FOLLOWS: FINE SAND

PRODUCTION GRAPHS ARE DEFINED AS THE SAND TYPES AS INDICATED IN THE TABLE BELOW:

<table>
<thead>
<tr>
<th>SAND TYPE GRAIN SIZE DENSITY</th>
<th>DECISIVE SITUATION</th>
<th>SIEVER RESIDUE IN % BY WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravel 1.3mm 2,100kg/m³</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>Coarse sand fine sand</td>
<td>80</td>
<td>70</td>
</tr>
<tr>
<td>Medium fine sand</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Fine sand 1.8mm 2,000kg/m³</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>2.3mm 2,000kg/m³</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>2.8mm 1,950kg/m³</td>
<td>10</td>
<td>235μm 1,900kg/m³</td>
</tr>
<tr>
<td>3.3mm 1,900kg/m³</td>
<td>50</td>
<td>440μm 2,000kg/m³</td>
</tr>
<tr>
<td>3.8mm 1,850kg/m³</td>
<td>70</td>
<td>600μm 1,800kg/m³</td>
</tr>
<tr>
<td>4.3mm 1,800kg/m³</td>
<td>90</td>
<td>800μm 1,700kg/m³</td>
</tr>
<tr>
<td>4.8mm 1,750kg/m³</td>
<td>80</td>
<td>1,000μm 1,600kg/m³</td>
</tr>
<tr>
<td>5.3mm 1,700kg/m³</td>
<td>70</td>
<td>1,100μm 1,500kg/m³</td>
</tr>
<tr>
<td>5.8mm 1,650kg/m³</td>
<td>60</td>
<td>1,200μm 1,400kg/m³</td>
</tr>
<tr>
<td>6.3mm 1,600kg/m³</td>
<td>50</td>
<td>1,300μm 1,300kg/m³</td>
</tr>
<tr>
<td>6.8mm 1,550kg/m³</td>
<td>40</td>
<td>1,400μm 1,200kg/m³</td>
</tr>
<tr>
<td>7.3mm 1,500kg/m³</td>
<td>30</td>
<td>1,500μm 1,100kg/m³</td>
</tr>
<tr>
<td>7.8mm 1,450kg/m³</td>
<td>20</td>
<td>1,600μm 1,000kg/m³</td>
</tr>
<tr>
<td>8.3mm 1,400kg/m³</td>
<td>10</td>
<td>1,700μm 900kg/m³</td>
</tr>
</tbody>
</table>

THE GRAPHS ARE BASED ON different types of sand is shown in the graphs that follow. This can then be matched with the required output to be pumped. A first selection can be made based on the pumping capacity of the dredger. The output of the various Beaver® dredgers for the same conditions is as follows:

- Beaver® 65 DDSP 1,706kW 650mm 18m 30%
- Beaver® 50 1,258kW 500mm 14m 25%
- Beaver® 45 764kW 450mm 10m 25%
- Beaver® 40 409kW 400mm 8m 20%
- Beaver® 30 250kW 300mm 6m 15%
- Beaver® 25 125kW 250mm 4m 10%

TO HELP YOU SELECT THE RIGHT BEAVER® FOR YOUR PROJECT, PLEASE USE THESE GRAPHS AS A GUIDE. A FIRST SELECTION AND PROJECT CONDITIONS SHOULD BE CONSIDERED.

THEORY OUTPUT CURVES ONLY INDICATE PUMPING CAPACITY, BASED ON FREE-FLOWING MATERIAL. IN PRACTICE, OUTPUTS, THE NATURE OF THE MATERIAL TO BE DREDGED AND DISTANCE TO BE PUMPED CAN BE MADE BASED ON THE PUMPING CAPACITY OF THE DREDGER. THE OUTPUT OF THE VARIOUS BEAVER® DREDGERS FOR THE SAME CONDITIONS IS AS FOLLOWS:

- Beaver® 65 DDSP 1,706kW 650mm 18m 30%
- Beaver® 50 1,258kW 500mm 14m 25%
- Beaver® 45 764kW 450mm 10m 25%
- Beaver® 40 409kW 400mm 8m 20%
- Beaver® 30 250kW 300mm 6m 15%
- Beaver® 25 125kW 250mm 4m 10%

CUTTER SUCTION DREDGERS (CSDs)

THE IHC BEAVER® IS WELL KNOWN FOR ITS ROBUST CONSTRUCTION, RELIABLE OPERATION AND EXCELLENT PERFORMANCE, RESULTING IN THE BEST VALUE FOR MONEY. WE ARE THE MARKET LEADER, WITH OVER 800 OF THESE CUTTER SUCTION DREDGERS SUPPLIED WORLDWIDE SINCE 1963.

MAIN FEATURES

- EASY CUSTOMISABLE WITH A WIDE RANGE OF OPTIONAL EQUIPMENT
- SUITABLE FOR SINGLE-HANDED OPERATIONS
- AVAILABLE FROM STOCK
- LOW EMISSIONS AND ENVIRONMENTALLY-FRIENDLY OPERATION
- MAXIMUM UPTIME
- LOWEST COST PER M³

EXCELLENT PERFORMANCE, RESULTING IN THE BEST VALUE FOR MONEY. WE ARE THE MARKET LEADER, WITH OVER 800 OF THESE CUTTER SUCTION DREDGERS SUPPLIED WORLDWIDE SINCE 1963.

OUR SOLUTION

YOUR PROJECT, WHAT DO YOU NEED?

- • wet mining
- • beach reclamation
- • port construction
- • environmental dredging
- • land reclamation

PROJECT TYPES

- CUTTER SUCTION DREDGERS
IHC BEAVER®
CUTTER SUCTION DREDGERS (CSDS)

The IHC Beaver® is well known for its robust construction, reliable operation and excellent performance, resulting in the best value for money. We are the market leader, with over 800 of these cutter suction dredgers supplied worldwide since 1963.

- lowest cost per m³
- available from stock
- lifetime support
- maximum uptime.

MAIN FEATURES
IHC Beaver® CSDs are reliable, fuel-efficient, have low maintenance costs and are extremely productive at a dredging depth range of 6-18 metres. They are equipped with state-of-the-art technology and offer the following features:

- dismountable and transportable over land
- suitable for single-handed operations
- easily customisable with a wide range of optional equipment
- low emissions and environmentally-friendly operation.

The design of our CSDs is continuously improved using the latest technological developments and feedback from customers.

YOUR PROJECT, OUR SOLUTION
Cutter suction dredgers can be used for a wide range of dredging projects. They reclaim land from the sea, dredge entrance channels, and create or extend harbours by removing soil from land. They are also used to clean up pollution and silt from rivers, lakes and canals.

PROJECT TYPES
- port and waterway maintenance
- land reclamation
- lakes and reservoirs dredging
- environmental dredging
- port construction
- beach reclamation
- sand and gravel dredging
- wet mining.
CSD OPTIONS
The standard IHC Beaver® series is already preconfigured for your dredging project. Other functionality can be added with a wide range of optional extras, including:

- accommodation
- air conditioning
- anchor booms
- cutting equipment (cutter heads, dredging wheels)
- floating dredge hoses
- increased discharge pipeline diameter
- increased dredging depth
- non-return valve and vacuum-relieve valve
- production measurement, automation and positioning system
- spud-carriage installation
- Spud Guard®
- swivel bend.

DELTA MULTI CRAFT (DMC)
DMC work boats can perform all supporting operations for your IHC Beaver® CSD, including:

- hoisting cutter head and pump parts
- anchor handling
- floating pipeline handling
- towing
- delivering stores
- crew changes.

**DMC 1050**
- **DIMENSIONS**
  - Designed for: IHC Beaver® 30, 40, 45, 50
  - Length x breadth (approx.): 10.4 x 4.1m
  - Installed power: 105kW
  - Bollard pull (approx.): 16kN
  - Deck crane SWL: 810kNm

**DMC 1450**
- **DIMENSIONS**
  - Designed for: IHC Beaver® 50, 65 DDSP
  - Length x breadth (approx.): 14.7 x 6.0m
  - Installed power: 2x 207kW
  - Bollard pull (approx.): 55kN
  - Deck crane SWL: 4100kNm

LEGEND
1. Cutter head
2. Cutter ladder
3. Anchor boom
4. Spud carriage
5. Spud poles
6. Floating discharge pipeline
7. Booster station
8. Work boat
Vierluik Beaver Series_GB.indd   2

- increased dredging depth
- increased discharge pipeline diameter
- anchor booms
- air conditioning
- accommodation

Other functionality can be added with a wide range of optional extras, including:

- swivel bend
- Spud Guard®
- spud-carriage installation
- non-return valve and vacuum-relieve valve
- positioning system

DMC work boats can perform all supporting operations for your IHC Beaver® CSD, including:

- Deck crane SWL 81kNm 410kNm
- Bollard pull (approx.) 16kN 55kN
- Installed power 165kW 2x 207kW
- Length x breadth (approx.) 10.4 x 4.1m 14.7 x 6.0m

Designed for IHC Beaver® 30, 40, 45, 50 IHC Beaver® 50, 65 DDSP

DIMENSIONS
Length overall (ladder raised), approx. 16.6m
Length over portions 12.4m
Breadth 4.87m
Depth 1.32m
Maximum standard dredging depth 1.5m
Suction pipe diameter 110mm (10")
Discharge pipe diameter 110mm (10")
Total installed power 294kW 483kW

SWING WIDTH WITH 35° SWING EACH SIDE
At maximum dredging depth 14.5m
At minimum dredging depth 18.0m

DREDGE PUMP
Type KIC 600-150-240 EasyX
Engine type (compliant with IMO Tier II) Scania D11
Engine power 294kW @ 1,800rpm 212.9kW @ 1,200rpm
Specific fuel consumption 1254 g/kWh

ELECTRICAL INSTALLATION
Voltage 24V DC 24V DC
Battery capacity 105Ah 260Ah
Voltage (50Hz) 24V DC 24V DC
Power (50Hz) 240A 230V AC 8kW

CUTTER
Type IHC Edge 830-50
Diameter 152.5mm
Maximum speed, approx. 15rpm

LADDER AND SWING WINCHES
Line pull, first layer 28kN
Maximum line speed 22m/min 22m/min
Wire diameter 12mm 12mm
Drum diameter 325mm 325mm
Swing wires length 15m 15m
Anchor weight 100kg 100kg

SPUDS
Length 8.6m
Diameter 124mm
Weight 724kg

SPUD HOISTING CYLINDERS
Stroke of cylinder 2.5m 2.5m

SPUD CARRIAGE TRAVELLING CYLINDER
Length 7.5m
Diameter 1.6m

CLASSIFICATION
Hull • MACH Dredger - no propulsion - Coastal area

MATCHING WORK BOAT
DMC 1050

SERVICES
Once the dredger has been delivered to the customer, IHC provides high-quality services and global support. We help customers to operate their IHC Beaver® in an efficient manner in order to achieve optimum levels of productivity. The services we can offer allow operators to increase the uptime and improve the performance of the vessels and equipment while reducing the total costs of ownership. We help increase uptime by providing maintenance support, repairs, and all necessary spare parts and logistics.

Our experienced service engineers and dredge masters are available to provide advice to customers and to instruct operators, as well as for analysing the operation and performance of the dredging equipment on site.

Wherever customers operate, we are there to support in improving the performance of the IHC Beaver®. To further enhance the skills and knowledge needed to operate and maintain the vessel, we provide project-specific, operational and maintenance training. The CSD on-the-job training programme strengthens and consolidates the knowledge and skills of attendees. Operators can put what they learn into practice on a daily basis and improve the overall efficiency of their dredger.

The CSD simulator training course gives operators a unique opportunity to enhance their skills using state-of-the-art dredge simulators and learn how to operate the equipment in a safe environment. For engineers, the IHC Training Institute offers an exclusive Beaver® maintenance training programme that covers all aspects of dredging equipment, such as electric installations and hydraulic systems.
WHICH BEAVER® IS RIGHT FOR YOUR PROJECT?

To help you select the right Beaver® for your project, please use these graphs as a guide. A first selection can be made based on the pumping capacity of the dredger. The output of the various Beaver® dredgers for different types of sand is shown in the graphs that follow. This can then be matched with the required output and distance to be pumped. The theoretical output graphs are based on the information as indicated below.

**THE GRAPHS ARE BASED ON**

- output expressed in cubic meters of in-situ solids per effective pump hour
- elevation at the end of the pipeline of 4 metres

**NOTE**

The calculated output curves only indicate pumping capacity, based on free-flowing material. In practice, soil properties may vary from free-flowing to hard-to-excavate material. When used for estimation actual outputs, the nature of the material to be dredged and project conditions should be considered.

### THE SAND TYPES AS INDICATED IN THE PRODUCTION GRAPHS ARE DEFINED AS FOLLOWS:

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<td>1,900kg/m³</td>
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<td>235μm</td>
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</tr>
<tr>
<td>C Coarse sand</td>
<td>440μm</td>
<td>2,000kg/m³</td>
</tr>
<tr>
<td>D Coarse sand and gravel</td>
<td>1.3mm</td>
<td>2,100kg/m³</td>
</tr>
<tr>
<td>E Gravel</td>
<td>7mm</td>
<td>2,200kg/m³</td>
</tr>
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### FINE SAND

**OUTPUT IN M³ PER HOUR**

- Beaver® 65 DDSP
  - 2,000kW
  - Diameter: 10m
  - Depth: 12m
  - Concentration: 25%

**AVAILAE POWER**

- Beaver® 30: 250kW
- Beaver® 40: 409kW
- Beaver® 45: 764kW
- Beaver® 50: 1,258kW
- Beaver® 65 DDSP: 1,706kW

**PIPELINE LENGTH IN METRES**

- 0m
- 500m
- 1,000m
- 2,000m
- 3,000m
- 4,000m
- 5,000m
- 6,000m

**DIAMETER OF GRADES IN Mm**

- 0.012
- 0.025
- 0.045
- 0.063
- 0.090
- 0.125
- 0.180
- 0.250

**TYPE OF DREDGER**

- Beaver® 30
- Beaver® 40
- Beaver® 45
- Beaver® 50
- Beaver® 65 DDSP

**CONCENTRATION**

- 20%
- 25%
- 30%

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