

**AMPHIBEX SERIE AE450E powered by CATERPILLAR**

The name "**Amphibex**" comes from the linkage of the two words "Amphibious" and "Excavator". The **Amphibex** is mainly an amphibious excavator. The **Amphibex AE450E** was built with versatility in mind for operations incorporating preventive ice breaking, private and municipal intakes / outfalls placement and mainly environmental restorations and aquatic plants control.

- Maximum length 36'4" (11 m)
- Working weight 22 tons
- Transport length 45.10" (14.85 m)
- Transport width 11'6" (3.5 m)
- Transport height 10'6" (3.2 m)
- Sailing speed 5 to 8 Knots

Working range:

- Maximum digging depth 17' 06" (5.35m) with Straight boom
- Maximum digging depth 20' 10" (6.35m) with curved boom
- Minimum digging depth 0m



- Maximum cutting height 25' 9" (7.90m)
- Maximum dumping height 18' 4" (5.60m)
- Maximum digging radius 27' 6" (8.40m) for 154°
- Maximum fixing depth 22' 8" (6.94m)

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## **AMPHIBEX-AE450E**

### Technical Specifications

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The maximum length of the machine is 11m, with an approximate working weight of 22 metric tons. Its approximate speed on water (with the propeller) is 5 to 8 knots.

The transport length, width and height are 12.85m, 3.5m and 3.2m respectively.

The maximum depth and reach is dependant on the length of the boom used. Using the standard boom that comes with the **Amphibex AE450E**, the depth is 6.35m.

There are many great advantages with the **Amphibex AE450E**. To mobilize the **Amphibex AE450E** to a site, only a flat bed trailer is required. Once on site, the **Amphibex AE450E** will lift itself up and the trailer can then move away. The **Amphibex AE450E** will then "walk" and float or crawl to the work site.





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#### Power System Engine Diesel: CATERPILLAR C9

• Model	C9 Diesel
• Displacement	8.8L (538 cu in)
• Cylinders	6
• Aspiration	Turbocharged for ATAAC
• Cooling System	Water cooled with pull fan 30"
• Maximum power	350 HP @ 1800-2200 rpm
• Maximum torque	1225 / 1557 Nm at 1400 rpm
• Emissions	EPA 3 and EURO III requirements
• Fuel tank capacity	317 Gal (1200 L)

#### Standard equipment

- Body corrosion resistant hull divided in nine watertight compartments.
- 2 rear stabilizers equipped with hydraulic tilting cylinders. Depth control by means of hydraulic cylinder .Square section 8" (203 mm) 30' (9.15m) length.
- 2 front stabilizers equipped with outrigger tilting cylinders. Depth control by means of hydraulic cylinder.
- 2 Side pontoon
- Propulsion system 1 propeller with hydraulically controlled height.
- **Horizontal suction pump bucket (dredge).** This system is it equipped with two hydraulic pumps, horizontal cutter
- Bucket conventional (500 L)
- Rake for vegetation, width 3 m
- Spray pipe
- Quick coupling for working attachment
- Slurry Flow Meter
- Slurry Pressure meter
- Powder fire extinguisher 4.55 kg
- Life saving equipment
- Heating system, Air conditioning
- Navigation mast and dredging lights.

All metallic elements are covered with heavy industrial resinous Epoxy coating environmental resistant to: fresh and salt water, many organic and inorganic acids, inorganic bases and salts, crude oils, petroleum and petro-chemical products.

## Hydraulic Components

- 1 load sensing hydraulic pumps 75 cc/rev maximum working pressure 300 bar
- 1 closed loop for the propeller 100cc/rev – max. working pressure 420 bar
- 3 variable displacement pumps 55 cc/rev Maximum working pressure 420 bar
- Hydraulic system capacity 119 Gal (450 L)
- Hydraulic oil vegetable base SHELL HF-E 46 biodegradable
- The pumping bucket uses Volvo hydraulic motors located directly on the bucket. Contrary to a standard excavator, most important **Amphibex AE450E** hydraulic functions have their own hydraulic pump for more power and greater precision.

## Optional equipment

- Bucket conventional 1 cubic yard (800 L)
- Exterior network pipe line for material and water transportation , SAE 250 and SAE 300 with Aluminum mounting flanges (SAE 250 and SAE 300) connected to float pipes
- Winch
- Crane
- GPS monitoring system
- Curved boom which can achieve 6.35m depth

### Horizontal suction dredge bucket pump

- |                                  |  |
|----------------------------------|--|
| • Suction diameter               | 2 x 8" (203 mm),   |
| • Discharge diameter             | 10" ( 250 mm),   |
| • Impeller diameter              | 15" (381 mm)   |
| • Maximum discharge              | 585 m³/h slurry at 20% dry solid (100 m³/h dry solid )<br>at 10 m water column |
| • Distance discharge (water)     | 1100 m   |
| • Distance discharge (20% solid) | 1,000 m  |

**Horizontal cutter characteristics:**

The horizontal auger is powered by two direct drive hydraulic motor and has 31 replaceable hard cutter teeth direction of rotation clockwise or counterclockwise

The maximum cutter speed is 157 rpm

The maximum cutter torque is 3390 Nm

## Attachments

When the Amphibex is equipped with the excavating bucket, it works like a traditional excavator.

The bucket pump is used in the same way but the material is mixed by the Auger and pumped by the slurry pumps, the performance of the bucket pump depends on the material consistency and the discharge pipe length.



The Rake works like the standard bucket and it is used for removal of debris and vegetation.



The Amphibex is equipped with a quick coupling system for attachments replacement.

## Propulsion System

- The **Amphibex AE450E** is equipped with a 19 inches propeller that allows a maximum speed of approximately 6 knots. This propeller can also be lifted for work in shallow waters



## Spray pipe

*The Attached on the lateral discharge pipe, used for non contaminated sediment dispersion on the shore or on water. Used mostly for navigation channel dredging and shore erosion control.*





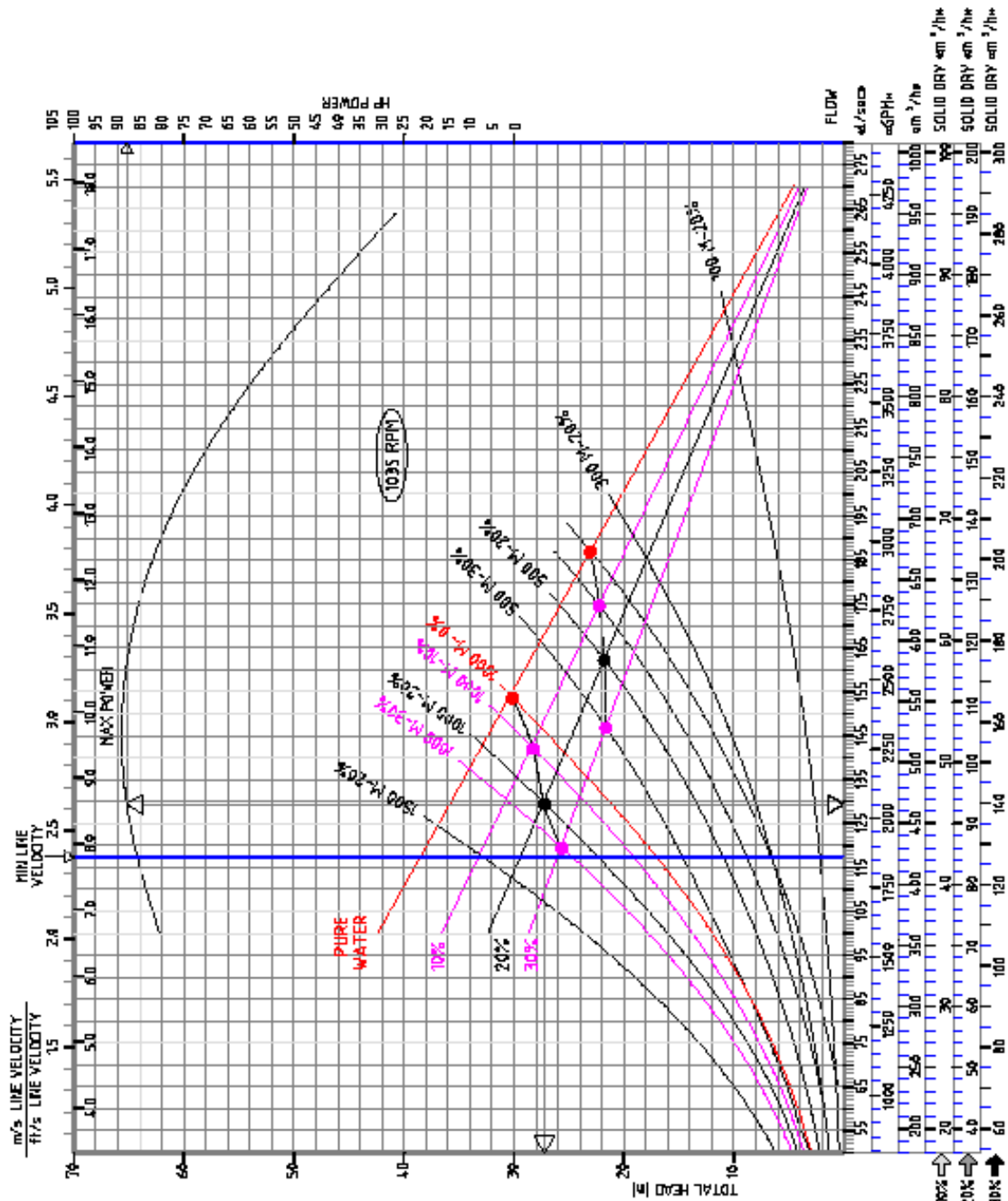
## Pumping Capacity

- The production of the **Amphibex AE450E**, as for other dredging technologies, will fluctuate depending on the quality of the material, the quantity of debris, the pumping distance and the thickness of material to be removed. It is obvious that heavier sediment will affect the production rate during hydraulic dredging, but this effect will be minimal during mechanical dredging. Production rate during mechanical dredging has been estimated to be in the order of 60 m<sup>3</sup>/hrs. with a cycle time of less than 1 minute. During hydraulic dredging, the production rates in heavy material such as mill-scale (specific gravity of close to 5) has fluctuated from 60m<sup>3</sup>/hrs. And as high as 120 m<sup>3</sup>/hrs. Dry solid, every time depending on distance (up to 1 km) and debris.
- Dredging in sand has showed production rates of approximately 90 m<sup>3</sup>/hrs. With some peaks at 170 m<sup>3</sup>/hrs. dry solid. Dredging in silt material has showed production rates of at least 100 m<sup>3</sup>/hrs. Dry solid.
- One of the most interesting aspects of dredging hydraulically with the **Amphibex AE450E** is the solids content in the dredged slurry. Since the pumps used by the **Amphibex AE450E** are located on the bucket (underwater), it is possible to obtain percentage of solids greater than 30% on a fairly constant basis.
- The standard hydraulic pump bucket is able to shred organic material. In conditions where heavy concentration of weeds or other aquatic vegetations has to be pumped, the **Amphibex AE450E** innovative pumping bucket can be equipped with special knives (shredders) which will shred vegetations and increase the pumping capabilities in organic material.



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119.3 l/s	129.5 l/s	162 l/s
1891 GPM	2052 GPM	2511 GPM
430 m³/h	464 m³/h	511 m³/h
128 m³/h solid (dry)	93.1 m³/h solid (dry)	51 m³/h solid (dry)

WORKING AREA (1000 meters distance discharge)



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#### Description of suitability of *Amphibex AE450E*

Parameter	<b><i>Amphibex AE450E</i></b>
Dredging productivity	<p>Dual centrifugal pumps at rear of 1.80m wide bucket provides greater suction capabilities and ability to remove excavated and re-suspended solids</p> <p><b><i>Amphibex AE450E</i></b></p> <ul style="list-style-type: none"> <li>• Maximum discharge 585 m<sup>3</sup>/h slurry at 20% dry solid at 10 m water column</li> <li>• 585 m<sup>3</sup>/h x 20% = 117 m<sup>3</sup>/h of solid material</li> <li>• 585 m<sup>3</sup>/h x 30% = 176 m<sup>3</sup>/h of solid material</li> <li>• 585 m<sup>3</sup>/h x 40% = 234 m<sup>3</sup>/h of solid material</li> <li>• Distance discharge (water) 1100m</li> </ul>
Excavating productivity	<p><b><i>Amphibex AE450E</i></b></p> <p>60 m<sup>3</sup>/hrs with a cycle time of less than 1 minute</p>
Working environment	Well suited to shallow conditions. Can excavate and dredge both river sediments and root mass material associated with floodplain
Method of anchoring	<p>No cables required.</p> <p>Two spuds and two side stabilizing arms are deployed in rear and front of <b><i>Amphibex AE450E</i></b> to holds his position firmly anchored.</p>
Method of movement	<p>The equipment is self propelled and can reach 5 to 8 knots in deep water. Also the <b><i>Amphibex</i></b> can be moved by a combination of pulling with spuds and pushing with bucket bottom. No cables are required.</p>
Method of dredging and sediment transport	<p>Articulated backhoe arm and bucket and the radial movement of the arm allow operator flexibility in positioning dredge head to dredge sediment. Rotating horizontal auger break sediment to loosen and move it to dual suction intake. Dredged material transported by slurry pipeline.</p>
Requirement for sediment control	<p><b><i>Amphibex</i></b> is considered capable of operating without a silt curtain with minimal effects on water qualities.</p> <p>Sediment control during dredging is very dependent on dredge operator.</p>
Debris effects	Backhoe can lift and remove large pieces of debris.