Efficient corrosion protection with the use of high pressure water jetting

Economical – High quality preparation – Eco-friendly
Efficient corrosion protection using water jetting

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High pressure water jetting

**Economical**
- Reduced docking time
- Priming can be carried out following the inspector’s approval. No cleaning of surfaces necessary following treatment.
- The spray arms are designed to provide an even energy distribution over the full working width
- Tremendously increased area output with the same pump performance
- No costs for intensive shredding of sensitive equipment, reduced time for cleaning of the dock. Water will not harm nearby seaworthy equipment and machinery as in the case with flying grit particles
- Other trades can work close to water blasting area
- The amount of waste to be disposed of is far less than that produced by dry blasting. It is only the waste water, old paint, marine growth and rust that need to be collected for separation and disposal. Water can be treated and recycled
- All-weather work possible
- The filtered (but not treated) water is pumped out of the vacuum system. This allows longer working times as the vacuum tank only needs to be replaced when full of slurry or mud
- Reduced labour costs due to the small number of operating personnel required

**Eco-friendly**
- No formation of dust, as dust particles are bound in water
- The amount of material to be disposed of is 1/100 compared to dry blasting
- Systems with a vacuuming unit provide direct feeding of the waste water and removed paint particles to an aftertreatment system
- Easy waste separation for controlled disposal. The waste water can be collected if the dock has no central water collection and treatment facilities
- The mud is collected in the settling tank and can be dumped into a bin. Either a spare tank is provided for quick exchange or an XXL filter bag is used which can be lifted out of the settling tank

High quality preparation

- Exposes the surface profile beneath the original coating
- Optimised bonding for fresh coatings, especially when using surface tolerant paints
- Steady removal quality due to constant feed and standoff distance of the nozzles
- The surface quality when using UHP water jets is far better compared to conventional methods
- No foreign particles, corrosion provoking materials or poorly adhering coatings remain
- Other methods require the surfaces to be cleaned afterwards
- Substrates prepared by Hammelmann systems meet the quality requirements set by international paint manufacturers and standards authorities (NACE/SSPC) for the application of new coatings

**Health / Safety**
- No risk of silicosis and other respiratory illnesses
- Reduced physical strain on operating personnel compared to hand-lancing
- No clouds of dust and dirt to put yard personnel’s health at risk
- Vacuum eliminates jetting noise

[Microscope image on right: the pockets and holes prior to treatment (circled in blue) are cleaned by water jetting, removing all impurities from them and from the surface. The residual chloride levels are at least 5 times lower than on a grit blasted surface and the substrate profile remains intact ensuring good adhesion of the new coating and greatly reducing the risk of future paint film defects.]

Water jetting

Microscope image on right: pockets and holes prior to treatment (indicated by yellow arrows). Blasting material residue and slag after sandblasting (green arrows). Wavelike substrate deformations (violet circles). Salt residue (white bits). Pitted material (red arrows).
Reference: EUROMARINE
Features of Hammelmann’s semi-automatic surface preparation systems

- **Quick set-up**
- **Quick change of working place**
- **Easy to manoeuvre in limited spaces**
- **No in-dock constructions necessary**
- **Minimum space required**
- **Parallel painting, maintenance and coating removal possible**

Performance examples of Hammelmann’s corrosion protection systems

Water jetting standards according to ISO 8501-4 – SSPC / NACE

- **Wa 2 ½**: Very thorough high pressure water jetting
- **WJ 2**: Very thorough or substantial cleaning
- **Wa 2**: Thorough high pressure water jetting
- **WJ 3**: Thorough cleaning
- **Wa 1**: Light high pressure water jetting
- **WJ 4**: Light cleaning

<table>
<thead>
<tr>
<th>Dockboy / Dockmate</th>
<th>Working width: 520 mm / 20 inch</th>
<th>Pump power: 300 kW / 400 hp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dockmate / Dockmaster</td>
<td>Working width: 1000 mm / 39 inch</td>
<td>Pump power: 600 kW / 800 hp</td>
</tr>
<tr>
<td>Spiderjet / Dockboy</td>
<td>Working width: 374 mm / 15 inch</td>
<td>Pump power: 200 kW / 270 hp</td>
</tr>
<tr>
<td>Aquablast Plus</td>
<td>Working width: 215 mm / 8 inch</td>
<td>Pump power: 200 kW / 270 hp</td>
</tr>
<tr>
<td>Hand lance</td>
<td>Pump power: 100 kW / 135 hp</td>
<td></td>
</tr>
</tbody>
</table>

Average removal rates m² / ft² per hour in accordance with standards shown below, depending on existing surface condition from loose paint/rust, to sound paintwork

<table>
<thead>
<tr>
<th>Water jetting standards</th>
<th>Average removal rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wa 2 ½: Very thorough high pressure water jetting</td>
<td>0 m² / ft²</td>
</tr>
<tr>
<td>WJ 2: Very thorough or substantial cleaning</td>
<td>50 m² / 540 ft²</td>
</tr>
<tr>
<td>Wa 2: Thorough high pressure water jetting</td>
<td>100 m² / 1,080 ft²</td>
</tr>
<tr>
<td>WJ 3: Thorough cleaning</td>
<td>150 m² / 1,610 ft²</td>
</tr>
<tr>
<td>Wa 1: Light high pressure water jetting</td>
<td>200 m² / 2,150 ft²</td>
</tr>
<tr>
<td>WJ 4: Light cleaning</td>
<td>250 m² / 2,690 ft²</td>
</tr>
<tr>
<td>Wa 1: Light high pressure water jetting</td>
<td>300 m² / 3,230 ft²</td>
</tr>
<tr>
<td>WJ 4: Light cleaning</td>
<td>350 m² / 3,770 ft²</td>
</tr>
</tbody>
</table>
Dockmate

The Dockmate is a completely dust-free and eco-friendly semiautomatic water blasting vehicle. The high pressure unit is attached separately.

Aquablast surface cleaner

- Special nozzle layout ensures uniform distribution of the high pressure water across the working width
- Hydraulically driven – for a constant rotation speed at all times
- Infinitely adjustable rotation speed from 100 to 2500 RPM
- Oil and water totally separated – no contamination of the hydraulic oil through high pressure leakage possible
- Threefold Poly-V belt drive for long service intervals
- Rotary joint with quick access to wearing parts (high pressure seals) from the top
- Powerful long-life axial piston hydraulic motor
- Equipped with an RPM sensor

Working parameters

- Working width
  - Spoted blasting: 274 mm (11 inch)
  - Working width: 374 mm (15 inch)
  - Working width: 520 mm (20 inch)
  - Working width: 1000 mm (39 inch)

- Working parameters
  - 28 – 47 l/min
  - 2800 – 3000 bar
  - 74 – 12.4 gpm
  - 40,610 – 43,500 psi

Recommended high pressure units depending on Aquablast surface cleaner:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Flow (l/min)</th>
<th>Flow (gpm)</th>
<th>Pressure (bar)</th>
<th>Pressure (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDP 200</td>
<td>28</td>
<td>7.4</td>
<td>3000</td>
<td>43,500</td>
</tr>
<tr>
<td>HDP 200</td>
<td>40</td>
<td>10.6</td>
<td>2800</td>
<td>40,610</td>
</tr>
<tr>
<td>HDP 300</td>
<td>47</td>
<td>12.4</td>
<td>3000</td>
<td>43,500</td>
</tr>
<tr>
<td>2x HDP 300</td>
<td>94</td>
<td>24.8</td>
<td>3000</td>
<td>43,500</td>
</tr>
</tbody>
</table>

Spot blasting

- High pressure pump unit
- Torsion free chassis with solid rubber tyres, 4-wheel drive and steering
- Upper carriage, pivot-mounted on a ball bearing ring
- Filter / recovery module
- Triple section telescopic jib
- Working arm functioning as an equipment carrier (five axis, hydraulically-adjustable)

Available versions:

<table>
<thead>
<tr>
<th>Jib height</th>
<th>Transport length</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 m</td>
<td>9.6 m</td>
<td>17 t</td>
</tr>
<tr>
<td>27 m</td>
<td>12.3 m</td>
<td>20 t</td>
</tr>
<tr>
<td>32 m</td>
<td>14.0 m</td>
<td>23 t</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Min. vehicle height</th>
<th>Vehicle width</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0 m</td>
<td>2.5 m</td>
</tr>
<tr>
<td>9.8 ft</td>
<td>8.2 ft</td>
</tr>
</tbody>
</table>
**Dockmate features**

**Electronic control unit**
- Enables a safe and easy operation of the Dockmate
- Ensures uniform supply to the blasting head – resulting in a steady paint removal
- Fail-safe! Sensors detect unsafe and critical conditions – triggering automatic stops or shutdowns
- Operational functions are mostly automated
- Pre-selection of main parameters at the control cabinet – regular operation via radio remote control

**Surface cleaner – automatic contact force**
- A system of sensors and proportional hydraulic valves enables a constantly consistent contact force of the blasting tool
- In overhead, vertical and inclined operating position, this makes sure that the Aquablast is always in contact with the ship hull or the surface to be treated
- The boom mounted Aquablast automatically follows the ship hull curvature
- Automatic compensation of the changing distance between vehicle and ship hull caused by travel

**4-wheel drive and steering**
- 4-wheel drive equipped with an integral, hydraulically controlled differential for safe operation and constant feed on uneven ground. High stability for precise tracking of the blasting head for blasting head accuracy. Powerful at low feeding speed, maximum traction.
- Excellent manoeuvrability thanks to independently steerable axles. This ensures maximum manoeuvrability in the often narrow space between hull and dock wall or through dock access ways.

**Construction and specification**

**Caterpillar engine:**
- C 4.4: 82 kW @ 1800 RPM
- 110 HP @ 1800 RPM
- 4 cylinder – 4.4 l turbo charged
- Fuel tank capacity: 165 l (43.6 gallons)

**Hydraulic system:**
- Axial piston pump with infinitely variable flow
- Performance of both systems:
  - 125 l/min @ 240 bar
  - 50 l/min @ 400 bar
- Hydraulic oil capacity: 230 l (60.80 gallons)
- Biodegradable hydraulic oil
- Radiator oil-cooler with electric fan

**Electric system:**
- 24 V DC

**Filter / disposal module**
- Pre-separation of solids directly in the vehicle
- Collection of particles in a “big-bag” for easy disposal
- Rotary lobe pump feeds the waste water to a treatment plant in a controlled manner (where available)

**Integrated vacuum system**
- Absorbs the solids (removed coating, rust) and waste water directly at the ship hull
- Particles are actively removed – resulting in a cleaner surface
- Dries the blasted surface rapidly, meaning less formation of flash rust

**Training software**
- All work steps and functions can be taught using a simulation software combined with a modified Dockmate remote control.
- Errors made when using the remote control are displayed and suggestions are given to improve operation.
- No matter where the operator is, he can teach himself the individual functions and procedures using this software.
Dockmaster

The Dockmaster is a completely dust-free and eco-friendly semi-automatic water jetting vehicle. The high pressure pump is on board.

The Dockmaster is a Dockmate system extension. The structurally identical parts are supplemented with a complete pump unit and a reel system for fresh and waste water.

The high pressure pump unit can be used as an independent system for other cleaning work.

**Optional jib height configurations**

- **Min. vehicle height:** 3.0 m / 9.8 ft
- **Vehicle width:** 2.5 m / 8.2 ft
- **Jib height:** 22 m / 72 ft
- **Transport length:** 9.6 m / 31.5 ft
- **Weight:** 24 t / 52,910 lbs

- **Jib height:** 27 m / 89 ft
- **Transport length:** 12.3 m / 40.4 ft
- **Weight:** 25 t / 55,115 lbs

- **Jib height:** 32 m / 105 ft
- **Transport length:** 14 m / 46 ft
- **Weight:** 26 t / 57,320 lbs

**Working arm functioning as an equipment carrier (five-axis, hydraulically adjustable)**

**Aquablast – Surface cleaner**

- **2x Aquajet 30**
  - 94 l/min – 3000 bar
  - 24.8 gpm – 43,500 psi

**Aquablast surface cleaner**

- **2x Aquajet 30**
  - 65 l/min – 3000 bar
  - 17.2 gpm – 43,500 psi

**1x Aquajet 30**

- 47 l/min – 3000 bar
- 12.4 gpm – 43,500 psi

**Spot blasting**

In “one pump mode” the second pump is disconnected via clutch.

**Upper carriage, pivot-mounted on a ball bearing ring**

**Triple section telescopic jib**

**Filter/recovery module**

**Torsion free chassis with solid rubber tyres and 4-wheel drive**

**Working width:**

- **274 mm / 11 inches**
- **520 mm / 20 inches**
- **1000 mm / 39 inches**

**Spot blasting in “one pump mode” the second pump is disconnected via clutch.**

**Dockmaster**

The Dockmaster is a Dockmate system extension. The structurally identical parts are supplemented with a complete pump unit and a reel system for fresh and waste water.

The high pressure pump unit can be used as an independent system for other cleaning work.

**Optional jib height configurations**

- **Min. vehicle height:** 3.0 m / 9.8 ft
- **Vehicle width:** 2.5 m / 8.2 ft
- **Jib height:** 22 m / 72 ft
- **Transport length:** 9.6 m / 31.5 ft
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- **Jib height:** 32 m / 105 ft
- **Transport length:** 14 m / 46 ft
- **Weight:** 26 t / 57,320 lbs

**Working width:**

- **274 mm / 11 inches**
- **520 mm / 20 inches**
- **1000 mm / 39 inches**

**Spot blasting in “one pump mode” the second pump is disconnected via clutch.**

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The Dockmaster is a Dockmate system extension. The structurally identical parts are supplemented with a complete pump unit and a reel system for fresh and waste water.

The high pressure pump unit can be used as an independent system for other cleaning work.

**Optional jib height configurations**

- **Min. vehicle height:** 3.0 m / 9.8 ft
- **Vehicle width:** 2.5 m / 8.2 ft
- **Jib height:** 22 m / 72 ft
- **Transport length:** 9.6 m / 31.5 ft
- **Weight:** 24 t / 52,910 lbs

- **Jib height:** 27 m / 89 ft
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- **Jib height:** 32 m / 105 ft
- **Transport length:** 14 m / 46 ft
- **Weight:** 26 t / 57,320 lbs

**Working width:**

- **274 mm / 11 inches**
- **520 mm / 20 inches**
- **1000 mm / 39 inches**

**Spot blasting in “one pump mode” the second pump is disconnected via clutch.**
The Dockboy is a semiautomatic vehicle primarily for working on ship hull bottoms or similar surfaces. Nearly all larger flat or slightly curved areas of a ship can be blasted.

In combination with direct vacuuming, it ensures eco-friendly rust removal and old coating removal with waste and waste water collection.

- Designed to treat flat areas such as: Ship hull bottoms, all kinds of curvatures, superstructures up to a height of approx. 6.05 m (20 ft) or optionally with telescopic extension arm of 9.35 m (30.7 ft)
- Can be used on ship decks, car and cargo decks and other flat floors
- For work on ship hull bottoms, the minimum vehicle height is just 1.26 m (4.13 ft)
- Vehicle height lower than the most common keel blocks (mostly 1.5 m (4.9 ft) or higher)
- Work functions are automated and adjustable to a great extent

Max. operating pressure: 3000 bar
Recommended flow rate: up to 47 l/min
Min. vehicle height: 1.26 m
Vehicle width: 1.48 m
Working width: 274 mm (optional) 11 inches (optional)
Working parameters 28 – 47 l/min 2800 – 3000 bar

Aquablast – Surface cleaner

- Special nozzle layout ensures uniform distribution of the high pressure water across the working width
- Hydraulically driven for a constant rotation speed at all times
- Infinitely adjustable rotation speed from 100 to 2500 RPM
- Oil and water totally separated – no contamination of the hydraulic oil through high pressure leakage possible
- Threefold Poly-V belt drive for long service intervals
- Rotary joint with quick access to wearing parts (high pressure seals) from the top
- Powerful long-life axial piston hydraulic motor
- Equipped with an RPM sensor

Working height: 0 – 6.05 m (6.50 m)
Arc width: 0 – 9.35 m (5.00 m)
Length: 6.30 m
Weight: approx. 5 t

Recommended high pressure units depending on Aquablast surface cleaner:

- HDP 200 – 28 l/min 7.4 gpm – 3000 bar 43,500 psi
- HDP 200 – 40 l/min 10.6 gpm – 2800 bar 40,610 psi
- HDP 300 – 47 l/min 12.4 gpm – 3000 bar 43,500 psi

Engine / hydraulic system

- Jib is designed to allow multifunctional work to be carried out on flat or rounded surfaces as well as on ground and overhead surfaces.
- Filter / recovery module
- Working arm functioning as an equipment carrier (five-axis hydraulically adjustable)
- Recommended high pressure units depending on Aquablast surface cleaner:

Spot blasting

Working width 274 mm (optional) 11 inches (optional)
Working parameters 28 – 47 l/min 2800 – 3000 bar

Working width 374 mm (optional) 15 inches (optional)
Working parameters 28 – 47 l/min 2800 – 3000 bar

Working width 520 mm (optional) 20 inches (optional)
Working parameters 47 l/min 2800 – 3000 bar
**Dockboy**

*Hydraulically powered vehicle*

- Working boom, adjustable in five axes, with a gimbal mounted Aquablast working head at the end
- Makes it possible to follow the ship hull curvature
- Enables a constantly optimal surface fit
- Keeps the nozzle standoff distance constant
- Excellent manoeuvrability between keel blocks
- Mounted on crawler tracks
- Powerful at low feeding speed
- High stability for blasting head accuracy

**Electronic control unit**

- Enables a safe and easy operation of the Dockboy
- Ensures uniform feeding of the blasting head – resulting in a steady paint removal
- Fail-safe! Sensors detect unsafe and critical conditions, triggering automatic stops or shutdowns
- Operational functions are mostly automated
- Pre-selection of main parameter at the control cabinet
- Regular operation via radio remote control

**Fully automatic mode for floor and overhead operation**

- Adjustable step length and speed
- Programmable slewing range through freely selectable endpoints
- Adjustable slewing speed
- Forward/backward operation possible

**Arc width:** 4.60 m / 15.09 ft

**Integrated vacuum system**

- Absorbs the solids (removed coating, rust) and waste water directly at the ship hull
- Particles are actively removed – resulting in a cleaner surface
- Dries the blasted surface rapidly, meaning less formation of flash rust

**Filter / disposal module**

- Pre-separation of solids directly in the vehicle
- Collection of particles in a “big-bag” for easy disposal
- Rotary lobe pump feeds the waste water to a treatment plant in a controlled manner (where available)

**Construction and specifications**

**Caterpillar diesel engine:**

- C 2.2 DIT: 36 kW @ 2500 RPM
  48 hp @ 2500 RPM
- 4 Cylinder – 2.2 l turbo charged
- Fuel tank capacity: 150 l (39.6 gallons)

**Electric motor:**

- 45 kW, 50 Hz/60Hz
The Spiderjet V is held on the work surface by a vacuum, which at the same time suctions off the removed waste material and waste water.

**Spiderjet V – vacuum**

- **Suction Power @ 500 mbar**
  - Max vacuum
  - Vacuum generator: Roots - rotary piston blower
  - Electric motor: 45 kW (60 hp)
- **Vacuum collector - 1900**
  - Length: 2335 mm (91.9 inches)
  - Width: 1500 mm (59.1 inches)
  - Height: 2380 mm (93.7 inches)
  - Capacity: 3 m³ (106 ft³)
- **Vacuum collector - 660**
  - Length: 1750 mm (68.9 inches)
  - Width: 970 mm (38.2 inches)
  - Height: 2180 mm (85.8 inches)
  - Capacity: 1.3 m³ (45.9 ft³)

**Technical data - Spiderjet V**
- **Working width:** 374 mm (14.7 inch)
- **Operation pressure:** up to 3000 bar (up to 43,500 psi)
- **Flow rate:** up to 50 l/min (up to 13.2 gpm)
- **Weight:** 95 kg (209 lbs)
- **Max. operation speed:** 0–7 m/min (0–22 ft/min)
- **Vacuum:** depending on the nature of the surface approx. 0.5 bar / 7.2 psi
- **Suction connection:** DN 100

The Spiderjet M is attached to the work surface with permanent magnets. An optional vacuum system retrieves all waste water and removed solids.

- Maximum manoeuvrability via two individually, electrically driven magnetic wheels
- Radio remote control
- Secured by a double fall arrest system
- Special nozzle layout ensures a uniform distribution of the high pressure water across the working width
- Nozzle holder is self-propelled due to the reaction force of the high pressure water jets
- Rotation speed can be varied with the spraybar angle
- Rotary joint with dynamic high pressure seals, leakage-free, long service intervals

**Spiderjet M – magnetic**

- **Working width:** 374 mm (14.7 inch)
- **Operation pressure:** up to 3000 bar (up to 43,500 psi)
- **Flow rate:** up to 50 l/min (up to 13.2 gpm)
- **Weight:** 112 kg (247 lbs)
- **Max. operation speed:** 0–7 m/min (0–22 ft/min)

**High pressure unit**
- **Vacuum unit (optional)** for suctioning off water & solids

**Radio remote control**

**Electrical control cabinet**

[Images of Spiderjet V and Spiderjet M]
Aquablast® Remote

Self-sufficient carrier vehicle that can connect various jetting tools for surface treatment i.e. the cleaning and de-coating of ship decks.

- Modular system for different working widths
- Simple and safe handling via radio remote control.
- Operator can control it from outside danger zones
- One-man operation

Overhead work

- No-hassle add-on for the existing Aquablast Remote
- Minimal working height at just 1.15 m (3.8 ft)
- Telescopic pipes enable ceiling cleaning at heights of up to 2.50 m (8.2 ft)
- Aquablast can be moved transverse to the direction of travel

Technical data

| Working width: | 520 mm | 20.5 inches |
| Working height: | 1.15 m – 2.50 m | 3.8 ft – 8.2 ft |
| Travelling speeds: | 5 – 67 m/min | 16.4 – 220 ft/min |
| Operating pressure: | max. 3000 bar | max. 43,500 psi |
| Flow rate: | 47 l/min | 12.4 gpm |

Floor work

Typical applications

- Removal of road markings on lanes, parking and storage spaces
- Cleaning and de-coating of ship decks, industrial floors etc.
- Can be used at airports to clean runways and terminal areas
- Removal of concrete laitance

Technical data

| Working width: | max. 860 mm | 34 inches |
| Travelling speeds: | 5 – 67 m/min | 16.4 – 220 ft/min |
| Operating pressure: | max. 3000 bar | max. 43,500 psi |
| Flow rate: | 79 l/min | 21 gpm |

Aquablast PLUS with direct vacuuming

Self propelled spray bar, driven by reaction force of water jets.

Optimum spray bar design with 4 nozzle arms enabling the fitting of up to 16 nozzle inserts.

Vacuum system type “200”

Dual chamber system suitable for suctioning off and pre-filtering waste water.

| Separator: | 230 litres | 63 gpm |
| Fine filter: | 230 litres | 63 gpm |
| Weight: | 670 kg | 1,477 lbs |
| Engine: | Electric engine |
| Max. flow rate: | 5.5 kW | 74 hp |
| Suction power: | 200 m³/h | 706.3 ft³/h |
| Vacuum: | 200 mbar | 2.9 psi |

Vacuum system type “650”

Dual chamber system suitable for suctioning off and pre-filtering waste water.

| Separator: | 630 litres | 166.3 gpm |
| Fine filter: | 430 litres | 113.5 gpm |
| Weight: | 1.5 t | 3,308 lbs |
| Engine: | 3-cylinder diesel engine |
| Max. flow rate: | 36.7 kW | 49.2 hp |
| Suction power: | 650 m³/h | 22,955 ft³/h |
| Vacuum: | 240 mbar | 3.5 psi |
Jetboy

Mechanical assistance for manual gun work

- Enables virtually fatigue-free working
- Noticeable increase in work rate
- Suitable for floor and overhead work
- Max. reaction force: 300 N (67.4 lbf)
- Twin handgrip bypass control of pump unit
- Weight attachment to adjust the counterbalance
- Adjustable length drawbar
- Joint for pivoting around two axes
- Mounting for the selected cleaning tool
- Demountable for space saving transport

Stroke length:
500 mm (19.7 inches)

Maximum reaction force:
400 N / 600 N
(90 lbf / 135 lbf)

Weight (deployment unit):
40 kg (88.2 lbs)

The system can be mounted onto various suitable carrier systems (e.g. manlifts, carrier baskets, work platforms etc.).

Aquablast LINE

Device for cleaning and de-coating vertical or vertically inclined surfaces. It is especially suitable for the treatment of rusty spots and similar areas of spot damage.

The system can be mounted onto various suitable carrier systems (e.g. manlifts, carrier baskets, work platforms etc.).

Max. op. pressure:
3000 bar
43,500 psi

Max. flow rate:
40 l/min
10.6 gpm

Working width:
250 mm
9.8 inches

Weight:
120 kg
265 lbs

Working distance:
450 – 900 mm
17 – 35.4 inches

- Vacuum suction connection
- Gimbal mounting of Aquablast and preloaded springs ensure stable positioning on the surface
- Version with electrical and manual stroke movement available

Handheld Aquablast

Ergonomic handheld cleaning and striping tool for removing marine growth and stripping hull coatings above and below the water line.

- Twin trigger operation
- Aluminium housing with all water bearing parts made of stainless steel
- Brush arrangement ensures that stand off distance is maintained
- Connection for vacuum system

Max. op. pressure:
3000 bar
43,500 psi

Max. flow rate:
19 l/min
5.0 gpm

Working width:
140 mm
5.5 inches

Weight:
77 kg
17 lbs

As a supplement to ceiling cleaning, an Aquablast is available for cleaning floors

Jetmate

Reaction free water jetting for fatigue-free working. Enables safe working with less physical strain on the operating personnel.

- Easy movement of cleaning tool in all directions thanks to a gimbal mounting
- Pneumatic deployment module to advance and retract during blasting
- Pneumatically powered
- Twin handgrip bypass control of pump unit
- Suitable for standard gun barrels

Stroke length:
500 mm (19.7 inches)

Maximum reaction force:
400 N / 600 N
(90 lbf / 135 lbf)

Weight (deployment unit):
40 kg (88.2 lbs)

The system can be mounted onto various suitable carrier systems (e.g. manlifts, carrier baskets, work platforms etc.).

Preloaded springs ensure contact stability and gentle approaching

Stroke movement for the optimal treatment of spot damage

READ ONLINE: HAMMELMANN.COM/SHIP
High pressure water blasting guns

An ergonomically formed handle and various extensions can be easily combined. Each operator can find the working posture that best suits him, saving him effort and increasing workplace health and safety.

A simple lever mechanism makes the trigger of our new blasting guns very easy to operate. The operator can use the gun without feeling strain and physical stress which enables more concentrated working over longer periods.

Removing burnt primer from weld seams

Removal of discharge residue and silicates from weld seams

• Removal of impurities from weld seams
• Metallically pure weld seams created
• Exposure of possible defects makes quality assessment possible
• Optimal adhesion for painting or coating
• No silicates or weld beads that might detach later
• No premature corrosion on and around weld seams in particular

Op. pressure: 2500 – 3000 bar
36,300 – 43,500 psi

Rotor jets

Rotor jets utilise the high efficiency of round jets to blast more surface in less time. Thanks to varying nozzle heads and controlled rotation speed adjustment, there are a great number of possibilities when it comes to blasting surfaces. The light and compact design enables the operator to reach areas with limited access.

RD Masterjet

The new rotor jet generation with HPS sealing technology

Variable speed

High level of ergonomics due to the light weight and compact nozzle design

Outstanding performance with operating pressures up to 3200 bar

High energy efficiency

The optimum internal flow allows the pump’s total performance to be used without loss of energy

Surface preparation versions

4-nozzle version
3200 bar – 50 l/min
46,400 psi – 13.2 gpm

6-nozzle version
3200 bar – 50 l/min
46,400 psi – 13.2 gpm

Pipe cleaning versions

6 nozzles (Radial-, push- and pull nozzles)
3200 bar – 50 l/min
46,400 psi – 13.2 gpm

6 nozzles (Radial-, pull nozzles)
3200 bar – 50 l/min
46,400 psi – 13.2 gpm

6 nozzles (Radial-, push- and pull nozzles)
400 bar – 80 l/min
5,800 psi – 21.1 l/min

Typical applications for surface preparation:

• Cleaning / Roughening
• Removing coatings
• Concrete demolishing

Universal nozzle hub

Speed adjustable by hand controlled by variable magnetic brake, in rev. settings (no oil or filling tool required)

Easy maintenance

Service friendly design with few components

Maximal operating pressures

Standard version: 3800 bar / 54,106 psi
HPS version: 3200 bar / 46,412 psi

Variable speed controlled by infinitely variable magnetic brake
High pressure pumps

The endurance runner in top quality

- Long lifetime of all high pressure components due to optimal valve and sealing technology, use of top quality materials and precise series production with modern machines
- Long lasting corrosion resistance of the fluid end
- High operational reliability and long maintenance intervals through the hermethical sealing of the gear end by means of the patented bellows sealing system
- Leakage free pump thanks to the arrangement of all pressurised high pressure components inside the pump housing
- Significant operating cost advantage thanks to the crank section with pressurised lubrication system which is designed for at least 25,000 operating hours under full load
- High reliability in continuous duty due to the performance reserves of high pressure pump, drive engine and all components

Energy savings through high efficiency

- Highly efficient Aquajet ultra high pressure pumps convert 95% of the shaft power into hydraulic energy
- Very smooth running due to low speed at maximum performance
- Low diesel consumption due to modern engines

Safe operation

- Everything under control
  Monitoring, control and nozzle calculation via the Hammelmann ES3 control unit. Intuitive navigation in many languages. All important operating data at a glance
- Easy set-up
  due to easily accessible supply and high pressure connections
- Large fuel reserve for long hours of continuous operation

Sturdy industrial engine

- Economical industrial engines
  in accordance with the current exhaust emission certification step 4
- Ample power reserves

Environmentally friendly

- Low noise pump unit*
  due to super soundproofing ≤ 75 dB(A) at distance of 7 m (23 ft), ≤ 84 dB(A) at distance of 1 m (3.3 ft)
- Environmentally safe operation
  is ensured by a totally enclosed bottom tray where installation is in a container or soundproofed housing
- Optional soundproof covers/containers

On-board applications

- Spot blasting
- Rust and coating removal in ballast tanks, holds and bunkers
- Blast cleaning and coating removal of superstructures, decks, deck machinery, anchor chains etc.

The E2500-07 shipboard design with a minimum space requirement is ideal for UHP water blasting operations where access is restricted such as in ship gangways.

At only 750 kg (1,654 lbs), this unit has an extremely high power to weight ratio. It is also available as a high pressure unit.

E 2500-07

HDP 30 Basic

Pump units for on-board operation

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On board applications

- Spot blasting
- Rust and coating removal in ballast tanks, holds and bunkers
- Blast cleaning and coating removal of superstructures, decks, deck machinery, anchor chains etc.
High pressure unit Aquajet 14

Stationary unit within a 10 ft. sound damped container

Available setups:
- Containerised with sound damping, e.g. a 10 ft. container for pump unit alone, or a 20 ft. container for a unit and workshop combination to customer specification
- Stationary with sound damping cover

High pressure unit Aquajet 20

Stationary unit with sound damping cover

Available setups:
- Containerised with sound damping, e.g. a 10 ft. container for pump unit alone, or a 20 ft. container for a unit and workshop combination to customer specification
- Stationary with sound damping cover

High pressure unit Aquajet 30

Stationary basic unit

Available setups:
- Containerised with sound damping, e.g. a 10 ft. container for pump unit alone, or a 20 ft. container for a unit and workshop combination to customer specification
- Stationary with sound damping cover

Op. pressure Flow rate
3200 bar 46,412 psi 23 l/min 6.1 gpm
2800 bar 40,610 psi 26 l/min 6.9 gpm
2600 bar 37,709 psi 30 l/min 8.9 gpm
1800 bar 26,106 psi 42 l/min 11.1 gpm
1400 bar 20,305 psi 78 l/min 20.6 gpm
1200 bar 17,985 psi 97 l/min 23.0 gpm
910 bar 13,198 psi 84 l/min 22.2 gpm

Required motor rating: 140 kW / 187 HP

Op. pressure Flow rate
3200 bar 46,400 psi 28 l/min 7.4 gpm
2800 bar 40,610 psi 40 l/min 10.6 gpm
1400 bar 20,305 psi 78 l/min 20.6 gpm
1200 bar 17,985 psi 97 l/min 23.0 gpm
910 bar 13,198 psi 84 l/min 22.2 gpm

Required motor rating: 200 kW / 268 HP

Op. pressure Flow rate
3200 bar 46,412 psi 47 l/min 12.4 gpm
2800 bar 40,610 psi 51 l/min 13.5 gpm
2600 bar 37,709 psi 62 l/min 16.4 gpm
1800 bar 26,106 psi 86 l/min 22.7 gpm
1600 bar 23,206 psi 101 l/min 26.7 gpm
1200 bar 17,985 psi 122 l/min 32.2 gpm
910 bar 13,198 psi 145 l/min 38.3 gpm
800 bar 11,603 psi 200 l/min 52.8 gpm

Required motor rating: 300 kW / 402 HP

* Pressure steps selectable at the control unit
### High pressure E-unit HDP 140

**Op. pressure** | **Flow rate**
--- | ---
3200 bar | 46,412 psi | 21 l/min | 5.5 gpm
2600 bar | 37,770 psi | 26 l/min | 6.9 gpm
2000 bar | 18,076 psi | 42 l/min | 11.1 gpm
1600 bar | 14,123 psi | 75 l/min | 19.8 gpm

Required motor rating: **140 kW / 187 HP**

Available setups:
- Containerised with sound damping, e.g. a 10 ft. container for the pump unit
- Stationary with sound damping cover
- Mobile with sound damping cover
- Basic unit: stationary without sound damping cover

### High pressure E-unit HDP 200

**Op. pressure** | **Flow rate**
--- | ---
3200 bar | 46,412 psi | 30 l/min | 7.9 gpm
2800 bar | 40,610 psi | 36 l/min | 9.5 gpm
2400 bar | 37,056 psi | 42 l/min | 11.1 gpm

Required motor rating: **200 kW / 268 HP**

Available setups:
- Containerised with sound damping, e.g. a 10 ft. container for the pump unit
- Stationary with sound damping cover
- Mobile with sound damping cover
- Basic unit: stationary without sound damping cover

### High pressure E-unit HDP 300

**Op. pressure** | **Flow rate**
--- | ---
3200 bar | 46,412 psi | 39 l/min | 10.3 gpm
3200 bar* | 46,412 psi* | 47 l/min | 12.4 gpm
2800 bar | 40,610 psi | 51 l/min | 13.5 gpm
2600 bar* | 37,709 psi* | 62 l/min | 16.4 gpm
1800 bar* | 26,306 psi* | 86 l/min | 22.7 gpm
1600 bar* | 23,206 psi* | 101 l/min | 26.7 gpm
1030 bar | 14,938 psi | 152 l/min | 44.2 gpm
900 bar | 11,053 psi | 182 l/min | 48.1 gpm

Required motor rating: **300 kW / 402 HP**

* Frequency converter required or 60 Hz line frequency

Available setups:
- Containerised with sound damping, e.g. a 10 ft. container for pump unit alone, or a 20 ft. container for a unit and workshop combination to customer specification
- Basic unit: stationary without sound damping cover

Stationary unit within a 10 ft. sound damped container

Stationary basic unit with variable frequency drive

Stationary unit with sound damping cover and with variable frequency drive

Stationary unit with sound damping cover, e.g. a 10 ft. container for the pump unit

Stationary with sound damping cover
Hammelmann worldwide

Subsidiaries in USA, China, Australia, Brazil, Spain and 40 agents and distributors worldwide