

Heat exchanger cleaning with high pressure water

Hammelmann offer a complete range of complementary tools and equipment for cleaning heat exchangers. The work can be carried out either in situ or in designated cleaning bays.

The energy required to effect the cleaning process is largely dictated by the contamination (deposits) to be removed. Examples are:

Contamination	Energy required
solvents, synthetic rubber, plastics, viscose, petroleum, petroleum coke, crude oil, oil, fuel oil, tar	Op. Pressures: 500-1000 bar Flow rates: up to 300 l/min.
plastics, petroleum derivatives	Op. Pressures: up to 3000 bar Flow rates: up to 30 l/min.



Semiautomatic units for internal cleaning



The Hammelmann "Pipemaster" is a semiautomatic bundle cleaning unit with rigid rotating water blasting lances.

The speed of lance advance/retraction is continuously adjustable between 0 and 0,5 m/sec.



The number of lances up to a max. of 5 per unit is governed by the sizes of bundles normally cleaned. On multiple lance units the distance between lance centres is adjustable to suit the various pitch circle diameters of the tube bundles.

The carrier is mounted on a traversing mechanism which in turn is mounted on a scissor type jack up access platform. If required the unit can be outfitted with a fully glazed, totally enclosed, ventilated operator's cabin incorporating all the unit controls.

The bundle is placed on a hydraulically driven twin roller unit enabling the operator to rotate it to the required position. The lance carrier incorporates the lance advance/retraction system and the fine adjuster.

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Semiautomatic units for external cleaning

The "Pipemaster" for cleaning external surfaces of tubes bundles is another purpose designed unit. The tube bundle is placed on roller supports mounted within the base frame of the unit. The water blasting head is mounted on a hydraulically powered gantry that travels the length of the bundle and back. The head is raised and lowered by a hydraulic spindle. A supplementary rotation/swivel motion of the head enables bundle end plate cleaning.



The rollers are hydraulically powered to rotate the bundle after each cleaning pass of the blasting head. The hydraulic power pack is available in both electric and diesel drive versions.

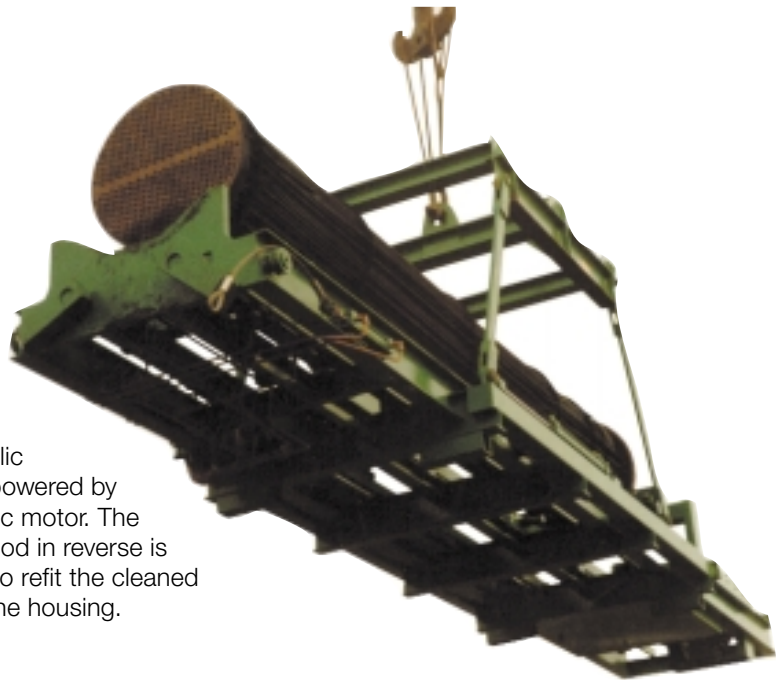
The Pipemaster is also available as a road going trailer.

Extracting and refitting heat exchanger tube bundles

The Hammelmann bundle extractor is suspended from a suitable crane and positioned horizontally in front of the heat exchanger housing mounting flange by means of a balancing cylinder.

A rigid connection is made between the housing and the extractor enabling the bundle to be pulled out.

The hydraulic system is powered by a pneumatic motor. The same method in reverse is employed to refit the cleaned bundle in the housing.



Manual internal cleaning with rigid or flexible lances

Manual lancing is predominately carried out with rigid lances. They are available with diameters of between 8-20 mm. The max. pressure lance available is designed for 3000 bar operation.



Ultra High Pressure lance performance can be enhanced by attaching it to an electrical bypass, pneumatically driven, rotating blasting gun.

Where access to the heat exchanger is restricted flexible lances are employed. They are available in lengths up to 20 m and operating pressures up to 3000 bar. All incorporate the necessary safety fittings.

Flexible lances are marked with a ring 50 cm back from the nozzle/hose connection to indicate to the operator that the lance end is approaching.

Safe operation is ensured by attaching the lance deployment device to the exchanger/bundle end flange.

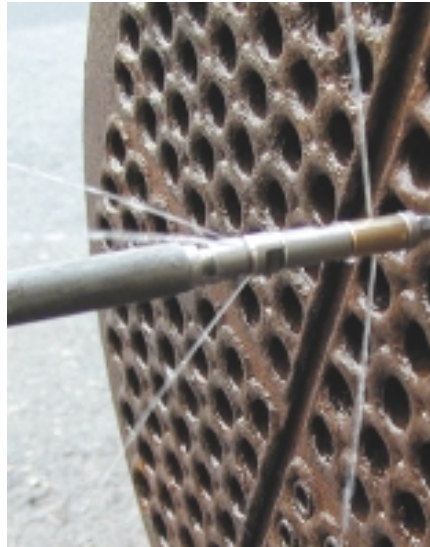


If a rigid lance is connected directly to a hose rather than to a blasting gun the pressure ON/OFF functions are controlled either by a foot operated bypass valve or a foot operated switch connected to the pump bypass valve.

Turbojets

Turbojets are available to operate at pressures up to 1500 bar. The nozzle body, driven by the reaction force of the water jets, rotates at speeds up to 20000 rpm eliminating the 'stripping' effect caused by some rotating nozzles.

Outside diameters range from 12 mm to 47 mm and are therefore suitable for tube i/d's from 15 mm to 100 mm.



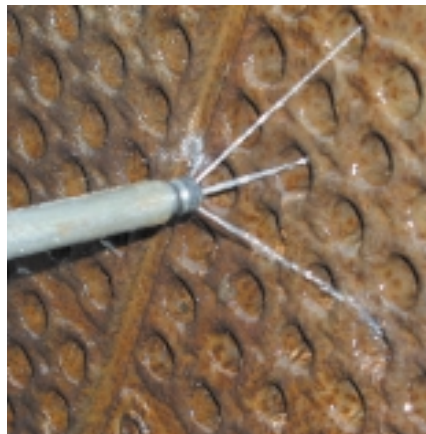
The Turbojet can be driven forwards into the tube by fitting a static nozzle holder as an adapter between it and the flexible lance hose. The reaction force of three jets angled backwards drives the Turbojet into the tube and simultaneously flushes out all the removed dirt.

This prevents clogging and lance jamming enabling longer tube.



Pull nozzles

Pull nozzles have backward facing angled jets and can be used on both rigid and flexible lances. Broaching pull nozzles have an additional.



Push nozzles

Push nozzles with forward facing angled jets are used on rigid lances to clean partially or fully blocked tubes. Broaching push nozzles with an additional forward facing central jet are also available.

Rotorjets

There is a special tube bundle external cleaning Rotorjet with a triple nozzle arrangement producing three extremely coherent high power jets.



Used in conjunction with High and Ultra high pressure blasting guns, Rotorjets are the ultimate surface cleaning/preparation tools for use in the Chemical and Petrochemical industries.