Lifting and Handling

Do’s

• Remove all water and solids contents before lifting or moving the unit;
• Always use the designated lifting points (Lip mounted Lifting Eyes or Fork lift Slots in base of unit);
• Lift shall always be undertaken in accordance with all relevant legislation and site requirements.

Don’ts

Don’t lift the unit with any WATER and SOLIDS present
Don’t lift or move the unit by applying force to any component other than those described above as this will result in severe damage to the unit and may result in personal injury.

When do I need to Empty the Lamella?

The frequency of emptying the unit is very dependent on the solids loading and the nature of the solids that it is separating. Until the operator has a complete understanding of the rate of solids build up in the unit, we recommend a “Little and Often Approach to removing the deposited solids” from the lamella unit, and this will determine the overall economic operational frequency of emptying required for your duty.

How do I De-sludge the Lamella?

• The knife gate valves on each of the hoppers are used to empty the deposited solids.
• The valves should be opened in turn and the sludge discharged to a suitable receptacle.

If problems are encountered with de-sludging refer to the relevant sections in the detailed Operating section of this document.

Emptying

The unit is emptied through the two de-sludging valves on the bottom of the Hoppers at the same time to ensure that all solids are washed from the each of the hoppers on the unit.
QUICK GUIDE

Setting Up
For additional specific detailed information on the operations above please refer to the relevant sections following this Quick Guide document.

Guide document

The Hopper Bottomed Units are designed to remove suspended solids from water to provide water clarification for a range of applications. Floating materials such as oil can also be removed in a variant of the standard unit.
Process water, groundwater or site runoff can be discharge off site either to watercourse or sewer or for reuse in a process.
The units are ideal for removing sediment load from water being discharged to sewer to reduce trade effluent discharge costs.
All our units are “Registered Designs”, Patented or have Operating & Maintenance Manual

This manual covers the Hopper Bottomed Unit Designated HB50 / HB20 / HB10
The standard unit is supplied skid mounted for temporary and mobile applications. Other options are available with bolt down feet for permanent installation; the operation of the unit is not affected by the type of base arrangement employed.

Introduction 1.

Thank you for selecting a WPL Lamella Hopper Bottomed Unit for your liquid/solids separation requirements.
As a supplier of environmental equipment we strive to supply our customers with the highest quality products to meet your exacting demands.

Safety Systems 2.

2.1 General Safety
The larger units are equipped with a fixed ladder to enable an operator to inspect the unit over the rim at the inlet end of the unit. If the need arises to gain access to the top of the unit this should be done in a safe manner using appropriate safety precautions and systems of work.
Always ensure the units are placed onto firm level ground. The units could topple if landed onto uneven ground and then filled with water.
2.2 Maintenance

Removal of plates is the most hazardous operation associated with the maintenance of the unit and will expose an operator to working at height, trip and falls hazards. These hazards will need to be assessed prior to carrying out this operation, and a safe system of work put in place prior to commencement. The plates will support a single person walking on their combined top edge; they will flex and deform against one another. It is recommended that the operator undertaking the work shall be equipped with a fall arrestor system from a suitable rated fixed point.

2.3 Permanent Access

WPL can manufacture a number of standard access system and can design bespoke systems for individual requirements, these can be permanently fixed to the unit to give full inspection facilities to the whole of the unit.

Operating Instructions 3.

3.1 Hoisting the Unit
The unit must always be hoisted empty of all material and fluids; this shall be done by use of the lifting eyes on the upper lip of the main tank. This operation must be undertaken by experienced operators using tested and approved equipment.

Individual unit weights are tabled in the next section.

3.2 Moving the Unit
The unit must be empty of all material and fluids before transporting the unit using a suitably rated telly-handler or fork lift device by a suitably qualified person.

It is important that Any Person who is to Operate the Lamella or Any Associated Equipment Supplied, Should Read and Understand the Operation Instructions before Undertaking Such Operations

3.3.1 Setting Up the Unit
The unit should be set on a suitable structurally sound base capable of with standing the full tank weight of approximately 12.5 tonnes (HB50). The ground must be approximately level for best performance. (The top edge of the unit should be within 10 mm across its width and along its length).
3.4 Valves
The units are shipped with the valves open to ensure they remain drained.

Close the Sludge Knife Gate Valve(s)  
Close the Sludge Level and Water Emptying Valve  
Close the Sludge Fluidising Valve(s)

3.5 Connecting The Unit
3.5.1 Connection the Outlet pipework to the Unit

The outlet hose should be complete with a suitable sized male Bauer for connection onto the units 150mm female Bauer coupling.  
(Sizes may alter for different Units)

3.5.2 Connection the Inlet Pipework to the Unit

The inlet hose should be complete with a suitable sized male Bauer for connecting onto the units 100 mm female Bauer coupling.  
(Sizes may alter for different Units)
3.6. Sludge Discharge Male 100mm Bauer Connection

The operator should watch the discharge to visually ascertain the length of
time to clear the deposited solids, i.e. until the flow quickens or becomes
clear. The Sludge shall also be drained through this
connection prior moving the Unit

3.7 Water Drain Down Connection and Sludge Level Indication

When moving the unit the water must be drained down before lifting. The
cleaner water can be drained through the 50 mm
connection, followed by final sludge removal via the Knife Gate valves.
The water drain down connection has a secondary function which enables the
user to check on the depth of the sludge build up in the hopper. With a little
practice an operator will be able to determine the quantity and thickness of the
sludge build up in the hopper by draining out a sample of fluid/sludge in to
receptacle and viewing the condition of the sample through this valve.
3.9 Cleaning

3.9.1 Cleaning Preparation

Prior to attempting to clean the plates the retaining bar and scum weir must be removed. The plates cannot be removed with the bar in place and the scum weir board is a trip hazard that is not readily in view due to the stance that is required to undertake the plate removal & cleaning. **A risk assessment shall be undertaken by the user prior to undertaking the plate cleaning.**

3.9.2 Plate Cleaning

The plates can be cleaned in situ provided the silt has not been allowed to build up for too long. Cleaning of the plates should be undertaken with a pressure washer regularly, the exact frequency will be determined by operator familiarity. Failure to undertake the cleaning of the plates may give rise to poor performance of the unit and penalties if the discharge is consented and is exceeded.
3.10 Plate Removal

The plates can be removed by sliding them from the tank body. The plates weigh approximately 12kg each (HB50) with no deposited sludge attached. If left for an extended period of operation without cleaning the plates can become clogged and difficult to lift. Avoid this by periodic plate cleaning.

The required frequency depends on the nature of product. Generally fatty products require more frequent cleaning (Weekly?) whilst other products require no cleaning.

3.11 Fluidising Sludge

An air line connection can be coupled to the fluidising connection on the hopper to break up any consolidated sludge build up in the hopper. The valves should be opened slowly and the flow of air limited to prevent the settled sludge from being remixed into the clarified flow; care must be taken when carrying out this action. It must be undertaken by a suitably competent person who has been trained in the use of compressed air.
4.1 Model HB50
4.2 Capacities
Weight Empty 2,500 kg
Weight Full (water) 12,500 kg
Total volume of unit 7.2 m³
Maximum volume of Sludge Hoppers 1.5 m³
Foot Print 3.7 m x 1.7 m
Height 3.1 m

4.3 Operational Parameters
Maximum flow rate 50 m³/hr
Solids Removal 95% particles > 100 µm
Lamella Plate Area 50 m²

4.4 Connections
Reference Number Description Size Type
1 Inlet 100 mm Female Bauer
2 Outlet 150 mm Female Bauer
3 Sludge (2) 100 mm Male Bauer
4 Water Drain Down 50 mm Male Bauer
5 Sludge Fluidizer (2) 25 mm Quick coupling

4.5 Connections Locations
Description Position
Inlet Flat End of unit
Outlet Slopping End of Unit
Sludge (2) Bottom of each Hopper
Water Drain Down Slopping end at interface of hopper & main tank
Sludge Fluidizer (2) Bottom of each hopper

4.6 Materials of Construction
Clarifier Body 10 mm thick Steel EN 10025 grade S275
Sludge Hopper 10 mm thick Steel EN 10025 grade S275
Lamella plates PVC

4.7 Corrosion Protection
Surface Preparation Shot-blasted to SA2.5 Minimum
Primer 100 micron minimum d.f.t. 2 pack high solids Anti Corrosive
Epoxy Primer
External Top Coat 50 Micron minimum d.t.f. 2 Pack Modified Acrylic Finish to RAL 5001
Internal Top Coat 500 micron minimum d.t.f. High Solids Glass Flake Epoxy
Specification 5.

5.1 Model HB20

5.2 Capacities
Weight Empty 1300 kg
Weight Full (water) 3800 kg
Total volume of unit 2.10 m³
Maximum volume of Sludge Hoppers 0.57 m³
Foot Print 2.5 m x 1.2 m
Height 2.6 m

5.3 Operational Parameters
Maximum flow rate 20 m³/hr
Solids Removal 95% particles > 100 um
Lamella Plate Area 20 m²

5.4 Connections
Reference Number Description Size Type
1 Inlet 75 mm Female Bauer
2 Outlet 100 mm Female Bauer
3 Sludge 100 mm Male Bauer
4 Water Drain Down 50 mm Male Bauer
5 Sludge Fluidizer 25 mm Quick coupling

5.5 Connections Locations
Description Position
Inlet Flat End of unit
Outlet Slopping End of Unit
Sludge Bottom of Hopper
Water Drain Down Slopping end at interface of hopper & main tank
Sludge Fluidizer Bottom of hopper

5.6 Materials of Construction
Clarifier Body 10 mm thick Steel EN 10025 grade S275
Sludge Hopper 10 mm thick Steel EN 10025 grade S275
Lamella plates PVC

5.7 Corrosion Protection
Surface Preparation Shot-blasted to SA2.5 Minimum
Primer 100 micron minimum d.f.t. 2 pack high solids Anti Corrosive
Epoxy Primer
External Top Coat 50 Micron minimum d.t.f. 2 Pack Modified Acrylic Finish to
RAL 5001
Internal Top Coat 500 micron minimum d.t.f. High Solids Glass Flake Epoxy

Note: In the interests of product development, the above specification may change without
warning
6.1 Model HB10

6.2 Capacities
- Weight Empty: 700 kg
- Weight Full (water): 1900 kg
- Total volume of unit: 1.20 m³
- Maximum volume of Sludge Hoppers: 0.25 m³
- Foot Print: 1.9 m X 0.9 m
- Height: 2.1 m

6.3 Operational Parameters
- Maximum flow rate: 10 m³/hr
- Solids Removal: 95% particles > 100 um
- Lamella Plate Area: 10 m²

6.4 Connections

<table>
<thead>
<tr>
<th>Reference Number</th>
<th>Description</th>
<th>Size</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inlet</td>
<td>50 mm</td>
<td>Female Bauer</td>
</tr>
<tr>
<td>2</td>
<td>Outlet</td>
<td>75 mm</td>
<td>Female Bauer</td>
</tr>
<tr>
<td>3</td>
<td>Sludge</td>
<td>100 mm</td>
<td>Male Bauer</td>
</tr>
<tr>
<td>4</td>
<td>Water Drain Down</td>
<td>50 mm</td>
<td>Male Bauer</td>
</tr>
<tr>
<td>5</td>
<td>Sludge Fluidizer</td>
<td>25 mm</td>
<td>Quick coupling</td>
</tr>
</tbody>
</table>

6.5 Connections Locations

<table>
<thead>
<tr>
<th>Description</th>
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</tr>
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<tbody>
<tr>
<td>Inlet</td>
<td>Flat End of unit</td>
</tr>
<tr>
<td>Outlet</td>
<td>Slopping End of Unit</td>
</tr>
<tr>
<td>Sludge</td>
<td>Bottom of Hopper</td>
</tr>
<tr>
<td>Water Drain Down</td>
<td>Slopping end at interface of hopper &amp; main tank</td>
</tr>
<tr>
<td>Sludge Fluidizer</td>
<td>Bottom of hopper</td>
</tr>
</tbody>
</table>

6.6 Materials of Construction
- Clarifier Body: 10 mm thick Steel EN 10025 grade S275
- Sludge Hopper: 10 mm thick Steel EN 10025 grade S275
- Lamella plates: PVC

6.7 Corrosion Protection
- Surface Preparation: Shot-blasted to SA2.5 Minimum
- Primer: 100 micron minimum d.f.t. 2 pack high solids Anti Corrosive Epoxy Primer
- External Top Coat: 50 Micron minimum d.t.f. 2 Pack Modified Acrylic Finish to RAL 5001
- Internal Top Coat: 500 micron minimum d.t.f. High Solids Glass Flake Epoxy

Terminology
- Inlet: Connection for receipt of the flow to be treated
- Outlet: Discharge point of flow after treatment
- Bauer Clip: type coupling for Pipework
- Sludge Settled Deposited material
- Hopper Receptacle: for settled sludge
- Ball Valve: Quarter turn isolation valve

Max flow Rate: The hydraulic design capacity of the unit, (Exceeding this flowrate will cause over-topping and inefficient treatment, Any flow below the Max Flow Rate can be put through the unit, the lower the flow the more effective the solid/liquid separation for a given product – Talk to Siltbuster Staff if you have any concerns or queries regarding throughput).

Sludge Volume: Maximum sludge that the unit will hold without impairing the separator efficiency.

Lamella Plate: uPVC sheet onto which the separated solids deposit prior to collecting in the sludge hopper.
Plant to be set up with Top Edges level to within 10 mm along either edge for max performance.