

Impact weights from Buderus Edelstahl Deep sea pile drivers



IHC Hydrohammer BV is located in Kinderdijk, Holland, and develops, builds and supplies hydraulic piling hammers for onshore and offshore use. Buderus Edelstahl was already involved in developing the first IHC underwater hammer. Since 1984 the company has been offering a wide range of hydraulic hammers for various locations, for which Buderus Edelstahl supplies impact weights weighing up to 69 tonnes each.

IHC Hydrohammer BV is part of the IHC Holland Merwede Group, a group of associated companies specializing in the fields of dredging, marine and foundation industries. The company has been involved in international operations for more than 30

years of engineering design and production experience with hydraulic piling hammers. The first underwater hammer was developed in 1984 under the leadership of Dik Arentsen, Technical Director at that time, and Aris van Duijvenboden, the current

Technical Manager; IHC now offers a wide range of standard versions, and also builds customised products to customer specification.

In August 2004, IHC Hydrohammer BV signed a contract with Petro Vietnam Petroleum and Distribution Company to supply an S-750 Hydrohammer set that can be used to operate under water. The end user will be Vietsovpetro (VSP), a joint venture between Petro Vietnam and the Russian company Zarubezhneft.

The S-750 hammer is to be used to install "jackets", the foundation structures for drilling rigs, into the sea bed. The impact weight for the S-750 naturally comes from Buderus Edelstahl.

Robust, weighing 123 tonnes

Producing a mighty IHC Hydrohammer like the S-750 takes a lot of steel. Its total weight is 123 tonnes, the impact weight weighs 38 tonnes. IHC supplies the Hydrohammer in a set with supplementary equipment, which can include a P-1600 W power pack (1100 kW) to move the hammer, a control cabin, and an 84 inch pile guide for driving in batter piles at an angle of 14° (1:4), depending on customer specification.

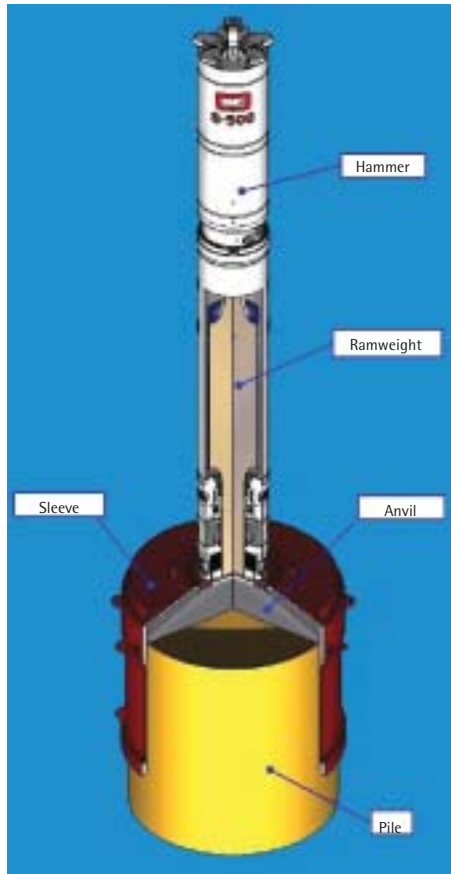
The impact weight falls from a height of 2 metres onto an impact plate made of solid steel, 50 times a minute, for hours on end. That makes high demands on the quality of the impact weights. They are some of the most highly stressed parts in the Hydrohammers, used down to a depth of 1,000 metres. Buderus Edelstahl supplies type S 30 impact weights (impact weight with a delivery weight of 1.7 tonnes) through to type S 1400 (impact weights with a delivery weight of about 67 tonnes) – either premachined or ready to be installed. They satisfy the extreme mechanical demands, and combine high yield strength with high toughness at below zero temperatures. "Operating safety is the key criterion for our customers when they are selecting a hammer supplier", says Egbert van't Hooft, Marketing and Sales manager at IHC, "so we make the highest demands on the quality and workmanship of the steel. We have been working very closely

with Buderus Edelstahl for decades, and value the high level of advisory know-how they provide." Jos van't Hoff also emphasises the excellent, close cooperation, "we enjoy the trust that our customers place in us. And we always think of Buderus Edelstahl when new developments are required that require innovative steels."

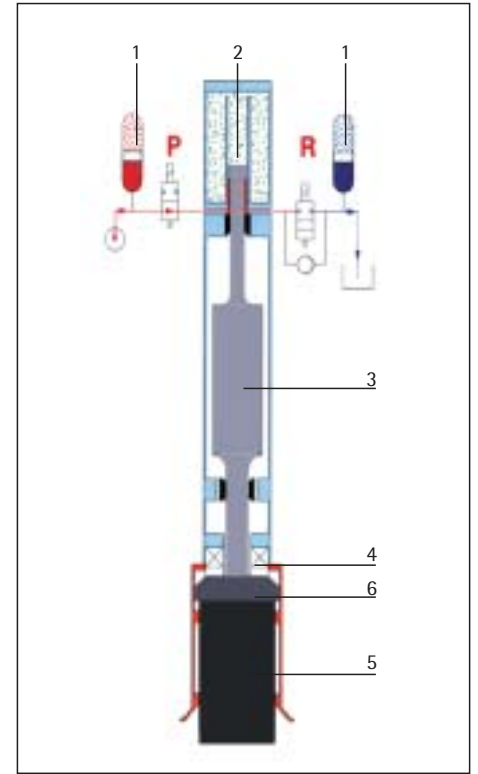
The simple construction of the IHC Hydrohammer is due to the drop weights made of a single forging, and the fully enclosed hammer housing. This results in a very robust, reliable pile driver. The hammers are suitable for all pile driving and foundation applications, ranging from driving impact-sensitive concrete piles through to long, heavy offshore pipes, and under-water rock breaking at full energy.

The pile driving cycle begins with an upward stroke to raise the drop weight (the impact tip, drop weight and piston are made in one piece). The P valve (pressure) in the pressure line is opened and the R valve (return) in the return line is closed. When the pre-programmed stroke is reached, the valves switch over and the drop stroke is initiated. The drop weight is accelerated by a pressurized gas buffer above the main piston up to an acceleration of 2 g. This reduces the maximum stroke required, and at the same time increases the blow rate. After impact, the valves are switched over again and the next driving cycle starts.

The drop weights run in oil lubricated



Construction and operation of the IHC Hydrohammer



- 1. Accumulator
- 2. Piston
- 3. Impact weight
- 4. Shock absorber
- 5. Pile sleeve
- 6. Impact plate

bearings top and bottom (for some types with greased bearings at the bottom). This minimises wear on the drop weights, and permits application at extreme angles, even horizontally in theory, thanks to the gas pressure from the cap. The drop weight impacts either on a solid steel anvil (for steel piles) or a helmet with damping plates

(for concrete piles). The cap has a hammer cushion at the top, and a pile cushion at the bottom. The hammer can be leader guided, i.e. on a guide and supporting rail, or free hanging. In free hanging use, a pile guide provides sufficient hammer stability on impact.

The complete S750 Hydrohammer in offshore use in Vietnam

Heavy bloc on the 55 MN press



The forged impact weight is placed in the hammer

