

Deliverable D2.2

Development of a compact, rotation-vibration drilling head for urban areas

WP2

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Dissemination Level

PU	Public	
CO	Confidential, only for members of the consortium (including the Commission Services)	X
CI	Classified, as referred to in Commission Decision 2001/844/EC	

Summary

The document D2.2, *“Development of a compact, rotation-vibration drilling head for urban areas”* is a confidential document delivered in the context of WP2: *“Powerful vibration-rotation drilling head mounted on a compact drilling machine to install the improved Co-axial Heat Exchangers”*.

This deliverable describes the newly designed and manufactured rotation-vibration drilling head, the new drill string including drill rods and one-time full face drill bits (lost bits). This head and drill string, once mounted on the drilling machine, will install co-axial heat exchangers in a very cost-effective way and improve the drilling performance in different soil conditions. The first test drillings and evaluations carried out with the new VibroDrill head are covered.

TKI has designed, developed and built a completely new rotation-vibration drilling head, that can be used inside cities and buildings (like historical buildings and cellars) and inside courtyards and gardens (like historical buildings with an inner square or existing complexes with green areas inside). Therefore, the new manufactured rotation-vibration drilling head for geothermal drilling applications is very compact in the overall dimensions. It has become a “light version” of the TKI product range of VibroDrill heads in weight and very flexible in transportation and handling inside of buildings and courtyards. In addition, the noise emission has been significantly reduced so it can be used in cities and downtowns without restrictions and limitations.

With a frequency of 105 Hz, adjustable eccentric moments and the option to have one or two motors installed as rotation drive, this VibroDrill VD105 is the most flexible and suitable rotation-vibration drilling head on the worldwide market for geothermal drilling applications.

In the first tests, respectively in Molinella and in a quarry near Firenze, the drilling performance was optimized with respect to the drilling speed and the function of disconnecting the newly designed one-time full face drill bit (lost drill bit = LDB) at the end of the drilling operation.