

# Centrifugal Separator Filtration For Cooking Oil Systems

Extended operating cycles between downtime/maintenance, while reducing heat exchanger fouling

**CSX**  
Separators

Exclusive and patented technology continuously removes crumbs and fines from cooking oil to extend oil life and sustain higher product quality. LAKOS CSX Series Separators employ centrifugal action to remove unwanted particle matter from pumped/recirculated cooking oil, concentrating the particulate for easy solids removal. Collection vessels also available from LAKOS.

## Benefits of Using CSX Centrifugal Separators

- Full flow filtration of the entire cooking oil reservoir or system.
- Operates in a pressurized, non-oxygenated environment.
- Longer operating cycles between downtime/maintenance.
- Reduced heat exchanger fouling & sustained heat transfer capacity.
- Optimum/consistent cooking oil velocities and the elimination of dead spots within the fryer by the prevention of crumbs and fines accumulation.
- Maximum cooking oil quality, including improved oil appearance and a lighter oil flavor.
- Removing crumbs and fines lowers the rate in which they affect free fatty acids.

***For complete, turnkey systems, refer to literature LS-732 for FrySafe Systems.***



Flow range:  
50 - 6125 US gpm (11 - 1390 m<sup>3</sup>/hr)  
Maximum standard pressure rating:  
100 psi (6.8 bar)

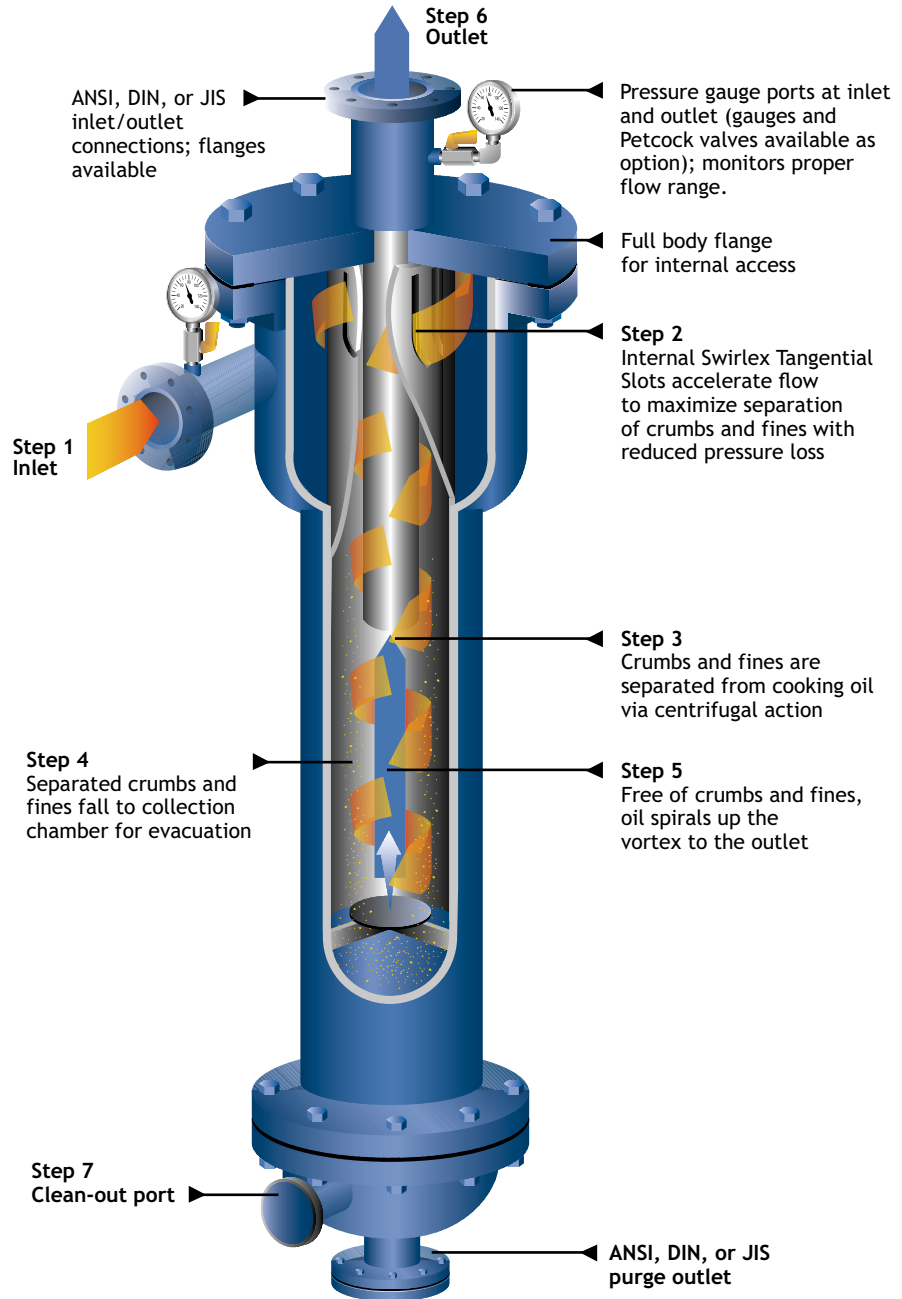


*LAKOS also provides complete packaged solutions for maximum efficiency and safety. See literature LS-732 for FrySafe Systems. Consult factory for options.*

## How It Works

### Other Key Features

- ▶ No moving parts to wear out
- ▶ Low and steady pressure loss, independent of separated crumbs and fines accumulation
- ▶ Compact, space saving profile
- ▶ Minimal oil loss
- ▶ Effective crumbs and fines concentration for easy collection
- ▶ Stainless steel (other materials available on request) construction & high temperature componentry
- ▶ Pressure rated to 100 psi (6.8 bar); higher pressures also available
- ▶ Flanged, inlet, outlet and purge connections
- ▶ Full internal accessibility for cleaning/serviceability
- ▶ CSX Separators are available as complete packaged systems. See LAKOS FrySafe System literature LS-732 for more information.



### Standard Equipment

- Centrifugal Separator

### Optional Accessories

- Collection Vessel
- Pressure Gauge
- Petcock Valve
- Flange Options
- For a complete system solution, refer to the FrySafe System in LS-732.

## Model Specifications

| Model    | Flow Range (Cooking Oil Only) |                    | Inlet/Outlet Size<br>*ANSI Flange | Inside Oil Capacity |        | Dry Weight |      |
|----------|-------------------------------|--------------------|-----------------------------------|---------------------|--------|------------|------|
|          | U.S. gpm                      | m <sup>3</sup> /hr |                                   | U.S. gal.           | liters | lbs        | kg   |
| CSX-0050 | 50-80                         | 12-18              | 1-1/2-inch                        | 2.7                 | 10.2   | 148        | 67   |
| CSX-0075 | 75-125                        | 17-29              | 2-inch                            | 6.0                 | 22.7   | 226        | 103  |
| CSX-0110 | 110-180                       | 25-40              | 2-1/2-inch                        | 7.7                 | 29.2   | 245        | 111  |
| CSX-0165 | 165-280                       | 38-65              | 3-inch                            | 8.0                 | 30.3   | 274        | 124  |
| CSX-0250 | 250-400                       | 57-90              | 4-inch                            | 16.7                | 63.2   | 490        | 222  |
| CSX-0360 | 360-670                       | 82-152             | 4-inch                            | 21.5                | 81.4   | 498        | 226  |
| CSX-0565 | 565-1030                      | 130-235            | 6-inch                            | 34.0                | 128.7  | 498        | 226  |
| CSX-0815 | 815-1500                      | 185-340            | 6-inch                            | 54.0                | 204.4  | 801        | 363  |
| CSX-1450 | 1450-2700                     | 330-615            | 8-inch                            | 107.0               | 405.0  | 816        | 370  |
| CSX-2300 | 2300-4250                     | 525-965            | 10-inch                           | 146.0               | 552.6  | 1305       | 592  |
| CSX-3300 | 3300-6125                     | 750-1390           | 12-inch                           | 217.0               | 820.0  | 2389       | 1084 |

Material construction: Available in carbon steel and 304L or 316L stainless steel. Electro-polishing of interior/exterior also available.

\*Connections: Inlet, outlet and purge are each standard ANSI, DIN, JIS flanges. DIN and JIS dimensions are slightly different than those shown. Contact LAKOS for more information. Sanitary connections also available. Purge may also be specified as NPT male.

Optional legs can be provided

Standard Temperature Rating: 400° F (204° C)

Standard Pressure Rating: 100 psi (6.8 bar)

Max Particle Size: 3/8" (9.5 mm)

**NOTE:** Certain caustic washing may degrade the integrity of carbon steel tanks, pumps, and centrifugal separators. We recommend only stainless steel products in these applications.



CSX-0050 HV



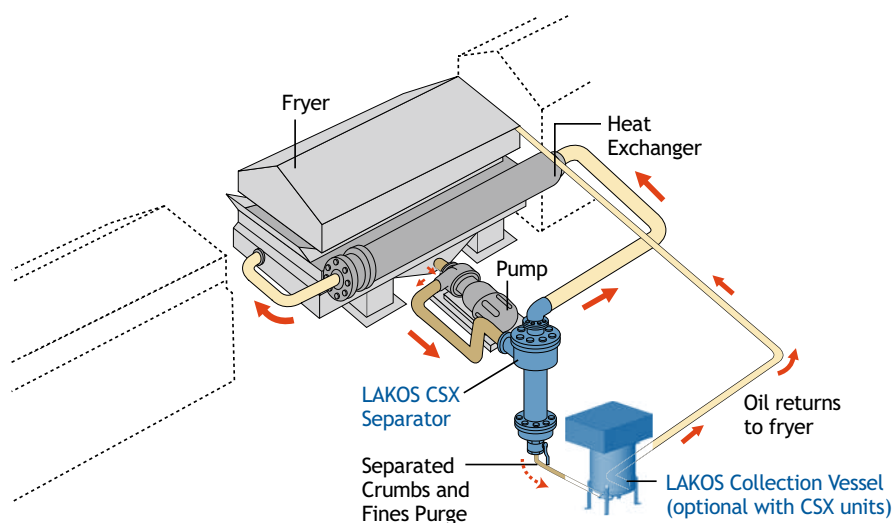
CSX-1450HL

## Typical Application Diagram

### Crumbs and Fines Collection Option

The continuous purging of crumbs and fines into a specialized collection vessel concentrates the solids for easy handling, returning all cooking oil to the process.

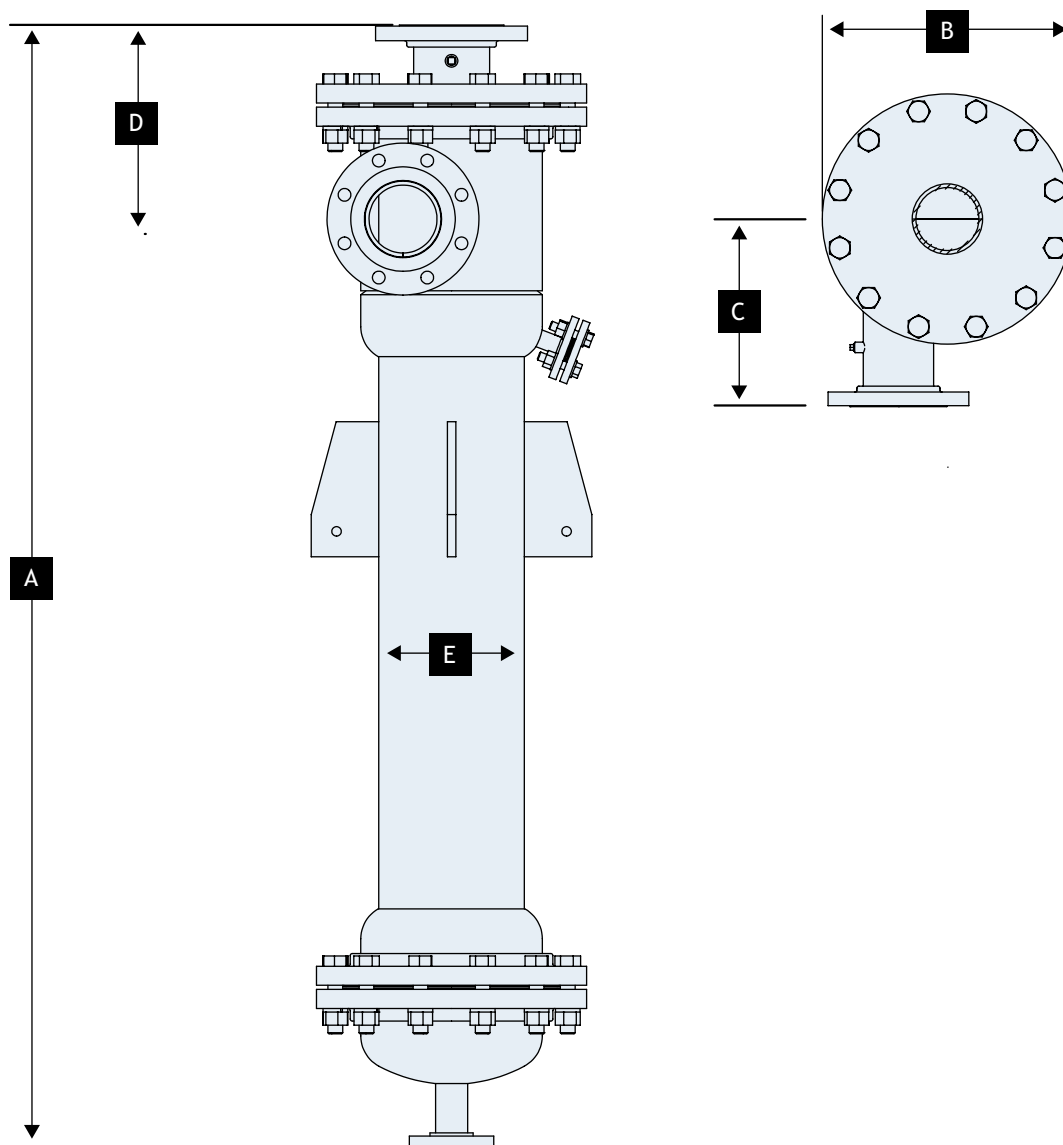
\*A bypass line may need to be added to prevent clogging.



Collection Vessel  
(optional equipment)



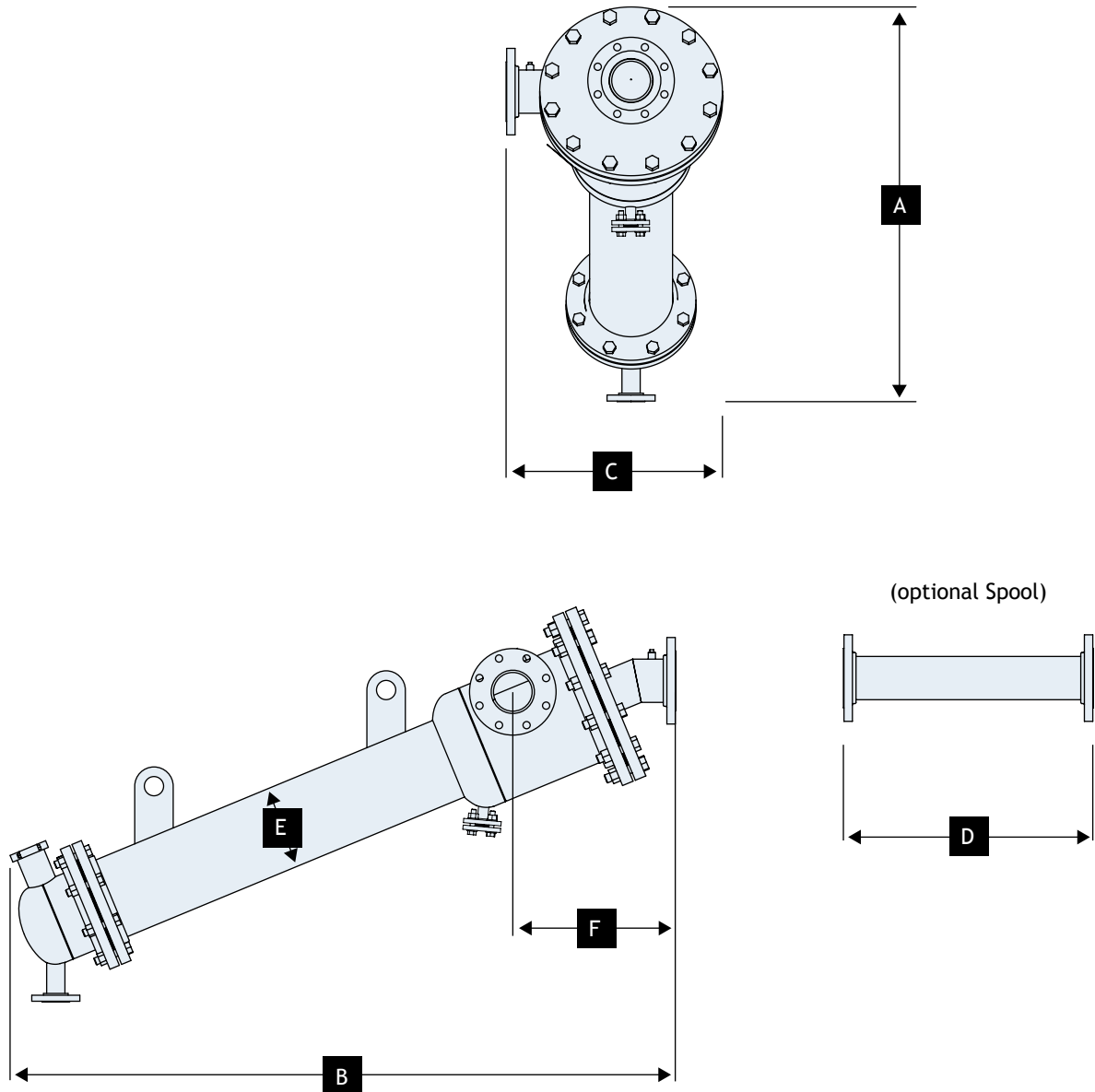
## Vertical Profile HV



## Dimensions

| Model       | A        |      | B      |     | C      |     | D        |     | E      |     |
|-------------|----------|------|--------|-----|--------|-----|----------|-----|--------|-----|
|             | in       | mm   | in     | mm  | in     | mm  | in       | mm  | in     | mm  |
| CSX-0050-HV | 34 13/16 | 884  | 11     | 279 | 8 1/2  | 216 | 8        | 203 | 4      | 102 |
| CSX-0075-HV | 47 1/4   | 1200 | 13 1/2 | 343 | 9 1/2  | 241 | 10 3/4   | 273 | 5 9/16 | 141 |
| CSX-0110-HV | 51       | 1295 | 13 1/2 | 343 | 9 1/2  | 241 | 9        | 229 | 6 5/8  | 168 |
| CSX-0165-HV | 54 1/16  | 1373 | 13 1/2 | 343 | 10     | 254 | 10 3/4   | 273 | 6 5/8  | 168 |
| CSX-0250-HV | 66 1/2   | 1689 | 16     | 406 | 11 1/2 | 292 | 11 1/2   | 292 | 8 5/8  | 219 |
| CSX-0360-HV | 75 3/8   | 1915 | 19     | 483 | 13     | 330 | 14 3/4   | 375 | 8 5/8  | 219 |
| CSX-0565-HV | 94 3/8   | 2397 | 21     | 533 | 14 1/2 | 368 | 14 5/16  | 364 | 10 3/4 | 273 |
| CSX-0815-HV | 105 5/8  | 2683 | 23 1/2 | 597 | 15 1/2 | 394 | 16 11/16 | 424 | 12 3/4 | 324 |
| CSX-1450-HV | 125 5/8  | 3191 | 27 1/2 | 699 | 17 1/2 | 445 | 20 5/16  | 516 | 16     | 406 |
| CSX-2300-HV | 137 5/16 | 3488 | 32     | 813 | 18 1/2 | 470 | 25 1/8   | 638 | 18     | 457 |

## Horizontal Profile HL



## Dimensions

| Model       | A       |      | B        |      | C      |     | D  |     | E      |     | F       |     |
|-------------|---------|------|----------|------|--------|-----|----|-----|--------|-----|---------|-----|
|             | in      | mm   | in       | mm   | in     | mm  | in | mm  | in     | mm  | in      | mm  |
| CSX-0360-HL | 41      | 1041 | 69 1/4   | 1759 | 22 1/2 | 572 | 26 | 660 | 8 5/8  | 219 | 17      | 432 |
| CSX-0565-HL | 50      | 1270 | 86 1/2   | 2197 | 25     | 635 | 28 | 711 | 10 3/4 | 273 | 16 9/16 | 421 |
| CSX-0815-HL | 56 5/16 | 1430 | 97 5/16  | 2472 | 27 1/4 | 692 | 28 | 711 | 12 3/4 | 324 | 19 1/8  | 486 |
| CSX-1450-HL | 66 3/4  | 1695 | 119 1/16 | 3024 | 31 1/4 | 794 | 36 | 914 | 16     | 406 | 26 3/8  | 670 |
| CSX-2300-HL | 74 1/8  | 1883 | 130 1/4  | 3308 | 34 1/2 | 876 | 38 | 965 | 18     | 457 | 31 3/4  | 806 |

## Testimonials

### Limited Warranty

All products manufactured and marketed by this corporation are warranted to be free of defects in material or workmanship for a period of at least one year from date of delivery. Extended warranty coverage applies as follows:

All LAKOS Separators: Five year warranty

All other components: 12 months from date of installation; if installed 6 months or more after ship date, warranty shall be a maximum of 18 months from ship date.

If a fault develops, notify us, giving a complete description of the alleged malfunction. Include the model number(s), date of delivery and operating conditions of subject product(s). We will subsequently review this information and, at our option, supply you with either servicing data or shipping instruction and returned materials authorization. Upon prepaid receipt of subject product(s) at the instructed destination, we will then either repair or replace such product(s), at our option, and if determined to be a warranted defect, we will perform such necessary product repairs or replace such product(s) at our expense.

This limited warranty does not cover any products, damages or injuries resulting from misuse, neglect, normal expected wear, chemically-caused corrosion, improper installation or operation contrary to factory recommendation. Nor does it cover equipment that has been modified, tampered with or altered without authorization.

No other extended liabilities are stated or implied and this warranty in no event covers incidental or consequential damages, injuries or costs resulting from any such defective product(s).

Lakos Separators are manufactured and sold under one or more of the following U.S. Patents:

5,320,747; 5,338,341; 5,368,735; 5,425,876; 5,571,416; 5,578,203; 5,622,545; 5,653,874; 5,894,995; 6,090,276; 6,143,175; 6,167,960; 6,202,543; 7,000,782; 7,032,760 and corresponding foreign patents, other U.S. and foreign patents pending.



Top: LAKOS CSX-1450L-S4 (In a FrySafe configuration)

Bottom left: Baskets inside the collection vessel

Bottom right: Purge System showing collection vessels and valves.

Backer's Chip Plant in Fulton, Missouri has two large fry lines to cook potato chips. A LAKOS complete stainless steel FrySafe CSX System was installed full stream to remove crumbs, fines and chip pieces before they reach the heat exchanger. As the CSX separator removes solids from the cooking oil, the solids are purged to one of two LAKOS Collection Vessels that can be isolated and allowed to cool before the solids-filled wire mesh baskets are removed and cleaned.

Mike Reeves, Operations Manager at Backers Chips, says they love the unit. *"The system is working great. It is virtually maintenance free. Just dump and clean the baskets and the unit continues working the whole time. It made us realize how bad the old system we had was. The LAKOS FrySafe system not only eliminates a serious hazard, it increases the length of time the oil can be used, maintaining better control of the free fatty acids, and an overall better quality product."* For more information about this installation refer to Case Study AB-217.



CSX-050 HV

One of the largest privately owned snack food vendors in the United States uses a LAKOS CSX-050 HV to ensure the highest quality of potato chip production.

*Name withheld upon request – they consider LAKOS a huge competitive advantage.*



### Return On Investment Example:

Using a LAKOS Separator as an effective filtration method for cooking oil can pay for itself in cost savings in a very short amount of time. A chip processing plant in Ecuador determined that they could extend the effective life of their cooking oil by 50% by using a LAKOS – a savings of over \$85,000 in oil alone per year. Read more about it in Case Study AB-227.