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APPLICATION SOLUTION
MARCH 2015

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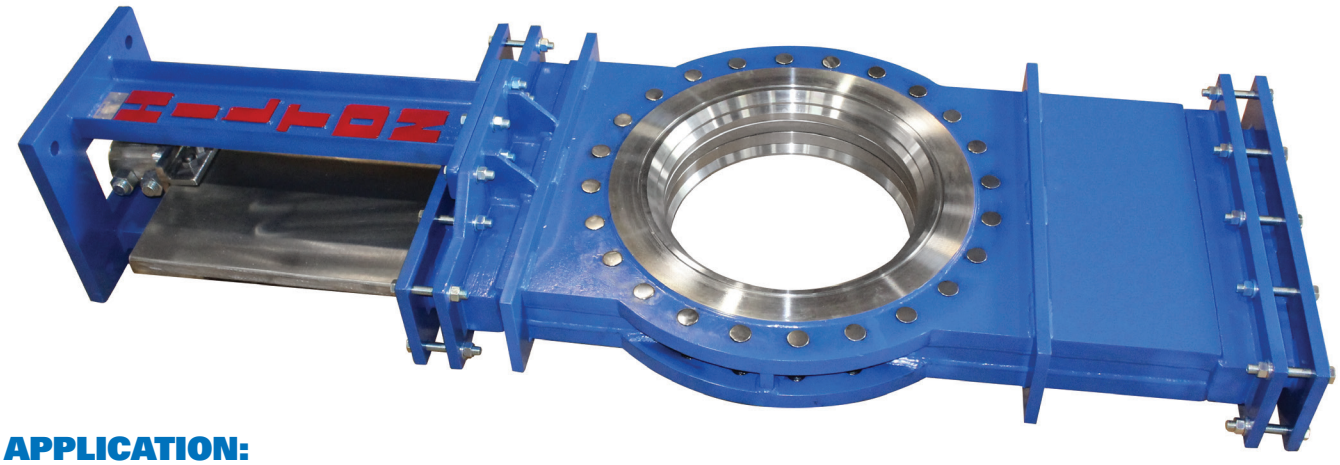
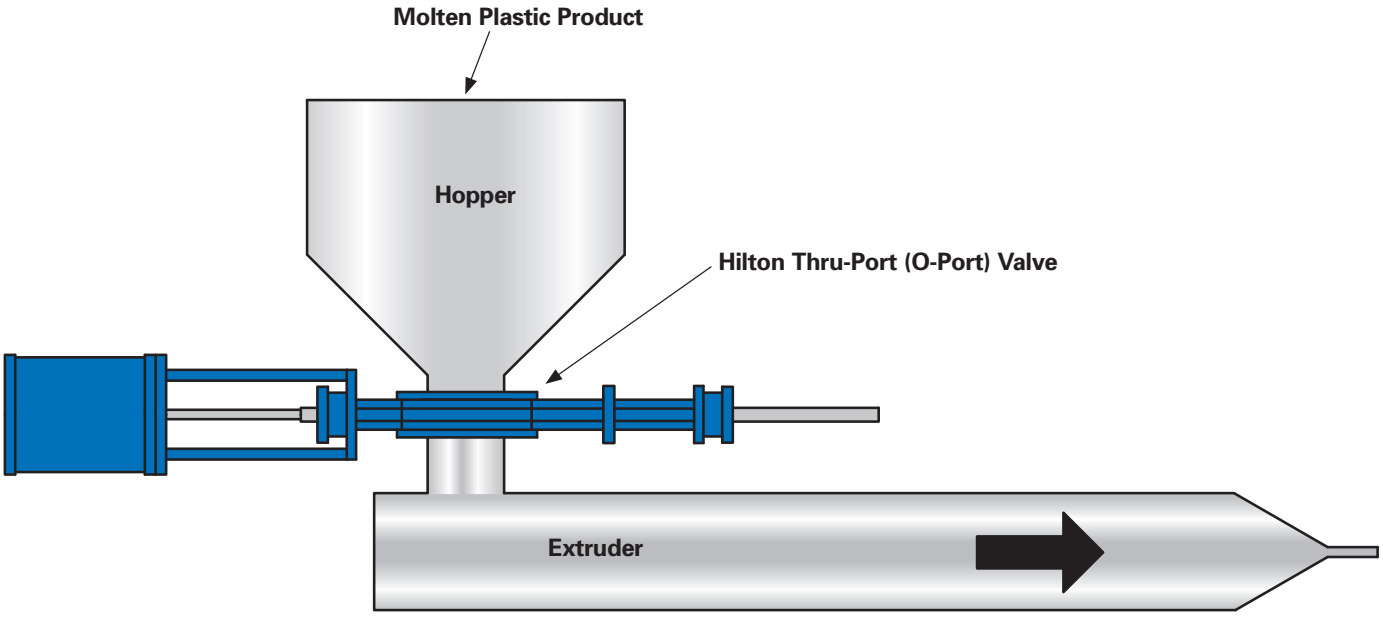
HILTON H-1502 THRU-PORT (O-PORT) VALVE IN A MOLTEN PLASTIC FEED HOPPER/EXTRUDER INSTALLATION



APPLICATION:

At a plastic extrusion mold facility, a hopper containing molten plastic feeds an extruder machine. In order to perform maintenance or repairs on the extruder, the flow of material through the bottom of the hopper must be shut off using an o-port valve. Under normal operating conditions, this o-port valve is in the open position and is only closed to isolate the hopper from extruder. Closing the o-port valve retains and preserves the molten plastic in the hopper, saving time and material by avoiding the need to drain the hopper before extruder maintenance can take place.

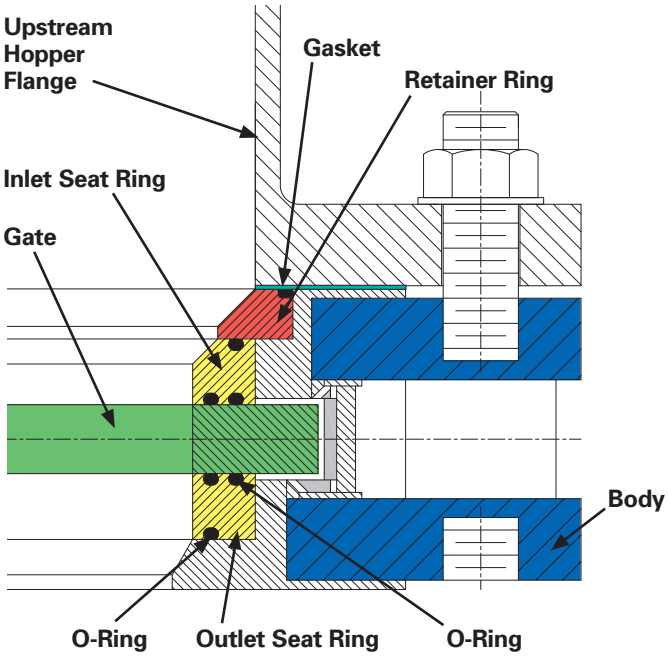


PROBLEM:

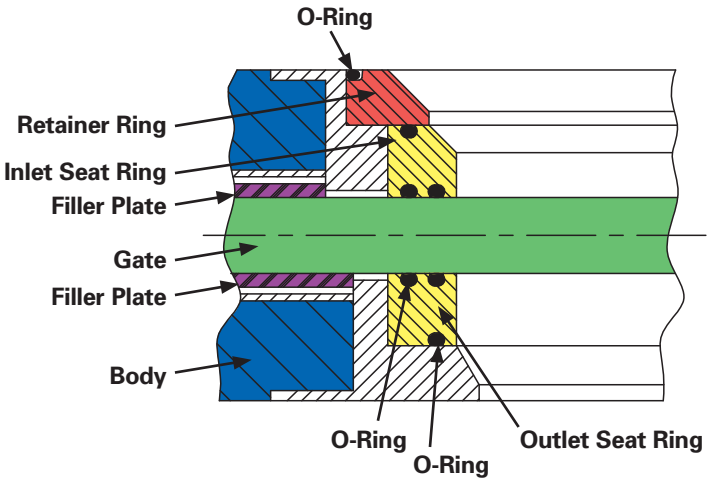
A standard o-port valve in the open position with material flowing, allows material into the body cavity of the valve. In addition, when closing the valve even more material is pushed into valve body cavity. Process material in the body cavity isn't typically a problem for an o-port valve installed on dry solids or liquid services because the material can be flushed out with purge ports. For this application, since purge ports cannot be effectively used on molten plastic, the molten plastic fills the body cavity and hardens, making the valve impossible to operate. As a result, the valve cannot be closed when needed for maintenance operations on the extruder, rendering the valve useless.

SOLUTION:

Hilton designed and built the H-1502 custom double resilient seat thru-port (o-port) valve rated to 400 degrees F for this application. The valve features Aflas® resilient seats on each side of the gate, multi-purpose non-stick PTFE filler plates in the body and 304 stainless steel wetted parts for a long service life. The resilient seats are retained by the upstream flange, which compresses the assembly creating a tight seal that prevents material from entering the body with the gate in the open or closed position. When the valve closes, some of the molten plastic is pushed by the gate and slides onto the non-stick PTFE filler plates in the body. When the valve re-opens, the plastic material slides off the non-stick PTFE filler plates and is pulled back into the line. PTFE filler plates, gate and valve body are machined to tight clearances, limiting the open spaces, which could be problematic if filled with plastic. The filler plates also provide a smooth bearing surface for the gate to ride on which will not gall or damage the gate when the valve is opened or closed.



Upstream flange compresses the retainer and seat rings against the gate.



Tight machined tolerances of gate, filler plates and body limits spaces that could fill with plastic.

Section views of valve seals showing gate, outlet seat ring, AFLAS® O-rings, inlet seat ring, and retainer ring.

SALES AND SERVICE

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