

# **TWINKLE CO**

P O Box 79 - West Liberty, IA 52776

800 258 3702

www.twinkleco.com

## **Hullpump dredges - OpenDeck vs. Open Hull**

You may have observed that Twinkle Co H-Series hullpump dredges are arranged with the engine clearly visible on the deck and the dredge pump located in a pump well. We refer to this arrangement as OpenDeck design. Other hullpump dredges have all of the machinery located inside a sheet metal housing covering an open top hull. We call this arrangement "Open Hull". The difference in the dredge designs is far greater than mere appearance.

Some history is in order. Open Hull dredges are the continuation of a heritage that started many years ago. As the 20<sup>th</sup> century dawned and the economy of the country developed, the demand for small dredges increased and many companies plunged into dredge building. Many of these early dredge builders had a background in boat building, so the dredges they built shared many boat building traits. These traits included stuffing all of the machinery into a small space to create a "machinery room", bilges, flotation manholes, making the operator's space integral with the hull to create a "bridge", keel coolers for the diesel engine, coaming around the "hatchways", piercing the hull below the water line for the service water suction and marine transmissions. These dredges were essentially boats turned into mining machines. They were mind numbing to operate, knuckle busting to maintain and prone to sinking.

Over time the nautical features of the dredges were combined with the desire for dredges that were transportable with legal width and height truck loads and minimal disassembly/assembly time. These additional features further compromised the usability and floatability of dredges. The result is seen today in the form of the modern Open Hull dredge. These modern dredges put a pretty face on the same design drawbacks that were built into the early dredges.

Without question, modern Open Hull dredges look nice on the outside, but the beauty is only skin deep. Under the shiny sheet metal these dredges continue the sorry tradition of the Open Hull dredge. The dredge pump, main engine, accessory engine, hydraulics and service water pump continue to be contained inside a very small space. It brings to mind 10 pounds of stuff in a 5 pound bag. This space quickly becomes hot, dark and oily after a few hours of operation.

Most Open Hull dredges have a dirty little secret that often leads to a violation of the First Law of Successful Dredging:

***The hull of an Open Hull dredge functions as flotation only until it fills with water, at which time the hull converts to deadweight.***

The area around a dredge pump is considered to be floodable space. Regardless of the overall dredge design, it is a rule that at some point the floodable space inside a hullpump dredge hull will fill with water. Because of this rule, the floodable space on a Twinkle Co OpenDeck dredge is restricted to the pump well. The floodable space on an Open Hull dredge is restricted only by the size of the hull.

What happens when the floodable space on an Open Hull dredge fills with water? They sink; many Open Hull dredges do not have enough reserve buoyancy to remain afloat.

Starting in 1983, Twinkle Co OpenDeck hullpump dredges were conceived, designed and built to address the shortcomings of Open Hull dredges. We thought sand & gravel producers deserved something better. At a minimum they deserved dredges that float. Our concept has proven to be successful. Since that time, our dredges have continued to evolve and we continue to develop new solutions for sand & gravel production problems.

Twinkle Co hullpump dredges with OpenDeck design do not suffer from a boat building heritage. They bring innovation to an ossified industry. They are designed with a single purpose. They are mining machines that float, with the clear understanding that a dredge must float to function. They are designed for ease of maintenance. They are superior to dredges with an Open Hull design.

OpenDeck design locates the dredge pump in a pump well in the forward part of the hull. The center of the dredge pump suction inlet is at the water surface to maintain suction-side capability. The pump well is sized to accommodate the dredge pump and allow easy access for maintenance, yet minimizes the floodable space.

The rear of the OpenDeck hull is a closed flotation cell. The top of the flotation cell forms an open deck for mounting the engine and accessory equipment. A vertical belt drive reduction allows for separation between the dredge pump and engine. The engine is mounted on vibration isolators. All of the equipment on the dredge is visible and accessible.

The operators cab is a separate structure. There are no hydraulic valves or live hydraulic lines in the cab. The cab has large windows on all sides. The positioning winches are located so that they are in direct forward view from the cab.

Twinkle Co OpenDeck hullpump dredges have adequate reserve buoyancy to remain afloat when the pump well fills with water. A flooded pump well is not a catastrophe, the dredge will continue to float and the engine and accessory equipment will be high and dry on the rear deck. When the pump well is emptied and the pump bearings have been cleaned and dried, the dredge can return to service. No need to call divers or the marine salvage company.

There are choices to make when considering the purchase of a hullpump dredge. Cutter type, digging depth, production rate, electric or diesel, etc.. They are all important, but none of the choices matter if the dredge will not remain afloat. Determine the size of the floodable space and the amount of reserve buoyancy before you buy.