



WANNER
Hydra-Cell[®]
 Seal-less Pump Technology

Case Study

Producing and impregnating catalytic beads in Russia

A catalyst plant in Russia, part of a large refinery, manufactures bead catalyst for use in the chemical and petrochemical industries. It is a 2-stage process. In the first stage, porous spherical glass beads are produced. In the second stage the beads are washed, processed and impregnated with catalysts - ultimately to be used as controlled-release carriers in a wide variety of catalytic operations.

Hydra-Cell seal-less pumping technology is seen throughout the plant as the preferred choice on grounds of Life Cycle Cost (including initial purchase, installation and operating costs) and also because of its versatility, flexibility and proven reliability.

In Stage 1, a slurry of 40% suspended solids in a carrier solvent is mixed with reactant to form a water glass which is allowed to fall from the mixing head into a warm bath to form the glass beads. It takes only 4 seconds from first gelling at the mixer to final bead formation in the bath, but without accurate proportioning and smooth liquid flow, the end result is not spherical glass beads but a white powder.

For this task the plant evaluated single-diaphragm pumps from two internationally-known pump manufacturers and a domestic manufacturer. Results were ultimately compared with those for 3-diaphragm Hydra-Cell P Series metering pumps.

None of the single-diaphragm pumps offered a solution giving the plant the quality and consistency of glass bead it was looking for.



Pump code: *P600MCGSSCo5H*



Pump code: *P400MPGSSBo5S*



Pump code: *P200MSGSSA10S*



Pump code: *G10XKCTCECA*

The flow rate of the locally manufactured single-piston diaphragm pump could not be controlled accurately enough, so valves were installed on the pump discharge to control the process liquid directly. Flow was still imprecise.

Evaluation of the 'global brand' single-diaphragm metering pumps was also unproductive. One was given thorough on-site trials but major limitations emerged.

The necessary addition of a pulsation dampener added extra cost and extra maintenance, while simultaneous adjustment of flow rate and pulsation dampening was difficult because the dampener had to be re-set at every flow rate change. Even the pump manufacturer's local support engineer could not do this easily. Maintenance also proved complicated and had to be carried out by the same support man.

Customer – Catalyst Plant, Russia

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



P Series pump installation



Bead mixing head

By contrast, the Hydra-Cell P400 and P600 metering pumps finally installed met all the plant's requirements – giving smooth, accurate flow, easily controllable over a wide range with no need for pulsation dampeners. The pumps operate at 5 bar, delivering respectively 400 l/hr and 1000 l/hr.

It was the only solution to give plant engineering the quality and consistency of glass bead it sought. It drastically reduced the need for human inspection required when using other pump technologies. Product quality is more consistent, productivity and yields have been greatly improved.

Stage 2 of production sees the beads washed and transported via channel baths into large processing tanks. Here, over a 2-day process they are impregnated with active catalytic material metered into the tanks as slurries.

Various Hydra-Cell models have been used for this duty – initially polypropylene-bodied G10 pumps pumping aluminium sulphite. A further order for 10 x G10 pumps followed the first successes, and a new line incorporating multiple Hydra-Cell P200 metering pumps soon followed.

Ongoing plans, according to plant forecasts, have included purchase of more P Series and G10 pumps, as well as Hydra-Cell G35 pumps (flows up to 140 l/min and pressures to 100 bar) to replace multi-stage centrifugal pumps elsewhere on the site.

WANNER
Hydra-Cell[®]
Seal-less Pump Technology

WANNER ENGINEERING - WORLD HEADQUARTERS & MANUFACTURING
Minneapolis USA
t: (612) 332-5681
e: sales@wannereng.com

WANNER ENGINEERING
Latin American Office
t: +55 (11) 3565 4001
e: sales@wannereng.com

WANNER INTERNATIONAL
Hampshire UK
t: +44 (0) 1252 816847
e: sales@wannerint.com

WANNER PUMPS
Shanghai CHINA
t: +86-21-6876 3700
e: sales@wannerpumps.com

WANNER PUMPS
Kowloon HONG KONG
t: +852 3428 6534
e: sales@wannerpumps.com

www.hydra-cell.eu