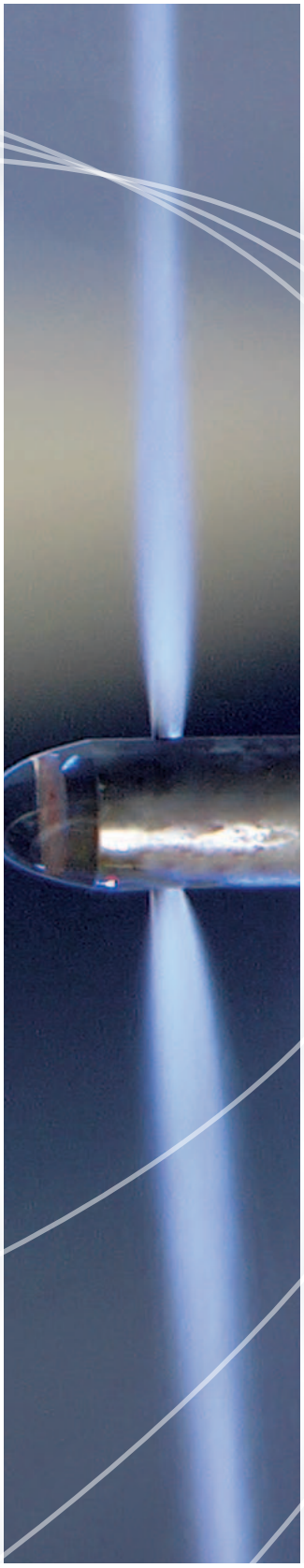

Engine-block decoring machine

Best-possible decoring of engine blocks using high-pressure, water-jet cleaning machines made by RST for foundries

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Decoring of engine blocks with the power of water

Make full use of high-pressure water-jets to decore castings efficiently and benefit from single-source solutions – from RST.

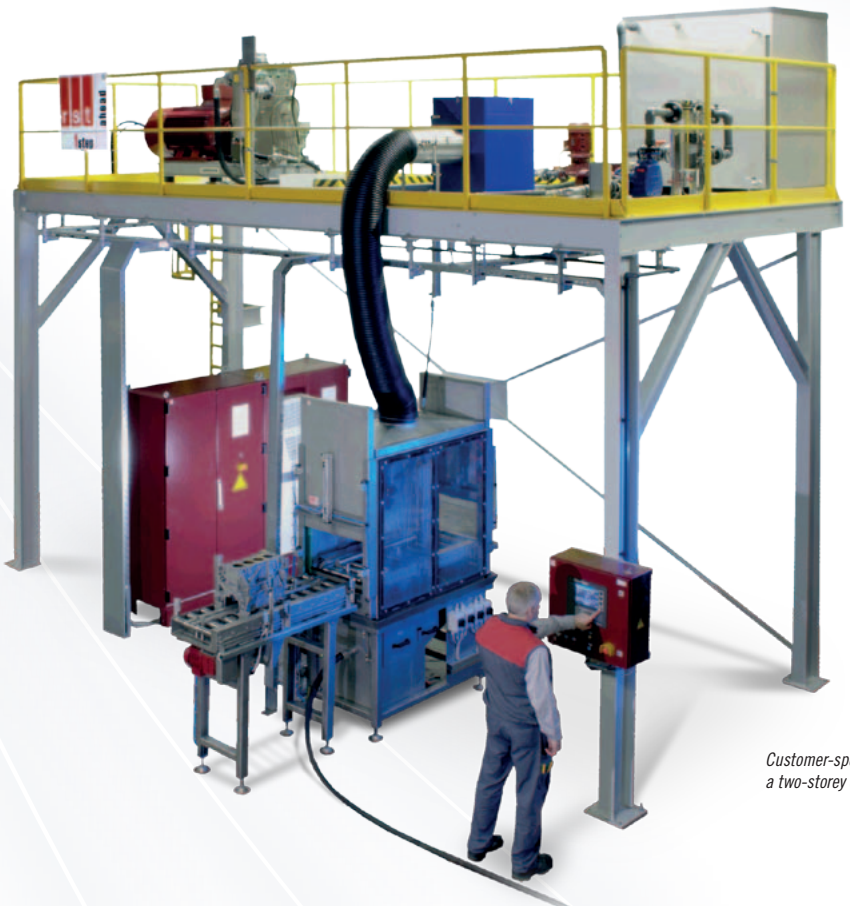
In order to be able to cast liquid metal, a suitable type of sand is mixed with a binding agent and pressed, or shot, into the core tool using compressed air. This sand core is an inverse copy of the intended workpiece and gives it the required structure.

Removing the core and all its residues after the casting has hardened is a crucial quality criterion.

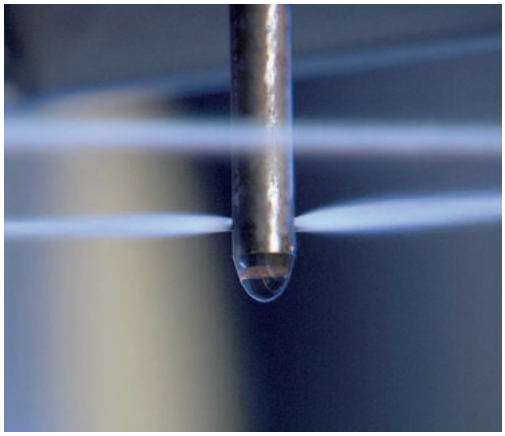
In particular where the parts have complex internal shapes, like the cooling channels in engine blocks, the conventional vibratory desanding method presents problems because residues from the sand core may remain inside the workpiece. RST's high-pressure water jet process guarantees that decoring will also free up the finest channels.

High-pressure nozzles ready to enter the workpiece and decore the engine block

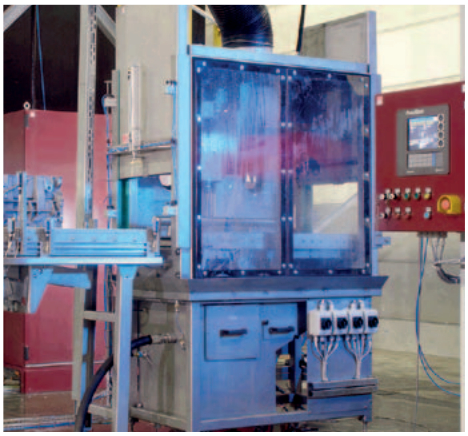
Individually designed systems enable solutions to address the specific needs of the application. For example, it is possible to integrate the RST machine in an existing production line or a space-saving two-storey arrangement. The high-pressure water system together with the water treatment unit and housing exhaust system are located on the upper level. The decoring machine itself and its user terminal and switch cabinet are mounted below that.



Customer-specific installation concept as a two-storey construction



High-pressure nozzles arranged in a starburst formation provide water pressure up to 1000 bar



Compact, soundproofed housing for integration in a production line

State-of-the-art frequency converter provides the power for the speed-controlled high-pressure pump drive

Decoring to meet needs

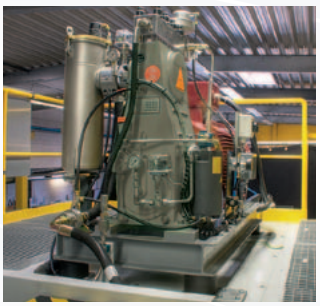
The engine block whose core is to be removed is fed into the housing on a roller conveyor. To enable the high-pressure nozzles to enter the block unhindered, the surface is first blasted with compressed air to remove any metal chips left over from the previous machining process. The second operation involves the decoring process, using high-pressure water. The engine block is detected by non-contact light barriers. Precise workpiece control and pneumatically operated stoppers ensure the engine

Engine block passing through the housing

blocks are positioned exactly. A position monitoring system checks that the workpiece is exactly aligned for the subsequent high-pressure cleaning operation. After the engine block has been decored in this way using high-pressure water, it is unloaded from the machine and passed on to the downstream production installation for the next operation.

Controllable water pressure

The high-performance, speed-controlled high-pressure plunger pump allows the water pressure to be set to suit the individual application. When castings are decored, water pressures of around 1000 bar are needed.



High-performance 3-plunger high-pressure pump

Motorised water jet tools

The newly designed water-jet system is equipped with three starburst revolving nozzles producing radial jets. The high-pressure nozzles are inserted in the cylinder head cooling channels of the cast engine block. The high-pressure jets shred the core in the channels and rinse all the debris out of the casting. To protect the machine components located inside the chamber, an integrated movable protective cover prevents the high-pressure water from hitting the area away from the engine block.

Clearly designed operating panel

The menu-based operator guidance system uses a panel and intuitive navigation. This guarantees short training times for operators. The detailed view of the machine and animated machine assembly status provides a quick, clear overview of the information pertinent to the production process. A comprehensive range of diagnostic options allow faults to be localised quickly and efficiently.

Operating panel with intuitive navigation

Switchgear and automation

The switchgear is the control system at the heart of the machine. This unit supplies all the machine sections with power and generates the control signals for all the automated process steps. State-of-the-art control engineering ensures the machine operates reliably. The high-pressure pump speed is controlled by a frequency converter, which ensures energy-saving pump operation which also protects the materials. Use of valve terminals with a common compressed air supply reduces hose connections and simplifies installation.

IDEAL ADDITION:

Our water treatment unit WAA

All solid residues are removed from the water via an inclined filter and a combined prefilter and fine cascade filter. All the filter cartridges can be easily replaced and disposed of after use. After being treated, the water is collected in a stainless steel header tank and, from here, is then recycled back to the high-pressure system. In this way, 90% of the water can be reused. A perfect, environmentally friendly recycling system.

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Machine data and advantages MBEA

Advantages

- Efficient system solutions from a single source - RST
- Fully automated water-jet process
- Minimum staffing requirements
- Extremely short high-pressure phases
- High quality of the castings achieved through residue-free high-pressure water decoring
- Complete, safe removal of even the finest channel cores
- Water recirculation thanks to integrated, environmentally friendly water treatment unit
- High degree of machine availability
- Decoring process recognised by the foundry business

Technical specifications and components

Overall weight	approx. 6 t
Moving mass	approx. 35 kg
Cycle time	approx. 20 s
Water pressure	approx. 1000 bar
Volume flow	approx. 78 l/min
MBEA power requirements including high-pressure pump	132 kW

Fully automated controller	☑
Measuring technology	☑
Suction fan	☑
Water separator	☑
Workpiece feed via roller conveyor	☑
Frequency regulated, motorised high-performance water-jet tools	☑
Processing chamber made of stainless steel	☑
Welded-in chamber sump	☑
High-pressure water pump	☑
Integrated water treatment unit for recycling process water	☑
Sensor technology	☑

Plant engineering

- Cleaning systems
- Water treatment systems
- High-pressure water-jet technology
- Robotics
- System integration

Electrical engineering

- Automation
- Drive technology
- Software engineering
- Process visualisation
- Switchgear manufacturing

Sheet-metal working

- Sound-absorbing hoods
- Machine covers
- Containers and tanks
- Control desks
- Housings

Enterprise certified to § 19 I WHG

WATER RESOURCES LAW: RST is certified to § 19 I WHG by the German TÜV testing authority and, with its equipment and qualifications, is thus authorised to build plant and equipment which may be used in connection with water-endangering substances. These include LAU facilities (storage, bottling and transhipment of water-endangering substances) and HBV facilities (production, treatment and use of water-endangering substances).

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