

# "Stretching" a Barrel of Oil

**It seems the oil and gas market makes headlines everyday in terms of the price of a barrel of crude oil, the availability of gasoline, the price of natural gas, etc. One thing is certain, we will continue to need large amounts of crude oil for the foreseeable future to satisfy the needs of a growing industrial capacity worldwide. Major newly industrialized countries such as China, South Korea, India virtually guarantees a growing demand for oil which will create continued worldwide shortages.**

By Fred Turco, Turco Valve Supply

Many major oil companies in the USA are now developing several techniques that essentially 'stretch' a barrel of oil. One of these is the addition or blending of Ethanol (usually a 10% cut) into gasoline for use in automobiles. One could question the merits of this but that is the subject of another article. What is a fact is that Ethanol use is becoming more and more widespread in the USA and mandates are now in place requiring Ethanol blending by certain deadline dates. Ethanol itself is a very efficient solvent/cleaning agent. Mix some Ethanol into a petroleum derivative line and many soft seals will melt away. Viton, a very common soft seal material used in pumps and valves, O-rings, pump seals, etc., when used in gasoline service will not hold up in Ethanol service. Ethanol in a pipeline will clean the pipe internals causing a great deal of debris, scale, rust, etc., to be washed downstream into meters, pumps and valves, etc.

## A possible solution

One solution that helps mitigate this problem, is to keep the Ethanol separated until the final stages of the blending operation. To do this, a valve with verifiable double isolation is highly preferred in order to keep product segregation at reliable levels.

The Array Accuseal (R) Double Block and Bleed expanding plug valve utilizes a design which uses resilient seals (Viton GF for Ethanol) on two separate seating areas. These seals are first retracted from the seats on the body before the valve turns from open to close or close to open. This is accomplished by mounting the seats (slips) on a plug shaped like a wedge. Each independent slip has dovetails machined on the backside allowing each slip to ride up/down on the wedge plug. As the wedge plug is pushed down (by rotating the hand wheel) the wedge becomes thicker and thicker forcing each slip outward thus resulting in an actual mechanical loading of each slip onto and outwards against the matching body seats; one slip against the upstream body seat, the other slip against the downstream body seat. A bleed is located within the body allowing verifiable detection of any leakage past either seat. Product segregation and verifiable isolation is thus assured. When the valve is to be opened, the above works in reverse. The plug wedge lifts this retracts the slips after this retraction the whole unit rotates 90 degrees.



Array Accuseal (R) DB&B Expanding Plug Valve ready for packing and sending out

## Results

The effect of retraction before rotation ensures the soft seals do not rub against the body seats during operation. The wedging action of the plug when the valve is closed provides a leveraged mechanical sealing directly up against the body seats. This results in drop tight verifiable sealing and long resilient seat life. This design allows the valve to achieve the high integrity sealing soft seats provide while protecting the same soft seats from damage caused by friction of valve cycling. Further, this design utilizes an actual mechanical loading on the seats from the outward push of the wedge mechanically forcing the slips outward against the body seats and perpendicular to them. The result is a long lasting soft seal high integrity, variable sealing, double block and bleed valve.

## Standard Materials of Construction

<b>Body:</b>	Cast Carbon Steel ASTM A216-WCC Electroless Nickel Plated or Stainless Overlay
<b>Bonnet/Lowerplate:</b>	Cast Carbon Steel ASTM A216-WCC
<b>Plug:</b>	Cast Carbon Steel ASTM A216-WCC Electroless Nickel Plated or Xylan
<b>Slips:</b>	Cast Ductile Iron ASTM A536-80-55-06
<b>Packing gland:</b>	ASTM A487-CA6NM or A36
<b>Packing:</b>	Flexible Graphit
<b>Studs:</b>	ASTM A193 B7
<b>Nuts:</b>	ASTM A194 2H
<b>O-rings &amp; slips seals:</b>	Viton Standard or other elastomers