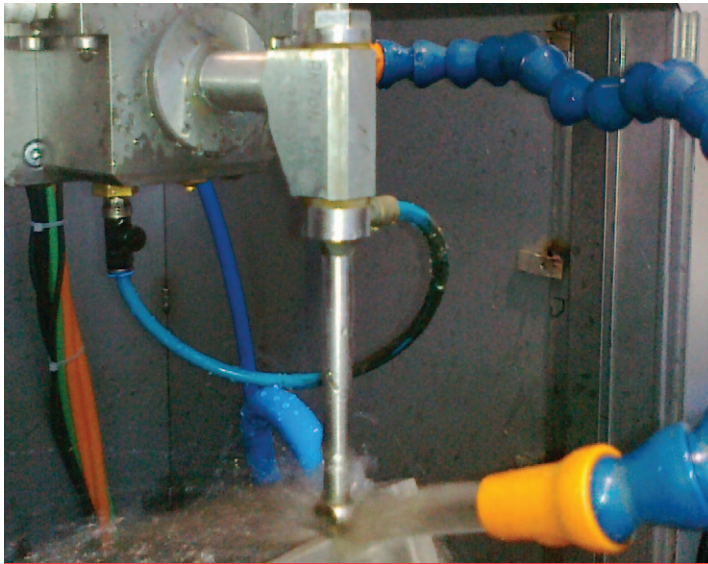




**WANNER**  
*Hydra-Cell*<sup>®</sup>  
 Seal-less Pump Technology

## Case Study

### EDM machining. Durable seal-less pump replaces rapidly wearing piston pump and enables production consistency

Rapid wear of a triplex piston pump delivering machining coolant was disrupting the prototyping of EDM drilling machinery at an engineering plant operated by Anton Kft in Hungary. Fall-off in pumping performance meant that cutting tolerances could not be held and quality of the end-product – turbine blades – was threatened.

The problem was overcome when the piston pump was replaced with a Hydra-Cell diaphragm pump – first of a number of Wanner's seal-less Hydra-Cell diaphragm pumps currently in operation at the plant.

The Special Manufacturing Division of Anton Kft is expert in the EDM and CNC machining of hard metal alloys, using customised production technology developed in-house. The plant concentrates on the manufacture of precision parts, including components for gas turbine engines.

The pump's task on the blades application is to deliver recycled water to the cutting surface during a drilling process in which deep holes are created in the turbine blades by spark erosion, using a hollow electrode as cutting tool.

In the finished product these holes act as intricate narrow-bore cooling channels. Accurate drilling during manufacture requires that the machining coolant passes through the electrode at constant high pressure, 60-80 bar, in order to penetrate to the work surface, cool it and flush out debris.



Pump code: G03EMBTHSHA

However the recycled water after filtering still contains hard, micronic metallic particles from the flushing operation. The combined effect of contaminated liquid and high operating pressure proved too much for the piston pump to handle.

Flow and pressure specifications of the pump originally installed were in line with requirement, but it was a different story in practice. This type of pump relies on mechanical seals – which makes it less than ideal for handling either abrasive solids or non-lubricating liquids, especially at high pressure.

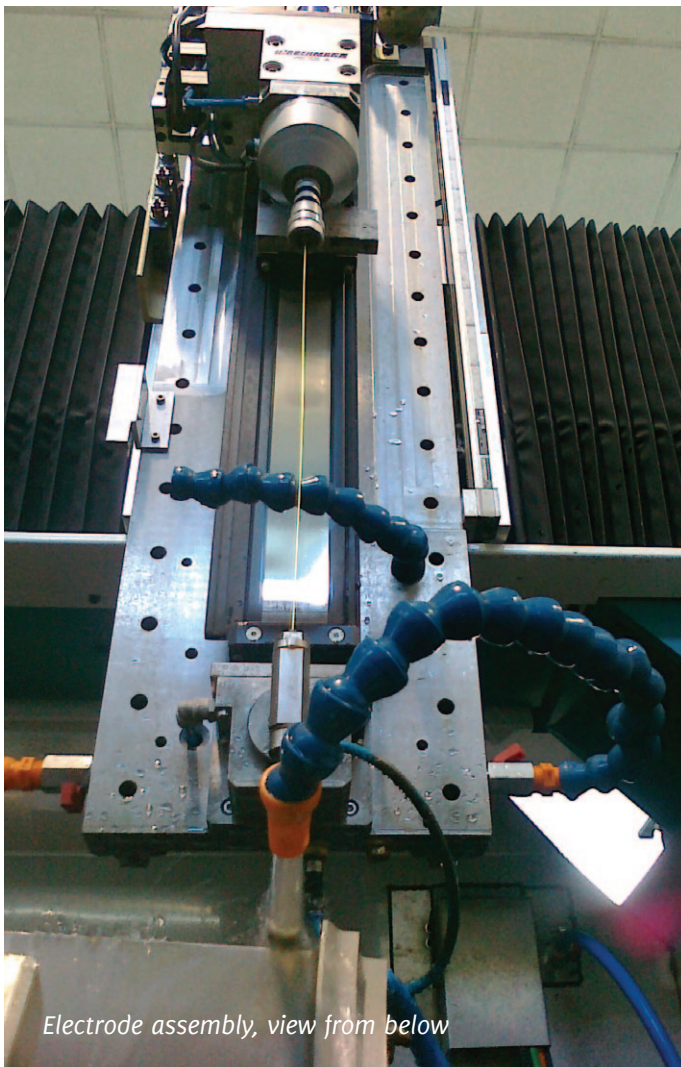
Conditions here were not in its favour. The recycled water is a thin non-lubricant, with viscosity below 5 cps. After filtration it still carries up to 5% content of abrasive.

## Customer – Anton Kft

Anton is one of the numerous Hydra-Cell customers who have appreciated the benefits of our seal-less pump technology and subsequently shared their experience with us.



*High and low-pressure pump installations*



*Electrode assembly, view from below*

Within two weeks of going into service with this harsh liquid at high pressure it was evident that the piston pump was unequal to the task. Internal pump wear meant flow/pressure performance could not be sustained or held constant. Among other effects, this would interfere with efficient removal of debris from the depths of the hole and result in inconsistent machining.

Pump specialist Verder Hungary advised that the piston pump be replaced with a Hydra-Cell diaphragm pump, featuring seal-less design and total separation of pumped liquid from the drive end of the pump. The model recommended and installed was the G03 Mono-Block – this version being preferred for its specially convenient maintenance access. It performed consistently from the outset. To control the vigorous expulsion of debris and high pressure water emerging from the depths of the hole, a low pressure external water jet is directed across its path. (photo p.1).

Following a successful test period, with no premature pump wear and with evidence of sustained system performance, the customer bought the trial pump. Further orders followed and within two years another twelve Hydra-Cell pumps were installed on production lines at the plant. No problems were reported.

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