

**Florence, Italy**  
**30<sup>th</sup> September – 2<sup>nd</sup> October 2019**

**Paper Ref #**  
**(the paper ref# will be supplied to authors)**

**E-Power Pipe®: Jet Pump Technology for long-distance drives in small diameters**

**ABSTRACT**

In Slurry Microtunnelling the slurry pump system is one of the decisive parameters in terms of drive length, especially when small diameter projects are discussed. With conventional centrifugal pumps, the drive length is so far limited to approximately 100 meters in small diameters below 800 mm inner diameter.

The Jet Pump technology is based on a Venturi system, which can be used to accelerate fluids inside the conveying line. The efficiency is such high that distances of up to 1,5km can be accomplished with only one high-pressure pump at the launch shaft. In standard pipe jacking on the other hand multiple centrifugal pumps in the machine or tunnel need to be engaged to overcome such a distance. The jet pump has been first tested by Herrenknecht in conjunction with HDD to extend the application range of HDD in soil formations with higher permeability. In a next step, the jet pump was integrated into the Slurry Microtunnelling machine range creating the AVNS machine designed for drive lengths of 1,000 meters and more.

At the same time the demand for small diameter long-distance pipe jacking had been fuelled by the decision of the German government together with the Energy companies to install high voltage cables underground. In order to install close parallel underground cable casings with minimal overburden and high precision over long distances, Herrenknecht AG has developed the E-Power Pipe® technology using the AVNS Microtunnelling machine (Ø 505mm) with jet pump system. Meanwhile three projects have been executed successfully reaching drive lengths of up to 700 meters.

This paper presents the new E-Power Pipe® technology as well as the AVNS machine type with its use in Microtunnelling. Further application potential in small diameter Direct Pipe® (<30") in the near future will be discussed as well.