

# Pulsating high speed water jet

## Development status

### Phase 3

**Technology validation and implementing it in real environment.** Testing the technology outside of the laboratory and its adjustment to external conditions.

## IP protection status

The principle of pulsation as well as devices for its implementation or specific applications are protected by several international patents owned by the Institute of Geonics AS CR v. i. in Ostrava: EP1863601, US7740188, US7934666, AU2006224192, CA2601050, IT0001388844 etc

## Partnering strategy

*Collaboration, licensing*

## Challenge

High-speed water jets are currently a relatively widespread unconventional technology valued primarily for their unique properties compared to other machining technologies: quality and fast "cold" cutting, narrow cutting joint and respect for the environment. Although the water jet is used in many variants mainly for cutting and machining almost any known material, it has recently begun to gradually penetrate other branches of industry, where it performs new functions. However, high financial demands for the acquisition of the necessary equipment and their operation prevent a greater spread of water jet technology.

## Description

The pulsating water jet represents a significant advance in reducing the energy requirements of water jet breaking of materials. It allows a several-fold reduction in the working pressure of water while maintaining disintegration capabilities comparable to commonly used continuous water jets. The essence of the pulsating water jet is the cyclic loading of the disturbed material by the impact of water clusters, which arise from the transformation of high-frequency pressure pulsations in the high-pressure system after the passage of the water stream through the nozzle. In addition to increasing the efficiency of the disintegration process, a reduction in acquisition and operating costs can be expected.

## Commercial opportunity

The pulsating water jet is ideal for breaking materials and removing surface layers, deposits, sprays, coatings, etc. by the action of clean water without chemical additives. It significantly increases the disintegration capabilities of the commonly used continuous water jet (without the presence of abrasive). • Removing deposits, coatings and paints from the surfaces of materials without the use of chemical additives. • Modification of surface properties of materials (change of roughness, tension in the surface layer - peening, etc.). • Removal of surface layers (ideal for rehabilitating concrete structures). • Easy disintegration of durable materials with clean water. • In medical



applications for cutting and breaking tissue.

Institution



Institute of Geonics Czech  
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