

## CASE STUDY

*Large midwest oil company needed three mobile units for testing gasoline in multiple locations.*



R. A. ROSS & ASSOCIATES, INC.

## The R. A. Ross team's creative skills solve complex problem with innovative solution

### SITUATION/SOLUTION:

A large oil company requested a Blackmer pump that would be used for "proving" gasoline, ethanol, diesel and biodiesel at several of their facilities. The specifications were:

Liquids handled	Gasoline and Various Fuels
Specific Gravity	.72-.84
Temp. °F	68
GPM	289
Total Differential Head (ft)	107-125
Differential pressure (psi)	39
Suction pressure	0
Operating pump RPM	303
Maximum pump RPM	530
Efficiency of pump (%)	66.85
HP (at rating)	9.81

The Ductile Iron Blackmer X4B 4" Sliding Vane Pump with Carbon vs. Iron. Viton mechanical seals met the specifications ideally running at 57% of maximum speed (which would give them long service life). The pumps would be coupled to Blackmer 5.77 to 1 HRB helical gear reducers with a 2.24 to 1 service factor for cool running operation and long reducer life. A 15 HP motor gave them more than sufficient safety margin.

*Continued on page 2*



*Custom Blackmer trailer package built to customer requirements.*



*Custom built cart assembly (on pick up) and trailer assembly being pulled behind.*

- ▶ Our job is to help keep you up and running.
- ▶ R. A. Ross & Associates offers customers over 100 years combined experience with pumps and repairs.

## THE PROJECT SPECS:

### **Blackmer X4B Sliding Vane Pump assembly:**

- Ductile iron construction
- Duravane vanes
- Viton o-rings
- Carbon vs. Iron mechanical seals
- Standard internal relieve valve w/35-50psi spring
- 4" NPT flange connections
- HRB 5.77:1 reducer to produce approx. 303rpm w/1750rpm motor
- 15hp 3/60/230-460/1750 rpm Explosion Proof motor
- Formed steel base plate, couplings and guards

### **Trailer packing and control panel:**

- 5' x 8' 2990# capacity single axle utility trailer w/DOT approved lighting
- Tongue jack w/foot plate / tongue accepts 2" ball
- Jack on each rear corner for leveling/stability
- 12ga. Treadplate steel floor
- 2 – Wheel chock set and tool box w/lid and closure for storage
- Trailer dolly for movement of package by hand

## BUILDING:



*The treadplate steel floor gives us a solid base to start construction.*



*The pump is positioned on the trailer to keep the balance of the trailer and tongue weight as close as possible to its unloaded state.*



*Once the pump is secured to the deck, bracing and supports are added to accommodate the control panel. A tongue storage box is also added to house wheel chocks and provide additional storage.*



*Similar to the trailer packages the pump and control panel for the cart are installed to maintain maneuverability and ease of use.*



*Trailer packages and the cart packages ready for customer delivery.*



*The excess deck space around the pump leaves room for operator safety when attaching hoses to the pump and storage space for hoses to stay with the package.*

## RESULT:

Our client is very satisfied with not only our solution, but with the fact that we finished the project on time and under budget, and has ordered additional units from us.



Blackmer pumps are chosen in many cases as they are much “greener” (more energy efficient) than internal gear pumps. Blackmer vane pumps maintain their efficiency and flow even as the vanes wear where gear pumps start losing flow and energy with any wear that occurs. The chart below shows the difference:

Annual Energy Cost Savings: Sliding Vane vs. Internal gear Pumps									
Liquid Viscosity	Pump	GPM	PSI	BHP	WHP (Water)	Efficiency (Motor rated at 88%)	kW Input	Annual Power Cost	Annual Savings w/Sliding Vane Pumps
						Pump		USD	USD
Pump Sized for Stated Flow									
Thin 1 cSt	Sliding Vane	310	75	20.1	13.6	68%	17.0	\$3,828	\$552
	Internal Gear			23.0		59%	19.5	\$4,380	
Viscous 5,250 cSt	Sliding Vane	180	75	12.2	7.9	65%	10.3	\$2,323	\$1,485
	Internal Gear			20.0		39%	17.0	\$3,809	
Pump Sized for Wear Factor Allowance									
Thin 1 cSt	Sliding Vane	310	75	20.1	13.6	68%	17.0	\$3,828	\$1,333
	Internal Gear			27.1		50%	23.0	\$5,161	
Viscous 5,250 cSt	Sliding Vane	180	75	12.2	7.9	65%	10.3	\$2,323	\$1,771
	Internal Gear			21.5		37%	18.2	\$4,094	
Assumptions-8 hours operation per day, 5 days per week, 52 weeks/year Duty cycle and \$0.09 KWh. Power costs maybe adjusted via direct ratio for other electric rates or duty cycles									

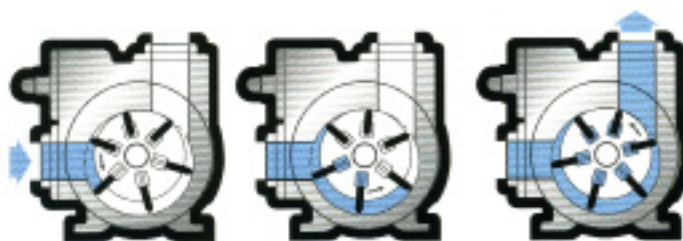
#### **Blackmer X-Sliding Vane Pump typical applications:**

Clean, non-corrosive industrial liquids and petroleum products, including fuel oils, lube oils, jet fuels, gasoline, edible oils, and a variety of solvents and thinners such as esters, ketones, naphtha's, ethers, amines, aromatics, alcohol's, terpenes, glycol's and many other similar liquids.

#### **Features and Benefits:**

- Unique sliding-vane pump design self-adjusts for wear to maintain flow rates.
- Excellent self-priming and dry run capabilities.
- Blackmer mechanical seal and ball bearing construction provide maximum reliability.
- Symmetrical bearing support assures even loading and wear for long life.
- Adjustable relief valve protects pump against excessive pressures.
- External ball bearings are isolated from pumpage by mechanical seals to maximize bearing life and minimize contamination risk.
- Easy maintenance: vanes can be easily replaced without removing the pump from the piping system.

Blackmer's positive displacement rotary pumps utilizing their unique sliding vane design offers the best combined characteristics of sustained high level performance, energy efficiency, trouble-free operation and low maintenance cost. Also, the high suction lift capability of these pumps makes them especially suitable for pumping from underground tanks, bulk plant service and aircraft refueling.



How Blackmer's sliding vane action works

## CASE STUDY INSIDE

*Large midwest oil company needed three mobile units for testing gasoline in multiple locations.*

# ***Specially designed and built mobile Blackmer pump solution***

### Vendors

Abel Pumps  
Amiad Filtration  
American Melt Blown Filtration  
American Marsh Pumps  
Anest Iwata Vacuum Pumps  
AquaFlow De-Watering Pumps  
ARO Pumps  
ASI Seals  
Blackmer Pumps  
Blackmer Compressors  
Blacoh Pulsation Dampeners  
Boerger Pumps  
Bray Valves  
Continental Pumps

### Continental Blowers

Dean Pumps  
Dickow Pumps  
Filterco Filtration  
Filter Technology Filtration  
Finish Thompson Pumps  
Grindex Pumps  
Graver Filtration  
HydroThermal Heat Exchangers  
Kinney Pumps  
Lobee Pumps  
MDM Pumps  
Neptune Pumps  
Neptune Mixers  
Pentair Filtration

### PolyProcessing Tanks

Republic Blowers  
Rosedale Filtration  
Sparks Filtration  
Stoddard Silencers  
Tarby Pumps  
Tuthill Blowers  
U.F. Strainrite Filtration  
Vanton Pumps  
Vertiflo Pumps  
Weir/Wemco/Rotojet Pumps

## CONTACT US

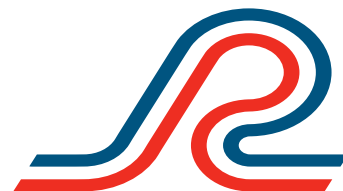
We enjoy solving problems like the case study above.  
Call us and put our team to work today on solving any  
processing problems you have.

- ▶ Pumps
- ▶ Blowers
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- ▶ Mixers
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- ▶ Vacuum Pumps
- ▶ Mechanical Seals
- ▶ Heat Exchangers
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**R. A. ROSS & ASSOCIATES, INC.**

2231-A Ampere Drive, Louisville, KY 40299



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*Keeping process flowing since 1985*

R. A. Ross & Associates, Inc.  
Headquarters  
2231 Ampere Drive  
Louisville, KY 40299

502 267-8677  
Fax 502 266-7928  
1 800-489-8677  
solutions@raross.com  
www.raross.com