Innovation of radial centrifugal pumps

Development status

Phase 4

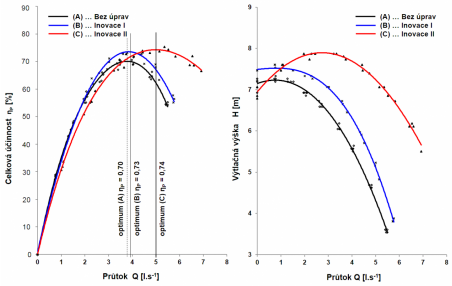
The transition from the prototype to the final and fully functional form. At this stage, the prototype is already fully tested, or the technology is certified and ready for mass deployment.

IP protection status

CZ patent, CZ utility model, know-how

Partnering strategy

Collaboration, licensing



Institution

Czech University of Life Sciences Prague

Vlastník

Česká zemědělská univerzita v Praze

Challenge

Market demand from the particular segment which is looking for the increasing equipment performance and efficiency.

Description

• Innovative modifications increase the efficiency of radial centrifugal pumps by 4-6%. Advantages of the innovation are particularly evident in pumps used in reverse turbine mode, where the overall efficiency increases by up to 10% and performance by 30%. In the field of hydro-power, this solution offers an economically advantageous alternative to conventional water turbines. • Optimized pump modifications are designed based on our existing research and hydraulic calculations. They are designed primarily to increase the efficiency of turbine pump operation. At the same time, they do not reduce efficiency in the pump mode. • Innovations have been experimentally tested on single-stage centrifugal pumps. • The increase in the power parameters of the innovated pump operated in the turbine mode is evident from Fig. 1. Influence of innovation on pump operation is evident from Fig. 2. UNIQUE FEATURES AND ADVANTAGES • Increased efficiency and performance when using pumps in turbine operation - greater efficiency and yields when using hydropower. • Pump operation is also positively influenced by innovative modifications. • Applicable additionally to existing pumps.

Commercial opportunity

• Pumps in reverse turbine operation can be applied especially in small water power plants. • Innovated pumps can be applied in the transport of liquids: water supply - cleaning, treatment and distribution of drinking water, domestic waterworks; wastewater treatment, industry, energetics, chemical and petrochemical industry, mining and metallurgical applications, agriculture (irrigation). • The innovation will help pump manufacturers to increase their market competitiveness and meet EED 2012/27 / EU.