Efficient corrosion protection with the use of high pressure water jetting

Economical – High quality preparation – Eco-friendly
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 shrouding of sensitive equipment, reduced time for cleaning of the dock. Water will not harm nearby seaworthy equipment and machinery as is often 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 where the facilities exist
- 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 pressure water jetting**

**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.

Grit blasting

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

Performance examples of Hammelmann’s corrosion protection systems

- **Dockmate**
  - Working width: 830 mm / 32 inch
  - Pump power: 600 kW / 800 hp

- **Dockmaster**
  - Working width: 580 mm / 22 inch
  - Pump power: 400 kW / 540 hp

- **Dockboy**
  - Working width: 374 mm / 15 inch
  - Pump power: 200 kW / 270 hp

- **Aquablaster Plus**
  - Working width: 235 mm / 8 inch
  - Pump power: 200 kW / 270 hp

- **Hand lance**
  - Pump power: 100 kW / 135 hp

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

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

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.
Dockmate

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

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: 17 t / 37,500 lbs

Jib height: 27 m / 89 ft
Transport length: 12.3 m / 40.4 ft
Weight: 20 t / 44,100 lbs

Jib height: 32 m / 105 ft
Transport length: 14.0 m / 46.0 ft
Weight: 23 t / 50,700 lbs

Dockmate

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.

Aquablast surface cleaner

Working width

<table>
<thead>
<tr>
<th>Working width</th>
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<td>28 – 61 l/min</td>
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- Can be combined with one, two or three high pressure pumps and the appropriate Aquablast cleaning heads according to requirements.
Dockmate features

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

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)

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 4-wheel steering, axles independently steerable. Front and rear axle have independent steering, ensuring 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:
  125 l/min @ 240 bar
  33 gpm @ 3480 psi
- Hydraulic oil capacity: 230 l (60.8 gallons)
- Biodegradable hydraulic oil
- Radiator oil-cooler with electric fan

Electric system:
- 24 V DC

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 this remote control are displayed and suggestions given as to their rectification.

No matter where the operator is, he can teach himself the individual functions and procedures using this software.
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.

<table>
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<tr>
<th>Jib height</th>
<th>Transport length</th>
<th>Transport weight</th>
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<td>22 m / 72 ft</td>
<td>12.3 m / 40.4 ft</td>
<td>28 t / 61,800 lbs</td>
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<td>27 m / 89 ft</td>
<td>13.5 m / 44 ft</td>
<td>25 t / 55,200 lbs</td>
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<td>32 m / 105 ft</td>
<td>17.5 m / 57.4 ft</td>
<td>32 t / 70,600 lbs</td>
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</table>

Aquablast surface cleaner

Aquajet 50

- 20.3 gpm
- 43,500 psi
- 77 l/min
- 3000 bar

Aquajet 50 (66 % RPM)

- 13.5 gpm
- 43,500 psi
- 51 l/min
- 3000 bar

Aquajet 50 (100 % RPM)

- 17.2 gpm
- 43,500 psi
- 77 l/min
- 3000 bar

Aquablast – Surface cleaner

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

Optional jib height configurations

Dockmaster

The Dockmaster is a completely dust-free and eco-friendly semi automatic water jetting vehicle. The high pressure pump is on board.
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 (19.85 ft) or optionally with telescopic extension arm of 9.00 m (29.53 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

Aquatblast surface cleaner

- Special nozzle layout ensures uniform distribution of the hp 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

Can be combined with one or two high pressure pumps and the appropriate Aquatblast cleaning heads according to requirements.
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
- Failsafe! 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

Dockboy

AQUABLAST 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

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 specification

Caterpillar engine:

- C 2.2 DIT: 45 kW @ 3000 RPM
- 60 hp @ 3000 RPM
- 4 Cylinder – 2.2 l turbo charged
- Fuel tank capacity: 150 l (39.6 gallons)

Hydraulic system:

- Axial piston pump with infinitely variable flow
- Performance: 100 l/min @ 200 bar
- 26.4 gpm @ 2,900 psi
- Hydraulic oil capacity: 170 l (44.9 gallons)
- Biodegradable hydraulic oil
- Radiator oil-cooler with electric fan

Electric system:

- 24 V DC
Spiderjet V – vacuum

Surface preparation unit for stripping of vertical, inclined and horizontal surfaces. 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.

- Special nozzle layout ensures a uniform distribution of the high pressure water across the working width
- Nozzle holder 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 sealing, leakage-free, long service intervals
- Maximum manoeuvrability with two individually and pneumatically driven wheels
- Control unit with separately adjustable feeding speed for left–right and forward–backward driving
- Overdrive speed selectable for fast positioning of the Spiderjet V
- Vacuum limiting valve
- Electronically monitored vacuum with automatic high pressure water shut-off
- Can be used on non-magnetic surfaces
- Secured by a double fall arrest system
- Reduced noise level due to fully encapsulated high pressure spraybar
- Vacuum sensor
- Bypass control of high pressure pump unit

VACUUM REQUIREMENTS:
- Air flow rate: > 1500 m³/h @ -500 mbar
- Suction: -400 mbar up to -500 mbar

Max. operating pressure: 3000 bar
Max. flow rate: 50 l/min
Working width: 375 mm
Weight: 105 kg
Vacuum: 53,000 ft³/h @ -73 psi
Max. operation speed: 6 m/min
Overdrive speed: 15 – 20 m/min
Compressed air supply: 1 m³/min @ 6 bar
Suction connection: DN 100

Max. operating pressure: 3000 bar
Max. flow rate: 50 l/min
Working width: 375 mm
Weight: 60 kg
Operation speed: 0–6 m/min

Spiderjet M – magnetic

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 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 sealing, leakage-free, long service intervals

Max. operating pressure: 3000 bar
Max. flow rate: 50 l/min
Working width: 375 mm
Weight: 60 kg
Operation speed: 0–6 m/min

Max. operating pressure: 3000 bar
Max. flow rate: 50 l/min
Working width: 375 mm
Weight: 60 kg
Operation speed: 0–6 m/min

Max. operating pressure: 43,500 psi
Max. flow rate: 13.2 gpm
Working width: 375 mm
Weight: 132 lbs
Operation speed: 0–20 ft/min

Max. operating pressure: 43,500 psi
Max. flow rate: 13.2 gpm
Working width: 375 mm
Weight: 132 lbs
Operation speed: 0–20 ft/min

Radio remote control

Ship bottom preparation

Special nozzle layout

Vacuum unit (optional) for suctioning off water & solids

Pneumatic control cabinet (optional: radio remote control)
Aquablast® Remote

**Floor work**

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

- Flexible use in combination with cleaning vehicles and with independent high pressure units
- Easy to use in combination with cleaning vehicles, without the hassle of performing hydraulic installation on the vehicle
- Modular system for different working widths
- Simple and safe handling, radio remote controlled. Operator can control it from outside danger zones
- One-man operation

Conversion option for ceiling/underfloor cleaning

**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 | max. 33.9 inches |
| Travelling speeds: | 5 – 67 m/min | 16.4 – 219.8 ft/min |
| Operating pressure: | max. 3000 bar | max. 43,500 psi |
| Flow rate: | 79 l/min | 20.9 gpm |

**Overhead work**

- No-hassle add-on for the existing Aquablast Remote
- Minimal working height at just 1.07 m (3.5 ft)
- Telescopic pipes enable ceiling cleaning at heights of up to 1.95 m (6.4 ft)
- Aquablast can be moved transverse to the direction of travel

**Technical data**

| Working width: | 518 mm | 20.4 inches |
| Travelling speeds: | 1.07 m – 1.95 m | 3.5 ft – 6.4 ft |
| Operating pressure: | max. 3000 bar | max. 43,500 psi |
| Flow rate: | 56 l/min | 14.8 gpm |

Aquablast® PLUS and vacuum systems

**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 “L”**

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

| Separator: | 230 litres | 60.7 gpm |
| Fine filter: | 230 litres | 60.7 gpm |
| Weight: | 670 kg | 1,477 lbs |
| Engine: | Electric engine | |
| Suction power: | 5.5 kW | 7.4 hp |
| Vacuum: | 60.7 gpm | 1,477 lbs |
| Weight: | 200 m³/h | 706.3 ft³/h |
| Vacuum: | 200 mbar | 2.9 psi |

**Vacuum system type “XL”**

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

| Separator: | 630 litres | 166.3 |
| Fine filter: | 430 litres | 113.5 |
| Weight: | 36.7 kW | 49.2 hp |
| Engine: | 3-cylinder diesel engine | |
| Suction power: | 240 m³/h | 22,955 ft³/h |
| Vacuum: | 240 mbar | 3.5 psi |

**Vacuum system type “XL” compressed air**

Compressed air injection powered vacuum unit with double chambers.

| Weight: | 110 kg | 243 lbs |
| Suction power: | 700 m³/h | 24,720 ft³/h |
| Vacuum: | 500 mbar | 7.3 psi |

**LOCAL SUPPLY REQUIRED:**

- Compressed air: 8 bar @ 8 m³/min 230 V / 50 Hz
- 116 psi @ 283 ft³/min
**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. manlifits, carrier baskets, work platforms etc.)

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**Handheld Aquablast**

Ergonomic handheld cleaning and stripping 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 gallons
**Working width:** 50 mm / 2 inches
**Weight:** 77 kg / 17 lbs

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**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 / 674 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.

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**Jetmate**

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

**Response by:**

E. Greenhouse

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**Aquablast SPOT**

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. manlifits, carrier baskets, work platforms etc.)

**Max. op. pressure:** 3000 bar / 43,500 psi
**Max. flow rate:** 40 l/min / 10.6 gallons
**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.
**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 child’s play to operate. The operator can use the gun without feeling strain and physical stress which enables more concentrated working over longer periods.

**Rotor jets**

Rotor jets utilise the high efficiency of round jets to blast more surface in less time.

Thanks to various nozzle heads and controlled rotation speed adjustment, there are a great number of possibilities when it comes to blasting surfaces. The rotation speed is adjusted by turning the dial.

The light and compact design enables the operator to reach areas with limited access.

**Handrail cleaner**

The “handrail cleaner” has been especially developed for cleaning, rust removal and paint stripping operations on hand rails and pipes up to 50 mm (2 inches) in diameter.

- Manual cleaning unit guided along the pipe
- Housing made of aluminium and synthetic materials
- Parts subjected to high pressure are made of high-strength corrosion-resistant stainless steel
- A series of roller guides ensures a consistent standoff distance
- 6 fan jets for optimal all-round cleaning
- Special design for minimal weight

**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 later painting or coating
- No silicates or weld beads that might detach later
- No premature corrosion on and around weld seams in particular

**Nozzle heads for:**
- Surface blasting
- Spot blasting
- Profile preparation

**Specs:**
- Max. op. pressure: 3000 bar 43,500 psi
- Max. flow rate: 30 l/min 8 gpm
- Weight: 6.5 kg 14.3 lbs
- Height: 242 mm 9.5 inches
- Width: 380 mm incl. handgrip 15 inches incl. handgrip
- Length: 560 mm 22.0 inches

**Nozzle heads for:**
- Surface blasting
- Spot blasting
- Profile preparation

**After water jetting**

Weld seam

**Op. pressure:**
- 2500 – 3000 bar
- 36,300 – 43,500 psi
**Pump units for on-board operation**

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 also has an extremely high power to weight ratio. It is also available as a high pressure unit.

**E 2500-07**

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* Operation with 460 V / 60 Hz supply

**HDP 40 Basic**

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* Operation with 460 V / 60 Hz supply

**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.

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**High pressure pumps**

The endurance runner in top quality

- Long lifetime of all high pressure components thanks to optimal valve and sealing technology, use of top quality materials and precise series production with state-of-the-art machines
- Long lasting corrosion resistance of the fluid end
- High operational reliability and long maintenance intervals through the gear end being hermetically sealed by 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 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**

- High efficiency. The Aquajet ultra high pressure pump converts 95 % of the shaft power into hydraulic energy
- Very smooth running due to low speed at maximum performance
- Low diesel consumption thanks to modern engines
- Large fuel reserve. Minimum of 8 hours operation possible due to the large internal fuel tank

**Safe operation**

- Everything under control. Control and monitoring by means of the Hammelmann control unit. Intuitive navigation in many languages. All important operating data at a glance.
- Easy commissioning thanks to easily accessible supply and high pressure connections

**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)
- Environmental safety operation is ensured by a totally enclosed bottom tray where installation is in a container or soundproofed housing

* Optional soundproof covers/containers

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**PUMP UNITS FOR ON-BOARD OPERATION**

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**HIGH PRESSURE PUMPS**

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**26**
**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

- Mobile with sound damping cover
- Road-going on tandem axle trailer
- Basic unit: stationary without sound damping cover

**Op. pressure** | **Flow rate** | **Flow rate**
--- | --- | ---
43,500 psi | 3000 bar | 22 l/min 5.8 gpm
36,250 psi | 2500 bar | 30 l/min 7.9 gpm
37,060 psi | 2600 bar | 26 l/min 6.9 gpm
23,200 psi | 1600 bar | 40 l/min 9.0 gpm
15,950 psi | 1000 bar | 57 l/min 15.1 gpm
11,890 psi | 820 bar | 78 l/min 20.6 gpm

Required motor rating: **135 kW / 180 HP**

* Pressure steps selectable at the control unit

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**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

- Mobile with sound damping cover
- Road-going on tandem axle trailer
- Basic unit: stationary without sound damping cover

**Op. pressure** | **Flow rate**
--- | ---
46,400 psi | 3200 bar | 28 l/min 7.4 gpm
40,600 psi | 2800 bar | 36 l/min 9.5 gpm
20,320 psi | 1400 bar | 78 l/min 20.6 gpm
15,230 psi | 1050 bar | 100 l/min 26.4 gpm

Required motor rating: **235 kW / 280 HP**

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**High pressure unit Aquajet 25**

**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
- Mobile with sound damping cover
- Road-going on tandem axle trailer
- Basic unit: stationary without sound damping cover

**Op. pressure** | **Flow rate** | **Flow rate**
--- | --- | ---
43,500 psi | 3000 bar | 44 l/min 11.6 gpm
37,700 psi | 2600 bar | 48 l/min 12.7 gpm
32,610 psi | 2250 bar | 57 l/min 15.0 gpm
23,930 psi | 1650 bar | 80 l/min 21.1 gpm
19,580 psi | 1350 bar | 96 l/min 25.4 gpm
16,680 psi | 1150 bar | 116 l/min 30.6 gpm
13,950 psi | 960 bar | 139 l/min 36.7 gpm

Required motor rating: **250 kW / 335 HP**

* Pressure steps selectable at the control unit

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**High pressure unit Aquajet 50**

**Setup of a containerised unit with sound damping in a 25 ft. container**

**Available setups:**
- Containerised with sound damping, e.g. a 20 ft. container for pump unit alone, or a 25 ft. container for a unit and workshop combination to customer specification
- Basic unit: stationary without sound damping cover

**Op. pressure** | **Flow rate** | **Flow rate**
--- | --- | ---
43,500 psi | 3000 bar | 77 l/min 20.3 gpm
36,984 psi | 2550 bar | 100 l/min 26.4 gpm
31,908 psi | 2200 bar | 122 l/min 32.2 gpm
27,640 psi | 1630 bar | 166 l/min 41.9 gpm
18,710 psi | 1290 bar | 212 l/min 56.0 gpm
15,080 psi | 1040 bar | 262 l/min 69.2 gpm

Required motor rating: **500 kW / 670 HP**

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ELECTRICALLY DRIVEN HIGH PRESSURE PUMP UNITS

High pressure E-unit HDP 120

Stationary basic unit with variable frequency drive

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

**Stationary unit with sound damping cover and with variable frequency drive**

**Op. pressure** | **Flow rate**
--- | ---
43,500 psi | 3000 bar | 18 l/min | 4.8 gpm
35,500 psi | 2450 bar | 24 l/min | 6.3 gpm
23,200 psi | 1600 bar | 40 l/min | 10.6 gpm
15,950 psi | 1200 bar | 57 l/min | 15.1 gpm
11,000 psi | 820 bar | 78 l/min | 20.6 gpm

**Required motor rating:** 120 kW / 160 HP

High pressure E-unit HDP 200

Stationary unit with variable frequency drive

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

**Stationary unit with sound damping cover and with variable frequency drive**

**Op. pressure** | **Flow rate**
--- | ---
46,410 psi | 3200 bar | 23 l/min | 6.1 gpm
46,430 psi | 3200 bar | 28 l/min | 7.4 gpm
40,630 psi | 2800 bar | 30 l/min | 7.9 gpm
40,630 psi | 2800 bar | 36 l/min | 9.5 gpm
26,300 psi | 1800 bar | 52 l/min | 13.7 gpm
20,740 psi | 1430 bar | 65 l/min | 17.2 gpm
15,820 psi | 1090 bar | 83 l/min | 22.9 gpm

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

**Frequency converter required or 60 Hz line frequency**

High pressure E-unit HDP 250

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
- Basic unit: stationary without sound damping cover

**Op. pressure** | **Flow rate**
--- | ---
43,500 psi | 3000 bar | 37 l/min | 9.8 gpm
37,710 psi | 2600 bar | 44 l/min | 11.6 gpm
12,630 psi | 2250 bar | 57 l/min | 15.1 gpm
23,910 psi | 1650 bar | 80 l/min | 21.1 gpm
19,580 psi | 1350 bar | 96 l/min | 25.4 gpm
15,230 psi | 1050 bar | 116 l/min | 30.6 gpm
12,330 psi | 850 bar | 158 l/min | 41.7 gpm

**Required motor rating:** 250 kW / 335 HP

**Frequency converter required or 60 Hz line frequency**

High pressure E-unit HDP 500

Stationary basic unit

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

**Op. pressure** | **Flow rate**
--- | ---
43,510 psi | 3000 bar | 77 l/min | 20.3 gpm
36,990 psi | 2550 bar | 100 l/min | 26.4 gpm
31,910 psi | 2200 bar | 122 l/min | 32.2 gpm
23,640 psi | 1630 bar | 166 l/min | 43.9 gpm
18,710 psi | 1290 bar | 212 l/min | 56.0 gpm
15,080 psi | 1040 bar | 262 l/min | 69.2 gpm

**Required motor rating:** 500 kW / 670 HP
Hammelmann worldwide

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