

Report

Chemical Technology



Water as a tool
for a clean environment

In all areas of chemical engineering, the amount of maintenance required is comparatively high. This particularly affects equipment for the conversion, treatment, transportation or storage of media, such as autoclaves, filters, vessels, tanks, sieves, heat exchangers, and pipelines. In addition, buildings need to be maintained.

To solve these often very complex problems, high-pressure water jets are used more and more. High-pressure water jetting is a

technique for a large variety of applications.

The WOMA high-pressure water jet systems are suitable for the following tasks:

- ▶ Surface cleaning.
- ▶ Removal of coatings and paint from buildings, structures and technical equipment.
- ▶ Derusting of steel surfaces.
- ▶ Cutting and separating of materials and composites.
- ▶ Removal of tenacious residues and incrustations from autoclaves,

vessels, heat exchangers, pipelines, etc.

- ▶ Rubber removal from pipelines and vessels.
- ▶ Partial demolition of buildings and equipment.

The transportation of critical media represents another permanent problem in chemical engineering. Here, WOMA offers special pumps for the transport of highly viscous and pasty media, abrasive media with different solids loading, and chemically aggressive media.



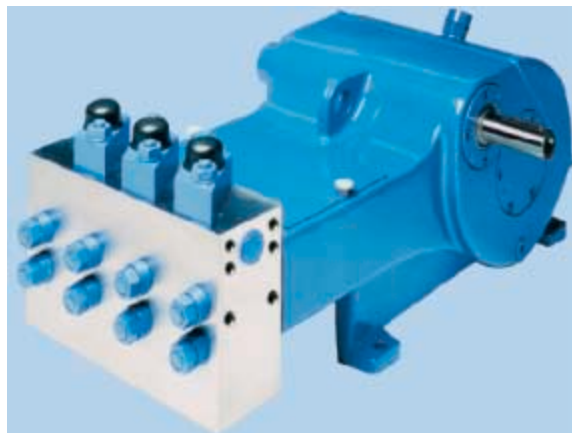
Heat exchanger cleaned by high-pressure water jetting



Surface cleaning with hot water gun and OrbiMaster®



Internal pipe cleaning with high-pressure water jet RDR-system



High-pressure plunger pump type 752 for injecting diesel and glycol

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Why High-Pressure Water Jets?

- ▶ There is a wide range of tools available.
- ▶ Small reaction forces. Therefore, the technique can easily be mechanized and automatized.
- ▶ No gas, vapour or slag formation.
- ▶ Minimum vibrations.
- ▶ High efficiency.
- ▶ Very careful removal of coatings, dirt and contaminations.
- ▶ High degree of industrial safety.
- ▶ Exclusion of chemical agents.
- ▶ Small tool dimensions and low weight.
- ▶ No influencing of surface structure or mechanical properties of the parts and materials treated.

Range of Materials

Using high-pressure water jets, the following materials can reliably and efficiently be removed:

adhering multi-layered coatings, contaminants, dirt, cakes and incrustations, linings, lacquer systems, tenacious residues, worn protective coatings.

Using abrasive ultra-high pressure water jets, the following materials can reliably and efficiently be cut: ceramics, construction steels, fibre-reinforced materials, multi-layered constructions, pipeline elements, reinforced concrete.

The Technique

WOMA offers the complete range of the high-pressure water jet technique.

WOMA's horizontal plunger pumps, equipped with central valve heads, generate water pressures up to 3,000 bar and deliver water flow rates up to 900 l/min. The performance range of the process pumps covers operating pressures up to 1,000 bar and flow rates between 17 l/min and 5,000 l/min. For complex maintenance problems, WOMA has developed complete ultra-high pressure systems (3,000 bar) as well as compact hot water jetting Ecotherm®-Systems (800 bar). Compact tube bundle and pipe cleaning units and vessel cleaning systems are also available.

The WOMA high-pressure water jet programme for application in chemical engineering comprises the following tools:

- ▶ FlexLanceMaster® for hand-held tube bundle cleaning.

- ▶ Modular gun programme for the treatment of sensitive surfaces and selective removal.
- ▶ Tools for horizontal and vertical use with simultaneous suction of water and waste material.
- ▶ Self-driving and externally driven rotating nozzle heads for surface preparation.
- ▶ TankMaster® heads for internal tank and autoclave cleaning.
- ▶ Positioning devices for cleaning heads and rotating nozzles.
- ▶ Pipe cleaning heads and nozzles.
- ▶ LanceMaster® für automatic tube bundle cleaning.
- ▶ PreventMaster® for safe tube bundle cleaning.
- ▶ Abrasive ultra-high pressure water jet cutting systems for the demolition of equipment and buildings.
- ▶ Modular water treatment systems.



Vessel cutting with an abrasive ultra-high pressure water jet system



Emission-free paint stripping from tanks



FlexLanceMaster® and PreventMaster® for tube bundle cleaning



prior to cleaning

Cleaning of recuperative air-heater surfaces by high-pressure water jetting

after cleaning

