

MACHINE TOOL COOLANT

Quick STUDY

Hydra-Cell
Seal-less Pumps

www.Hydra-Cell.com

Location:	United States
Application:	Pumping coolant for cutting machines
Media:	• Sapphire dust • Coolant
Model No.:	D10 with ceramic valves and seats
Flow Rate:	2.0 - 5.5 gpm (7.6 - 20.8 l/min)
Pressure:	500 psi (34 bar)
Hydra-Cell Advantages:	• Seal-less design with total separation of pumped fluid from the hydraulic end of the pump • High-pressure capability



Coolant for Sapphire Machining

A leading US specialist in growing and machining sapphire crystals found that the centrifugal pumps fitted as original equipment on the cutting machines were unable to deliver coolant fluid at pressures needed on a process in which sapphires are machined into wafers. Nor were they able to handle fine abrasive particles carried in the coolant liquid.

Sapphire dust created in the machining process is not only very abrasive, it is very difficult to filter. Though the centralized coolant system incorporates three centrifuge filters, with two bag filters before the pump, dust particles still manage to migrate through them.

Replacing the centrifugal pumps with Hydra-Cell D10 pumps enabled the coolant systems to work at higher pressures, resulting in cleaner cutting and extended tool life. And the seal-less design of the pumps meant greatly improved resistance to wear as compared with the mechanical seal-reliant centrifugal pumps. The ceramic valves and seats in the Hydra-Cell pumps last up to 10 months before being replaced.

The first D10 pumps have now been in operation more than 3 years. Tests more recently undertaken with a Hydra-Cell H25 working at 400 rpm could prolong valve and seat life even further.

Characteristics of Fluid Pumped:

☒ Contains Abrasives ☐ Corrosive ☒ Solids in Suspension ☐ High-temp. (>158°F/70°C) ☐ Non-lubricating ☐ High-viscosity (>500 cPs)