

Overhead Drill Press

What the Overhead Drill Press is and why it is innovative?

The Overhead Drill Press is designed to support a rotohammer drill for drilling into concrete or metal ceilings to place hangers for installing various building systems (plumbing, electrical, HVAC, fire sprinklers, etc.). It uses an inverted drill-press design to raise the drill to the ceiling using a hand wheel & linear gear. It allows workers to drill from the floor up to 15 foot ceilings – eliminating the risk of falling from a ladder while drilling.

The system can support a dust-capturing system, which is important for reducing silica exposure. Workers using the tool experience much reduced physical load and vibration to their body, especially to the hand, arm, shoulder and back (Rempel D et al. Field evaluation of a modified intervention for overhead drilling. J Occupational and Environmental Hygiene 2010; 7:194-202). Because the worker is farther from the drill, they experience reduced exposure to noise, vibration, and dust.

Other features include: The main column can be removed from the wheeled base for use in bucket or scissor lift. The saddle accommodates most hammer drills with a square body shape. It has 9-inch, air-filled, locking tires that move easily over rough floors & small obstacles. The saddle can be hinged over to change the bit, adjust the depth stop, clear a dust bin, or move under an obstacle. There is an adjustable collar with bubble levels to set the column to vertical. It disassembles into 3 parts for easy transportation.

Written comments we received from workers during our research include: “Can drill all day without fatigue. If there are a lot of holes to drill this is an excellent tool.” “Fast set up. Easy to move and clean. Improves speed of installation.” “I like how much easier it is to drill holes, how you’re not covered by all the dust and how much less you have to do to drill.” “Easy to adjust, easy to operate, less dust and debris, less stress on the muscles.” “Relieves muscle fatigue. Safer than drilling by hand.” “My low back did not get sore – this keeps me from getting tired so soon.”

What it changed or replaced.

Previously, workers drilled standing on a ladder (or in lift or bucket) holding the drill by hand. This requires holding 8-pound drill overhead, pushing upward with 55 lbs of force for 1 to 2 minutes per hole. In a small commercial construction project hundreds of holes must be drilled overhead to install the various building systems. The problem of drilling overhead by handheld drill has been a well-known ergonomics problem in the construction industry and has been associated with shoulder, arm and hand injuries and fatigue. The force required to crank the column on the drill press is 5 lbs-force.

Where and when it originated, has been used, and is expected to be used in the future.

The original designs were developed in 2004 at the UCSF Ergonomics Program and were improved over a 4 years period after testing by more than 100 commercial construction workers on over 45 job sites. This tool can be used by workers who install overhead mechanical systems, including plumbing, pipefitting, sprinkler filling, HVAC, and electrical systems.

Please note that while we are working with a manufacturer to take this tool to market, currently this piece of equipment is only available from the researchers for loan or purchase (at cost). We will share our drawings with anyone interested in building one for their construction company (ergo.berkeley.edu).



Figure 1: Details of saddle with dust-capturing drill installed



Figure 2: Controls



Figure 3: Overhead drill press in the field



Figure 4: The usual method