82, which is defined according to the following formula: (1) n sQ = n Q 0.5 H 0.75 where: n - the rotation speed [rpm], Q - the optimal volumetric flow rate [m 3 /s ...

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